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Environmental and Social
Impact Assessment (ESIA)
for

10th of Ramadan GIS Substation
and its interconnecting
Overhead Transmission lines

Final

October 2019

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**Environmental and Social Impact Assessment (ESIA) for
10th of Ramadan GIS Substation and its interconnecting Overhead
Transmission Lines**

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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

Technical Executive Summary

I. Project Background

Egypt is witnessing a rapid expansion in urbanization and population, paralleled with a surge in demand for electricity. The rate of electricity coverage in 2009 was approximately 99.6 percent; according to International Energy Agency (IEA). This rate is among the highest rates in Africa with 100 percent connection rates at urban areas and 99.3 percent at rural areas. However, with the growing population, it is expected that the demand for energy will rise over the coming years. It is calculated that the demand for energy has risen by 30% from 2007 to 2012; from 19,738 MW to 25,705 MW. Moreover, the number of the customers has increased from 23.8 million to 28.1 million during the same period. The total transformers capacity reached 99.6 thousands MVA in middle of 2014 compared to 95.9 thousand MVA during 2013 with a percentage rate 3.9%.

In order to meet the forecasted demand on electricity, secure electrical stability and to meet the commitment of supplying electricity to slum areas and informal buildings (based on the approval of the Cabinet (2005) and the Council of Governors approval (2005)), the EETC together with the distribution companies need to provide additional substations(SSs) and their interconnections lines/cables. The European Investment Bank (EIB) is funding the construction of several substations and interconnecting lines in cooperation with the EETC.

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

In line with EIB environmental and social standards, EETC is committed to carrying out an Environmental and Social Impact Assessment (ESIA) for construction of 10th of Ramadan substation and its interconnecting Over Head Transmission Lines (OHTLs), and a Resettlement Action Plan (RAP) which should trigger the Egyptian legislations and/or EIB Environmental and Social Standards instruments relevant to resettlement. Prior to producing a RAP and given that the design route of the OHTLs has not yet been finalized, a Resettlement Policy Framework (RPF) has been produced. The RPF will eventually evolve into a precise and specific RAP. The ESIA, the RPF and the RAP represent the components of a consolidated document, which have been produced except the RAP, and will be approved in stages.

EcoConServ environmental services has been contracted to carry out the ESIA study, the RPF and the RAP for this project. Also in accordance with national legislations as well as EIB standards; which aims to investigate the potential impact of the project activities on the environmental parameters and the project-affected persons (PAPs) and communities' livelihood in the project's area. In addition, the management and monitoring plan, including the mitigation measures during construction, operation and maintenance phases are described within the ESIA report.

II. The ESIA 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.

The RPF Methodology

The RPF has been prepared by conducting several field visits and consultation activities with concerned Governmental departments, Potential affected persons PAPs, neighboring communities and EETC. The preparation of the RPF is also based on the experience of previous experience in other similar projects. The discussion with the concerned bodies included information about the Egyptian Laws, views on the application methods and timing of execution. Moreover, the consultant depend on desktop review of various data sources.

The RAP Methodology

Preparation of a RAP for the entire line including complete census, identification and valuation of affected assets in the 50-meter right of way (RoW) determined by the coordinates presented in the Detailed Line Route 2017 for 500 kV and 220 kV (Annex 2)and publication of the cut-off date. The RAP should be a full and detailed planning report in compliance with the latest applicable Egyptian regulations regarding resettlement and the principles and objectives of the “EIB environmental and Social Practices handbook, 2013”¹, World Bank OP4.12 and the standards of IFC, particularly the book 5 on the preparation of a resettlement action plan RAP report.² The RAP should take all the relevant data from the ESIA and RPF.

All man-made structures such as roads, buildings, drainages, culverts, bridges located within the Right of Way (ROW) shall be 50 meters (divided into 25 meters each from the center of the transmission lines). Also all potential sensitive natural habitat, natural features will be captured such as rivers, creeks, canals, etc. as well as all terrain conditions and vegetation types. At surface crossings, such as roads, creeks and so on, the survey shall be conducted in such a manner as to determine the crossing width, elevation, direction and the name of the crossing. For above ground crossings such as power and high-tension lines, their elevation, type, direction of crossing shall be determined. Appropriate consideration will be given to vulnerable social groups, such as women, children, the elderly, poor and ethnic minorities, all of whom are susceptible to environmental and social impacts, and who may have little access to the decision-making process within society. Disclosure of information was conducted at an early stage and the outcomes of public consultations activities will be incorporated into the contents of the ESIA. In order to achieve this, the Consultant carried out stakeholder engagement activities through one phase in August 2017 by applying the following methods: Focus Group Discussions (FGDs) with community members and surrounding farming-related stakeholders, Group Meetings and Semi-Structured Interviews with community stakeholders.

III.Legislative and Regulatory Frameworks

Egyptian Laws, Regulations and Policies

- 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 and Social practices Handbook – 2013 EIB

¹ http://www.eib.org/attachments/strategies/environmental_and_social_practices_handbook_en.pdf

² <http://documents.worldbank.org/curated/en/206671468782373680/pdf/301180v110PAPE1ettlement0sourcebook.pdf>
https://www.ifc.org/wps/wcm/connect/322d9d80488559f584b4d66a6515bb18/OD430_InvoluntaryResettlement.pdf

- EIA Directive 85/337/EEC, amended by Directives 97/11/EC and 2003/35/EC for EIA requirement
- Environmental and social standards overview, EIB 07/2014
- IFC book 5, handbook for preparing a resettlement action plan
- EU Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora
- EU Directive 2009/147/EC on the conservation of wild birds

IV. Project Objectives

The construction of 10th of Ramadan 500 GIS Substation 500/220 kV (2x750 MVA +future transmitter) and its overhead transmission lines interconnection (500kV and 220 networks) will improve power capacity at Canal Zone Area with minimum losses of transferred power. The project aims to fulfill the following five main objectives:

- Evacuate the generated power from Banha and Ismailia Power plant,
- Improve the voltage level and system stability in Canal Zone area, and
- Reinforce the 500kV and 220kV national electricity network.

Those objectives are in accordance to the EEHC and its affiliated companies' mission toward the society: to provides continuous and safe supply of electricity to all type of consumers. In addition, as the EEHC and its affiliated companies' long-term goals, all the implementation of their project is in accordance with international performance standards and taking into consideration all the environmental, social and economic determinants.

V. Project Overview

As part of the current project, the 10th of Ramadan 500 GIS Substation will be connected to the national electricity network through 500 kV and this is through:

- Construction of OHTL double circuit, quadruple connector, 10th of ramdana 500/East Banha with approximately 52 kilometer long (IN/OUT);
- Construction of OHTL double circuit, quarter connector, 10th of Ramadan 500/East Ismailia with approximately 97 kilometer (IN/OUT); and
- Empty space for future connection to 2 spare cells of 500 kV

Moreover, 10th of Ramadan 500 GIS Substation will be connected to the national electricity network through 220 kV and this is through

- Construction of OHTL double circuit, triple connector, 10th of Ramadan 500/Zezenia with approximately 12 kilometer (IN/OUT);
- Construction of OHTL double circuit, triple connector, 10th of Ramadan 500/Belbees with approximately 8 kilometer (IN/OUT); and
- improving the 66 kV network through future expansion for the construction of a new 66 kV network.

The site of the substation is located northwest of 10th of Ramadan city. It is 14,500 km away from 10th of Ramadan residential area, and about 500 meters from Belbees – 10th of Ramadan road.

The site of the proposed substation at 10th Ramadan 500 GIS will be constructed in arid area with no vegetation cover; the proposed substation has a square shape with area of approximately 0.25km² as determined in the following coordinates:

Proposed 10th of Ramadan 500 GIS SS coordinates

UTM Coordinates		
P1	30°20' 12.343"N	31°37' 53.885"E
P2	30°20' 24.458"N	31°37' 41.406"E
P3	30°20' 13.67"N	31°37' 27.428"E
P4	30°20' 1.545 "N	31°37' 39.877"E

The proposed location of substation can be described as desert land with scare vegetation and unoccupied, far from any sensitive receptors. There is not existing buildings or structures over the land and the land is relatively flat thus does not require much of land preparation activities. There are no sensitive receptors to the project activities due to the large spatial range of the proposed project location.

The project land is located in the area allocated for facilities and services in the strategic planning of West area of 10th of Ramadan City. The area is devoid of facilities excluding the new water station, which is adjacent to the project site from the north and about 50 meters away from it. There is an agricultural area adjacent to the project site from East and North. The nearest residential block to the project site is located in the East and it is about 5 km away from the project site, the area represents youth housing area and land zoning of “Build your Own Home” project.

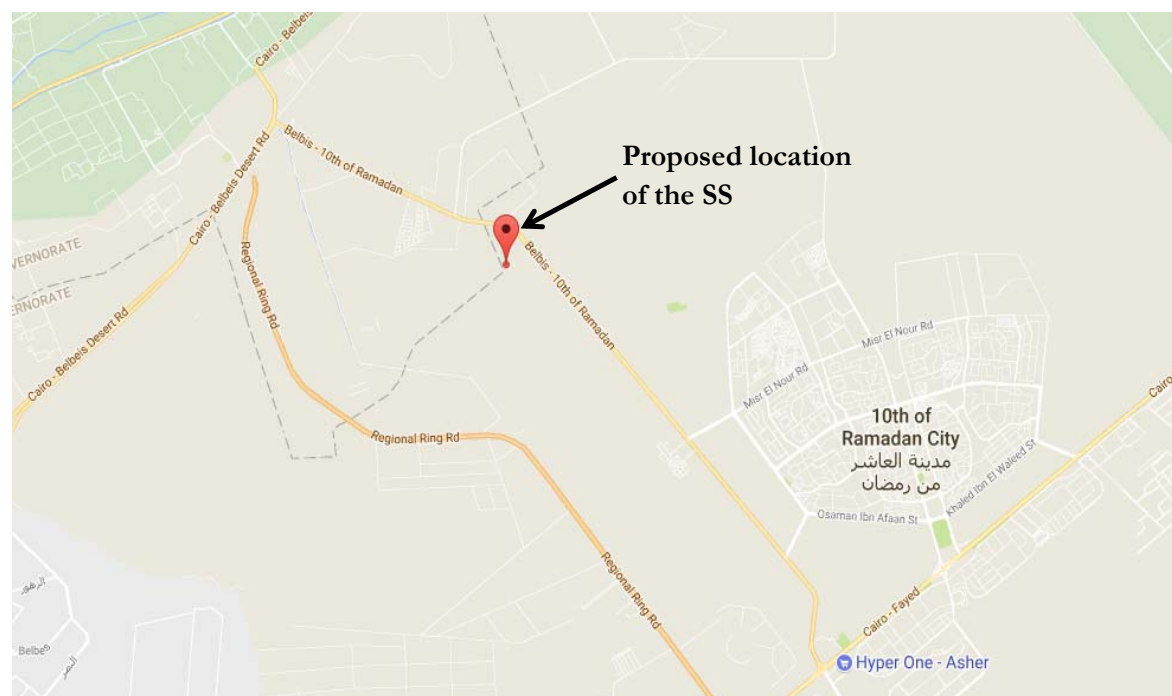


Figure 0-1: proposed location of 10th Ramadan SS

Overhead Transmission lines

Design of the Overhead transmission towers will vary in terms of Height, foundations, usage (suspension, tension, and crossing towers). The heights of suspension towers and tension angle terminal towers will range from 42 m to 47 m, while the crossing towers height will be 197 m (according to coordination between EETC and Suez Canal Authority) . It is anticipated that distance between transmission towers is approximately 400 m.

500kV OHTL 10th Ramadan SS /East Banha

The OHTL from 10th Ramadan SS to East banha is about 52 km. It originates from banha power station in Qalyubia Governorate on agricultural plots varies between crops and trees with approximately distance 53 km , crosses Zazazik-Banha Road heading to Ismailia- Cairo road to cross Belbees- 10th Ramadan Road to reach 10th Ramadan SS in Sharqiyah Governorate.

According to the site visits the OHTL will pass by several agriculture lands and the towers will be constructed on these lands. The ROW along the overhead lines may require cut off some crops or tall trees. Accordingly, a resettlement action plan (RAP) will be prepared with full detailed about the types of these crops and the acquired compensations.

The agricultural areas of the transmission line route is approximately 96% of the total length of the line, while the remaining 10% lies on unoccupied desert lands.

The final coordinates for the line's route will be produced in due course, subject to the final design of the lines. The current coordinates presented are indicative. The exact and final route will be presented in the RAP to be produced in due course. Annex 2 presents the indicative detailed route coordinates for 500 Kv of 10th Ramadan SS /East Banha.

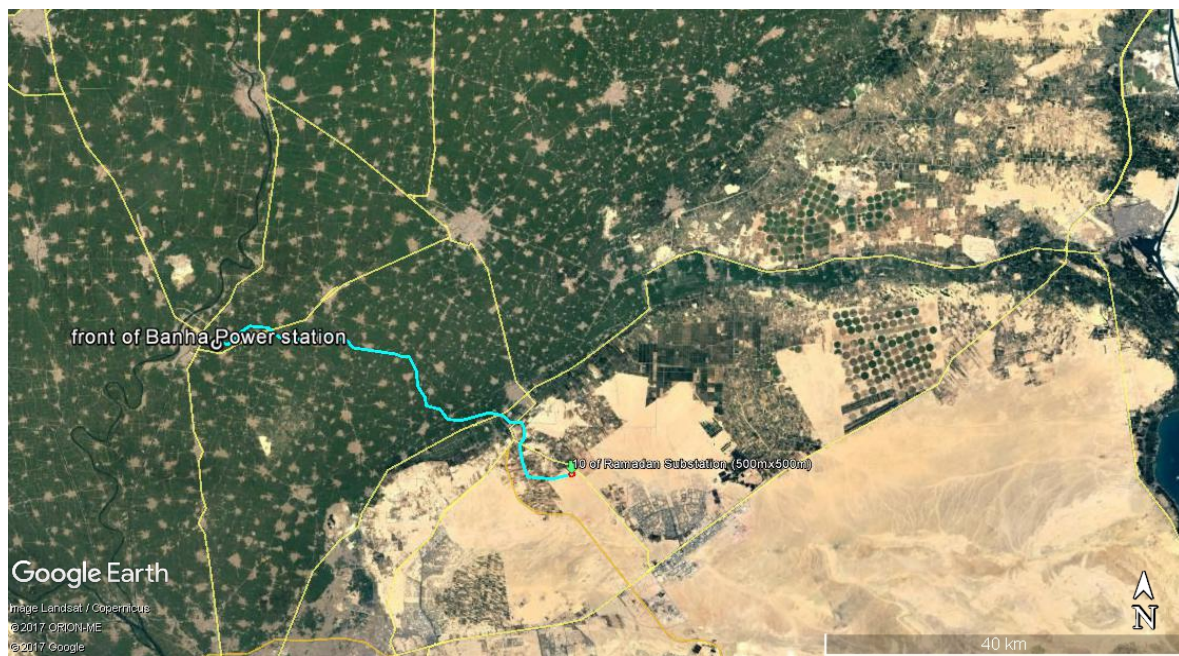


Figure 0-2 Route of 500kV from 10th Ramadan SS to East Banha power plant



Figure 0-3 The agricultural plots where the route will pass through

500 kV OHTL 10th Ramadan SS /East Ismailia

The OHTL from/to Ismailia power plant, originates from Ismailia power plant, runs parallel to Ras Sedr road-Al Qantara Shark road on agricultural lands, then the line crosses port said-Suez canal road and continues its path on agricultural lands, after that, the line crosses Hurghada –Ismailia road heading to Cairo –Fayed road and runs parallel to Cairo –Fayed road on uninhabited, uncultivated state-owned desert lands to cross Cairo-Ismailia road and passes through agricultural plots, then passes along the borders of 10th of Ramadan city on the road reserve to reach 10th Ramadan SS.

A coordination will take place between the Electricity District and 10th of Ramadan City, in order to allocate areas to install the electric towers away from the residential areas.

The OHTL route is of 97 km distance, about 37 km of the line route passes through agricultural lands varies between crops and trees, 1.5 km crosses port said-Suez canal road, 20.5 km of the line passes along the borders of 10th of Ramadan city. The remaining passes through uninhibited, uncultivated state-owned desert lands.

For the 37 km of the line route which will passes through agricultural lands, it may require cut off some crops or tall trees. Accordingly, a resettlement action plan (RAP) will be prepared with full detailed about the types of these crops and the acquired compensations.

The final coordinates for the line's route will be produced in due course, subject to the final design of the lines. The current coordinates presented are indicative. The exact and final route will be presented in the RAP to be produced in due course. Annex 2 presents the detailed route coordinates for 500 kV of 10th Ramadan SS /East Ismailia.



Figure 0-4 Route of 500kV from 10th Ramadan SS to East Ismailia power plant



Figure 0-5: The agricultural plots where the route will pass through

220 kV OHTL 10th Ramadan SS /Proposed Belbees SS

The OHTL from 10th Ramadan SS to the proposed Belbees SS originates 1 km far from 10th Ramadan SS running parallel to a branch from a drainage canal for 1 km then through agriculture lands varies between crops and trees for approximately 3.5 km then crossing the drainage canal to be running parallel to Regional ring road. The OHTL continues in agriculture lands for 3.5 km heading to the proposed location of Belbees SS. The OHTL is with estimate 8 km long.

According to site visits, the OHTL will pass by several agriculture lands and the towers will be constructed on these lands. Construction the towers may require cut off some crops or tall trees if exist on these lands. Accordingly, a resettlement action plan (RAP) will be prepared with full detailed about the types of these crops and the acquired compensations.

The agricultural areas of the transmission line route is approximately 88% of the total length of the line, while the remaining 12% lies on unoccupied desert lands.

Annex 2 presents the detailed route coordinates for 220 kV OHTL 10th Ramadan SS /Proposed Belbees SS



Figure 0-6 Route of 200 kV from 10th Ramadan SS to proposed Belbees SS



Figure 0-7: The agricultural plots where the route will pass through

220 kV OHTL 10th Ramadan SS /Zezenia

The OHTL 10th Ramadan /Zezenia originates from a distance of 0.25 km from 10th of Ramadan SS running parallel to Belbees- 10th Ramadan desert road for a distance of estimate 12 km passing by 10th of Ramadan power plant. The OHTL route runs in desert land and parallel to the main road, therefore no land acquisition is required for this line. The following table shows the coordinates of the route.

Table 0-1 10th Ramadan SS/ Zezinia OHTL coordinates

Point number	Latitude (North)	Longitude (East)
1	30 20 14.05	31 38 01.89
2	30 18 31.58	31 39 44.67
3	30 17 48.29	31 40 28.64
4	30 17 44.00	31 40 40.39
5	30 17 22.09	31 41 0.08
6	30 16 08.86	31 42 15.53
7	30 15 56.35	31 42 26.35
8	30 15 42.73	31 42 46.98

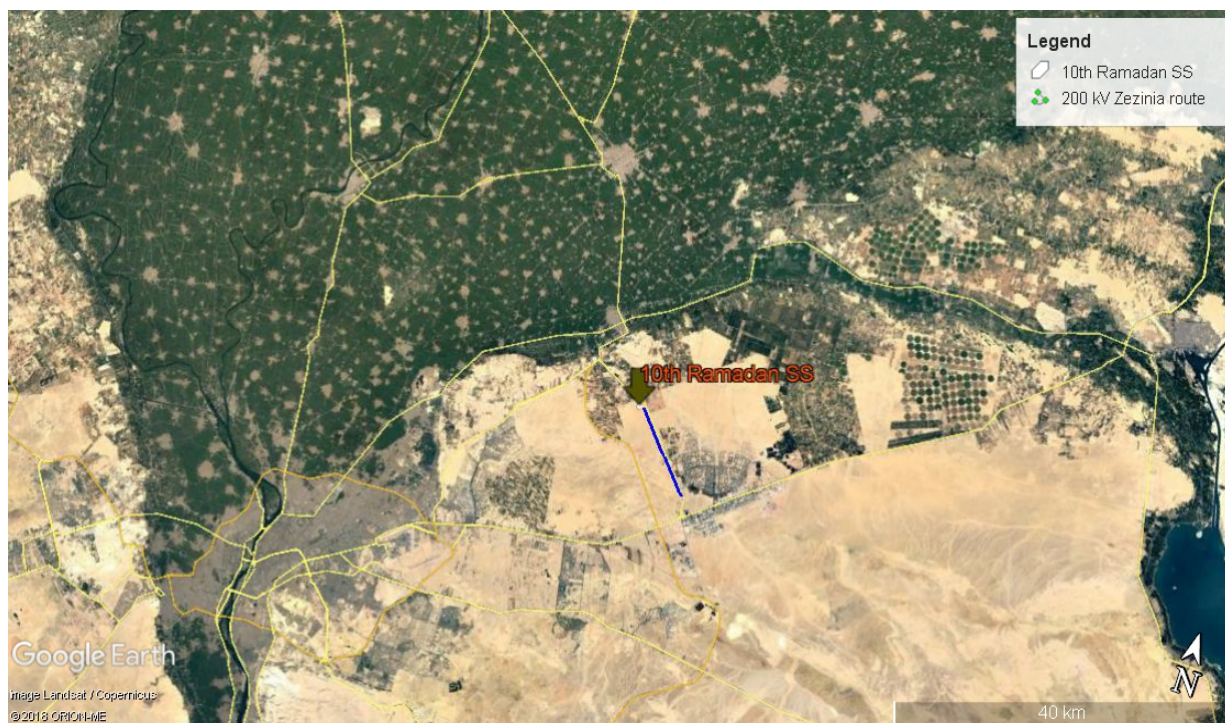


Figure 0-8 Route of 200 kV from 10th Ramadan SS/ Zezenia



Figure 0-9: the unoccupied desert lands where the route will pass through

VI. Project Components

The main components of the project are the construction of according to EETC technical specifications on 06/06/2017 are as following:

1. 10th Ramadan 500 GIS Substation 550/220 kV (2x750 MVA) in Canal Zone, with the following scope:
 - Voltage ratio 500/220 kV
 - Future expansion with 3rd transmitter 500/220 kV
 - Future Expansion for 2 spare units of 500 kV to be connected to the local network.
 - 500 kV, switchgear GIS, 10 bays (6 feeder bays + 3 transformer bays + 1 Bus Coupler Bay) including 3 bays (2 feeders + 1 transformer Bay) for future expansion
 - 220 kV, switch gear GIS, 17 bays (8 feeder bays + 3 transformer bays + 2 Bus Coupler bays) including 9 bays (4 feeders + 5 transformer Bay) for future expansion
 - 2x750 MVA 500/220 kV Power Transformers ONAN/ONAF1/ONAF2
2. Construction of 500 kV overhead transmission line network with the following scope:
 - Construction of OHTL double circuit, quadruple connector, 10th of Ramadan 500/East Banha with approximately 52 kilometer (IN/OUT);
 - Construction of OHTL double circuit, quarter connector, 10th of Ramadan 500/East Ismailia with approximately 97 kilometer (IN/OUT); and
 - Empty space for future connection to 2 spare cells of 500 kV
3. Construction of 220 kV overhead transmission line network with the following scope:
 - Construction of OHTL double circuit, triple connector, 10th of Ramadan 500/Zezenia with approximately 12 kilometer (IN/OUT);

- Construction of OHTL double circuit, triple connector, 10th of Ramadan 500/Belbees with approximately 8 kilometer (IN/OUT); and
 - Empty space for future connection to 4 spare cells of 220 kV
4. Construction of 66 kV overhead transmission line network:
- It should be taken in consideration the possibility of the SS future expansion to 66 kV network

VII. Project Alternatives

No Go Option

The main objective of the project is to meet the steady increase in energy demand and evacuate the power generated from Banha and Ismailia power plants. Environmental and social impacts from the project are assessed and no significant impacts are anticipated. Other objectives of the proposed project includes improve the voltage level and system stability in Canal Zone area, and reinforce the 550kV and 220 kV national electricity network.

If the SS and the OHTL 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, and
- As a result, an increase in the economic activities in the region in not expected.

The site of the proposed SS at 10th Ramadan city is far from residential area and connected with a main road. Therefore, the no project alternative is not environmental/social requirements

Technology Limitation

The substation is based on GIS technology with SF₆ gas insulated is the most appropriate technology to be used based on environmentally and economically acceptable standards for similar SSs. It requires limited space (occupies only 1/10 compared to the conventional SS), especially since the site is located at an urban area (due to the aesthetic landscape as the SS will be indoor) and more reliable than conventional SS are the priorities to select the GIS system in this project. In addition, to reducing the risk of flammable materials, having long lifetime and less operation and maintenance compared to the conventional SS, the SF₆ gas insulated system is selected for this substation at 10th Ramadan City.

However, if SF₆ is released to the environment will increase the impact on ozone depletion and global warming. Therefore, the periodically check of the insulated gas has to be done properly and periodically in accordance to the specification and operation manuals.

In addition, there is no justification of interconnection underground cables instead of the overhead transmission lines. As most of the routes is far from residential zones and connecting employing OHTL proves technically more feasible and environmentally more benefit, as the excavation of OHTL is much less in comparison with underground cable which would require drilling and more land work.

Location/Routes Alternatives

10th Ramadan Substation

The selection of the SS location and the OHTL routes should be undertaken according to criteria that fulfills technical, environment as well as socioeconomic objectives in order to achieve the most feasible application.

The SS site at 10th Ramadan city is proposed to be built to serve the increase of the electricity demand from the Banha and Ismailia power plants, establishment and demand on new connections to residential area around the substation. The SS location is far from any sensitive receptors and in best location for interconnection with Banha SS and Ismailia SS. The selection of the SS location and the proposed routes have been considered length optimization thus reducing the cost as much as possible whilst at the same time the proposed routes are aligned to the existing road network as much as possible for easy access during construction and maintenance and to reduce to a minimum the number as possible the number of sensitive receptors.

500kV OHTL to Ismailia Power plant

The route is not crossing by any of the protectorates and is only crossing over Suez canal with minimal biodiversity that would have minor impact over any receptors given mitigation measures set forth in chapter 7 are followed.

500kV OHTL to Banha Power plant

The route is not crossing by any of the protectorates.

220 kV OHTL 10th Ramadan SS /Proposed Belbees SS

The route is not crossing by any of the protectorates.

220 kV OHTL 10th Ramadan SS /Zezenia

The route is not crossing by any of the protectorates.

VIII. Baseline Environmental and Social Conditions

This section of the ESIA contains a description of the baseline physical, biological and socio-cultural characteristics of the environment at the proposed project areas.

10th of Ramadan SS is located among the boundaries of 10th of Ramadan city, Sharqiya governorate east of Nile delta, Egypt. The description of socio-economic baseline is on the concerned community that anticipated to be impacted from the project activities, which are 10th of Ramadan City and Sharqiya Governorate. The mitigation and monitoring plans are developed with respect to the baseline condition covering the construction and operation of the SS and OHTL project. Environmental and social baseline conditions are assessed through a combination of a desk-based study, site visits, previous projects conducted in the area, and consultation with relevant authorities and stakeholders.

IX. Impact Assessment during Construction and Operation of SS and OHTL

The following tables present significance of expected impacts during construction phase of 10th of Ramadan substation and OHTL

Table 0-2. Assessed significance of expected impacts during construction phase of 10th Ramadan 500 GIS substation

Impact	Likelihood and Severity	Significance	Mitigation Measures
During construction 10 th of Ramadan substation			
Noise	High likelihood to occur – short term and temporary -	Medium Impact	Application of the health and safety guide of the contractor should be normally taken by construction workers for example personal protection equipment (PPE), ear muffs...etc 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
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 routes and movement.
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
Vibration	Low likelihood to occur	Minor impact	Schedule and time plan for vehicles movements and construction activities

Impact	Likelihood and Severity	Significance	Mitigation Measures
During construction 10 th of Ramadan substation			
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	<p>Agreement should be reached prior to commencing construction work between the contractor and a licensed waste collector for officially assigning a location for the disposal of construction waste.</p> <p>Waste management submitted by the contractor for waste management (upon the agreement with the licensed waste collector. •For The hazardous waste, it will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).” Protection of spillage including paved site for workshop or maintenance of vehicles</p> <p>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.</p>
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	<p>Standard protection by placing clear project signs.</p> <p>Time management for vehicles movement; especially avoiding the peak hours</p> <p>Standard protection for the workers especially working at elevated heights</p>
Visual Resources and landscaping	Low likelihood to occur	Minor impact, localized and temporary	<p>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</p> <p>Clear sign of the construction activities</p>

Impact	Likelihood and Severity	Significance	Mitigation Measures
During construction 10 th of Ramadan substation			
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 (Fauna ,Flora)	Low likelihood to occur	Negligible impact (no impact)	No mitigation measures are needed.
Natural disaster risks	Low likelihood to occur	No significant impact	No mitigation measures is prepared Technical specifications of the equipment is include the standard measures for natural disaster risks
land use and Involuntary resettlement	Low likelihood to occur	Very low or insignificant	No mitigation measures is prepared as EETC has already received the governor's decree to allocate the land for the construction of the proposed SS.
Archeological and cultural sites	Low likelihood to occur as no archeological and cultural sites are located near to the SS.	Very low or insignificant	No mitigation measures is prepared
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 0-3. Assessed significance of expected impacts during construction phase of East Ismailia OHTL

Impact	Likelihood and Severity	Significance	Mitigation Measures
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Impacts during construction phase of East Ismailia OHTL			
Noise	High likelihood to occur – short term and temporary	Medium Impact	<p>Application of the health and safety guide of the contractor should be implemented by the construction workers.</p> <p>Notification to the surrounding establishment prior to the construction of the SS</p> <p>Time management and construction schedule according to the IFC regulation provided by the contractor prior to the construction phase</p>
Traffic	High likelihood to occur – short term, temporary and localized only on the main road	Low to medium impact	<p>Time management for transporting the materials, equipment, debris, etc</p> <p>Clear sign surrounding construction site and the enter / exit gate</p> <p>Coordination with traffic department (ministry of interior) for vehicles routes and movement.</p>
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.	<p>Medium impact on construction workers</p> <p>Low impact on the residents, surrounding establishment and pedestrians passing by the construction site</p>	<p>Spraying the sandy soil with water (if needed, especially during the dry period).</p> <p>Maneuver area and the parking area should be well paved</p> <p>Management of the number of vehicles at the same time for specific location and the scheduling the intensity of vehicles</p>
Hazardous Materials and Waste Management	Likely to occur - short term – Highly sensitive receptors include soil at protectorate areas and workers. Receptors with medium sensitivity include nearby settlements. Receptors with low sensitivity include groundwater.	Medium	<p>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.</p> <p>Waste management submitted by the contractor for waste management upon the agreement with the licensed waste collector. For The hazardous waste, it will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).”</p> <p>Protection of spillage including paved site for workshop or maintenance of vehicles</p> <p>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.</p>
Health and Safety	Low likelihood of major or medium	Minor	Standard protection by placing clear project signs.

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of East Ismailia OHTL			
	impacts for workers– high likelihood of minor impact for sensitive recipient		Time management for vehicles movement; especially avoiding the peak hours Standard protection for the workers especially working at elevated heights
Removing trees on ROW	Low likelihood of major or medium impacts	Medium to Major	Reduce impact significance to minor following RAP
Land use	Medium and direct impact to livelihood	Medium	Reduce impact significance to minor following recommendations of RAP preparation
Visual intrusion	Low likelihood of major or medium impacts and localized	Minor	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
Ecological (Fauna and Flora)	Medium likelihood to occur – short term	Minor	Following the standard protection for the fauna and flora and proper waste management described on the section of waste management measures
Bird Migration	Low likelihood to occur	Medium to Minor impact	<ul style="list-style-type: none"> Installing bird diverters devices or line markers such as spheres, spiral vibrational dampers, or bird deflectors in order to attract the attention of birds and avoid collision Avoid working in seasons of bird migration, Spring (March-May) and Autumn (August to November)
Water Resources	Medium likelihood to occur – short term	Minor	Standard prevention or precaution measures shall be prepared by the contractor prior to the construction. It is preferable to include the waste management plan to be included in the ToR of the contractor.
Cultural resources	Low likelihood of major or medium impacts	Insignificant	No mitigation measures is needed
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 0-4. Assessed significance of expected impacts during construction phase of East Banha OHTL

Impact		Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of East Banha OHTL				
Noise	High likelihood to occur – short term and temporary -	Medium Impact		<p>Application of the health and safety guide of the contractor should be implemented by construction workers.</p> <p>Notification to the surrounding establishment prior to the construction of the SS</p> <p>Time management and construction schedule according to the IFC regulation provided by the contractor prior to the construction phase</p>
Traffic	High likelihood to occur – short term, temporary and localized only on the main road	Low to medium impact		<p>Time management for transporting the materials, equipment, debris, etc</p> <p>Clear sign surrounding construction site and the enter / exit gate</p> <p>Coordination with traffic department (ministry of interior) for vehicles routes and movement.</p>
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.	<p>Medium impact on construction workers</p> <p>Low impact on the residents, surrounding establishment and pedestrians passing by the construction site</p>		<p>Spraying the sandy soil with water (if needed, especially during the dry period).</p> <p>Maneuver area and the parking area should be well paved</p> <p>Management of the number of vehicles at the same time for specific location and the scheduling the intensity of vehicles</p>
Hazardous Materials and Waste Management	Likely to occur - short term – Highly sensitive receptors include soil at protectorate areas and workers. Receptors with medium sensitivity include nearby settlements. Receptors with low sensitivity include groundwater.	Medium		<p>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.</p> <p>Waste management submitted by the contractor for waste management upon the agreement with the licensed waste collector. For The hazardous waste, it will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).”</p> <p>Protection of spillage including paved site for workshop or maintenance of vehicles</p>

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of East Banha OHTL			
			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	Low likelihood of major or medium impacts for workers– high likelihood of minor impact for sensitive recipient	Minor	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
Removing trees on ROW	Low likelihood of major or medium impacts	Medium to Major	Reduce impact significance to minor following RAP
Land use	Medium and direct impact to livelihood	Medium	Reduce impact significance to minor following recommendations of RAP preparation
Visual intrusion	Low likelihood of major or medium impacts and localized	Minor	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
Ecological (Fauna and Flora)	Medium likelihood to occur – short term	Minor	Following the standard protection for the fauna and flora and proper waste management described on the section of waste management measures
Bird Migration	Low likelihood to occur-	Medium to Minor impact	<ul style="list-style-type: none"> Installing bird diverters devices or line markers such as spheres, spiral vibrational dampers, or bird deflectors in order to attract the attention of birds and avoid collision Avoid working in seasons of bird migration, Spring (March-May) and Autumn (August to November)
Water Resources	Medium likelihood to occur – short term	Minor	Standard prevention or precaution measures shall be prepared by the contractor prior to the construction. It is preferable to include the waste management plan to be included in the ToR of the contractor.
Cultural resources	Low likelihood of major or medium impacts	Insignificant	No mitigation measures is needed
Creation of Job opportunities and flourishing	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
Impacts during construction phase of East Banha OHTL			
Economics of construction site			

Table 0-5. Assessed significance of expected impacts during construction phase of Belbees OHTL

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of Belbees OHTL			
Noise	High likelihood to occur – short term and temporary -	Medium Impact	Application of the health and safety guide of the contractor should be implemented 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
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 routes and movement.
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
Hazardous Materials and Waste Management	Likely to occur - short term – Highly sensitive receptors include soil at protectorate areas and workers. Receptors with medium sensitivity include nearby settlements. Receptors with low sensitivity include	Medium	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 upon the agreement with the licensed waste collector. For The hazardous waste, it will be

Impact		Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of Belbees OHTL				
	groundwater.			<p>managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).”</p> <p>Protection of spillage including paved site for workshop or maintenance of vehicles</p> <p>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.</p>
Health and Safety	Low likelihood of major or medium impacts for workers– high likelihood of minor impact for sensitive recipient	Minor		<p>Standard protection by placing clear project signs.</p> <p>Time management for vehicles movement; especially avoiding the peak hours</p> <p>Standard protection for the workers especially working at elevated heights</p>
Removing trees on ROW	Low likelihood of major or medium impacts	Medium to Major		Reduce impact significance to minor following RAP
Land use	Medium and direct impact to livelihood	Medium		Reduce impact significance to minor following recommendations of RAP preparation
Visual intrusion	Low likelihood of major or medium impacts and localized	Minor		<p>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</p> <p>Clear sign of the construction activities</p>
Ecological (Fauna and Flora)	Medium likelihood to occur – short term	Minor		Following the standard protection for the fauna and flora and proper waste management described on the section of waste management measures
Water Resources	Medium likelihood to occur – short term	Minor		Standard prevention or precaution measures shall be prepared by the contractor prior to the construction. It is preferable to include the waste management plan to be included in the ToR of the contractor.
Cultural resources	Low likelihood of major or medium impacts	Insignificant		No mitigation measures is needed
Creation of Job	Creating job opportunities for	High positive temporary		Coordination with the contractor to employ members of the local community as

Impact		Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of Belbees OHTL				
opportunities and flourishing Economics of construction site	members of the local community	impact		construction workers and guards

Table 0-6. Assessed significance of expected impacts during construction phase of Zezenia OHTL

Impact		Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of Zezenia OHTL				
Noise	High likelihood to occur – short term and temporary -	Medium Impact		Application of the health and safety guide of the contractor should be implemented 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
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 routes and movement.
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
Hazardous Materials and Waste Management	Likely to occur - short term – Highly sensitive receptors include soil at protectorate areas and workers. Receptors with medium sensitivity include nearby settlements. Receptors	Medium		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 upon the

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of Zezenia OHTL			
	with low sensitivity include groundwater.		<p>agreement with the licensed waste collector. For The hazardous waste, it will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).”</p> <p>Protection of spillage including paved site for workshop or maintenance of vehicles</p> <p>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.</p>
Health and Safety	Low likelihood of major or medium impacts for workers– high likelihood of minor impact for sensitive recipient	Minor	<p>Standard protection by placing clear project signs.</p> <p>Time management for vehicles movement; especially avoiding the peak hours</p> <p>Standard protection for the workers especially working at elevated heights</p>
Removing trees on ROW	Low likelihood	insignificant	no cut of trees is associated to this OHTL.
Land use	low likelihood	insignificant	OHTL will not pass by or cross any land use plans or community goals.
Visual intrusion	Low likelihood of major or medium impacts and localized	Minor	<p>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</p> <p>Clear sign of the construction activities</p>
Ecological (Fauna and Flora)	Medium likelihood to occur – short term	Minor	Following the standard protection for the fauna and flora and proper waste management described on the section of waste management measures
Bird Migration	Low likelihood to occur-	Medium to Minor impact	<ul style="list-style-type: none"> Installing bird diverters devices or line markers such as spheres, spiral vibrational dampers, or bird deflectors in order to attract the attention of birds and avoid collision Avoid working in seasons of bird migration, Spring (March-May) and Autumn (August to November)
Water Resources	Medium likelihood to occur – short	Minor	Standard prevention or precaution measures shall be prepared by the contractor prior

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of Zezenia OHTL			
	term		to the construction. It is preferable to include the waste management plan to be included in the ToR of the contractor.
Cultural resources	Low likelihood of major or medium impacts	Insignificant	No mitigation measures is needed
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 0-7. Assessed significance of expected impacts during operation phase of 10th Ramadan 500 GIS substation

Impact	Likelihood and severity	Significance	Mitigation Measures
During operation and maintenance of 10 th of Ramadan substation			
Noise	Low likelihood to occur –receptors include nearby settlements (residential) are far at a distance above 10km.	Low impact on settlement and nearby establishment :Low 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 provided at the substation.
Traffic	Low likelihood to occur	Low impact	No mitigation identified
Air quality	Low likelihood to occur	Low impact	No mitigation identified
Vibration	Minor or very low likelihood to occur	Very minor	No mitigation identified

Impact	Likelihood and severity	Significance	Mitigation Measures
During operation and maintenance of 10 th of Ramadan substation			
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	Medium impact on industrial wastes generated (hazardous and non-hazardous) Low impact on domestic wastes (solid and liquid wastes)	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 upon the agreement with the licensed waste collector. For The hazardous waste, it will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).”
Soil contamination	High likelihood to occur, only during the incident of oil spillage from the transformers and possible vehicles.	Low to medium impact	Standard design of precaution for the site of transformers Paved within surrounding site of substation especially at the area 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. Please refer to Annex 1 for the health and safety guide
Natural disaster risks	Low likelihood to occur	Negligible impact	No mitigation identified Technical specifications of the equipment is include the standard measures for natural disaster risks

Impact	Likelihood and severity	Significance	Mitigation Measures
During operation and maintenance of 10 th of Ramadan substation			
Visual Resources	Low likelihood to occur	Very low impact or negligible impact	No mitigation measure is prepared
Ecological Resources (Fauna and Flora)	Low likelihood to occur	No significant impact	No mitigation identified
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

Table 0-8. Assessed significance of expected impacts during operation phase of East Ismailia OHTL

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of East Ismailia OHTL			
Risk of Waste generated	Likely to occur - short term – Highly sensitive receptors include soil and workers. Receptors with medium sensitivity include nearby projects/settlements. Receptors with low sensitivity include groundwater.	Medium	Waste management implemented according to EEAA 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. Disposal means of the hazardous wastes will be according to the Egyptian laws and regulations regarding the disposal.
Exposure to EMFs	Likely to occur - long term impact	Medium	In order to maintain safety of the general public and minimize exposure to EMFs some laws and guidelines require maintaining a suitable ROW distance of 25 meters (for 500 kV OHTL) so that the EMFs would effectively attenuate at the edge of this EMF
Risk of soil	Low likelihood of occurrence - short term impact	Minor	Following standard protection for the soil and proper

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of East Ismailia OHTL			
contamination			waste management described on the section of waste management measures
Noise	Low likelihood of occurrence - short term impact	Minor	Minimizing impact significance
Cultural resources	Low likelihood of major or medium impacts	insignificant	Standard mitigation measures of recording and reporting
Health and Safety	Low likelihood of minor impact for the sensitive recipient and medium to major for the workers	Medium to Major	Standard protection for the workers especially working at elevated heights
Bird Migration	Low likelihood to occur	Medium to Minor impact	<ul style="list-style-type: none"> Installing bird diverters devices or line markers such as spheres, spiral vibrational dampers, or bird deflectors in order to attract the attention of birds and avoid collision Avoid working in seasons of bird migration, Spring (March-May) and Autumn (August to November)
Natural disaster risks	Low likelihood to occur	Negligible impact	No mitigation identified Technical specifications of the equipment is include the standard measures for natural disaster risks
Visual Resources	Low likelihood to occur	Very low impact or negligible impact	No mitigation measure is prepared
Ecological Resources(Fauna and Flora)	Low likelihood to occur	No significant impact	No mitigation identified
Creation of Job opportunities	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

Table 0-9. Assessed significance of expected impacts during operation phase of East Banha OHTL

Impact	Likelihood and severity	Significance	Mitigation Measures
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Impacts during operation phase of East Banha OHTL			
Risk of Waste generated	Likely to occur - short term – Highly sensitive receptors include soil and workers. Receptors with medium sensitivity include nearby projects/settlements. Receptors with low sensitivity include groundwater.	Medium	Waste management implemented according to EEAA 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. Disposal means of the hazardous wastes will be according to the Egyptian laws and regulations regarding the disposal.
Exposure to EMFs	Likely to occur - long term impact	Medium	In order to maintain safety of the general public and minimize exposure to EMFs some laws and guidelines require maintaining a suitable ROW distance of 25 meters (for 500 kV OHTL) so that the EMFs would effectively attenuate at the edge of this EMF
Risk of soil contamination	Low likelihood of occurrence - short term impact	Minor	Following standard protection for the soil and proper waste management described on the section of waste management measures
Noise	Low likelihood of occurrence - short term impact	Minor	Minimizing impact significance
Cultural resources	Low likelihood of major or medium impacts	insignificant	Standard mitigation measures of recording and reporting
Health and Safety	Low likelihood of minor impact for the sensitive recipient and medium to major for the workers	Medium to Major	Standard protection for the workers especially working at elevated heights
Bird Migration	Low likelihood to occur	Medium to Minor impact	<ul style="list-style-type: none"> Installing bird diverters devices or line markers such as spheres, spiral vibrational dampers, or bird deflectors in order to attract the attention of birds and avoid collision Avoid working in seasons of bird migration, Spring (March-May) and Autumn (August to November)
Natural disaster risks	Low likelihood to occur	Negligible impact	No mitigation identified

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of East Banha OHTL			
			Technical specifications of the equipment is include the standard measures for natural disaster risks
Visual Resources	Low likelihood to occur	Very low impact or negligible impact	No mitigation measure is prepared
Ecological Resources(Fauna and Flora)	Low likelihood to occur	No significant impact	No mitigation identified
Creation of Job opportunities	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

Table 0-10. Assessed significance of expected impacts during operation phase of Belbees OHTL

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of Belbees OHTL			
Risk of Waste generated	Likely to occur - short term – Highly sensitive receptors include soil and workers. Receptors with medium sensitivity include nearby projects/settlements. Receptors with low sensitivity include groundwater.	Medium	Waste management implemented according to EEAA 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. Disposal means of the hazardous wastes will be according to the Egyptian laws and regulations regarding the disposal.
Exposure to EMFs	Likely to occur - long term impact	Medium	In order to maintain safety of the general public and minimize exposure to EMFs some laws and guidelines require maintaining a suitable ROW distance of 25 meters (for 500 kV OHTL) so that the EMFs would effectively attenuate at the edge of this EMF
Risk of soil contamination	Low likelihood of occurrence - short term impact	Minor	Following standard protection for the soil and proper waste management described on the section of waste management measures
Noise	Low likelihood of occurrence - short term impact	Minor	Minimizing impact significance
Cultural resources	Low likelihood of major or medium impacts	insignificant	Standard mitigation measures of recording and

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of Belbees OHTL			
			reporting
Health and Safety	Low likelihood of minor impact for the sensitive recipient and medium to major for the workers	Medium to Major	Standard protection for the workers especially working at elevated heights
Natural disaster risks	Low likelihood to occur	Negligible impact	No mitigation identified Technical specifications of the equipment is include the standard measures for natural disaster risks
Visual Resources	Low likelihood to occur	Very low impact or negligible impact	No mitigation measure is prepared
Ecological Resources(Fauna and Flora)	Low likelihood to occur	No significant impact	No mitigation identified
Creation of Job opportunities	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

Table 0-11. Assessed significance of expected impacts during operation phase of Zezenia OHTL

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of Zezenia OHTL			
Risk of Waste generated	Likely to occur - short term – Highly sensitive receptors include soil and workers. Receptors with medium sensitivity include nearby projects/settlements. Receptors with low sensitivity include groundwater.	Medium	Waste management implemented according to EEAA 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. Disposal means of the hazardous wastes will be according to the Egyptian laws and regulations regarding the disposal.
Exposure to EMFs	Likely to occur - long term impact	Medium	In order to maintain safety of the general public and minimize exposure to EMFs some laws and guidelines require maintaining a suitable ROW distance of 25 meters (for 500 kV OHTL) so that the EMFs would effectively attenuate at the edge of this EMF
Risk of soil contamination	Low likelihood of occurrence - short term impact	Minor	Following standard protection for the soil and proper waste management described on the section of waste management measures
Noise	Low likelihood of occurrence - short term impact	Minor	Minimizing impact significance
Cultural resources	Low likelihood of major or medium impacts	insignificant	Standard mitigation measures of recording and reporting
Health and Safety	Low likelihood of minor impact for the sensitive recipient and medium to major for the workers	Medium to Major	Standard protection for the workers especially working at elevated heights
Bird Migration	Low likelihood to occur	Medium to Minor impact	<ul style="list-style-type: none"> Installing bird diverters devices or line markers such as spheres, spiral vibrational dampers, or bird deflectors in order to attract the attention of birds and avoid collision Avoid working in seasons of bird migration, Spring (March-May) and Autumn (August to

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of Zezenia OHTL			
			November)
Natural disaster risks	Low likelihood to occur	Negligible impact	No mitigation identified Technical specifications of the equipment is include the standard measures for natural disaster risks
Visual Resources	Low likelihood to occur	Very low impact or negligible impact	No mitigation measure is prepared
Ecological Resources(Fauna and Flora)	Low likelihood to occur	No significant impact	No mitigation identified
Creation of Job opportunities	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

English Non-Technical Executive Summary

In order to meet the forecasted demand on electricity, secure electrical stability and to meet the commitment of supplying electricity to slum areas and informal buildings (based on the approval of the Cabinet (2005) and the Council of Governors approval (2005)), the EETC together with the distribution companies need to provide additional substations(SSs) and their interconnections 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 and the Environment Egyptian Environmental Affairs Agency (EEAA), EETC is committed to carry out an Environmental and Social Impact Assessment (ESIA) for construction of 10th Ramadan substation and its interconnecting Over Head Transmission Lines (OHTLs) and a Resettlement Action Plan (RAP). The ESIA and the RAP represent the components of a consolidated document. This document will be subject to review and acceptance as whole..

EcoConServ environmental services has been contracted to carry out the ESIA study and RAP in accordance with national legislations as well as EIB standards.

I. ESIA & RAP Objectives

The studies aims at examining all aspects and activities of the project in terms of influencing the environmental elements and affected people. Moreover, providing the best alternatives for preserving the environment and avoiding possible negative impacts during the establishment and operation of the project.

The studies also aims to comply with the legal requirements, regulations and general guidelines that define the methods of sustainable development.

II. ESIA & RAP Methodology

Many methods have been used to identify and assess environmental and social impacts. These include conducting field surveys of the terrestrial and geological environment and interviews with relevant authorities. Environmental and social references covering the study area were reviewed. In addition, a team of environmental and social experts, as well as an environmental impact assessment expert, an environmental law expert had been involved to assess the environmental and social impacts. Preparation of a RAP for the entire line including complete census, identification and valuation of affected assets in the 50-meter right of way (RoW) (divided into 25 meters each from the center of the transmission lines) determined by the coordinates presented in the Detailed Line Route 2017 (See Annex 2)and publication of the cut-off date.

This executive report will include a non-technical summary of the full study to describe project components, activities and expected impacts on the environment and community includes ways of mitigate or minimize these impacts.

III. Legislative and Regulatory Frameworks

Egyptian Laws, Regulations and Policies

- 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 and Social practices Handbook – 2013 EIB
- EIA Directive 85/337/EEC, amended by Directives 97/11/EC and 2003/35/EC for EIA requirement
- Environmental and social standards overview, EIB 07/2014
- IFC book 5, handbook for preparing a resettlement action plan
- EU Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora
- EU Directive 2009/147/EC on the conservation of wild birds

IV. Project Overview

As part of the current project, the 10th of Ramadan 500 GIS Substation will be connected to the national electricity network through 500 kV and this is through

- Construction of OHTL double circuit, quadruple connector, 10th of Ramadan 500/East Banha with approximately 52 kilometer long (IN/OUT);
- Construction of OHTL double circuit, quarter connector, 10th of Ramadan 500/East Ismailia with approximately 97 kilometer (IN/OUT); and
- Empty space for future connection to 2 spare cells of 500 kV

Moreover, 10th of Ramadan 500 GIS Substation will be connected to the national electricity network through 220 kV and this is through

- Construction of OHTL double circuit, triple connector, 10th of Ramadan 500/Zezenia with approximately 12 kilometer (IN/OUT);
- Construction of OHTL double circuit, triple connector, 10th of Ramadan 500/Belbees with approximately 8 kilometer (IN/OUT); and
- improving the 66 kV network through future expansion for the construction of a new 66 kV network.

V. Project's Site location

The SS is located in Sharqiya governorate, which is one of the governorates of East Delta. It is surrounded from the North by Manzala Lake, from the South by Cairo & Qaliubiya governorates, from the East by two Suez Canal governorates: Ismailia & Port Said, while from the West by Gharbeya governorate.

The Site visits to the project area showed that the land surrounding the substation site varied between desert lands devoid of structures, residential blocks and farm lands. The boundaries and geographical surroundings of the substation according to the site visit will be described below:

- The project land is located in the area allocated for facilities and services in the strategic planning of West area of 10th of Ramadan City. The area is devoid of facilities excluding the new water station which is adjacent to the project site from the north and about 50 meters away from it.
- There is an agricultural area adjacent to the project site from East and North. The agricultural area represents number of fruit and citrus farms. The nearest farm to the project area is Abdel Hamid Amar farm which is about 1.5 km away from it.
- The Field visits showed that the area located in the South and West of the project is devoid of facilities. The strategic planning for this area indicates that it is regional service area of 384.83 feddans(1.616 km²), and free zone of 1311.80 feddans(5.51 km²),
- The nearest residential block to the project site is located in the East and it is about 5 km away from the project site, the area represents youth housing area and land zoning of “Build your Own Home” project.

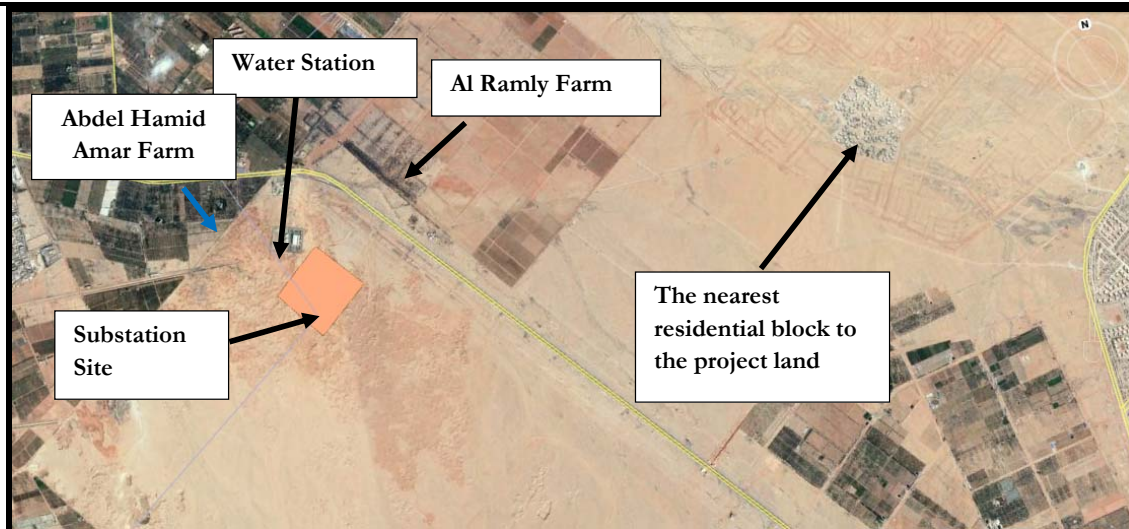


Figure 0-1: The nearest structures to the substation location

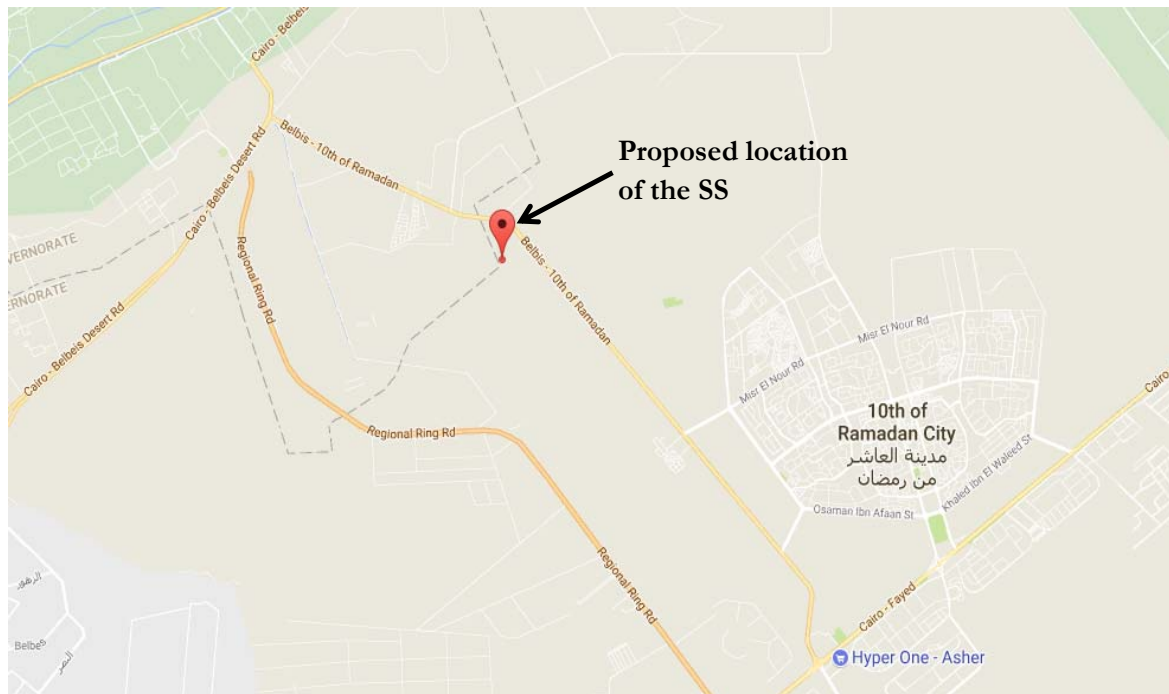


Figure 0-2: proposed location of 10th Ramadan SS

VI. Description of Activities during Construction Phase of SS

- **Site preparation:** including but not limited to: site clearance (limiting ground disturbance to existing networks during site preparation), fences construction, preparing site camp, preparing access road (if needed) for moving construction material and machineries and temporary storage of construction materials, machineries, etc.
Besides the site preparation, the approvals or the permissions from the competent authorities and surrounding establishments shall be obtained.
- **Construction of concrete works:** (footing, foundations, SS framework, support structures and equipment) and other concrete construction for OHTL path, etc.
- **Construction of Supporting buildings:** including administration building and facilities, control room, etc.
- **Erection of the equipment:** including transformers, switches yards, electrical panel, etc.
- **Waste management:** including generated domestic and construction waste (hazardous and non-hazardous). This activity will include waste identification, temporary storage, handling and transportation to the designated landfill. In general, the disposal method for the construction wastes should be included in the ToR for the Contractor for waste management during construction. 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. The common practice in Egypt that the wastes are segregated and it can sold to a contractor for reuse or recycling depends on the classification of the wastes.

VII. Description of Activities during Construction Phase of OHTL

- **Identifying the right of way (ROW):**As discussed in chapter 2, the Electricity Law 87/2015 has identified the limits of distances to be measured from the axis of the OHTL routes in order to identify the Right of Way (ROW) zone. A distance of 25 meters from both sides for OHTL (of 500 kV) will be kept as a Right of Way (ROW) or buffer zone for maintaining the public safety from electric hazards and high exposure to electric magnetic fields (EMFs).
- **Tower erection:** The depth of drilling is about 4.5 m per base and the average area required to implement the base tower from 22 m X 22 m to 33 m X 33 m.
- **Installation of tower suspension accessories:** they are erected manually by hauling the accessory using chain pulley
- **Stringing of pulling line over each stringing block for the conductor:** the pilot wire is manually strung over valley in mountainous area which is attached to power cable. The pilot wire is sometimes shot using winch or through drones.
- **Tensioning and sagging of conductor:** tension and sag corrected using manual winch, chain pulleys, bull wheel type pullers and other associated equipment
- **Waste management:** for generated domestic and construction waste (hazardous and non-hazardous). This activity will include waste identification, temporary storage, handling and transporting to the designated landfill, etc. In general, the disposal method for the construction wastes should be included in the ToR for the Contractor for waste management during construction. 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. The common practice in Egypt that the wastes are segregated and it can sold to a contractor for reuse or recycling depends on the classification of the wastes

For The hazardous waste, it will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).

Besides all activities described above, the training for operation and maintenance, including the emergency plans is required to be conducted by the contractors who supply, erect and start up the transformers and their accessories. The capacity building activities shall be held during the warranty period.

VIII. Description of Activities during operation phase of the SS and OHTLs

The SS and the OHTLs need regular maintenance and repair work to maintain it at best during operation. Maintenance is followed by a periodic schedule to avoid faults and keep the SS operates as required and planned. The frequent maintenance depends on several factors such as technology used, environmental conditions on site, warranty conditions, and seasonal differences. Maintenance activities

include, for example, structural safety checks. Repair work is performed in the event of breakdowns, for example to repair or replace damaged or damaged equipment.

IX. Environmental and Social Baseline Conditions

a. Climate

The Nile Delta is characterized with the Mediterranean climate with rainfall in winter, though not in large quantities. The relative humidity is high in the Nile Delta. July and August are among the hottest months in the Nile Delta as the average temperature in these months is about 3 °C, and the maximum temperature is 35° C.; while in winter, the temperature is usually between 8 °C and 16 °C.

b. Geology

The geological studies ; since 1901 up to now ; have helped in disclosing many facts about the geology of the Nile Delta which had started to form since the Miocene as the Nile Delta region – together with the sediments composing it – has been influenced by the changes in the sea level and region tectonics as well as the climate conditions, as there have been three sediment cycles leading to the formation of the current Delta.

c. Surface Water

The surface water resources of the Nile Delta may be classified as follows:

Rivers

The Nile River is composed of two branches pouring into the Mediterranean Sea: Damietta Branch in the east, ending at the city of Damietta; and Rashid Branch in the west ending at the city of Rashid. It is the most important water resource for the governorates as they depend on it for the irrigation of the agricultural lands as well as for some other fields. The surplus water in the Nile Delta region are poured into the Mediterranean Sea and the Northern Lakes. In addition, there is a big number of canals to meet the needs of agriculture and populations in the Delta region.

Seas

The Nile Delta governorates are located on the Mediterranean Sea with a length of about 100 KM.

Lakes

Lake Burullus is located northern of Kafr El Sheikh Governorate. It is entirely located within the borders of such governorate on an area of 120 thousand acres. It is connected to the Mediterranean Sea through Burullus strait. El Manzala Lake covers 20% of Damietta Governorate region. It is a shallow moderately saline lake connected to the Sea through three main straits. Edco lake is located northern of El Behira Governorate; it is bordered to the north by an agricultural road and Alexandria railway. Edco Lake is located on an area of about 20 thousand acres. The water of the lake is drinkable and the depth of the water in the lake ranges from 75 cm to 1.25 m. Edco Lake is one of the most important lakes and fisheries in the Arab Republic of Egypt as it is listed the third after El Manzala Lake and Burullus Lake

with regard to the fish production. The Great Bitter Lake is a saltwater lake in Egypt, connected to the Mediterranean Sea and the Red Sea via the Suez Canal. It is connected to the Small Bitter Lake through which the canal also runs.

Rain

The monthly and annual rain quantities falling on the Nile Delta region vary. The importance of the rain and its effect on agriculture is almost absent due to that agriculture is based on irrigation by the Nile river. January is the most rainy month when the quantity of rain is almost 17 mm, followed by December with a quantity of 13.6 mm. No rains fall on July, and there are rare rains on June and September. The annual quantity of rain is about 96.6 mm. The falling waters are in positive correlation with the number of rainy days, i.e. the most rainy months are the greatest as for the number of rainy days; this is due to the nature of the rains falling on Egypt which come after low pressure.

d. Ground Water

Ground water is found in the Delta Governorates mainly due to the leakage of the Nile river waters, the rains and a big part of the irrigation water. The ground water is one of Egypt's water resources that had not receive sufficient attention until recently. Ground water is used in the Middle Delta region as a source to fill the shortage of the Nile water or at the times of the non-arrivals of the water to the ends of the canals for the works of sensitive crops irrigation as such crops require short periods of irrigation. They are also used as a direct source of drinkable water as they do not require large treatment plants.

e. Ecological (Flora and Fauna)

Due to the presence of agriculture lands near by the project's location, the dominating fauna in the area is farm animals and other species adapted to urban areas as feral cats and dogs, rodents, lizards, bats and birds, which depend on waste as food.

The agricultural lands includes common plants of the region such as wormwood plant trees sycamore tree, acacia, eucalyptus and different palm plants which spread on the banks of canals and drains. In addition to the cultivated crops in which the most common are wheat, rice, corn, and vegetables)

However, there are no recorded for flora and fauna found within the vicinity as the proposed site itself is an empty land within the urban area and it is considered as a desert area so the scarcity of flora is expected but not endemic flora. The local pets and pot plantations might exist at the surrounding residential area but those habitats will not be impacted from the project activities. In conclusion, no endangered species were identified within the project's affected areas.

Bird Migration

Regarding the bird migration, the SS isn't located along the path of the birds' migration. However, 3 of the OHTLs routes (except the one connecting to the East Belbees substation) cross the path of the birds' migration as seen on the below maps. Based on Bird Life international tool's report (Annex 4) ,the overall sensitivity of this project area is considered medium as there are 4 soaring bird species observed in the area, classified as **LC**(least concern) according to the IUCN Red List; while a further 28 soaring bird species classified as **LC**; **NT**(near threatened); **VU** (vulnerable); **EN** (endangered) are

expected but not observed (classification of ‘observed’ or ‘expected’ based on presence status). Therefore, mitigation measures are required to be implemented for these particular 3 OHTLs to minimize the risk of birds’ electrocution and collision. The following figures represent the birds’ migration path versus the project’s location and routes of OHTLs.

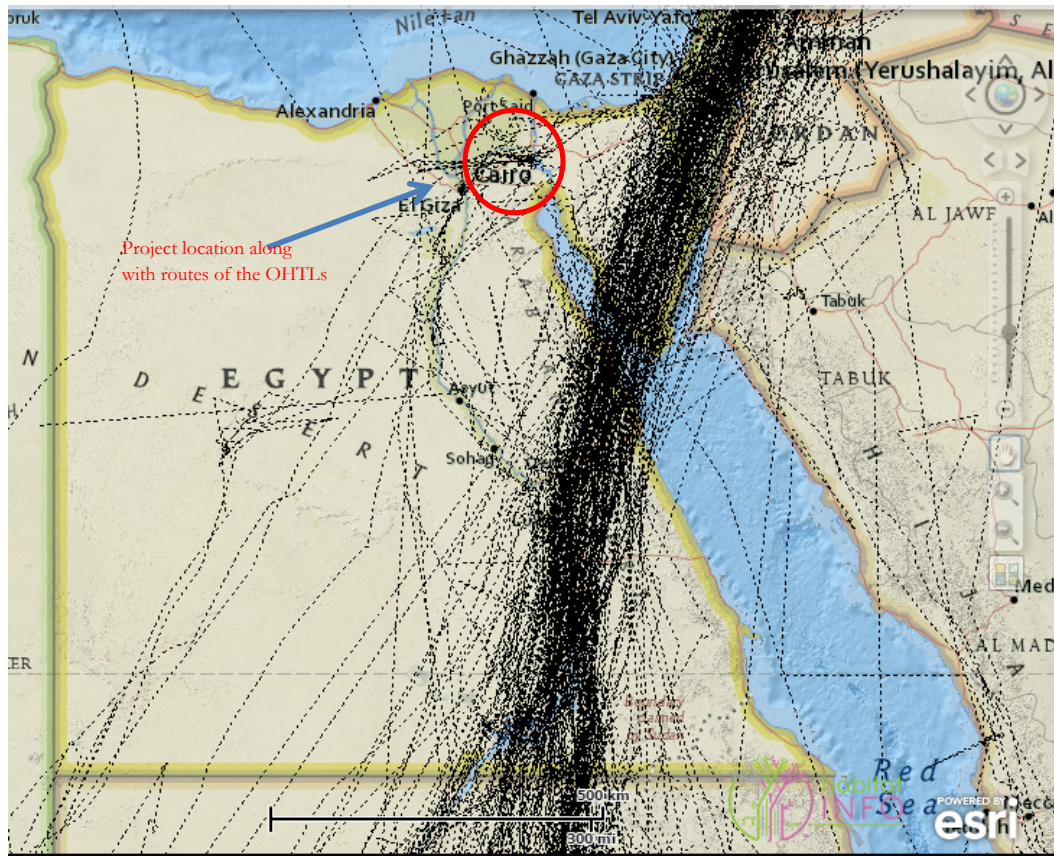


Figure 0-3Main migration routes in Egypt

source: BirdLife International (2015)

10th of Ramadan GIS Substation & its Overhead Transmission Lines_Final

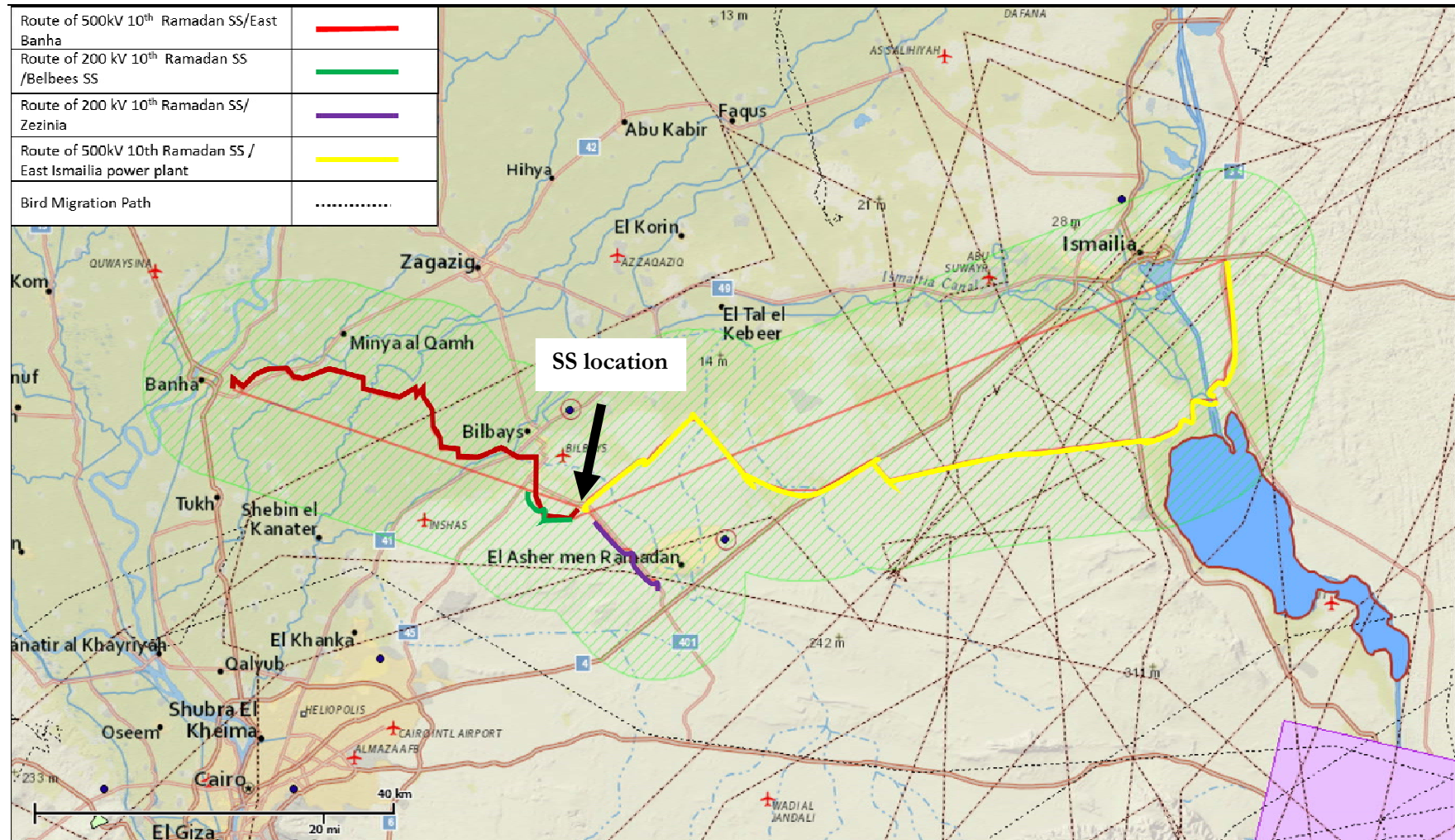


Figure 0-4 Main migration routes in Egypt versus the location of OHTLs and SS

source: BirdLife International (2019)

Mitigation measures:

- Installing bird diverters devices or line markers such as spheres, spiral vibrational dampers, or bird deflectors in order to attract the attention of birds and avoid collision
- Avoid working in seasons of bird migration, Spring (March-May) and Autumn (August to November)

X. Baseline Socioeconomic Conditions

The land of the substation is located northwest of 10th of Ramadan city and close to lands division known as Knowledge City. The substation's land and its surrounding area are allocated from 10th of Ramadan City Authority (State Property) in accordance of the specifications of the Ministry of Electricity and the Egyptian Law. The site of the substation is 14,500 km away from 10th of Ramadan agency, and about 500 meters from Belbees – 10th of Ramadan road.

10th of Ramadan city was implemented in 1980 in order to mitigate the population pressure within Cairo governorate and within the urban areas, and to create job opportunities for youth as it is the largest industrial zone in Egypt. The area of 10th of Ramadan reaches about 398 km² which equivalent to 95 thousand feddans,³

10th of Ramadan City is located 55 km away from Cairo, passing through El Obour and El Shorouq cities. It is connected to Delta region via Sharkia governorate, and to the Canal cities via Rubiky, passing through Badr city and Ismailia desert road. It is about 65 km away from Ismailia city and 45 km away from Al Zakazek city passing through Belbees city. The population of 10th of Ramadan city reaches 650,000, in addition to 150,000 visitors, and it is expected to reach 2.1 million in 2032 (*Source: 10th of Ramadan City Information Center, 2017*).

XI. Project Alternatives

The main objective of the project is to meet the steady increase in energy demand and evacuate the power generated from Banha and Ismailia power plants. Environmental and social impacts from the project are assessed and no significant impacts are anticipated. Other objectives of the proposed project includes improve the voltage level and system stability in Canal Zone area, and reinforce the 550kV and 200 kV national electricity network.

a. Technology Limitation

The substation is based on GIS technology with SF6 gas insulated is the most appropriate technology to be used based on environmentally and economically acceptable standards for similar SSs. There is no justification of interconnection underground cables instead of the overhead transmission lines. As most of the routes is far from residential zones and connecting employing OHTL proves technically more feasible and environmentally more benefit, as the excavation of OHTL is much less in comparison with underground cable which would require drilling and more land work.

³ A feddan (Arabic: فدان, faddān) is a unit of area. It is used in Egypt, Sudan, Syria and the Sultanate of Oman. In Egypt the feddan is the only non-metric unit which remained in use following the switch to the metric system. A feddan is divided into 24 kirat (Arabic: قيراط, qīrāt) which equals 175 square metres.[1]

b. Location/Routes Alternatives

The selection of the SS location and the proposed routes; have been considered length optimization thus reducing the cost as much as possible. Moreover, the proposed routes are aligned to the existing road network as much as possible for easy access during construction and maintenance and to reduce to a minimum the number as possible the number of sensitive receptors.

The routes (500/220 kV) are not crossing by any of the protectorates except for the 500kV east Ismailia is crossing over Suez canal with minimal biodiversity that would have minor impact over any receptors given mitigation measures set forth in chapter 7 are followed.

XII. Environmental impacts and mitigation measures

The report presents the potential arise from the project activities on environmental and social impacts and proposed mitigation measures should be followed during the construction and operation phase of the SS and OHTLs.

Example of the impacts ; noise generated by vehicles / equipment during construction and drilling, air emissions from vehicles / equipment and soil transfer during construction, impact on cultural resources and ecological resources, handling of waste (hazardous and non-hazardous). In addition; Impacts on occupational health and safety of workers, and use, archaeological and cultural sites, social impacts, traffic, flora and fauna, groundwater sources, aviation and Telecom, the loss of some environmental advantages as a result of cutting trees to establish OHTLs, the path and patterns of bird migration. The impact of the project on society through job creation and economic prosperity is also studied.

The following tables present significance of expected impacts during construction phase of 10th of Ramadan substation and OHTLs

Table 0-1. Assessed significance of expected impacts during construction phase of 10th Ramadan 500 GIS substation

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction 10 th Ramadan of substation			
Noise	High likelihood to occur – short term and temporary -	Medium Impact	Application of the health and safety guide of the contractor should be 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
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 routes and movement.
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
Vibration	Low likelihood to occur	Minor impact	Schedule and time plan for vehicles movements and construction activities
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 a licensed waste collector for officially assigning a location for the disposal of construction waste. Waste management submitted by the contractor for waste management (upon the agreement with the licensed waste collector). •For The hazardous waste, it will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).” 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.

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction 10 th Ramadan of substation			
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
Visual Resources and landscaping	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
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 (Fauna and Flora and bird migration)	Low likelihood to occur	Negligible impact (no impact)	No mitigation measures are needed.
Natural disaster risks	Low likelihood to occur	No significant impact	No mitigation measures is prepared Technical specifications of the equipment is include the standard measures for natural disaster risks
Land use and Involuntary resettlement	Low likelihood to occur	Very low or insignificant	No mitigation measures is prepared as EETC has already received the governor's decree to allocate the land for the construction of the proposed SS.
Archeological and cultural sites	Low likelihood to occur	Very low or insignificant	No mitigation measures is prepared

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction 10 th Ramadan of substation			
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 0-2. Assessed significance of expected impacts during construction phase of East Ismailia OHTL

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of East Ismailia OHTL			
Noise	High likelihood to occur – short term and temporary	Medium Impact	Application of the health and safety guide of the contractor should be implemented by the 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
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 routes and movement.
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
Hazardous Materials and Waste Management	Likely to occur - short term – Highly sensitive receptors include soil at protectorate areas and workers. Receptors with medium sensitivity include nearby settlements. Receptors	Medium	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 upon the

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of East Ismailia OHTL			
	with low sensitivity include groundwater.		<p>agreement with the licensed waste collector. For The hazardous waste, it will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).”</p> <p>Protection of spillage including paved site for workshop or maintenance of vehicles</p> <p>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.</p>
Health and Safety	Low likelihood of major or medium impacts for workers– high likelihood of minor impact for sensitive recipient	Minor	<p>Standard protection by placing clear project signs.</p> <p>Time management for vehicles movement; especially avoiding the peak hours</p> <p>Standard protection for the workers especially working at elevated heights</p>
Removing trees on ROW	Low likelihood of major or medium impacts	Medium to Major	Reduce impact significance to minor following RAP
Land use	Medium and direct impact to livelihood	Medium	Reduce impact significance to minor following recommendations of RAP preparation
Visual intrusion	Low likelihood of major or medium impacts and localized	Minor	<p>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</p> <p>Clear sign of the construction activities</p>
Ecological (Fauna and Flora)	Medium likelihood to occur – short term	Minor	Following the standard protection for the fauna and flora and proper waste management described on the section of waste management measures
Bird Migration	Low likelihood to occur	Medium to Minor impact	<ul style="list-style-type: none"> Installing bird diverters devices or line markers such as spheres, spiral vibrational dampers, or bird deflectors in order to attract the attention of birds and avoid collision Avoid working in seasons of bird migration, Spring (March-May) and Autumn (August to November)
Water Resources	Medium likelihood to occur – short	Minor	Standard prevention or precaution measures shall be prepared by the contractor prior

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of East Ismailia OHTL			
	term		to the construction. It is preferable to include the waste management plan to be included in the ToR of the contractor.
Cultural resources	Low likelihood of major or medium impacts	Insignificant	No mitigation measures is needed
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 0-3. Assessed significance of expected impacts during construction phase of East Banha OHTL

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of East Banha OHTL			
Noise	High likelihood to occur – short term and temporary -	Medium Impact	Application of the health and safety guide of the contractor should be implemented 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
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 routes and movement.
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
Hazardous	Likely to occur - short term – Highly	Medium	Agreement should be reached prior to commencing construction work between the

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of East Banha OHTL			
Materials and Waste Management	sensitive receptors include soil at protectorate areas and workers. Receptors with medium sensitivity include nearby settlements. Receptors with low sensitivity include groundwater.		<p>contractor and landfill for officially assigning a location for the disposal of construction waste.</p> <p>Waste management submitted by the contractor for waste management upon the agreement with the licensed waste collector. For The hazardous waste, it will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).”</p> <p>Protection of spillage including paved site for workshop or maintenance of vehicles</p> <p>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.</p>
Health and Safety	Low likelihood of major or medium impacts for workers– high likelihood of minor impact for sensitive recipient	Minor	<p>Standard protection by placing clear project signs.</p> <p>Time management for vehicles movement; especially avoiding the peak hours</p> <p>Standard protection for the workers especially working at elevated heights</p>
Removing trees on ROW	Low likelihood of major or medium impacts	Medium to Major	Reduce impact significance to minor following RAP
Land use	Medium and direct impact to livelihood	Medium	Reduce impact significance to minor following recommendations of RAP preparation
Visual intrusion	Low likelihood of major or medium impacts and localized	Minor	<p>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</p> <p>Clear sign of the construction activities</p>
Ecological (Fauna and Flora)	Medium likelihood to occur – short term	Minor	Following the standard protection for the fauna and flora and proper waste management described on the section of waste management measures
Bird Migration	Low likelihood to occur	Medium to Minor impact	<ul style="list-style-type: none"> Installing bird diverters devices or line markers such as spheres, spiral vibrational dampers, or bird deflectors in order to attract the attention of birds and avoid collision

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of East Banha OHTL			
			<ul style="list-style-type: none"> Avoid working in seasons of bird migration, Spring (March-May) and Autumn (August to November)
Water Resources	Medium likelihood to occur – short term	Minor	Standard prevention or precaution measures shall be prepared by the contractor prior to the construction. It is preferable to include the waste management plan to be included in the ToR of the contractor.
Cultural resources	Low likelihood of major or medium impacts	Insignificant	No mitigation measures is needed
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 0-4. Assessed significance of expected impacts during construction phase of Belbees OHTL

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of Belbees OHTL			
Noise	High likelihood to occur – short term and temporary -	Medium Impact	<p>Application of the health and safety guide of the contractor should be implemented by construction workers.</p> <p>Notification to the surrounding establishment prior to the construction of the SS</p> <p>Time management and construction schedule according to the IFC regulation provided by the contractor prior to the construction phase</p>
Traffic	High likelihood to occur – short term, temporary and localized only on the main road	Low to medium impact	<p>Time management for transporting the materials, equipment, debris, etc</p> <p>Clear sign surrounding construction site and the enter / exit gate</p> <p>Coordination with traffic department (ministry of interior) for vehicles routes and movement.</p>
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.	<p>Medium impact on construction workers</p> <p>Low impact on the residents, surrounding establishment and pedestrians passing by</p>	<p>Spraying the sandy soil with water (if needed, especially during the dry period).</p> <p>Maneuver area and the parking area should be well paved</p> <p>Management of the number of vehicles at the same time for specific location and the scheduling the intensity of vehicles</p>

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of Belbees OHTL			
		the construction site	
Hazardous Materials and Waste Management	Likely to occur - short term – Highly sensitive receptors include soil at protectorate areas and workers. Receptors with medium sensitivity include nearby settlements. Receptors with low sensitivity include groundwater.	Medium	<p>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.</p> <p>Waste management submitted by the contractor for waste management upon the agreement with the licensed waste collector. For The hazardous waste, it will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).”</p> <p>Protection of spillage including paved site for workshop or maintenance of vehicles</p> <p>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.</p>
Health and Safety	Low likelihood of major or medium impacts for workers– high likelihood of minor impact for sensitive recipient	Minor	<p>Standard protection by placing clear project signs.</p> <p>Time management for vehicles movement; especially avoiding the peak hours</p> <p>Standard protection for the workers especially working at elevated heights</p>
Removing trees on ROW	Low likelihood of major or medium impacts	Medium to Major	Reduce impact significance to minor following RAP
Land use	Medium and direct impact to livelihood	Medium	Reduce impact significance to minor following recommendations of RAP preparation
Visual intrusion	Low likelihood of major or medium impacts and localized	Minor	<p>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</p> <p>Clear sign of the construction activities</p>
Ecological (Fauna and Flora)	Medium likelihood to occur – short term	Minor	Following the standard protection for the fauna and flora and proper waste management described on the section of waste management measures

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of Belbees OHTL			
Water Resources	Medium likelihood to occur – short term	Minor	Standard prevention or precaution measures shall be prepared by the contractor prior to the construction. It is preferable to include the waste management plan to be included in the ToR of the contractor.
Cultural resources	Low likelihood of major or medium impacts	Insignificant	No mitigation measures is needed
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 0-5. Assessed significance of expected impacts during construction phase of Zezenia OHTL

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of Zezenia OHTL			
Noise	High likelihood to occur – short term and temporary -	Medium Impact	Application of the health and safety guide of the contractor should be implemented 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
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 routes and movement.
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	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
Impacts during construction phase of Zezenia OHTL			
		the construction site	
Hazardous Materials and Waste Management	Likely to occur - short term – Highly sensitive receptors include soil at protectorate areas and workers. Receptors with medium sensitivity include nearby settlements. Receptors with low sensitivity include groundwater.	Medium	<p>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.</p> <p>Waste management submitted by the contractor for waste management upon the agreement with the licensed waste collector. For The hazardous waste, it will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).”</p> <p>Protection of spillage including paved site for workshop or maintenance of vehicles</p> <p>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.</p>
Health and Safety	Low likelihood of major or medium impacts for workers– high likelihood of minor impact for sensitive recipient	Minor	<p>Standard protection by placing clear project signs.</p> <p>Time management for vehicles movement; especially avoiding the peak hours</p> <p>Standard protection for the workers especially working at elevated heights</p>
Removing trees on ROW	Low likelihood	insignificant	no cut of trees is associated to this OHTL
Land use	low likelihood	insignificant	OHTL will not pass by or cross any land use plans or community goals.
Visual intrusion	Low likelihood of major or medium impacts and localized	Minor	<p>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</p> <p>Clear sign of the construction activities</p>
Ecological (Fauna and Flora)	Medium likelihood to occur – short term	Minor	Following the standard protection for the fauna and flora and proper waste management described on the section of waste management measures
Bird Migration	Low likelihood to occur	Medium to Minor impact	<ul style="list-style-type: none"> Installing bird diverters devices or line markers such as spheres, spiral vibrational

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of Zezenia OHTL			
			dampers, or bird deflectors in order to attract the attention of birds and avoid collision <ul style="list-style-type: none"> Avoid working in seasons of bird migration, Spring (March-May) and Autumn (August to November)
Water Resources	Medium likelihood to occur – short term	Minor	Standard prevention or precaution measures shall be prepared by the contractor prior to the construction. It is preferable to include the waste management plan to be included in the ToR of the contractor.
Cultural resources	Low likelihood of major or medium impacts	Insignificant	No mitigation measures is needed
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 0-6. Assessed significance of expected impacts during operation phase of 10th Ramadan 500 GIS substation

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation and maintenance of 10 th of Ramadan substation			
Noise	Low likelihood to occur –receptors include nearby settlements (residential) are far at a distance above 10km.	Low impact on settlement and nearby establishment :Low 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 provided at the substation.
Traffic	Low likelihood to occur	Low impact	No mitigation identified
Air quality	Low likelihood to occur	Low impact	No mitigation identified
Vibration	Minor or very low likelihood to occur	Very minor	No mitigation identified
Hazardous Materials and Waste Management	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)	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 upon the agreement with the licensed waste collector. For The hazardous waste, it will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).”
Soil contamination	High likelihood to occur, only during the incident of oil spillage from the transformers and possible vehicles.	Low to medium impact	Standard design of precaution for the site of transformers Paved within surrounding site of substation especially at the area for parking and movement of vehicles

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation and maintenance of 10 th of Ramadan substation			
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. Please refer to Annex 1 for the health and safety guide
Natural disaster risks	Low likelihood to occur	Negligible impact	No mitigation identified Technical specifications of the equipment is include the standard measures for natural disaster risks
Visual Resources	Low likelihood to occur	Very low impact or negligible impact	No mitigation measure is prepared
Ecological Resources (Fauna and Flora)	Low likelihood to occur	No significant impact	No mitigation identified
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

Table 0-7. Assessed significance of expected impacts during operation phase of East Ismailia OHTL

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of East Ismailia OHTL			
Risk of Waste generated	Likely to occur - short term – Highly sensitive receptors include soil and workers. Receptors with medium sensitivity include nearby projects/settlements. Receptors with low sensitivity include groundwater.	Medium	Waste management implemented according to EEAA 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. Disposal means of the hazardous wastes will be according to the Egyptian laws and regulations regarding the disposal.
Exposure to EMF's	Likely to occur - long term impact	Medium	In order to maintain safety of the general public and minimize exposure to EMF's some laws and guidelines require maintaining a suitable ROW distance of 25 meters (for 500 kV OHTL) so that the EMF's would effectively attenuate at the edge of this EMF
Risk of soil contamination	Low likelihood of occurrence - short term impact	Minor	Following standard protection for the soil and proper waste management described on the section of waste management measures
Noise	Low likelihood of occurrence - short term impact	Minor	Minimizing impact significance
Cultural resources	Low likelihood of major or medium impacts	insignificant	Standard mitigation measures of recording and reporting
Health and Safety	Low likelihood of minor impact for the sensitive recipient and medium to major for the workers	Medium to Major	Standard protection for the workers especially working at elevated heights
Bird Migration	Low likelihood to occur	Medium to Minor impact	<ul style="list-style-type: none"> Installing bird diverters devices or line markers such as spheres, spiral vibrational dampers, or bird deflectors in order to attract the attention of birds and avoid collision Avoid working in seasons of bird migration, Spring (March-May) and Autumn (August to November)
Natural disaster risks	Low likelihood to occur	Negligible impact	No mitigation identified

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of East Ismailia OHTL			
			Technical specifications of the equipment is include the standard measures for natural disaster risks
Visual Resources	Low likelihood to occur	Very low impact or negligible impact	No mitigation measure is prepared
Ecological Resources(Fauna and Flora)	Low likelihood to occur	No significant impact	No mitigation identified
Creation of Job opportunities	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

Table 0-8. Assessed significance of expected impacts during operation phase of East Banha OHTL

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of East Banha OHTL			
Risk of Waste generated	Likely to occur - short term – Highly sensitive receptors include soil and workers. Receptors with medium sensitivity include nearby projects/settlements. Receptors with low sensitivity include groundwater.	Medium	Waste management implemented according to EEAA 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. Disposal means of the hazardous wastes will be according to the Egyptian laws and regulations regarding the disposal.
Exposure to EMFs	Likely to occur - long term impact	Medium	In order to maintain safety of the general public and minimize exposure to EMFs some laws and guidelines require maintaining a suitable ROW distance of 25 meters (for 500 kV OHTL) so that the EMFs would effectively attenuate at the edge of this EMF
Risk of soil contamination	Low likelihood of occurrence - short term impact	Minor	Following standard protection for the soil and proper waste management described on the section of waste management measures
Noise	Low likelihood of occurrence - short term impact	Minor	Minimizing impact significance

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of East Banha OHTL			
Cultural resources	Low likelihood of major or medium impacts	insignificant	Standard mitigation measures of recording and reporting
Health and Safety	Low likelihood of minor impact for the sensitive recipient and medium to major for the workers	Medium to Major	Standard protection for the workers especially working at elevated heights
Bird Migration	Low likelihood to occur	Medium to Minor impact	<ul style="list-style-type: none"> Installing bird diverters devices or line markers such as spheres, spiral vibrational dampers, or bird deflectors in order to attract the attention of birds and avoid collision Avoid working in seasons of bird migration, Spring (March-May) and Autumn (August to November)
Natural disaster risks	Low likelihood to occur	Negligible impact	No mitigation identified Technical specifications of the equipment is include the standard measures for natural disaster risks
Visual Resources	Low likelihood to occur	Very low impact or negligible impact	No mitigation measure is prepared
Ecological Resources(Fauna and Flora)	Low likelihood to occur	No significant impact	No mitigation identified
Creation of Job opportunities	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

Table 0-9. Assessed significance of expected impacts during operation phase of Belbees OHTL

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of Belbees OHTL			

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of Belbees OHTL			
Risk of Waste generated	Likely to occur - short term – Highly sensitive receptors include soil and workers. Receptors with medium sensitivity include nearby projects/settlements. Receptors with low sensitivity include groundwater.	Medium	Waste management implemented according to EEAA 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. Disposal means of the hazardous wastes will be according to the Egyptian laws and regulations regarding the disposal.
Exposure to EMFs	Likely to occur - long term impact	Medium	In order to maintain safety of the general public and minimize exposure to EMFs some laws and guidelines require maintaining a suitable ROW distance of 25 meters (for 500 kV OHTL) so that the EMFs would effectively attenuate at the edge of this EMF
Risk of soil contamination	Low likelihood of occurrence - short term impact	Minor	Following standard protection for the soil and proper waste management described on the section of waste management measures
Noise	Low likelihood of occurrence - short term impact	Minor	Minimizing impact significance
Cultural resources	Low likelihood of major or medium impacts	insignificant	Standard mitigation measures of recording and reporting
Health and Safety	Low likelihood of minor impact for the sensitive recipient and medium to major for the workers	Medium to Major	Standard protection for the workers especially working at elevated heights
Natural disaster risks	Low likelihood to occur	Negligible impact	No mitigation identified Technical specifications of the equipment is include the standard measures for natural disaster risks
Visual Resources	Low likelihood to occur	Very low impact or negligible impact	No mitigation measure is prepared
Ecological Resources(Fauna and Flora)	Low likelihood to occur	No significant impact	No mitigation identified
Creation of Job	Increasing the opportunity for opening small business and shops as a result of having a stable electricity	Moderate positive impact	No mitigation measures is prepared Awareness campaigns for community members to

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of Belbees OHTL			
opportunities	service		rationalize consumption of electricity service

Table 0-10. Assessed significance of expected impacts during operation phase of Zezenia OHTL

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of Zezenia OHTL			
Risk of Waste generated	Likely to occur - short term – Highly sensitive receptors include soil and workers. Receptors with medium sensitivity include nearby projects/settlements. Receptors with low sensitivity include groundwater.	Medium	Waste management implemented according to EEAA 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. Disposal means of the hazardous wastes will be according to the Egyptian laws and regulations regarding the disposal.
Exposure to EMF's	Likely to occur - long term impact	Medium	In order to maintain safety of the general public and minimize exposure to EMF's some laws and guidelines require maintaining a suitable ROW distance of 25 meters (for 500 kV OHTL) so that the EMF's would effectively attenuate at the edge of this EMF
Risk of soil contamination	Low likelihood of occurrence - short term impact	Minor	Following standard protection for the soil and proper waste management described on the section of waste management measures
Noise	Low likelihood of occurrence - short term impact	Minor	Minimizing impact significance
Cultural resources	Low likelihood of major or medium impacts	insignificant	Standard mitigation measures of recording and reporting
Health and Safety	Low likelihood of minor impact for the sensitive recipient and medium to major for the workers	Medium to Major	Standard protection for the workers especially working at elevated heights
Bird Migration	Low likelihood to occur	Minor impact	<ul style="list-style-type: none"> Installing bird diverters devices or line markers such as spheres, spiral vibrational dampers, or bird deflectors in order to attract the attention of birds and avoid collision Avoid working in seasons of bird migration, Spring (March-May) and Autumn (August to

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of Zezenia OHTL			
			November)
Natural disaster risks	Low likelihood to occur	Negligible impact	No mitigation identified Technical specifications of the equipment is include the standard measures for natural disaster risks
Visual Resources	Low likelihood to occur	Very low impact or negligible impact	No mitigation measure is prepared
Ecological Resources(Fauna and Flora)	Low likelihood to occur	No significant impact	No mitigation identified
Creation of Job opportunities	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

XIII. Environmental and Social Management Plan (ESMP) and Monitoring Plan

This chapter presents Environmental and Social Management Plan (ESMP) developed for EETC and the contractor for 10th of Ramadan Substation. This chapter consists of the following sections:

- ESMP during construction and operation phase (including detailed mitigation measures) of Substation and OHTLs(500kV and 220 kV)
- Guidance on Emergency Response Plans
- Roles and responsibilities in the implementation of the ESMP (during construction and operation phase) of Substation and OHTLs (500 kV and 220 kV)
- Trainings
- Cost Estimation

Arabic Non-Technical Executive Summary

1 مقدمة

في إطار مشاريع التنمية في زيادة الطاقة الكهربائية والتي توليها الدولة اهتمام 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 للآثار البيئية لأي 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 إكوكونسرف للحلول البيئية لإعداد دراسة تقييم أثر بيئي للمشروع والذي يتكون من محطة محولات العاشر من رمضان 500 والخطوط الهوائية لربطها بالشبكة القومية

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 مسح 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. إعداد خطة إعادة التوطين RAP للخط بأكمله ويشمل ذلك التعداد الكامل وتحديد وتقييم الأشخاص و الأصول المتأثرة بحق طريق (ROW) يبلغ طوله 50 مترًا يحدده الإحداثيات الواردة في خط التفصيل لعام 2017 ونشر التاريخ النهائي. 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 و 2015/105.

- 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 البيئية والاجتماعية.

5 وصف المشروع

1-5 بيانات المشروع

- إنشاء محطة محولات العاشر من رمضان 500 جهد 220/500 ك.ف. سعة 2 * 750 م.ف.أ. قابلة للتوسيع بمحول ثالث (مع مراعاة أن تكون سعة المهمات مناسبة لسعة الكابلات وخطوط الربط) ويتم ربطها بالشبكة القومية عن طريق ما يلي:
- 1.1.5 جهد 500 ك.ف. :

1.1.1.5 إنشاء الخط الهوائي المزدوج الدائرة رباعي الموصل العاشر 500/ شرق بنها جهد 500 ك.ف بطول حوالى 52 كم.

2.1.1.5 إنشاء الخط الهوائي المزدوج الدائرة رباعي الموصل العاشر 500 / شرق الإسماعيلية 500 جهد 500 ك.ف بطول حوالى 97 كم.

3.1.1.5 ترك مكان خالى لعدد (2) خلية إحتياطية جهد 500 ك.ف. للربط بالشبكة مستقبلا.

2.1.5 جهد 220 ك.ف. عن طريق :

1.2.1.5 إنشاء الخط الهوائي المزدوج الدائرة ثلاثى الموصل العاشر 500 / زيزينيا جهد 220 ك.ف بطول حوالى 12 كم.

2.2.1.5 إنشاء الخط الهوائي المزدوج الدائرة ثلاثى الموصل العاشر 500 / بلبيس جهد 220 ك.ف (المقترحة) بطول حوالى 8 كم.

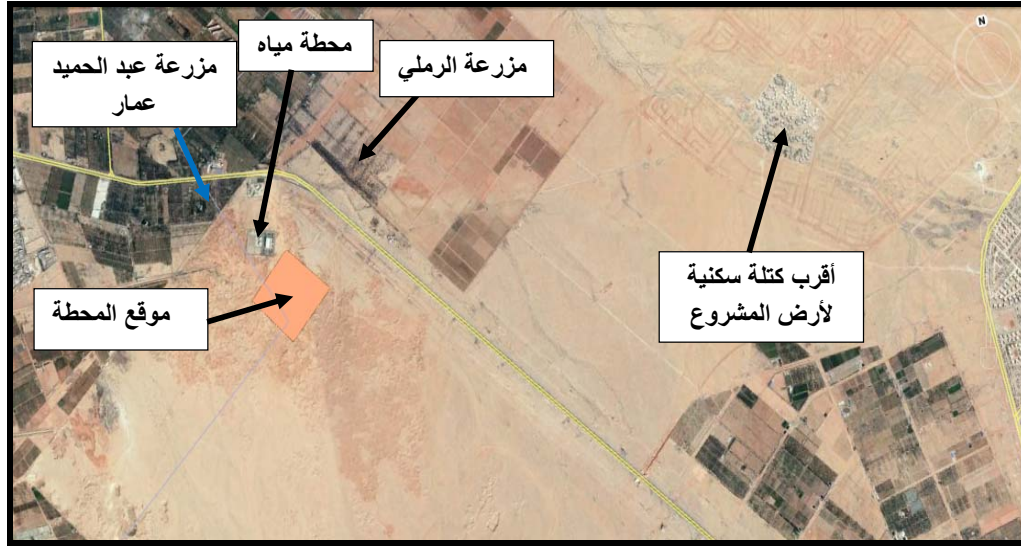
3.2.1.5 ترك مكان خالى لعدد (4) خلية إحتياطية جهد 220 ك.ف. للربط بالشبكة مستقبلا.

مع الأخذ فى الاعتبار إمكانية توسيع المحطة مستقبلا بالجهد 66 ك.ف.

2-5 مكان وموقع المشروع

يقع المشروع في مدينة العاشر من رمضان، وقد أظهرت الزيارات لمنطقة المشروع:

- أن الأراضي المحيطة بموقع المحطة تتنوع بين أراضي صحراوية خالية من المنشآت والكتل السكنية وأراضي مزارع،
- وأن أرض المشروع تقع في المنطقة المخصصة للمرافق والخدمات في التخطيط الإستراتيجى لمنطقة غرب العاشر وتخلو المنطقة من المنشآت فيما عدا محطة مياه العاشر الجديدة المحيطة لموقع المشروع من الجهة الشمالية وتبعد عنه مسافة 50 كم تقريباً.
- توجد منطقة زراعية بالقرب من موقع المشروع تقع في الجهة المقابلة له من الناحية الشرقية والشمالية، وهي عبارة عن عدد من مزارع الفاكهة والمواالح أقربها للمشروع مزرعة الرملية وعبد الحميد عمار، وتبعد عن أرض المشروع حوالى 1.500 كم تقريباً.
- تخلو المنطقة الواقعة جنوب وغرب المشروع من أي منشأة، ويشير المخطط الاستراتيجي لهذه المنطقة أنها عبارة عن منطقة خدمات إقليمية بمساحة 384.83 فدان، منطقة حرة بمساحة 1311.80 فدان،
- تقع أقرب كتلة سكنية لموقع المشروع في الجهة الشرقية وتبعد عنه حوالى 5 ك وهي منطقة إسكان الشباب وتقسيم أراضي مشروع ابني بيتك.



شكل رقم 1: أقرب المنشآت لموقع المحطة



شكل رقم 2: الموقع المقترح لمحطة محولات العاشر من رمضان

3-5 وصف موجز لأنشطة الإنشاء

1-3-5 إنشاء محطة المحولات

إعداد الموقع: يشمل أعمال تسوية الموقع (الحد من التأثيرات على شبكات البنية الأساسية القائمة في الموقع) نقل مواد البناء والمعدات اللازمة للإنشاءات - تشوين مواد البناء والمعدات في الموقع

يتم في هذه المرحلة الحصول على التصاريح والموافقات من الجهات الرسمية المختصة

أعمال الخرسانة: أعمال إنشاء الأساسات وصب الخرسانة والهيكل

أعمال إنشاء المباني الفرعية: تشمل المباني الإدارية وغيرها من المباني وغرف التحكم... الخ

تركيب المعدات: تشمل المحولات ووحدات التحكم واللوحات الكهربائية .. الخ

إدارة المخلفات: وتشمل المخلفات البلدية ومخلفات الإنشاءات (مخلفات خطرة وغير خطرة)، وتشمل التعرف على أنواع المخلفات وتخزينها بشكل مؤقت وإدارتها ونقلها إلى مدفن النفايات.

بالإضافة إلى الأنشطة السابقة سوف يتم تدريب العاملين على التشغيل والصيانة وسوف تشمل برامج التدريب خطة الطوارئ التي سوف يلتزم بها المقاول خلال أعمال توريد وتركيب وإعداد المحولات ومستلزماتها، سوف تتم أنشطة بناء القدرات في خلال فترة الضمان.

2-3-5 مرحلة أعمال الإنشاءات للكابلات الهوائية

تحديد مسار الطريق (ROW): حدد قانون الكهرباء 2015/87 حدود المسافات التي يجب قياسها من محور مسارات من أجل تحديد مسار الطريق (ROW). وسيتم الاحتفاظ بمسافة 25 متراً من كلا الجانبين من أجل خطوط الجهد الهوائية (500 كيلو فولت) كحق الطريق (ROW) أو المنطقة العازلة للحفاظ على السلامة العامة من المخاطر الكهربائية والتعرض الشديد للمجالات المغناطيسية الكهربائية

حفر القواعد: يتم الحفر بعمق حوالي 4.5 م لكل قاعده ويبلغ متوسط المساحة المطلوبة لتنفيذ قاعدة البرج من 22م X 22م إلى 33م X 33م.

تركيب ملحقات تعليق البرج: يتم تركيبها يدوياً عن طريق نقل الملحق باستخدام بكرة سلسلة

تركيب الأبراج الهوائية: يتم تجهيز البرج كأجزاء منفصلة ويتم تركيبه بالموقع عن طريق شركة مقاولات متخصصة. ويستخدم فريق الانشاء الروافع والمعدات لتركيب البرج بالموقع حيث يتم تركيب الزوايا الحديدية والعازلات.

عملية شد الأسلاك: بعد اتمام عملية انشاء الأبراج تقوم الروافع ب تثبيت الاسلاك الكهربائية ومدها ما بين الابراج حتي تصل بين المحطتين

إدارة المخلفات: وتشمل المخلفات البلدية ومخلفات الإنشاءات (مخلفات خطرة وغير خطرة)، وتشمل التعرف على أنواع المخلفات وتخزينها بشكل مؤقت وإدارتها ونقلها إلى مدفن النفايات.

بالإضافة إلى الأنشطة السابقة سوف يتم تدريب العاملين على التشغيل والصيانة وسوف تشمل برامج التدريب خطة الطوارئ التي سوف يلتزم بها المقاول خلال أعمال توريد وتركيب وإعداد المحولات ومستلزماتها، سوف تتم أنشطة بناء القدرات في خلال فترة الضمان.

5-3-3 مرحلة التشغيل

تحتاج محطة المحولات والابراج الهوائية إلى أعمال صيانة دورية وقائية وإصلاحية للحفاظ على عليها في أحسن حال في فترة التشغيل. تتبع الصيانة الوقائية جدول دوري يهدف إلى تجنب حدوث الأعطال والحفاظ على تشغيل المحولات على مستواها الأمثل. يعتمد تكرار الصيانة الوقائية على عدة عوامل مثل التكنولوجيا المستخدمة، والأوضاع البيئية في الموقع، شروط الضمان، والفروق الموسمية. تضم أنشطة الصيانة على سبيل المثال، فحص المحولات من حيث السلامة الهيكلية. تجرى أعمال الصيانة الإصلاحية في حالة حدوث الأعطال، على سبيل المثال لإصلاح أو تبديل المعدات المعطلة أو التالفة.

6 الوصف البيئي والاجتماعي

المناخ

يسود في دلتا النيل مناخ البحر المتوسط مع سقوط الأمطار في الشتاء ولكن ليس بكميات كبيرة. ويكون شهري يوليو و أغسطس من أكثر الشهور حرارة في الدلتا حيث يكون المتوسط حوالي 30 درجة مئوية وأقصى درجة حرارة 35 درجة مئوية. بينما تتراوح درجات الحرارة في فصل الشتاء عادة ما بين 8 الى 16 درجة مئوية. أما عن الرطوبة النسبية فترتفع في دلتا النيل.

الجيولوجيا

منذ عام 1901 وحتى الآن ساعدت الدراسات الجيولوجية في الكشف عن العديد من الحقائق عن جيولوجيا دلتا النيل التي بدأت تتشكل منذ الميوسين كمنطقة دلتا النيل -جنبا إلى جنب مع الرواسب التي يؤلفها -تأثرت بالتغيرات في مستوى سطح البحر وتكوينات المنطقة فضلا عن الظروف المناخية، حيث كانت هناك ثلاث دورات للرواسب تؤدي إلى تشكيل دلتا الحالية.

المياه السطحية

يمكن تصنيف موارد المياه السطحية في دلتا النيل على النحو التالي:

الأنهار

يتفرع نهر النيل الى فرعين يصبان في البحر المتوسط هما: فرع دمياط في الشرق وينتهي بمدينة دمياط وفرع رشيد في الغرب وينتهي عند مدينة رشيد. نهر النيل من أهم موارد المياه لمحافظة مصر التي تعتمد عليه في ري الأراضي الزراعية بالإضافة الاعتماد عليه في المجالات الأخرى. وتصب المياه الفائضة في منطقة دلتا النيل في البحر الأبيض المتوسط والبحيرات الشمالية. كما يوجد عدد كبير من القنوات لتلبية احتياجات الزراعة والسكان في منطقة الدلتا.

البحار

تقع محافظات دلتا النيل على البحر الأبيض المتوسط ويبلغ طولها حوالي 100 كم.

البحيرات

بحيرة البرلس

تقع بحيرة البرلس شمال محافظة كفر الشيخ وتبلغ مساحتها 120 ألف فدان. تتصل البحيرة بالبحر الأبيض المتوسط من خلال مضيق البرلس.

بحيرة المنزلة

تغطي بحيرة المنزلة 20% من منطقة محافظة الدلتا. وهي بحيرة ضحلة متوسطة الملوحة متصلة بالبحر من خلال ثلاثة مضائق رئيسية.

بحيرة إدكو

تقع بحيرة إدكو شمال محافظة البحيرة؛ يحدها من الشمال طريق زراعي وسكة حديد الإسكندرية. وتبلغ مساحة البحيرة حوالي 20 ألف فدان. مياه البحيرة مياه صالحة للشرب وتتراوح عمق المياه في البحيرة من 75 سم إلى 1.25 متر. تعد بحيرة إدكو واحدة من أهم البحيرات ومصادر الأسماك في جمهورية مصر العربية، حيث أنها تحتل المرتبة الثالثة بعد بحيرة المنزلة وبحيرة البرلس فيما يتعلق بإنتاج الأسماك.

بحيرات المرة

بحيرة المريّة العظيمة هي بحيرة مالحة في مصر، متصلة بالبحر الأبيض المتوسط والبحر الأحمر عبر قناة السويس. وهو متصل إلى بحيرة المر الصغيرة التي من خلالها القناة أيضا يعمل.

الأمطار

تختلف كمية سقوط الأمطار الشهرية والسنوية في منطقة دلتا النيل. ويكاد يكون أهمية الأمطار وتأثيرها على الزراعة معدوم تماما في الدلتا؛ وذلك نظرا للاعتماد على نهر النيل في ري الأراضي الزراعية. ويكون شهر يناير هو أكثر الشهور التي تسقط فيها الأمطار وتبلغ 17 ملميمتر يليه شهر ديسمبر بمعدل 13.6 ملميمتر. ولا يشهد شهر يوليو أي سقوط للأمطار، بينما تسقط أمطار قليلة في شهري يونية وسبتمبر.

المياه الجوفية

توجد المياه الجوفية في محافظات الدلتا ويرجع ذلك في الأساس إلى تسرب مياه نهر النيل والأمطار وجزء كبير من مياه الري. وتعتبر المياه الجوفية إحدى موارد مصر المائية التي لم تحظ بالاهتمام الكافي حتى وقت قريب. يتم استخدام المياه الجوفية في منطقة الدلتا الوسطى كمصدر لسد النقص في مياه نهر النيل أو في أوقات عدم وصول المياه إلى نهايات القنوات الري. كما أنها تستخدم كمصدر مباشر للمياه الصالحة للشرب حيث أنها لا تتطلب محطات معالجة كبيرة.

فونا وقلورا

نظرا لوجود أراضي زراعية بالقرب من موقع المشروع، فتعتبر الحيوانات الأكثر هيمنة في المنطقة هي حيوانات المزارع أما عن الحيوانات الأخرى فهي أنواع متكيفة مع البيئة الحضرية كالقطط والكلاب والقوارض والسحالي والخفافيش والطيور، والتي تعتمد على المخلفات كغذاء لها.

تضم الأراضي الزراعية النباتات الشائعة في المنطقة وهم أشجار شجرة الشيح، شجرة الجميز، السنط، الكافور والنباتات المختلفة التي تنتشر على ضفاف القنوات والمصارف. بالإضافة إلى المحاصيل المزروعة والأكثر شيوعاً وهي القمح والأرز والذرة والخضروات.

ومع ذلك، لا توجد أي تسجيلات للنباتات أو الحيوانات الموجودة داخل المنطقة المحيطة، حيث أن الموقع المقترح للمشروع هو أرض فارغة داخل المنطقة الحضرية، والتي تعتبر منطقة صحراوية ولذلك فمن المتوقع ندرة النباتات ولكن ليس النباتات المتوطنة. ويمكن أن تقع مزارع الحيوانات الأليفة والمحلية في المنطقة السكنية المحيطة، ولكن لن تتأثر هذه الموائل من أنشطة المشروع.

وفيما يتعلق بهجرة الطيور، فلا يقع موقع المحطة في مسار الطيور المهاجرة محلياً أو دولياً.

الخصائص الاقتصادية والاجتماعية

تقع أرض المحطة شمال غرب مدينة العاشر من رمضان بالقرب من تقسيم أراضي يعرف باسم مدينة المعرفة. تم تخصيص أرض المحطة والحرم المحيط بها من جهاز مدينة العاشر من رمضان (أملك دولة) طبقاً لمواصفات وزارة الكهرباء والقانون المصري. ويبعد موقع المحطة عن جهاز مدينة العاشر من رمضان مسافة 14.500 كم، وتبعد حوالي 500 م من طريق بلبيس - العاشر.

تم إنشاء مدينة العاشر من رمضان في عام 1980 من أجل تخفيف الضغط السكاني في محافظة القاهرة والمناطق الحضرية، ولخلق فرص عمل للشباب، فهي أكبر منطقة صناعية في مصر. تبلغ مساحة مدينة العاشر من رمضان 398 كيلو متر مربع. وتقع المدينة على بعد 55 كم من القاهرة مروراً بمدينة العبور ومدينة الشروق، وترتبط بإقليم الدلتا عن طريق محافظة الشرقية، وترتبط بمدن القناة عن طريق الروبيكي مروراً بمدينة بدر وطريق مصر الإسماعيلية الصحراوي، وتبعد حوالي 65 كم من مدينة الإسماعيلية و45 كم عن مدينة الزقازيق مارة بمدينة بلبيس. ويبلغ عدد سكان المدينة 650 ألف نسمة بخلاف 150 ألف متردد على المدينة ومن المستهدف أن يصل إلى 2.1 مليون نسمة عام.

لا توجد أي أرقام مسجلة للنباتات أو الحيوانات الموجودة داخل المنطقة المحيطة، حيث أن الموقع المقترح للمشروع يمثل أرض فضاء صحراوية داخل المنطقة الحضرية، لذا من المتوقع ندرة النباتات ولكن ليس النباتات المتوطنة. ويمكن أن تقع مزارع الحيوانات الأليفة والمحلية في المنطقة السكنية المحيطة، ولكن لن تتأثر هذه الموائل من أنشطة المشروع.

وفيما يتعلق بهجرة الطيور، فلا يقع موقع المحطة في مسار الطيور المهاجرة محلياً أو دولياً.

7 بدائل المشروع

1-7 المشروع والتقنيات المستخدمة

- يهدف المشروع للتوسع في خدمات الكهرباء المقدمة لمنطقة العاشر من رمضان
- التقنية المطبقة في محطة المحولات هي محطة GIS وتعتبر أفضل نوع تكنولوجيا لمحطة المحولات من ناحية الأمان والسلامة والصحة المهنية في مرحلة التشغيل. سوف يتم ربط المحطة بالشبكة من خلال الكابلات القائمة بالفعل وهو ما يمثل استغلال أمثل للموارد المتاحة.

2-7 بدائل الموقع ومسار خطوط الربط الهوائية

- تم تخصيص الأرض المخصصة لإنشاء محطة المحولات للشركة المصرية لنقل الكهرباء من جهاز مدينة العاشر من رمضان وتم اختيار موقع المحطة ومسار الكابلات لمراعاة الاستخدام الأمثل للموارد وتجنب اي مستقبلات حساسة.
- سوف يتم إنشاء الكابلات بمحاذاة شبكة الطرق (بما يسهل من توصيل المواد الخام والقيام بأعمال الصيانة)
- تم اختيار موقع المحطة ومسار الكابلات لمراعاة الاستخدام الأمثل (الحد من التكلفة بقدر الإمكان)
- محطة المحولات وخطوط الربط لها تأثيرات قليلة على مستقبلات الموجودة في المنطقة المحيطة بالموقع. باتباع إجراءات التخفيف الموصي بها تكون التأثيرات محدودة.

8 تأثيرات المحتملة على البيئة وإجراءات التخفيف

يتضمن التقرير تفاصيل التأثيرات المحتملة على البيئة وإجراءات التخفيف المقترحة خلال مرحلة أعمال الإنشاءات وخلال مرحلة التشغيل لمحطات المحولات وخطوط 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 وغير 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 العناصر الرئيسية من التأثيرات المحتملة لمحطة المحولات خلال مرحلة الإنشاء

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
الضوضاء الناتجة عن أعمال الإنشاءات	احتمال كبير أن يحدث - ولكنه مؤقت وعلى المدى القصير	متوسط	إتباع خطة الإدارة البيئية للحد من شدة التأثير
التأثير على حركة المرور	احتمال كبير أن يحدث على الطريق الرئيسي فقط - ولكنه مؤقت وعلى المدى القصير	منخفض الى متوسط	إتباع خطة الإدارة البيئية للحد من شدة التأثير
انبعاثات الهواء الناتجة عن أعمال الإنشاءات	احتمال كبير أن يحدث - ولكنه مؤقت وعلى المدى القصير	تأثير متوسط على عمال البناء، وتأثير منخفض على السكان والمنشآت المحيطة والمارة بموقع الإنشاءات	الحد من شدة التأثير في الأراضي التي تتكون من تربة رملية
التأثير على الاهتزاز	احتمال ضعيف أن يحدث	تأثير ضعيف	وضع الخطة الزمنية لحركة السيارات وأنشطة الإنشاء

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
التأثير على المواد الخطرة ومخلفات البناء	احتمال غير مؤكد	منخفض الى متوسط	لابد من التوصل إلى اتفاق بين المفاوض وجامع المخلفات المعتمد قبل البدء في أعمال الإنشاءات من أجل تخصيص موقع رسمي للتخلص من مخلفات البناء. بالنسبة للمخلفات الخطرة، سيتم إدارتها والتخلص منها وفقا للأنظمة والتشريعات المصرية المعمول بها من قبل الشركة المتخصصة تحت إشراف السلطات البيئية.
المخاطر المرتبطة بالسلامة والصحة المهنية	احتمال كبير أن يحدث لعمال الإنشاءات احتمال ضعيف أن يحدث للمنشآت المحيطة والمستقبلات الحساسة	تأثير ضعيف على المستقبلات الحساسة وتأثير متوسط إلى عالي / كبير على العمال	- الالتزام بمعايير الحماية البيئية من خلال وضع علامات واضحة للمشروع. - إدارة الوقت لحركة السيارات؛ وخاصة وقت الذروة
التأثير على الموارد البصرية والمناظر الطبيعية	احتمال ضعيف أن يحدث	تأثير ضعيف، محلي، ومؤقت	إتباع معايير الحماية البيئية المتعلقة باختلال التربة والأرض، ونوعية الهواء (والغبار) والإدارة السليمة للمخلفات التي تم وصفها في قسم تدابير إدارة المخلفات
التأثير على موارد المياه (المياه الجوفية، والمياه السطحية ومياه الشرب)	احتمال ضعيف أن يحدث	تأثير ضعيف على المياه الجوفية والمياه السطحية ومياه الشرب	إتباع معايير الحماية البيئية المتعلقة بالأرض والتربة، والإدارة السليمة للمخلفات التي تم وصفها في قسم تدابير إدارة المخلفات

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
التأثيرات على الكساء النباتي والحيواني والطيور المهاجرة	احتمال منخفض	تأثير ضئيل (لا يوجد تأثير)	ليس هناك حاجة لوضع تدابير التخفيف
مخاطر حدوث كوارث طبيعية	احتمال منخفض	لا يوجد تأثير كبير	ليس هناك حاجة لوضع تدابير التخفيف
التأثير على الموارد البيئية	احتمال منخفض	لا يوجد تأثير كبير	ليس هناك حاجة لوضع تدابير التخفيف
على استخدام الأرض وإعادة التوطين القسري	احتمال منخفض	لا يوجد تأثير كبير	ليس هناك حاجة لوضع تدابير التخفيف
التأثير على المواقع الأثرية والثقافية	احتمال منخفض	ضعيف جدا الى لا يذكر	ليس هناك حاجة لوضع تدابير التخفيف
خلق فرص العمل وإنعاش الاقتصاد في موقع البناء	سيتم خلق فرص عمل لأفراد المجتمع المحلي	تأثير كبير وإيجابي ولكنه مؤقت	التنسيق مع المقاول لتوظيف أفراد المجتمع المحلي كعمال بناء وحراس

يمثل الجدول التالي العناصر الرئيسية من التأثيرات المحتملة لخط ربط شرق الاسماعيلية خلال مرحلة الإنشاء

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
الضوضاء الناتجة عن أعمال الإنشاءات	احتمال كبير أن يحدث - ولكنه مؤقت وعلى المدى القصير	متوسط	إتباع خطة الإدارة البيئية للحد من شدة التأثير
التأثير على حركة المرور	احتمال كبير أن يحدث على الطريق الرئيسي فقط - ولكنه مؤقت وعلى المدى القصير	منخفض الى متوسط	إتباع خطة الإدارة البيئية للحد من شدة التأثير
انبعاثات الهواء الناتجة عن أعمال الإنشاءات	احتمال كبير أن يحدث - ولكنه مؤقت وعلى المدى القصير	تأثير متوسط على عمال البناء، وتأثير منخفض على السكان والمنشآت المحيطة والمارة بموقع الإنشاءات	الحد من شدة التأثير في الأراضي التي تتكون من تربة رملية

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
التأثير على المواد الخطرة وإدارة المخلفات	من المرجح أن تحدث -على المدى القصير	متوسط	لا بد من التوصل إلى اتفاق بين المقاول وجامع المخلفات المعتمد قبل البدء في أعمال الإنشاءات من أجل تخصيص موقع رسمي للتخلص من مخلفات البناء. بالنسبة للمخلفات الخطرة، سيتم إدارتها والتخلص منها وفقا للأنظمة والتشريعات المصرية المعمول بها من قبل الشركة المتخصصة تحت إشراف السلطات البيئية.
المخاطر المرتبطة بالسلامة والصحة المهنية	احتمال منخفض لتأثيرات كبرى بالنسبة للعمال - احتمال كبير لتأثيرات منخفضة على المتلقي الحساس	ضعيف	- الالتزام بمعايير الحماية البيئية من خلال وضع علامات واضحة للمشروع. - إدارة الوقت لحركة السيارات؛ وخاصة وقت الذروة
إزالة الأشجار الواقعة على مسار الخط	احتمال منخفض لتأثيرات كبيرة أو متوسطة	متوسط الى كبير	تقليل أهمية التأثير إلى طفيفة من خلال إتباع خطة عمل إعادة التوطين
استخدام الأراضي	تأثير متوسط ومباشر على سبل العيش	متوسط	تقليل أهمية التأثير إلى طفيفة من خلال إتباع خطة عمل إعادة التوطين
التأثير على موارد المياه	احتمال متوسط أن يحدث	ضعيف	يجب أن يقوم المقاول بإعداد إجراءات وقائية أو تدابير وقائية قبل البدء في الإنشاء.

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
التأثيرات على الكساء النباتي والحيواني	احتمال متوسط أن يحدث - على المدى القصير	ضعيف	إتباع معايير الحماية البيئية المتعلقة بالكساء النباتي والحيواني، ونوعية الهواء (والغبار) والإدارة السليمة للمخلفات التي تم وصفها في قسم تدابير إدارة المخلفات
خلق فرص العمل وإنعاش الاقتصاد في موقع البناء	سيتم خلق فرص عمل لأفراد المجتمع المحلي	تأثير كبير وإيجابي ولكنه مؤقت	التنسيق مع المقاول لتوظيف أفراد المجتمع المحلي كعمال بناء وحراس
التأثير على هجرة الطيور	احتمالية حدوث متوسطة	متوسط	<ul style="list-style-type: none"> تركيب الأدوات المعززة للرؤية أو الخطوط المحددة مثل موانع مرور الطيور، وصمامات الاهتزازات اللولبية تركيب الأدوات المعززة للرؤية مثل الكرات المعلمة، أو موانع مرور الطيور، أو تحويل مسارها

يمثل الجدول التالي العناصر الرئيسية من التأثيرات المحتملة لخط ربط شرق بنها خلال مرحلة الإنشاء

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
الضوضاء الناتجة عن أعمال الإنشاءات	احتمال كبير أن يحدث - ولكنه مؤقت وعلى المدى القصير	متوسط	إتباع خطة الإدارة البيئية للحد من شدة التأثير

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
التأثير على حركة المرور	احتمال كبير أن يحدث على الطريق الرئيسي فقط - ولكنه مؤقت وعلى المدى القصير	منخفض الى متوسط	إتباع خطة الإدارة البيئية للحد من شدة التأثير
انبعاثات الهواء الناتجة عن أعمال الإنشاءات	احتمال كبير أن يحدث - ولكنه مؤقت وعلى المدى القصير	تأثير متوسط على عمال البناء، وتأثير منخفض على السكان والمنشآت المحيطة والمارة بموقع الإنشاءات	الحد من شدة التأثير في الأراضي التي تتكون من تربة رملية
التأثير على المواد الخطرة وإدارة المخلفات	من المرجح أن تحدث -على المدى القصير	متوسط	لابد من التوصل إلى اتفاق بين المقاول وجامع المخلفات المعتمد قبل البدء في أعمال الإنشاءات من أجل تخصيص موقع رسمي للتخلص من مخلفات البناء. بالنسبة للمخلفات الخطرة، سيتم إدارتها والتخلص منها وفقا للأنظمة والتشريعات المصرية المعمول بها من قبل الشركة المتخصصة تحت إشراف السلطات البيئية.

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
المخاطر المرتبطة بالسلامة والصحة المهنية	احتمال منخفض لتأثيرات كبرى بالنسبة للعمال - احتمال كبير لتأثيرات منخفضة على المتلقي الحساس	ضعيف	- الالتزام بمعايير الحماية البيئية من خلال وضع علامات واضحة للمشروع. - إدارة الوقت لحركة السيارات؛ وخاصة وقت الذروة
إزالة الأشجار الواقعة على مسار الخط	احتمال منخفض لتأثيرات كبيرة أو متوسطة	متوسط الى كبير	تقليل أهمية التأثير إلى طفيفة من خلال إتباع خطة عمل إعادة التوطين
استخدام الأراضي	تأثير متوسط ومباشر على سبل العيش	متوسط	تقليل أهمية التأثير إلى طفيفة من خلال إتباع خطة عمل إعادة التوطين
التأثير على موارد المياه	احتمال متوسط أن يحدث	ضعيف	يجب أن يقوم المقاول بإعداد إجراءات وقائية أو تدابير وقائية قبل البدء في الإنشاء.
التأثيرات على الكساء النباتي والحيواني	احتمال متوسط أن يحدث - على المدى القصير	ضعيف	إتباع معايير الحماية البيئية المتعلقة بالكساء النباتي والحيواني، ونوعية الهواء (والغبار) والإدارة السليمة للمخلفات التي تم وصفها في قسم تدابير إدارة المخلفات

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
التأثير على هجرة الطيور	احتمالية حدوث متوسطة	متوسط	<ul style="list-style-type: none"> تركيب الأدوات المعززة للرؤية أو الخطوط المحددة مثل موانع مرور الطيور، وصمامات الاهتزازات اللولبية تركيب الأدوات المعززة للرؤية مثل الكرات المعلقة، أو موانع مرور الطيور، أو تحويل مسارها
خلق فرص العمل وإنعاش الاقتصاد في موقع البناء	سيتم خلق فرص عمل لأفراد المجتمع المحلي	تأثير كبير وإيجابي ولكنه مؤقت	التنسيق مع المقاول لتوظيف أفراد المجتمع المحلي كعمال بناء وحراس

يمثل الجدول التالي العناصر الرئيسية من التأثيرات المحتملة لخط ربط زيزنيا خلال مرحلة الإنشاء

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
الضوضاء الناتجة عن أعمال الإنشاءات	احتمال كبير أن يحدث - ولكنه مؤقت وعلى المدى القصير	متوسط	إتباع خطة الإدارة البيئية للحد من شدة التأثير
التأثير على حركة المرور	احتمال كبير أن يحدث على الطريق الرئيسي فقط - ولكنه مؤقت وعلى المدى القصير	منخفض الى متوسط	إتباع خطة الإدارة البيئية للحد من شدة التأثير

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
انبعاثات الهواء الناتجة عن أعمال الإنشاءات	احتمال كبير أن يحدث - ولكنه مؤقت وعلى المدى القصير	تأثير متوسط على عمال البناء، وتأثير منخفض على السكان والمنشآت المحيطة والمارة بموقع الإنشاءات	الحد من شدة التأثير في الأراضي التي تتكون من تربة رملية
التأثير على المواد الخطرة وإدارة المخلفات	من المرجح أن تحدث - على المدى القصير	متوسط	لابد من التوصل إلى اتفاق بين المقاول وجامع المخلفات المعتمد قبل البدء في أعمال الإنشاءات من أجل تخصيص موقع رسمي للتخلص من مخلفات البناء. بالنسبة للمخلفات الخطرة، سيتم إدارتها والتخلص منها وفقا للأنظمة والتشريعات المصرية المعمول بها من قبل الشركة المتخصصة تحت إشراف السلطات البيئية.
المخاطر المرتبطة بالسلامة والصحة المهنية	احتمال منخفض لتأثيرات كبرى بالنسبة للعمال - احتمال كبير لتأثيرات منخفضة على المتلقي الحساس	ضعيف	- الالتزام بمعايير الحماية البيئية من خلال وضع علامات واضحة للمشروع. - إدارة الوقت لحركة السيارات؛ وخاصة وقت الذروة

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
إزالة الأشجار الواقعة على مسار الخط	احتمال منخفض لتأثيرات كبيرة أو متوسطة	متوسط الى كبير	تقليل أهمية التأثير إلى طفيفة من خلال إتباع خطة عمل إعادة التوطين
استخدام الأراضي	تأثير متوسط ومباشر على سبل العيش	متوسط	تقليل أهمية التأثير إلى طفيفة من خلال إتباع خطة عمل إعادة التوطين
التأثير على موارد المياه	احتمال متوسط أن يحدث	ضعيف	يجب أن يقوم المقاول بإعداد إجراءات وقائية أو تدابير وقائية قبل البدء في الإنشاء.
التأثيرات على الكساء النباتي والحيواني	احتمال متوسط أن يحدث - على المدى القصير	ضعيف	إتباع معايير الحماية البيئية المتعلقة بالكساء النباتي والحيواني، ونوعية الهواء (والغبار) والإدارة السليمة للمخلفات التي تم وصفها في قسم تدابير إدارة المخلفات
التأثير على هجرة الطيور	احتمالية حدوث متوسطة	متوسط	<ul style="list-style-type: none"> تركيب الأدوات المعززة للرؤية أو الخطوط المحددة مثل موانع مرور الطيور، وصمامات الاهتزازات اللولبية تركيب الأدوات المعززة للرؤية مثل الكرات المعلقة، أو موانع مرور الطيور، أو تحويل مسارها

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
خلق فرص العمل وإنعاش الاقتصاد في موقع البناء	سيتم خلق فرص عمل لأفراد المجتمع المحلي	تأثير كبير وإيجابي ولكنه مؤقت	التنسيق مع المقاول لتوظيف أفراد المجتمع المحلي كعمال بناء وحراس

يمثل الجدول التالي العناصر الرئيسية من التأثيرات المحتملة لخط ربط بلبيس خلال مرحلة الإنشاء

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
الضوضاء الناتجة عن أعمال الإنشاءات	احتمال كبير أن يحدث - ولكنه مؤقت وعلى المدى القصير	متوسط	إتباع خطة الإدارة البيئية للحد من شدة التأثير
التأثير على حركة المرور	احتمال كبير أن يحدث على الطريق الرئيسي فقط - ولكنه مؤقت وعلى المدى القصير	منخفض الى متوسط	إتباع خطة الإدارة البيئية للحد من شدة التأثير
انبعاثات الهواء الناتجة عن أعمال الإنشاءات	احتمال كبير أن يحدث - ولكنه مؤقت وعلى المدى القصير	تأثير متوسط على عمال البناء، وتأثير منخفض على السكان والمنشآت المحيطة والمارة بموقع الإنشاءات	الحد من شدة التأثير في الأراضي التي تتكون من تربة رملية

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
التأثير على المواد الخطرة وإدارة المخلفات	من المرجح أن تحدث -على المدى القصير	متوسط	لا بد من التوصل إلى اتفاق بين المقاول وجامع المخلفات المعتمد قبل البدء في أعمال الإنشاءات من أجل تخصيص موقع رسمي للتخلص من مخلفات البناء. بالنسبة للمخلفات الخطرة، سيتم إدارتها والتخلص منها وفقا للأنظمة والتشريعات المصرية المعمول بها من قبل الشركة المتخصصة تحت إشراف السلطات البيئية.
المخاطر المرتبطة بالسلامة والصحة المهنية	احتمال منخفض لتأثيرات كبرى بالنسبة للعمال - احتمال كبير لتأثيرات منخفضة على المتلقي الحساس	ضعيف	- الالتزام بمعايير الحماية البيئية من خلال وضع علامات واضحة للمشروع. - إدارة الوقت لحركة السيارات؛ وخاصة وقت الذروة
إزالة الأشجار الواقعة على مسار الخط	احتمال منخفض لتأثيرات كبيرة أو متوسطة	متوسط الى كبير	تقليل أهمية التأثير إلى طفيفة من خلال إتباع خطة عمل إعادة التوطين
استخدام الأراضي	تأثير متوسط ومباشر على سبل العيش	متوسط	تقليل أهمية التأثير إلى طفيفة من خلال إتباع خطة عمل إعادة التوطين
التأثير على موارد المياه	احتمال متوسط أن يحدث	ضعيف	يجب أن يقوم المقاول بإعداد إجراءات وقائية أو تدابير وقائية قبل البدء في الإنشاء.

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
التأثيرات على الكساء النباتي والحيواني	احتمال متوسط أن يحدث - على المدى القصير	ضعيف	إتباع معايير الحماية البيئية المتعلقة بالكساء النباتي والحيواني، ونوعية الهواء (والغبار) والإدارة السليمة للمخلفات التي تم وصفها في قسم تدابير إدارة المخلفات
خلق فرص العمل وإنعاش الاقتصاد في موقع البناء	سيتم خلق فرص عمل لأفراد المجتمع المحلي	تأثير كبير وإيجابي ولكنه مؤقت	التنسيق مع المقاول لتوظيف أفراد المجتمع المحلي كعمال بناء وحراس

يمثل الجدول التالي العناصر الرئيسية من التأثيرات المحتملة لمحطة المحولات خلال مرحلة التشغيل

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
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التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
الضوضاء الناتجة عن أعمال التشغيل	احتمال منخفض أن يحدث	- تأثير منخفض على المنشآت القريبة - تأثير منخفض على العمال الدائمين	إتباع خطة الإدارة البيئية للحد من التأثير
التأثير على حركة المرور	احتمال منخفض أن يحدث	منخفض	لم يتم تحديد أي إجراءات للتخفيف
انبعاثات الهواء الناتجة عن أعمال التشغيل	احتمال منخفض أن يحدث	منخفض	لم يتم تحديد أي إجراءات للتخفيف
المخاطر الناتجة عن المخلفات الخطرة وغير الخطرة	احتمال غير مؤكد	تأثير متوسط على المخلفات الصناعية (الخطرة وغير الخطرة) تأثير منخفض على المخلفات المنزلية (الصلبة والسائلة)	- إدارة المخلفات المنفذة وفقا لتعليمات جهاز شئون البيئة، وخاصة المخلفات الصناعية الخطرة (المخلفات الصلبة والسائلة) - المتابعة المنتظمة لشبكة الصرف الصحي المنزلية وتوفير صناديق للمخلفات للتخزين المؤقت قبل جمع البلدية لها.
المخاطر المرتبطة بتلوث التربة	احتمال كبير أن يحدث، فقط خلال واقعة تسرب النفط من المحولات والمركبات المحتملة.	منخفض الى متوسط	- الالتزام بمعايير الحماية البيئية من خلال وضع علامات واضحة للمشروع.

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
المخاطر المرتبطة بالسلامة والصحة المهنية	احتمال كبير أن يحدث للعمال الدائمين احتمال منخفض أن يحدث للمنشآت المحيطة	ضعيف	- الالتزام بمعايير الحماية البيئية من خلال وضع علامات واضحة للمشروع. - إدارة الوقت لحركة السيارات؛ خاصة وقت الذروة
مخاطر حدوث كوارث طبيعية	احتمال منخفض أن يحدث	تأثير ضئيل	ليس هناك حاجة لوضع تدابير التخفيف
التأثير على الموارد البصرية	احتمال منخفض أن يحدث	تأثير ضعيف جداً أو لا يذكر	ليس هناك حاجة لوضع تدابير التخفيف
التأثير على الموارد البيئية	احتمال منخفض أن يحدث	لا يوجد تأثير كبير	ليس هناك حاجة لوضع تدابير التخفيف
خلق فرص العمل وإنعاش الاقتصاد في موقع البناء	زيادة فرص فتح المحلات التجارية نتيجة لوجود كهرباء مستقرة	تأثير إيجابي متوسط	لم يتم إعداد إجراءات التخفيف

يمثل الجدول التالي العناصر الرئيسية من التأثيرات المحتملة لخط ربط شرق الاسماعلية خلال مرحلة التشغيل

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
المخاطر الناتجة عن المخلفات	من المرجح أن تحدث -تأثير على المدى القصير	متوسط	إدارة المخلفات المنفذة وفقا لتعليمات جهاز شئون البيئة، وخاصة المخلفات الصناعية الخطرة المخلفات (الصلبة والسائلة)
التعرض للمجال الكهرومغناطيسي	من المرجح أن تحدث -تأثير على المدى الطويل	متوسط	الحد من شدة التأثير
المخاطر المرتبطة بتلوث التربة	احتمال منخفض أن يحدث -على مدى قصير	ضئيل	إتباع معايير الحماية البيئية المتعلقة بالأرض والتربة، والإدارة السليمة للمخلفات التي تم وصفها في قسم تدابير إدارة المخلفات
المخاطر المرتبطة بالسلامة والصحة المهنية	احتمال منخفض لتأثيرات ضئيلة على المتلقي الحساس ومن متوسط الى كبير على العمال احتمال منخفض أن يحدث للمنشآت المحيطة	متوسط الى كبير	- الالتزام بمعايير الحماية البيئية من خلال وضع علامات واضحة للمشروع.
مخاطر حدوث كوارث طبيعية	احتمال منخفض أن يحدث	تأثير ضئيل	ليس هناك حاجة لوضع تدابير التخفيف
التأثير على الموارد البصرية	احتمال منخفض أن يحدث	تأثير ضعيف جدا أو لا يذكر	ليس هناك حاجة لوضع تدابير التخفيف
التأثير على الموارد البيئية	احتمال منخفض أن يحدث	لا يوجد تأثير كبير	ليس هناك حاجة لوضع تدابير التخفيف

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
خلق فرص العمل وإتعاش الاقتصاد في موقع البناء	زيادة فرص فتح المحلات التجارية نتيجة لوجود كهرباء مستقرة	تأثير إيجابي متوسط	لم يتم إعداد إجراءات التخفيف
هجرة الطيور	احتمال منخفض أن يحدث	تأثير ضئيل	اعتمادًا على الموقع والطوبوغرافيا ، قد يكون من المناسب إنشاء خطوط الكهرباء منخفضة تقع أسفل الأرض التي تسير فيها الطيور . جعل الموقع غير جذاب الطيور ، عن طريق منع زراعة أو زراعة المناطق الخضراء حول الموقع ومنع وجود نفايات صلبة أو سائلة. تنشيط كائنات تحسين الرؤية أو علامات الخطوط مثل كاشف الطيور أو المجالات أو الذبذبات الحلزونية أو انحرافات الطيور .

يمثل الجدول التالي العناصر الرئيسية من التأثيرات المحتملة لخط ربط شرق بنها خلال مرحلة التشغيل

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
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التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
المخاطر الناتجة عن المخلفات	من المرجح أن تحدث -تأثير على المدى القصير	متوسط	إدارة المخلفات المنفذة وفقا لتعليمات جهاز شئون البيئة، وخاصة المخلفات الصناعية الخطرة المخلفات الصلبة (والسائلة)
التعرض للمجال الكهرومغناطيسي	من المرجح أن تحدث -تأثير على المدى الطويل	متوسط	الحد من شدة التأثير
المخاطر المرتبطة بتلوث التربة	احتمال منخفض أن يحدث -على مدى قصير	ضئيل	إتباع معايير الحماية البيئية المتعلقة بالأرض والتربة، والإدارة السليمة للمخلفات التي تم وصفها في قسم تدابير إدارة المخلفات
المخاطر المرتبطة بالسلامة والصحة المهنية	احتمال منخفض لتأثيرات ضئيلة على المتلقي الحساس ومن متوسط الى كبير على العمال احتمال منخفض أن يحدث للمنشآت المحيطة	متوسط الى كبير	- الالتزام بمعايير الحماية البيئية من خلال وضع علامات واضحة للمشروع.
مخاطر حدوث كوارث طبيعية	احتمال منخفض أن يحدث	تأثير ضئيل	ليس هناك حاجة لوضع تدابير التخفيف
التأثير على الموارد البصرية	احتمال منخفض أن يحدث	تأثير ضعيف جدا أو لا يذكر	ليس هناك حاجة لوضع تدابير التخفيف
التأثير على الموارد البيئية	احتمال منخفض أن يحدث	لا يوجد تأثير كبير	ليس هناك حاجة لوضع تدابير التخفيف

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
خلق فرص العمل وإنعاش الاقتصاد في موقع البناء	زيادة فرص فتح المحلات التجارية نتيجة لوجود كهرباء مستقرة	تأثير إيجابي متوسط	لم يتم إعداد إجراءات التخفيف
هجرة الطيور	احتمال منخفض أن يحدث	تأثير ضئيل	تثبيت كائنات تحسين الرؤية أو علامات الخطوط مثل كاشف الطيور أو المجالات أو الذبذبات الحلزونية أو انحرافات الطيور.

يمثل الجدول التالي العناصر الرئيسية من التأثيرات المحتملة لخط ربط زيزنيا خلال مرحلة التشغيل

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
المخاطر الناتجة عن المخلفات	من المرجح أن تحدث -تأثير على المدى القصير	متوسط	إدارة المخلفات المنفذة وفقا لتعليمات جهاز شئون البيئة، وخاصة المخلفات الصناعية الخطرة المخلفات (الصلبة والسائلة)
التعرض للمجال الكهرومغناطيسي	من المرجح أن تحدث -تأثير على المدى الطويل	متوسط	الحد من شدة التأثير
المخاطر المرتبطة بتلوث التربة	احتمال منخفض أن يحدث -على مدى قصير	ضئيل	إتباع معايير الحماية البيئية المتعلقة بالأرض والتربة، والإدارة السليمة للمخلفات التي تم وصفها في قسم تدابير إدارة المخلفات

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
المخاطر المرتبطة بالسلامة والصحة المهنية	احتمال منخفض لتأثيرات ضئيلة على المتلقي الحساس ومن متوسط الى كبير على العمال احتمال منخفض أن يحدث للمنشآت المحيطة	متوسط الى كبير	- الالتزام بمعايير الحماية البيئية من خلال وضع علامات واضحة للمشروع.
مخاطر حدوث كوارث طبيعية	احتمال منخفض أن يحدث	تأثير ضئيل	ليس هناك حاجة لوضع تدابير التخفيف
التأثير على الموارد البصرية	احتمال منخفض أن يحدث	تأثير ضعيف جدا أو لا يذكر	ليس هناك حاجة لوضع تدابير التخفيف
التأثير على الموارد البيئية	احتمال منخفض أن يحدث	لا يوجد تأثير كبير	ليس هناك حاجة لوضع تدابير التخفيف
خلق فرص العمل وإنعاش الاقتصاد في موقع البناء	زيادة فرص فتح المحلات التجارية نتيجة لوجود كهرباء مستقرة	تأثير إيجابي متوسط	لم يتم إعداد إجراءات التخفيف
هجرة الطيور	احتمال منخفض أن يحدث	تأثير ضئيل	. تثبيت كائنات تحسين الرؤية أو علامات الخطوط مثل كاشف الطيور أو المجالات أو الذبذبات الحلزونية أو انحرافات الطيور .

يمثل الجدول التالي العناصر الرئيسية من التأثيرات المحتملة لخط ربط بليبس خلال مرحلة التشغيل

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
المخاطر الناتجة عن المخلفات	من المرجح أن تحدث -تأثير على المدى القصير	متوسط	إدارة المخلفات المنفذة وفقا لتعليمات جهاز شئون البيئة، وخاصة المخلفات الصناعية الخطرة المخلفات (الصلبة والسائلة)
التعرض للمجال الكهرومغناطيسي	من المرجح أن تحدث -تأثير على المدى الطويل	متوسط	الحد من شدة التأثير
المخاطر المرتبطة بتلوث التربة	احتمال منخفض أن يحدث -على مدى قصير	ضئيل	إتباع معايير الحماية البيئية المتعلقة بالأرض والتربة، والإدارة السليمة للمخلفات التي تم وصفها في قسم تدابير إدارة المخلفات
المخاطر المرتبطة بالسلامة والصحة المهنية	احتمال منخفض لتأثيرات ضئيلة على المتلقي الحساس ومن متوسط الى كبير على العمال احتمال منخفض أن يحدث للمنشآت المحيطة	متوسط الى كبير	- الالتزام بمعايير الحماية البيئية من خلال وضع علامات واضحة للمشروع.
مخاطر حدوث كوارث طبيعية	احتمال منخفض أن يحدث	تأثير ضئيل	ليس هناك حاجة لوضع تدابير التخفيف
التأثير على الموارد البصرية	احتمال منخفض أن يحدث	تأثير ضعيف جدا أو لا يذكر	ليس هناك حاجة لوضع تدابير التخفيف

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
التأثير على الموارد البيئية	احتمال منخفض أن يحدث	لا يوجد تأثير كبير	ليس هناك حاجة لوضع تدابير التخفيف
خلق فرص العمل وإنعاش الاقتصاد في موقع البناء	زيادة فرص فتح المحلات التجارية نتيجة لوجود كهرباء مستقرة	تأثير إيجابي متوسط	لم يتم إعداد إجراءات التخفيف

9 خطة الإدارة والرصد البيئية

يتضمن هذا الفصل مصفوفات الإدارة البيئية خلال مرحلة أعمال الإنشاءات وخلال 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 وخلال مرحلة التشغيل لكلاً من محطات المحولات وخطوط نقل الكهرباء، ويشمل التأثيرات المحتملة، مؤشرات المتابعة، موقع المتابعة، أسلوب المتابعة، دورية المتابعة، ومسؤولية المتابعة.

يمثل الجدول التالي العناصر الرئيسية من مصفوفة خطة الإدارة البيئية لمحطة المحولات خلال مرحلة الإنشاء

التأثيرات المحتملة	إجراءات التخفيف المقترحة	المسؤولية الإدارية عن التنفيذ	تقديرات التكلفة (\$)*	التعليقات
الضوضاء والاهتزاز خلال إعداد الموقع، الإنشاء وتركيب المعدات	التدابير العامة للمنشآت المحيطة والمستقبلات الحساسة			
	خطاب إعلام من أجل تقديم المشروع ومدته للمنشآت المحيطة والبلدية	المقاول	-	خطاب تغطية من الشركة المصرية لنقل الكهرباء للموافقة على بدء المشروع
	وضع علامة واضحة وعلامة تحذير (يمكن أن ينظر إليها خلال النهار والليل) طوال فترة المشروع (متضمنة المدة)	المقاول كجزء من الشروط المرجعية للمتطلبات العامة للصحة والسلامة البيئية	غير محددة	
	مدة العمل في الموقع (متضمنة التحميل) خلال النهار فقط (بين 7 صباحا الى 5 مساء)	المقاول	-	
	تدابير التخفيف لعمال البناء أثناء الإعداد والبناء			

التأثيرات المحتملة	إجراءات التخفيف المقترحة	المسؤولية الإدارية عن التنفيذ	تقديرات التكلفة (\$)*	التعليقات
التأثيرات على حركة المرور في الطرق	معايير إجرائية صارمة على مستوى الصحة وسلامة العمال وفقا للمبادئ التوجيهية العامة لمؤسسة التمويل الدولية بشأن الصحة والسلامة البيئية وإدارة أعمال التركيز على الآلات الثقيلة	المقاول (خلال المناقصة)	غير محددة	
	معايير إجرائية صارمة خاصة لحماية الأذن أثناء العمل	المقاول (خلال المناقصة) متعلقة بمتطلبات الصحة والسلامة البيئية خلال أعمال الإنشاءات		
	الموافقة من إدارة المرور قبل البدء في الإنشاء	المقاول	-	خطاب تغطية من الشركة المصرية لنقل الكهرباء للموافقة على بدء المشروع
	وضع علامة واضحة وعلامة تحذير (يمكن أن ينظر إليها خلال النهار والليل) طوال فترة المشروع (متضمنة المدة)	المقاول (خلال المناقصة) متعلقة بمتطلبات الصحة والسلامة البيئية	غير محدد	
	حركة المركبات (لنقل المواد ومخلفات البناء ومعدات محطة المحولات أثناء الليل والتحميل أثناء النهار داخل موقع محطة المحولات).	المقاول بالتعاون مع إدارة المرور إذا لزم الأمر	غير محدد	

التأثيرات المحتملة	إجراءات التخفيف المقترحة	المسؤولية الإدارية عن التنفيذ	تقديرات التكلفة (\$)*	التعليقات
المخلفات المتولدة (الخطرة وغير الخطرة، الصلبة والسائلة وكذلك مخلفات البناء والمخلفات المنزلية)	ينبغي أن يتلقى السائقون والفنيون التدريب على كيفية الاستخدام الآمن لألاتهم	السائقين والفنيين الذين يتم توظيفهم من قبل المقاول. وتقع مسؤولية تطبيق اللوائح على السائقين والفنيين على عاتق المقاول	غير محدد	
	الاتفاق على التخزين المؤقت والتخلص النهائي إلى مكتب النفايات المحدد	استنادا إلى خطة إدارة المخلفات المقدمة من المقاول والموافقة من الشركة المصرية لنقل الكهرباء	غير محدد	
	الإخطار والعقد، إذا لزم الأمر لنقل المخلفات الخطرة وغير الخطرة إلى مدافن المخلفات المعينة. فصل المخلفات الخطرة والمخلفات غير الخطرة للتخزين المؤقت ينبغي إدراج المنطقة أو الموقع المخصص في خطة إدارة المخلفات المقدمة من المقاول والموافقة عليها من قبل الشركة المصرية لنقل الكهرباء	المقاول	غير محدد	تنفيذ إدارة المخلفات المقدمة من قبل المقاول والموافقة عليها من قبل الشركة المصرية لنقل الكهرباء قبل مرحلة الإعداد والإنشاء

التأثيرات المحتملة	إجراءات التخفيف المقترحة	المسؤولية الإدارية عن التنفيذ	تقديرات التكلفة (\$)*	التعليقات
	ينبغي نقل مخلفات البناء في نهاية كل يوم عمل إلى مواقع التخلص المعتمدة رسمياً			
	الشاحنات المناسبة لنقل النفايات إلى مكبات النفايات المعينة. وفيما يتعلق بنقل النفايات الخطرة، يجب أن تكون المركبات وفقاً للمعايير المذكورة في لوائح جهاز شؤون البيئة لنقل النفايات الخطرة			
	يجب توفير صناديق المخلفات المؤقتة في الموقع للمخلفات الصلبة قبل جمعها ومرافق الصرف الصحي المؤقتة للعمال			
الصحة والسلامة المهنية للعمال	يجب أن يحصل السائقين على رخصة قيادة سارية	المقاول	غير محدد	الإشراف على الموقع مراجعة تقارير المشرف
	يجب فحص كافة المعدات قبل الاستخدام			
	يجب وضع لافتات واضحة لكافة المعدات الميكانيكية أثناء الاستخدام أو في حالة عدم الاستخدام			
				وفقاً لخطة إدارة المخلفات المقدمة إلى الشركة المصرية لنقل الكهرباء

التأثيرات المحتملة	إجراءات التخفيف المقترحة	المسؤولية الإدارية عن التنفيذ	تقديرات التكلفة (\$)*	التعليقات
الموارد المائية وتلوث التربة خلال مرحلة الإنشاء	الاحتياطات والوقاية من إدارة المخلفات لمنع تلوث التربة والموارد المائية (المياه الجوفية)	المقاول	غير محدد	

يمثل الجدول التالي العناصر الرئيسية من مصفوفة خطة الإدارة البيئية لمحطة المحولات خلال مرحلة التشغيل

التأثيرات المحتملة	إجراءات التخفيف المقترحة	المسؤولية الإدارية عن التنفيذ	* (\$) تقديرات التكلفة	التعليقات
خلال تشغيل وصيانة محطة المحولات				
الضوضاء	تدابير التخفيف للفنيين وعمال محطة المحولات			
	الإجراءات المعيارية لصحة وسلامة العمال وفقا للمبادئ التوجيهية العامة لمؤسسة التمويل الدولية بشأن الصحة والسلامة البيئية (بما في ذلك الحد من مدة التعرض للضوضاء العالية) وإدارة أعمال التركيز على الآلات الثقيلة	الشركة المصرية لنقل الكهرباء	حوالي 10000 جنيه مصري سنويا لمعايير حماية فريق العمل	
	المعدات القياسية خاصة لحماية الأذن أثناء العمل	الشركة المصرية لنقل الكهرباء		

التأثيرات المحتملة	إجراءات التخفيف المقترحة	المسؤولية الإدارية عن التنفيذ	* (\$)تقديرات التكلفة	التعليقات
المخلفات المتولدة (المخلفات الخطرة وغير الخطرة والصلبة والسوائل الصناعية (والمخلفات المنزلية	الإدارة السليمة للمخلفات (المخلفات الصناعية) بما في ذلك فصل المخلفات، ومساحة منفصلة للمخلفات المؤقتة، ونقل المخلفات الصناعية إلى مكبات المخلفات المخصصة لها والتخلص منها	الشركة المصرية لنقل الكهرباء	غير محددة	
	خاصة للمخلفات الخطرة، يجب أن يتم تخزين المخلفات الخطرة وجمعها ونقلها والتخلص منها وفقا للوائح جهاز شئون البيئة بشأن المخلفات الخطرة			
	وفيما يتعلق بالمخلفات المنزلية، ينبغي الالتزام بالإجراءات المعيارية لصيانة الشبكات (بما في ذلك (توفير صناديق المخلفات)			
الأفراد والفنيين وسلامة الموظفين من التعرض للمجالات المغناطيسية	الصيانة الدورية لمحطة المحولات وتوصيلاتها. وهذا يشمل التشديد المنتظم، كفاءة المحطة، جودة الزيت، ضغط الغاز، الخ	فنيين الشركة المصرية لنقل الكهرباء بمحطة المحولات	—	

التأثيرات المحتملة	إجراءات التخفيف المقترحة	المسؤولية الإدارية عن التنفيذ	* (\$تقديرات التكلفة	التعليقات
الكهربائية	قراءة للمجالات المغناطيسية الكهربائية لمحطة المحولات والموقع المحيط	الشركة المصرية لنقل الكهرباء	USD 100-150 per EMF meter 150-100	من المستحسن شراء جهازين لأغراض الاستعداد
التدريبات المقدمة حول المخاطر المحتملة أثناء الحوادث (التدريب على مكافحة الحرائق، وانسكاب النفط، وكشف الدخان، وما إلى ذلك)	توفير التدريبات المقدمة من قبل الشركة المصرية لنقل الكهرباء كمتطلبات عامة	الشركة المصرية لنقل الكهرباء	غير محددة	يتم تضمين تقدير التكلفة في الدورات التدريبية السنوية التي تقدمها الشركة المصرية لنقل الكهرباء لعمال محطة المحولات
صحة وسلامة العمال	الحماية المعيارية لفنيين محطة المحولات والموظفين	الشركة المصرية لنقل الكهرباء	غير محددة	
التأثير على هجرة الطيور	• تركيب الأدوات المعززة للرؤية أو الخطوط المحددة مثل موانع مرور الطيور، وصمامات الاهتزازات اللولبية	فريق التشغيل التابع للشركة المصرية لنقل الكهرباء	تكلفة التشغيل	• ضمان تنفيذ إجراءات التخفيف داخل التصميم

التعليقات	* (\$)تقديرات التكلفة	المسئولية الإدارية عن التنفيذ	إجراءات التخفيف المقترحة	التأثيرات المحتملة
			<ul style="list-style-type: none"> تركيب الأدوات المعززة للرؤية مثل الكرات المعلقة، أو موانع مرور الطيور، أو تحويل مسارها 	

10 الخلاصة

بعد تحليل أنشطة المشروع المختلفة خلال مرحلتي 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 مرحلتي الإنشاء والتشغيل فهي محدودة ويمكن تخفيفها إلى الحد الأدنى الذي يمكن به جعل هذه التأثيرات مهملة بتطبيق خطة الإدارة والرصد البيئي المقترحة.

1. Introduction

1.1 Project Background

Egypt is witnessing a rapid expansion in urbanization and population, paralleled with a surge in demand for electricity. The rate of electricity coverage in 2009; was approximately 99.6 percent; according to International Energy Agency (IEA). This rate is among the highest rates in Africa with 100 percent connection rates at urban areas and 99.3 percent at rural areas. However, with the growing population, it is expected that the demand for energy will rise over the coming years. It is calculated that the demand for energy has risen by 30% from 2007 to 2012; from 19,738 MW to 25,705 MW. Moreover, the number of the customers has increased from 23.8 million to 28.1 million during the same period. The total transformers capacity reached 99.6 thousands MVA in middle of 2014 compared to 95.9 thousand MVA during 2013 with a percentage rate 3.9%.

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

In order to meet the forecasted demand on electricity, secure electrical stability and to meet the commitment of supplying electricity to slum areas and informal buildings (based on the approval of the Cabinet (2005) and the Council of Governors approval (2005)), the EETC together with the distribution companies need to provide additional substations(SSs) and their interconnections 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 and IFC standards EETC is committed to carrying out an Environmental and Social Impact Assessment (ESIA) for construction of 10th Ramadan substation and its interconnecting Over Head Transmission Lines (OHTLs) and a Resettlement Action Plan (RAP) which should trigger the Egyptian legislations and/or EIB Environmental and Social Standards instruments relevant to resettlement. The ESIA and the RAP represent the components of a consolidated document. This document will be subject to review and acceptance as whole. EcoConServ environmental services has been contracted to carry out the ESIA study and RAP in accordance with national legislations as well as EIB standards; which aims to investigate the potential impact of the project activities on the environmental parameters and the project affected persons (PAPs) and communities livelihood in the project's area. In addition, the management and monitoring plan, including the mitigation measures during construction, operation and maintenance phases are described within the ESIA report.

1.2 The ESIA & RAP Objectives

According to the ToR, this consultancy task had two main outputs; An Environmental and Social Impact Assessment (ESIA) study, and a resettlement Action Plan (RAP) study.

The objectives of the ESIA study thus are as follows:

- Identify and assess the potential environmental and social impacts of the each project components on the surrounding areas (during construction and operation phase).
- Compare the impacts in relation to the relevant national and international legal requirements and guidelines.
- Develop an environmental and social management plan for the mitigation of the potential negative impacts of each project components and for monitoring compliance with the relevant environmental laws and regulations during construction and operation.
- Carrying out stakeholder engagement activities through one phase in August 2017 through the following methods: Focus Group Discussions (FGDs) with community members and surrounding farming-related stakeholders, Group Meetings and Semi-Structured Interviews with community stakeholders.
- As a requirement, in parallel with the consultations activities, the disclosure will be conducted in accordance with the EIB standards. The disclosure shall take place to ensure that the information about the project was well conveyed to the stakeholders and the community involved in the decision processes.

The objectives of the RAP study are as follows:

- to ensure that the project affected persons (PAPs) including those who might be affected by physical resettlement or negative impacts on their sources of livelihoods or other impacts according to the World Bank OP 4.12 will be fairly compensated and that allocations for this will be planned as part of the social management plan.
- To enable those displaced by a project to improve their standard of living. This requires an examination of social, environmental, and economic conditions beyond simple physical inventories. Thus, resettlement activities should result in measurable improvements in the economic conditions and social well-being of affected people and communities.
- Displacement may be either physical or economic.
 - Physical displacement is the actual physical relocation of people resulting in a loss of shelter, productive assets or access to productive assets (such as land, water, and forests).
 - Economic displacement results from an action that interrupts or eliminates people's access to productive assets without physically relocating the people themselves.
- While land acquisition does not necessarily require the displacement of people occupying or using the land, it may have an effect on the living standards of people who depend on resources located in, on, or around that land. For example, a farming family may lose a portion of its land to a project without having to vacate its homestead.

1.3 The ESIA 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.

1.4 The RAP Methodology

Preparation of a RAP for the entire line including complete census, identification and valuation of affected assets in the 50-meter right of way (RoW) determined by the coordinates presented in the Detailed Line Route 2017 (See Annex 2 and publication of the cut-off date. The RAP should be a full

and detailed planning report in compliance with the latest applicable Egyptian regulations regarding resettlement and World Bank OP4.12 and the principles and objectives of the “EIB environmental and Social Practices handbook, 2013⁴”, and World Bank OP4.12⁵. The RAP should take all the relevant data from the ESIA and RPF.

All man-made structures such as roads, buildings, drainages, culverts, bridges located within the Right of Way (ROW) shall be 50 meters (divided into 25 meters each from the center of the transmission lines). Also all potential sensitive natural habitat, natural features will be captured such as rivers, creeks, canals, etc. as well as all terrain conditions and vegetation types. At surface crossings, such as roads, creeks and so on, the survey shall be conducted in such a manner as to determine the crossing width, elevation, direction and the name of the crossing. For above ground crossings such as power and high-tension lines, their elevation, type, direction of crossing shall be determined. Appropriate consideration will be given to vulnerable social groups, such as women, children, the elderly, poor and ethnic minorities, all of whom are susceptible to environmental and social impacts, and who may have little access to the decision-making process within society. Disclosure of information was conducted at an early stage and the outcomes of public consultations activities will be incorporated into the contents of the ESIA.

⁴ http://www.eib.org/attachments/strategies/environmental_and_social_practices_handbook_en.pdf

⁵ <http://documents.worldbank.org/curated/en/206671468782373680/pdf/301180v110PAPE1ettlement0sourcebook.pdf>

https://www.ifc.org/wps/wcm/connect/322d9d80488559f584b4d66a6515bb18/OD430_InvoluntaryResettlement.pdf

2. Legislative and Regulatory Frameworks

2.1. Egyptian Laws, Regulations and Policies

The main legislations and guidelines that will be discussed under this section are as follows:

2.1.1. Egyptian Constitution of 2014:

Article 13 states that the State shall protect workers' rights and strive to build balanced work relationships between both parties to the production process. It shall ensure means for collective negotiations, protect workers against work risks, guarantee the fulfillment of the requirements of security, safety and occupational health, and prohibit unfair dismissal, all as regulated by Law.

Article 35 states that the state is responsible for protecting private properties. With regards to expropriation, it shall be allowed only in the public interest and for its benefit, and against fair compensation to be paid in advance according to the Law.

Article 36 states that the State shall motivate the private sector to undertake its social responsibility in serving the economy and society.

Article 46 states that protecting the Environment is a national duty and that the State shall take necessary measures to protect and ensure not to harm the environment; ensure a rational use of natural resources so as to achieve sustainable development; and guarantee the right of future generations thereto.

2.1.2. Environmental Law 4/1994 for the Protection of the Environment

Law 4/1994 and its executive regulations, subject to the Cabinet Decree 338/1995, as revised in some of its provisions in Cabinet decree 1741/2005, is the main environmental protection legislation in Egypt. The published Environmental Impact Assessment (EIA) guidelines (October 2001/January 2005/January 2009) form the key regulation on environmental protection.

Provisions for Project Activities

Based on Law 4/1994 and its Executive Regulations, the following are some provisions, pertinent to the activities of the proposed project:

- Preparation of an ESIA study of the project and its presentation to the competent administrative authority, which, in turn shall refer it to EEAA for consultation.
- In terms of EEAA classifications, the project is classified as a Category B Project. For Category B project, it is not compulsory to submit the full ESIA study including consultations and disclosure. However, based on the International requirements (EIB guidelines) the full ESIA study including public consultations activities and disclosure processes was followed during the study preparation.
- Obtaining a license for the handling of hazardous materials from the competent administrative authority (Ministry of Housing). Onsite generation rates of hazardous wastes shall be reduced. Safe storage of hazardous waste in solid containers with clear and visible marks for their hazard type and maintenance of an integrated record for waste handling is required by law.

- Disposal of excavation/construction waste at licensed locations through the local authority.
- Maintenance of work place noise levels and exposure periods within the regulatory limits. Strict prohibition of ambient noise higher than regulation limits for housing zones
- Taking precautionary measures to control fugitive dust emissions during excavation and construction works.
- Compliance with the maximum permissible limits of air pollutants in the gas emissions at the project site.

2.1.3. Law 38/1967 on Public Cleanliness

The conditions mentioned in the previous paragraph are also mentioned in Law 38/1967 for General Cleanliness and its Executive Regulations. Article 15 of the Executive regulations stipulates that vehicles hauling construction waste should have tight cover to prevent dispersion or falling of its contents.

2.1.4. Law 93/1962: Discharge of Liquid Waste

The law regulates the discharge of liquid waste to sewerage networks, thus protecting such networks and sewerage utilities from polluting discharges. Provisions of this law apply to all parts of sewerage networks including final inspection chambers and their joints to the main network and all pipelines whether constructed under public or private roads. Decree 649/1962 was revised (regulations of law 93/63) by Minister of Housing decree 44/200 including the revised specifications of liquid waste, prior to their discharge to the sewerage network. Late 2003, Minister of Housing decree 254/2003 (as 8th chapter of decree 44/2000) was issued for the bases and specifications of the treatment, handling and safe re-use of sludge.

Following, are some pertinent articles for the project activity.

Wastewater discharged to the sewerage network should comply with the standards stipulated in the regulations (decree 44/2000).

2.1.5. Electricity Law No. 87 of the Year 2015

In addition to Environmental Impact Assessment requirements, concerning the electricity sector installation, the People Assembly passed the bill of Electricity Law 87 which regulates all activities and developments related to the electricity sector.

Electricity Law 87/2015 addresses the limits of distances to be measured from the axis of the OHTL routes as well as the underground cables, which should be kept away from the infrastructures and development areas.

For the purposes of this report, Chapter 5 of law 87/2015 stipulates proceedings as follows:

Land Acquisition: Article 53, 55 and 62 addresses matters pertaining to land acquisition resulting from electricity projects and covers the compensation, the formation and responsibilities of the compensation committee, addressing grievances as well as specifications for the right of way.

Addressing Grievances: Article 53 further stipulates the owner/the tenants may submit written grievances/objections within 15 days from receiving the notice of forthcoming construction activities.

Rejected objections will need a decision from the relevant minister to be implemented. Further grievances may be taken to the specialized courts.

Right of Way: Article 55 of the law specifies the distances to be measured and cleared from the axis of the OHTL routes as well as the underground cables, which should be kept away from the infrastructures and development areas tall trees, buildings and structures for the axis of the overhead/aerial lines routes as well as the cables. These paths are called the Right of Way (RoW). Following are the specifications:

- Twenty five meters in the case of overhead ultrahigh voltage lines (OUHVL). (132+kV)
- Thirteen meters in the case of overhead high voltage lines (HVL). (33kV – 66kV)
- Five meters from the medium voltage lines (MVL). (1kV – 33kV)
- Two meters in the case of low voltage lines (HVL). (up to 1kV)

2.1.6. Electricity Law No. 67 of the Year 2006

Electricity Law 67/2006 was issued for the sake of protecting the consumer. Article 2 of this law, states that the consumer's rights must not be compromised, including the consumer's right to access to knowledge on the protection of his legitimate rights and interests in order to ensure that he is aware of the party whom he can refer to in case of any complaints. The consumer also has the right to bring lawsuits on all that would prejudice or damage his rights or restrict them. The service provider also must supply the consumer with correct information about the nature and characteristics of the product – which is indicated in this report as "the electricity" - to avoid misleading the consumers or the beneficiaries of the service causing them to fall into error or mistake.

Under this law, an agency should be established for the protection of the consumer and his interests. The Egyptian Electric Utility & Consumer Protection Regulatory Agency is the authority competent for the protection of the consumer in the electricity sector. In regard of electricity tariff and collection fee, EETC is already provides the certain fees regulation and fees collection system, to provide all diverse consumers.

2.1.7. The work environment and operational health and safety

Several laws and decrees tackle occupational health and safety provisions at the work place, in addition to Article 43 – 45 of Law 4/1994, which address air quality, noise, heat, humidity and the provision of protective measures to workers. These laws and decrees apply to the work crew that will be involved in construction activities.

Labour Law 12/2003, addresses workforce safety and assure of the adequacy of the working environment. The law also deals with the provision of protective equipment to workers and fire-fighting/emergency response plans. Moreover, the following laws and decrees should be considered:

- Minister of Labour Decree 48/1967
- Minister of Labour Decree 55/1983
- Minister of Industry Decree 91/1985
- Minister of Labour Decree 116/1991

2.2. European Investment Bank (EIB) Environmental Guidelines

The European Investment Bank (EIB) promotes European Union (EU) policies through its financial and other support to sustainable investment projects. Its approach is based on the environmental principles enshrined in the Treaty of preservation of the environment, protection of human health, rational utilization of natural resources and promotion of measures at the international level, establishing the European Community and the standards and practices incorporated in European Union (EU) secondary legislation on the environment.

The EIB adopted an Environmental Statement in 1996 to underline its commitment to protecting and improving the natural and built environment according to EU policy. A revised Statement was issued in 2002 and again in 2004, aligning the Bank with the Sixth EAP in support of sustainable development both within the EU and outside.

The EIB environmental and social handbook also refers to the following directives as references to consider during the preparation of an ESIA:

- The EU EIA Directive 2011/92/EU
- The Habitats Directive and 92/43/EEC
- The Birds Directive 2009/147/EC
- The EU Water Framework Directive (2000/60/EC)
- The SEA Directive 2001/42/EC
- The SEA Protocol under the UN ECE Espoo Convention

Regarding the project screening, in accordance to the EIB Initial Project categorization, EETC project 10th of Ramadan 500 GIS SS and its interconnecting OHTL lies within category B that local and short term negative environmental and associated social impacts and for which effective mitigation measures are readily available – Low to moderate risk. According to guidelines of the EU EIA Directive, this type of project is listed under No 20 of the list of projects subject to article 4(1) of the EIA Directive 2011/92/EU of the European Parliament and the Council of 13 December 2011 Annex I, which requires a full ESIA. EIB policy towards EIA is summarized in its Environmental Statement 2004 and "Environmental and Social Handbook" of 2013 - EIB.

According to the EU EIA Directive, it is the responsibility of the host country and its competent Authorities to ensure that the "public concerned" are informed and consulted on the proposed project (Articles 6 and 9). Bank staff as part of their environmental assessment checks that these requirements have been fulfilled.

Regarding the bird migration, the SS isn't located along the path of the birds' migration. However, 3 of the OHTLs routes (except the one connecting to the East Belbees substation) cross the path of the birds' migration as seen on the below maps. Based on Bird Life international tool's report (Annex 4), the overall sensitivity of this project area is considered medium as there are 4 soaring bird species observed in the area, classified as **LC** (least concern) according to the IUCN Red List; while a further 28 soaring bird species classified as **LC**; **NT** (near threatened); **VU** (vulnerable); **EN** (endangered) are expected but not observed (classification of 'observed' or 'expected' based on presence status).

Therefore, mitigation measures are required to be implemented for these particular 3 OHTLs to minimize the risk of birds' electrocution and collision. The following figures represent the birds' migration path versus the project's location and routes of OHTLs.

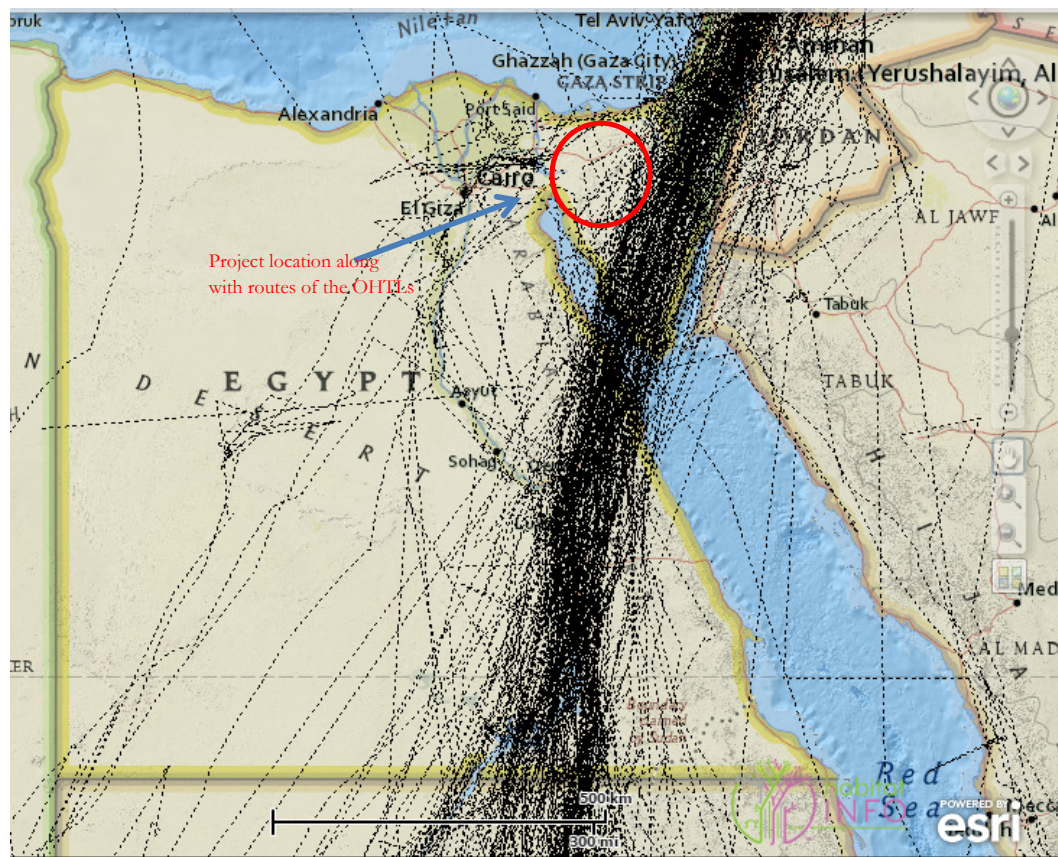


Figure 2-1 Main migration routes in Egypt

source: BirdLife International (2015)

10th of Ramadan GIS Substation & its Overhead Transmission Lines_ Final

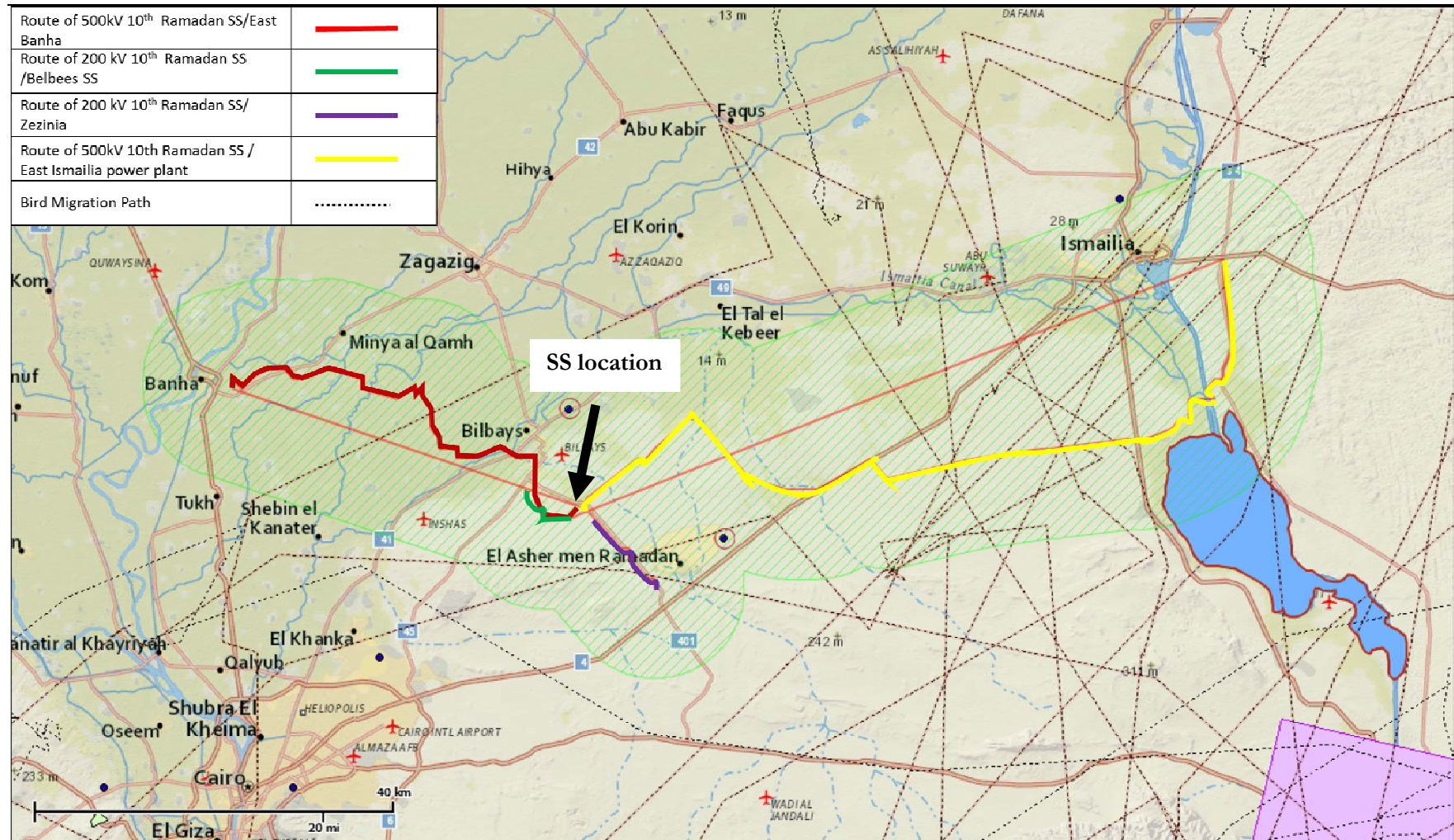


Figure 2-2 Main migration routes in Egypt versus the location of OHTLs and SS

source: BirdLife International (2019)

In addition, as the nature of the existing sites are the empty land dedicated for a construction of a substation (within the suburb residential area) and interconnections lines to connect the new SS to the national grid, there is no natural habitats or wild life are present on site. Similarly, the flora and fauna of the project sites are considered low.

Consultation and participation is essential for investment sustainability through increased local ownership and support through informed involvement. Moreover, meaningful dialogue and participation is crucial to promoting and supporting the rights of people affected by a project. This includes the rights to due process via recourse to independent appeal and arbitration procedures in the case of disputes. As such, public consultation is a general requirement of the environmental and social safeguards of the Bank. For this ESIA, to ensure the public participation and public concerns is accounted, disclosure of information was conducted at an early stage and the outcomes of public consultations activities have been incorporated into the contents of the ESIA; to achieve this the Consultant carried out stakeholder engagement activities through one phase in August 2017 through the following methods: Focus Group Discussions (FGDs) with community members and surrounding farming-related stakeholders, Group Meetings and Semi-Structured Interviews with community stakeholders.

Summary of the EEAA, EIB policies and WB Procedures and guidelines concerning the environmental and social aspects of the project is presented at Table 2-1.

Table 2-1. Summary EEAA, EIB and WB safe guard and policies for environmental and social aspects

	Safe guard	Policy Triggered		Justification
		EEAA	EIB	
1	EIA	Yes	Yes	<ul style="list-style-type: none"> • ESIA is a compulsory study (in accordance to Egyptian and International guidelines and regulations); that has to be provided prior to the implementation of any project. • This policy applies to all projects requiring a Category B of Egyptian Laws and Regulations 4/1994, and Table D of EIB project categorization will be applied. In addition, the EIA is in accordance to EIA Policy summarize in Environmental Statement 2004 governed by Directive 85/337/EEC, amended by Directives 97/11/EC and 2003/35/EC • All Environmental and Social aspects related to construction of the substation and interconnections project will be adequately examined in accordance to the Egyptian and EIB regulations and guideline • All Environmental and Social aspects related to operation of the substation and interconnections project shall be adequately examined in accordance with the Egyptian and EIB regulations and guidelines
2	Natural habitat and Bird Migration	No	YES	<ul style="list-style-type: none"> • No natural habitat or physical cultural or natural protectorate property issues have been identified during site visits or desk studies, hence the risk of project affecting natural habitats or physical cultural or natural protectorate property is considered negligible. • The project belongs to the international bird migration path. Therefore, the bird migration is to some extent triggered in this study by International (EIB). • In addition, the project sites are mainly urban areas which are characterized by only local birds
3	Involuntary Resettlement	No	Yes	<ul style="list-style-type: none"> • For this particular component of the project, involuntary resettlement was triggered. • There is no private land acquisition or resettlement that will take place at the new SS site as it is already plotted and approved by the decree from Cairo Governorate. However for the overhead transmission lines, the parts of the OHTLs which pass through the desert lands (State-owned) no land acquisition is required for these parts but it will be required for the parts crosses by agricultural lands (Private Ownership).
4	Public Consultation	No	Yes	Although it is not compulsory under the Egyptian laws and regulations, the Consultant carried out stakeholder engagement activities through Two phases in August 2017 and April 2018 through the

	Safe guard	Policy Triggered		Justification
		EEAA	EIB	
				<p>following methods: Focus Group Discussions (FGDs) with community members and surrounding farming-related stakeholders, Group Meetings and Semi-Structured Interviews with community stakeholders to ensure that the public is well informed. The consultations involved as part of the scoping, several discussions and interviews held to receive stakeholders' feedback on the project's . the stakeholder engagement activities were conducted on the station and its OHTLs, and designed in accordance with EIB handbook, IFC Guidance Consultation activities process and results are presented as a part of the ESIA study</p> <ul style="list-style-type: none"> Public Consultation Process has been designed in accordance with EIB handbook and IFC Guidance. <p>The site of the SS is far away of residential areas. However, some parts of the routes lines pass through the desert lands (State-owned), while others in agricultural lands (Private Ownership), accordingly, various consultation activities were conducted with the owners of the agricultural lands located along the route of the OHTLs to be included in the framework of the RAP.</p>
4	Disclosure	No	Yes	<ul style="list-style-type: none"> According to Egyptian Law and Regulation, Disclosure is only applicable to category C project; hence it is not applicable to the current project. <p>However, as the Disclosure process is compulsory under the EIA Directive, it has been designed in accordance with EIB handbook, WB Guidance The Consultant carried out stakeholder engagement activities through one phase in August 2017 through the following methods: Focus Group Discussions (FGDs) with community members and surrounding farming-related stakeholders, Group Meetings and Semi-Structured Interviews with community stakeholders in order to spread information about the project and identify their concerns toward the project</p>

3. Project Description

3.1. Project Objectives

The construction of 10th of Ramadan 500 GIS Substation 500/220 kV (2x750 MVA +future transmitter) and its overhead transmission lines interconnection (500kV and 220 networks) will improve power capacity at Canal Zone Area with minimum losses of transferred power. The project aims to fulfill the following objectives:

- Evacuate the generated power from Banha and Ismailia Power plant,
- Improve the voltage level and system stability in Canal Zone area, and
- Reinforce the 500kV and 220kV national electricity network.

Those objectives are in accordance to the EEHC and its affiliated companies' mission toward the society: to provides continuous and safe supply of electricity to all type of consumers. In addition, as the EEHC and its affiliated companies' long term goals, all the implementation of their project is in accordance with international performance standards and taking into consideration all the environmental, social and economic determinants.

3.2. Project Overview

As part of the current project, the 10th of Ramadan 500 GIS Substation will be connected to the national electricity network through 500 kV and this is through

- Construction of OHTL double circuit, quadruple connector, 10th of Ramadan 500/East Banha with approximately 52 kilometer long (IN/OUT);
- Construction of OHTL double circuit, quarter connector, 10th of Ramadan 500/East Ismailia with approximately 97 kilometer (IN/OUT); and
- Empty space for future connection to 2 spare cells of 500 kV

Moreover, 10th of Ramadan 500 GIS Substation will be connected to the national electricity network through 220 kV and this is through

- Construction of OHTL double circuit, triple connector, 10th of Ramadan 500/Zezenia with approximately 12 kilometer (IN/OUT);
- Construction of OHTL double circuit, triple connector, 10th of Ramadan 500/Belbes with approximately 8 kilometer (IN/OUT); and
- improving the 66 kV network through future expansion for the construction of a new 66 kV network.

The site of the substation is located northwest of 10th of Ramadan city. It is 14,500 km away from 10th of Ramadan residential area, and about 500 meters from Belbes – 10th of Ramadan road.

The site of the proposed substation at 10th Ramadan 500 GIS will be constructed in arid area with no vegetation cover; the proposed substation has a square shape with area of approximately 0.25km² as determined in the following coordinates:

Table 3-1 Proposed 10th of Ramadan 500 GIS SS coordinates

UTM Coordinates		
P1	30°20' 12.343"N	31°37' 53.885"E
P2	30°20' 24.458"N	31°37' 41.406"E
P3	30°20' 13.67"N	31°37' 27.428"E
P4	30°20' 1.545 "N	31°37' 39.877"E

The proposed location of substation can be described as desert land with scare vegetation and unoccupied, far from any sensitive receptors. There is not existing buildings or structures over the land and the land is relatively flat thus does not require much of land preparation activities. There are no sensitive receptors to the project activities due to the large spatial range of the proposed project location.

The substation (SS) is located in the area allocated for facilities and services in the strategic planning of West area of 10th of Ramadan City. The area is devoid of facilities excluding the new water station, which is adjacent to the SS site from the north and about 50 meters away from it. There is an agricultural area adjacent to the project site from East and North. The nearest residential block to the project site is located in the East and it is about 5 km away from the project site, the area represents youth housing area and land zoning of “Build your Own Home” project.

The routes for the overhead transmission line was identified according to the data and maps collected from EETC, including the map showing the general layout of the Substation and the routes of the overhead transmission lines sorting from the new 10th of Ramadan 500 GIS SS. The data provided by the EETC and site reconnaissance visits conducted by the experts, gave the team a better understanding of the SS location along with the OHTLs, description of the SS location and route of the OHTLs and its surroundings; and the existing environmental and social conditions related to the different perspectives (environmental, social, human being, flora, fauna, cultural heritage sites, etc.).

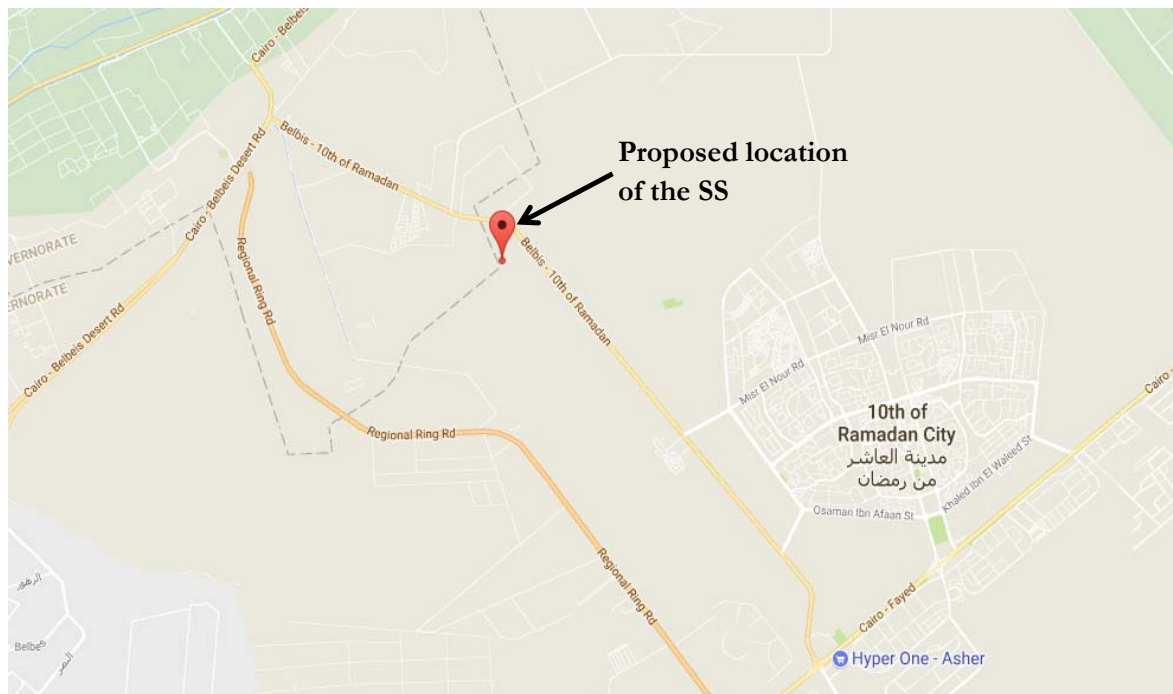


Figure 3-1 Proposed location of 10th Ramadan SS

Overhead Transmission lines

Design of the Overhead transmission towers will vary in terms of Height, foundations, usage (suspension, tension, and crossing towers). The heights of suspension towers and tension angle terminal towers will range from 42 m to 47 m, while the crossing towers height will be 197 m (according to coordination between EETC and Suez Canal Authority) . It is anticipated that distance between transmission towers is approximately 400 m.

500kV OHTL 10th Ramadan SS /East Banha

The OHTL from 10th Ramadan SS to East banha is about 52 km. It originates from banha power station in Qalyubia Governorate on agricultural plots varies between crops and trees with approximately distance 53 km , crosses Zazazik-Banha Road heading to Ismailia- Cairo road to cross Belbees- 10th Ramadan Road to reach 10th Ramadan SS in Sharqiyah Governorate.

According to the site visits the OHTL will pass by several agriculture lands and the towers will be constructed on these lands. The ROW along the overhead lines may require cut off some crops or tall trees. Accordingly, a resettlement action plan (RAP) will be prepared with full detailed about the types of these crops and the acquired compensations.

The agricultural areas of the transmission line route is approximately 96% of the total length of the line, while the remaining 10% lies on unoccupied desert lands.

The final coordinates for the line's route will be produced in due course, subject to the final design of the lines. The current coordinates presented are indicative. The exact and final route will be presented in the RAP to be produced in due course.

Annex 2 presents the detailed route coordinates for 500 Kv of 10th Ramadan SS /East Banha.

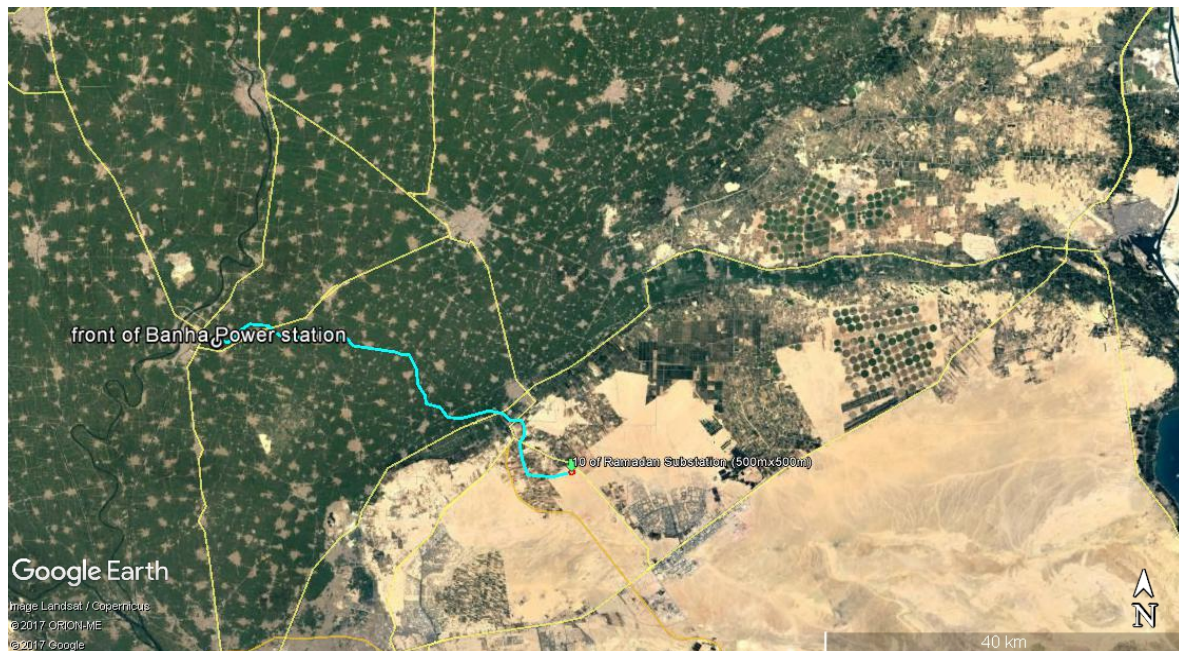


Figure 3-2 Route of 500kV from 10th Ramadan SS to East Banha power plant



Figure 3-3 The agricultural plots where the route will pass through

500 kV OHTL 10th Ramadan SS /East Ismailia

The OHTL from/to Ismailia power plant, originates from Ismailia power plant, runs parallel to Ras Sedr road-Al Qantara Shark road on agricultural lands, then the line crosses port said-Suez canal road and continues its path on agricultural lands, after that, the line crosses Hurghada –Ismailia road heading to Cairo –Fayed road and runs parallel to Cairo –Fayed road on uninhabited, uncultivated state-owned desert lands to cross Cairo-Ismailia road and passes through agricultural plots, then passes along the borders of 10th of Ramadan city on the road reserve to reach 10th Ramadan SS.

A coordination will take place between the Electricity District and 10th of Ramadan City, in order to allocate areas to install the electric towers away from the residential areas.

The OHTL route is of 97 km distance, about 37 km of the line route passes through agricultural lands varies between crops and trees, 1.5 km crosses port said-Suez canal road, 20.5 km of the line passes along the borders of 10th of Ramadan city. The remaining passes through uninhibited, uncultivated state-owned desert lands.

For the 37 km of the line route which will passes through agricultural lands, it may require cut off some crops or tall trees. Accordingly, a resettlement action plan (RAP) will be prepared with full detailed about the types of these crops and the acquired compensations.

The final coordinates for the line's route will be produced in due course, subject to the final design of the lines. The current coordinates presented are indicative. The exact and final route will be presented in the RAP to be produced in due course.

Annex 2 presents the detailed route coordinates for 500 kV of 10th Ramadan SS /East Ismailia.



Figure 3-4 Route of 500kV from 10th Ramadan SS to East Ismailia power plant



Figure 3-5: The agricultural plots where the route will pass through

220 kV OHTL 10th Ramadan SS /Proposed Belbees SS

The OHTL from 10th Ramadan SS to the proposed Belbees SS originates 1 km far from 10th Ramadan SS running parallel to a branch from a drainage canal for 1 km then through agriculture lands varies between crops and trees for approximately 3.5 km then crossing the drainage canal to be running parallel to Regional ring road. The OHTL continues in agriculture lands for 3.5 km heading to the proposed location of Belbees SS. The OHTL is with estimate 8 km long.

According to site visits, the OHTL will pass by several agriculture lands and the towers will be constructed on these lands. Construction the towers may require cut off some crops or tall trees if exist on these lands. Accordingly, a resettlement action plan (RAP) will be prepared with full detailed about the types of these crops and the acquired compensations. The agricultural areas of the transmission line route is approximately 88% of the total length of the line, while the remaining 12% lies on unoccupied desert lands.

The final coordinates for the line's route will be produced in due course, subject to the final design of the lines. The current coordinates presented are indicative. The exact and final route will be presented in the RAP to be produced in due course. Annex 2 presents the detailed route coordinates for 220 kV OHTL 10th Ramadan SS /Proposed Belbees SS.



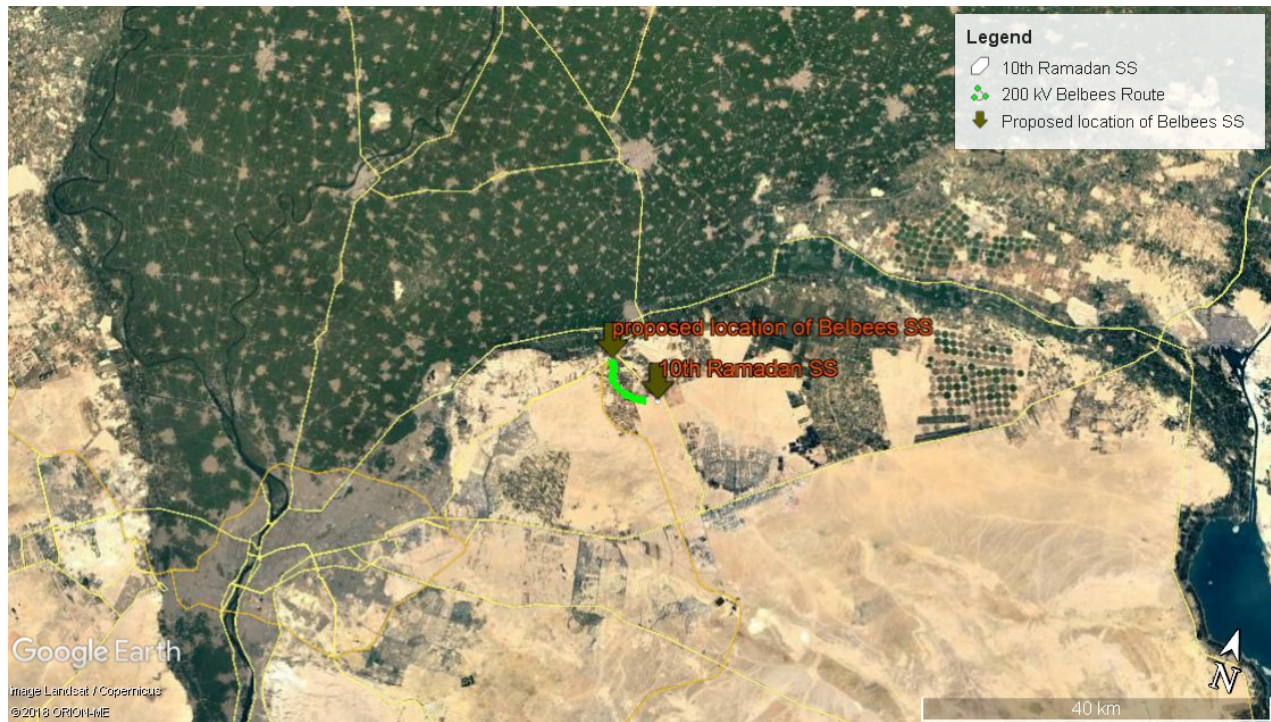


Figure 3-6 Route of 200 kV from 10th Ramadan SS to proposed Belbees SS





Figure 3-7: The agricultural plots where the route will pass through

220 kV OHTL 10th Ramadan SS /Zezenia

The OHTL 10th Ramadan /Zezenia originates from a distance of 0.25 km from 10th of Ramadan SS running parallel to Belbees- 10th Ramadan desert road for a distance of estimate 12 km passing by 10th of Ramadan power plant. The OHTL route runs in desert land and parallel to the main road, therefore no land acquisition is required for this line. The following table shows the coordinates of the route

Table 3-2 10th Ramadan SS/ Zezenia OHTL coordinates

Point number	Latitude (North)	Longitude (East)
1	30 20 14.05	31 38 01.89
2	30 18 31.58	31 39 44.67
3	30 17 48.29	31 40 28.64
4	30 17 44.00	31 40 40.39
5	30 17 22.09	31 41 0.08
6	30 16 08.86	31 42 15.53
7	30 15 56.35	31 42 26.35
8	30 15 42.73	31 42 46.98



Figure 3-8 Route of 200 kV from 10th Ramadan SS/ Zezenia



Figure 3-9: the unoccupied desert lands where the route will pass through

3.3. Project Components

The main components of the project are the construction of according to EETC technical specifications on 06/06/2017 are as following:

5. 10th Ramadan 500 GIS Substation 550/220 kV (2x750 MVA) in Canal Zone, with the following scope:
 - Voltage ratio 500/220 kV
 - Future expansion with 3rd transmitter 500/220 kV
 - Future Expansion for 2 spare units of 500 kV to be connected to the local network.
 - 500 kV, switchgear GIS, 10 bays (6 feeder bays + 3 transformer bays + 1 Bus Coupler Bay) including 3 bays (2 feeders + 1 transformer Bay) for future expansion
 - 220 kV, switch gear GIS, 17 bays (8 feeder bays + 3 transformer bays + 2 Bus Coupler bays) including 9 bays (4 feeders + 5 transformer Bay) for future expansion
 - 2x750 MVA 500/220 kV Power Transformers ONAN/ONAF1/ONAF2
6. Construction of 500 kV overhead transmission line network with the following scope:
 - Construction of OHTL double circuit, quadruple connector, 10th of Ramadan 500/East Banha with approximately 52 kilometer (IN/OUT);
 - Construction of OHTL double circuit, quarter connector, 10th of Ramadan 500/East Ismailia with approximately 97 kilometer (IN/OUT); and
 - Empty space for future connection to 2 spare cells of 500 kV
7. Construction of 220 kV overhead transmission line network with the following scope:
 - Construction of OHTL double circuit, triple connector, 10th of Ramadan 500/Zezenia with approximately 12 kilometer (IN/OUT);
 - Construction of OHTL double circuit, triple connector, 10th of Ramadan 500/Belbees with approximately 8 kilometer (IN/OUT); and
 - Empty space for future connection to 4 spare cells of 220 kV
8. Construction of 66 kV overhead transmission line network:
It should be taken in consideration the possibility of the SS future expansion to 66 kV network

3.4. Description of Activities during project implementation

3.4.1. Description of Activities during Construction Phase of SS

- **Site preparation:** including but not limited to: site clearance (limiting ground disturbance to existing networks during site preparation), fences construction, preparing site camp, preparing access road (if needed) for moving construction material and machineries and temporary storage of construction materials, machineries, etc.
Besides the site preparation, the approvals or the permissions from the competent authorities and surrounding establishments shall be obtained.
- **Construction of concrete works:** (footing, foundations, SS framework, support structures and equipment) and other concrete construction for OHTL path, etc.
- **Construction of Supporting buildings:** including administration building and facilities, control room, etc.

- **Erection of the equipment:** including transformers, switches yards, electrical panel, etc.
- **Waste management:** including generated domestic and construction waste (hazardous and non-hazardous). This activity will include waste identification, temporary storage, handling and transportation to the designated landfill. In general, the disposal method for the construction wastes should be included in the ToR for the Contractor for waste management during construction. 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. The common practice in Egypt that the wastes are segregated and it can sold to a contractor for reuse or recycling depends on the classification of the wastes.

For the hazardous waste, it will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA). Besides all activities described above, the training for operation and maintenance, including the emergency plans is required to be conducted by the contractors who supply, erect and start up the transformers and their accessories. The capacity building activities shall be held during the warranty period.

3.4.2. Description of Activities during Construction Phase of OHTL

- **Identifying the right of way (ROW):**As discussed in chapter 2, the Electricity Law 87/2015 has identified the limits of distances to be measured from the axis of the OHTL routes in order to identify the Right of Way (ROW) zone. A distance of 25 meters from both sides for OHTL (of 500 kV and 220kV) will be kept as a Right of Way (ROW) or buffer zone for maintaining the public safety from electric hazards and high exposure to electric magnetic fields (EMFs).
- **Tower erection:** The depth of drilling is about 4.5 m per base and the average area required to implement the base tower from 22 m X 22 m to 33 m X 33 m.
- **Installation of tower suspension accessories:** they are erected manually by hauling the accessory using chain pulley
- **Stringing of pulling line over each stringing block for the conductor:** the pilot wire is manually strung over valley in mountainous area which is attached to power cable. The pilot wire is sometimes shot using winch or through drones.
- **Tensioning and sagging of conductor:** tension and sag corrected using manual winch, chain pulleys, bull wheel type pullers and other associated equipment
- **Waste management:** for generated domestic and construction waste (hazardous and non-hazardous). This activity will include waste identification, temporary storage, handling and transporting to the designated landfill, etc. In general, the disposal method for the construction wastes should be included in the ToR for the Contractor for waste management during construction. 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. The common practice in Egypt that the wastes are segregated and it can sold to a contractor for reuse or recycling depends on the classification of the wastes

For The hazardous waste, it will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).

Contractor responsibility before EETC

Under the project scope agreement of EETC with substation and OHTL contractor, the work shall cover on turn-key basis engineering, design, services, fabrication, factory testing, site delivery, loading, unloading of the specified equipment, civil works, installing, site testing, commissioning and insurance till handing over, training, warranty and technical assistance during warranty period. The contractor shall abide to the ESIA findings and the ESMP in this study should be included within the ToR of the contractor. Moreover, and the contractor will adhere to the recommendations entailed in the environmental permit that would be issued by the Egyptian Environmental Affairs Agency upon approval of the environmental studies.

3.4.3. Description of Activities during Operation Phase of SS

- **General check:** for the fitting, oil quality, performance of the transformers, gas insulation quality and quantity etc.
- **Oil filtration:** Please note that during the operation and maintenance, it is expected to generate limited amounts of the rejected oil (from machines at the SS site), since oil is generally filtered using the oil filter machine available at the SS site.
- **Transformer replacement:** Due to the increased power demand at some areas, EETC may change the transformer. Please note that the current practice of the EETC is to replace the transformer. The old transformer is reused at other SS with less demand on electricity.
- **Replacement of cables and insulators:** the old and rejected insulators, OHTL cables, etc.
- **Waste management:** including the generated domestic waste and rejected waste (rejected cables and spare parts). The waste management will include waste identification, temporary storage, handling and transporting to the designated landfill. In general, the disposal method for the operation wastes should be included in the ToR for the Contractor for waste management during operation phase. It is preferable to include the temporary onsite waste management for the workers in the ToR of the contractor.

For The hazardous waste, it will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).”Besides all activities mentioned above, to ensure the knowledge and the skill of the operator of the SS, the regular training, including regular simulation during the emergency shall be organized and provided by EETC to the operators of the SS.

3.4.4. Description of Activities during Operation Phase of OHTLs

On the other hand, regular maintenance and monitoring activities along the transmission lines OHTL are minimum, it involves periodically inspecting the OHTL and the safety clearances are maintained.

3.5. Description of the Technology

3.5.1. Proposed Substation Technology

Gas Insulated Switchgear (GIS) with SF₆ gas will be used at 10th of Ramadan 500 GIS Substation SS. GIS is a compact multi component assembly enclosed a ground metallic housing in which the primary insulating medium is compressed Sulphur hexafluoride (SF₆) gas. SF₆ acts as insulation between live parts and the earthed metal closure.

The use of SF₆ gas is one of the revolutionary technologies in addition to the technology of circuit breakers. The dielectric strength of SF₆ gas atmospheric pressure is approximately 3 times that of air, it is combustible, low order of toxicity, colorless and chemical inert. Also, it has quenching properties three to four times better than air at equal pressure. GIS occupy 25% space than it is required for conventional substation (needed only small ground space requirements).








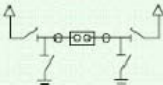

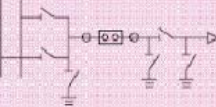
With regards to maintenance activities, the GIS substation requires minimal maintenance efforts (nearly zero maintenance), has less field erection time and erection cost.

Reasons for selection of the SS technology, is that the site is located at an arid area. The optimal option for SS technology is the indoor GIS substation using SF₆ gas as described above.

Regarding the pollution and other accidents that may occur during operation and maintenance, the GIS SS with SF₆ gas is known to be non-flammable, non-explosive, oil free and less pollution.

In addition, with regards to the aesthetic aspects, the GIS SS is placed inside a closed building. Thus there will be no impact on the scenery at existing establishment surrounding. Figure 3.4 below describe

the main advantages of the GIS SS compared with other technologies (Conventional SS, Hybrid GIS

	Conventional AIS	Hybrid GIS	GIS
Main Bus	In air	In air	In SF6 gas
Arrangement of Equipment	Distributed		Highly integrated
Exposure of Live Parts	Exposed		Fully enclosed
Overall Land Area	Large		Small
Equipment Cost	Less than GIS		-
Outline of main component	 	 	 

SS)

Figure 3-10 Type of GIS and their specifications

3.5.2. Proposed Overhead Transmission Line Technology(500kV)

Codes and Standards

Electrical

IEC60826-2003: Design criteria of overhead transmission lines.

IEC 61865: Overhead lines-Calculation of the electrical component of distance between live parts and obstacles- Method of calculation.

IEEE C2-2012: National Electrical Safety Code (NESC).

IEEE 516-2009: IEEE Guide for Maintenance Methods on Energized Power Lines.

GB 50545-2010: Code for design of 110-750kV overhead transmission line Electricity utilities specification

Civil Work

ASCE 7-05: Minimum Design Loads for Buildings and Other Structures

ASCE 10-97: Design of Latticed Steel Transmission Structures

IEEE Std 691™-2001: IEEE Guide for Transmission Structure Foundation Design and Testing

American concrete institutes (ACI)

Material

IEC61089: Round wire concentric lay overload electric standard conductor.

IEEE 812: Definition of terms relating to the fiber optics

IEC 60120: Dimensions of ball and socket coupling for string Insulators.

ISO 898: Mechanical properties of fasteners made of carbon steel and alloy steel.

ASTM: American Society for Testing and Materials.

GB/T: 700-2006: Carbon structural steels.

GB/T: 1591-2008: High strength low alloy structural steels.

3.6. Description of the materials to be used

3.6.1. Basic Design Data

The following table presents the basic information of the OHTL

Table 3-3. Basic Information of the OHTL

Subject		Description
Nominal Voltage		500kV AC
Number of Circuits		Double circuit
Max. ambient temperature		50°C
Min. ambient temperature		-5°C
Av. ambient temperature		25°C
Conductor		ACSR-490/65 AAAC-506
Shield wire		AACSR-94.1 GSW-108 OPGW(48)-G.652
Suspension Insulator String		1×160kN single suspension Insulator set 2×160kN double suspension Insulator set
Tension Insulator String		2×240kN double tension Insulator set
Types of Towers	Suspension towers	W2
	Tension towers	WA, W30, W60
	Terminal towers	WT60
	Navigation towers	WCR

3.6.2. Electrical System Data

Table 3-4 Electric system data

Subject	Description
Nominal voltage Un	500kV
Maximum operating voltage Us	525kV
Power frequency	50Hz
Basic Insulation Level Design BIL (lightning impulse)	1550kV
Switching impulse withstand voltage	2.0p.u.
Design creepage distance	40mm/kV 45mm/kV

3.6.3. Conductor and Shield wire

The new 500kV transmission line will consist of two circuits of each quad-bundle phase conductors ACSR-490/65 or conductor AAAC-506. The line will be equipped with two shield wires; one shield wire shall be of AACSR-94.1 type, the other of similar type but designed as OPGW with 48 fibers. Basic Standards as follows:

For the complete conductor: ASTM B 232 and EN 50182

For the component wires:

- a) aluminum wires EN 60889
- b) steel wires EN 50189
- c) grease EN 50326
- d) conductor creep IEC 61395

Conductor ACSR 490/65 and AAAC-506

The phase configuration shall be quad-bundle of aluminum conductor steel reinforced (ACSR) and all aluminum alloy conductor (AAAC) as per DIN_EN 50182.

The main principal of conductor selection is as follows:

- 1) Meet the requirement of current-carrying capacity;
- 2) Meet the requirement of electromagnetic environment;
- 3) Good mechanical properties;
- 4) Economical;
- 5) Meet the requirement of production and construction.

The conductor of this project is mainly selected based on these principles and the employer's requirements.

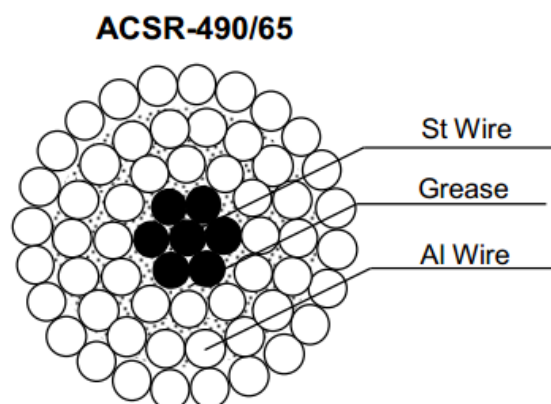


Figure 3-11 Conductor ACSR-490/65 Structure

The main technical data of the ASCR 490/65 are as follows in accordance with EN 50182:

Table 3-5 Technical data for ASCR 490/65

Parameter		Unit	Value
Structure	Center: Steel wire	Nos./mm	1/3.40
	Layer 1: Steel wire		6/3.40
	Layer 2: Aluminum wire		12/3.40
	Layer 3: Aluminum wire		18/3.40
	Layer 4: Aluminum wire		24/3.40
Standard		/	IEC 60888/60889/61089
Stranding direction of outer layer		Direction	Right
Conductor diameter		mm	30.60
Cross section		mm ²	553.8
Conductor weight(Without grease)		kg/km	1852
Conductor weight(All the conductor is greased except the outer layer)		kg/km	1922
Rated tensile strength		kN	152.85
Modulus of Elasticity		GPa	70
Coefficient of linear expansion		10 ⁻⁶ /°C	19.3
Max. DC Resistance at 20°C		Ω/km	0.05896
Dropping point temperature		°C	120
Lay ratio	Aluminum layer	times	Inner layer 10-16 Outer layer 10-14
	Steel layer		6 wires layer 16-26

The main technical data of the AAAC-506are as follows in accordance with EN 50182:

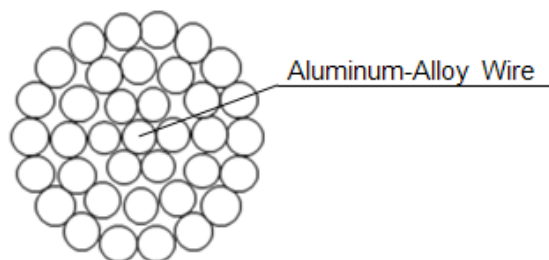


Figure 3-12 Conductor AAAC-506 Structure

Table 3-6. Technical data of conductor AAAC-506

Code name	AAAC-506
Sectional area of Aluminum alloy	506.71 mm ²
Total sectional area	506.71 mm ²
Overall diameter	29.23mm
Approximate weight	1399 kg/km
Modulus of elasticity	55000 N/mm ²
Coefficient of linear expansion	23×10 ⁻⁶ /°C
Minimum UTS	144.7kN
EDT at 25°C and no wind	18%UTS
0°C and max wind pressure	33%UTS
Resistance DC @20°C	0.06609Ω/km

Conductor creep will be compensated by over tensioning the conductor at a temperature of 25°C lower than the stringing temperature for ACSR-490/65 and AAAC-506 for the transmission lines.

Shield wire AACSR-94.1 and GSW-108

94.1 mm² Aluminum clad steel will be used as shield wire for 500 kV O.H.T's in coastal areas and in other areas 108 mm² zinc coated steel wires (hot dip galvanized) will be used.

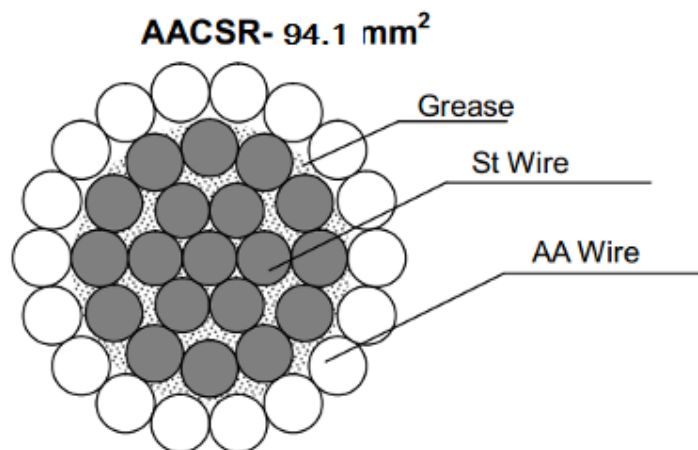


Figure 3-13 Shield wire AACSR-94.1 structure

The main technical data of the AACSR-94.1 type according to ASTM are shown in the table below:

Table 3-7. Technical data for AACSR-94.1

Standard	FRENCH CONDUCTOR (Non-equal steel and aluminum wire diameter)
Conductor type	PHLOX 94.1
Aluminum Alloy Area	51.95
Steel Area	42.12
Total sectional area(mm ²)	94.07
No. & Dia Of Al Alloy Wires(mm ²)	15×2.10
No. & Dia Of Steel Wires	19×1.68
Overall diameter(mm)(mm ²)	12.8
Linear weight(kg/m)	0.481
Modulus of elasticity(N/mm ²)	112000
Coefficient of linear expansion	14.7×10 ⁻⁶
Rated tensile strength/kN	80.35
Max. DC resistance at 20°C	0.642

The main technical data of the GSW-108 are shown in the table below:

Table 3-8. Technical data of conductor GSW-108

Conductor type	GSW-108
Total sectional area(mm ²)	108
Overall diameter(mm)(mm ²)	13.29
Linear weight(kg/m)	0.87
Modulus of elasticity(N/mm ²)	186200
Coefficient of linear expansion	11.5×10 ⁻⁶
Rated tensile strength/kN	134.26

The shield wire sag shall be equal the phase conductor's sag for everyday conditions (25°C, still air).

Dampers are proposed for the shield wire for wire protection against aeolian vibration as a necessary measure for the adopted tension.

3.6.4. Optical fiber composite overhead ground wire (OPGW)

An Optical Phase Conductor with a design similar to a AACSR conductor shall be used.

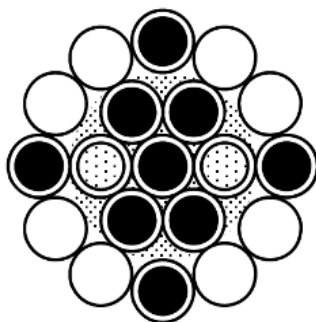


Figure 3-14 OPGW structure

Table 3-9. Technical data of OPGW

Structure Details		Named	No.	Diameter
		27%AS wire	1	3.00 mm
	Layer 1	27%AS wire	4	3.00 mm
		SUS-Tube	2	3.00 mm
Layer 2		27%AS wire	4	3.00 mm
		AA wire(LHA1)	8	

Technical Data	According to IEEE std 1138、IEC 60794-4 standards		
	Stranding direction of outer layer is "Right-hand"		
	Fiber No. & Type	48 G.652D	
	Standard Diameter	15.00 mm	
	Supporting Cross Section	120.17 mm ²	
	Section of AS wire	63.62 mm ²	
	Section of AA wire	56.55 mm ²	
	Approximate mass	574.9 kg/km	
	Rated Tensile Strength	82.7 kN	
	Maximum Allowable Tension(40%RTS)	275.4 N/mm ²	
	Everyday Stress(20%RTS)	137.7 N/mm ²	
	Strain Margin Stress(70%RTS)	481.9 N/mm ²	
	Modulus of Elasticity	105.0 GPa	
	Thermal Elongation Coefficient	16.2 ×10 ⁻⁶ /℃	
	Calculated D.C. Resistance at 20℃	0.374 Ω/km	
	Short-Circuit Current (0.5 sec, 50~200℃)	14.3 kA	
	Short-Circuit Current Capacity (50~200℃)	101.7 kA ² ·s	
	Minimum Bending Radius	300 mm	
	Ratio between Pull and Weight	14.67 km	
Temperature Range:	Installation	-10℃~+50℃	
	Transportation and Operation	-40℃~+80℃	

Remarks: All Sizes and Values are Nominal Values

OPGW sag shall be equal the phase conductor's sag for everyday conditions (25°C, still air).

Dampers are proposed for the OPGW for wire protection against aeolian vibration as a necessary measure for the adopted tension.

Regarding the optical fibers, the OPGW shall have 48 fibers.

Splice boxes

Suitable splice boxes (enclosures) shall be provided to encase the optical cable ends and fusion splices in protective, moisture and dust free environment.

- The splice boxes shall be designed for the storage and protections of a (48) fibers cables as specified and provide access through locked doors.
- Attenuation of single mode fusion splices shall not exceed 0.03 dB when measured at either 1310 or 1550 nm wavelengths.
- The splice boxes shall be appropriate for mounting on steel structures and accommodate pass-through splicing and fiber terminations.
- The splice box, including organizer/splicing trays , shall be designed to seal and protect the fiber cable splices from the environment and it shall protect easy access for any maintenance function.
- All splice boxes shall be of metal construction that are clean and smooth finished, treated to resist rust , accommodate the storage of a minimum of 3 meters of coiled fiber and allow easy access to the splice trays.
- The splice box shall be furnished with necessary grounding pads to connect the grounding conductor.
- The splice boxes shall be IP65.

Vibration damper shall be Stockbridge type.

Suspension clamp shall be flexible.

Tension clamp shall include adjustable extension link.

If an armor rod be inserted between the clamp of VD and the cable, thickness of the armor rod should be stated to ensure that the diameter of VD clamp is compatible with the diameter of the armor rod plus the OPGW diameter.

3.6.5. Tension limitation

Conductor tension limitation shall be as follows:

- a) 33% of rated strength at 0°C with max wind. OPGW final sag shall be equal to the conductor sag of EDS temperature. Maximum tension of OPGW shall be at 0°C and maximum wind of referring to its tension mentioned above at EDS temperature.
- b) 18% of rated strength at 25°C with no wind.

3.6.6. Phase Order

Total trip-out rate of double circuit transmission lines from high to low is same phase sequence (ABC-ABC) different phase sequence (ABC-BCA), reverse phase sequence (ABC-CBA). Lightning stroke simultaneity trip-out rate of parallel double circuit from high to low arrangement is same phase sequence (ABC-ABC), reverse phase sequence (ABC-CBA) and different phase sequence (ABC-BCA). Total trip-out rate of double circuit with same phase sequence (ABC-ABC) is significantly higher than that with different phase sequence and reverse phase sequence. Thus considering the lighting protection, double

circuit transmission line shall avoid the same phase sequence. At the same time, in order to reduce the capacitive current different phase sequence and reverse phase sequence are proposed.

3.6.7. Transposition

According to international rules, for directly grounded system, it is necessary to conduct a transposition if the length of transmission lines from the substation is more than 100km.

Sketch map of the transposition of the line is shown in attached drawings. Transposition tower will be modified and design based on the tension tower.

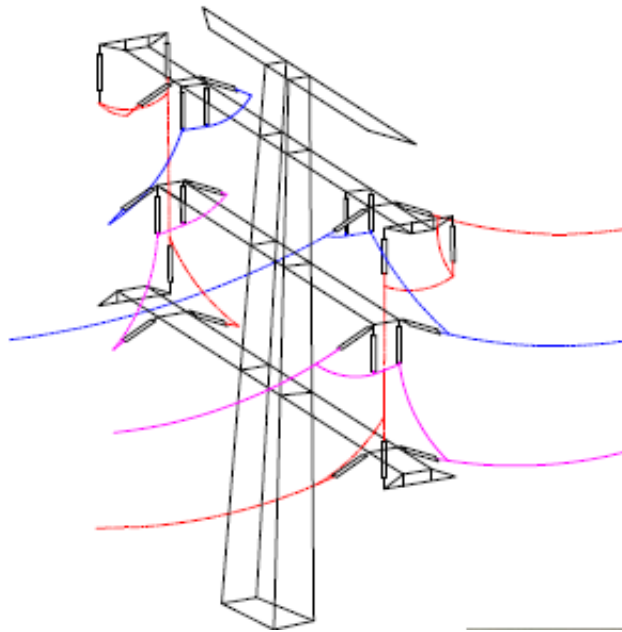


Figure 3-15 Sketch map of transposition tower

3.7. Waste generation

The waste generated during construction could be categorized as follows:

- Normal construction wastes including scrap concrete, steel, bricks, wood, etc.,
- Miscellaneous non-hazardous solid wastes, including packaging waste, used drums, wood, scrap metal, and building rubble will be generated during the construction phase of the project
- Solid hazardous wastes generated include empty containers, spent welding materials, solvents, paints or adhesives, and other hazardous wastes resulting from operation and maintenance of the equipment and vehicles, i.e. spent oils, spent lube, waste oil filters, batteries, etc. Among the hazardous wastes also are the wasted or faulted materials including conductors and insulators.

Human or domestic wastes generated by construction labor, including sewage and garbage collected from the labor camp location. The wastes generated during Operation phase will be minimal and will

largely consist of municipal waste (e.g. food; packaging) and over time potentially defunct parts and spare parts, cabling and control equipment etc. Waste management arrangements for the construction phase should be continued (proper control of collection, storage and final disposal via licensed contractors).

3.7.1. Waste Disposal during project phases (construction and operation)

For hazardous solid and liquid wastes, proper waste collection and storage plus regular (preferably twice a week) waste collection by licensed contractors will need to be arranged by site management. To co-ordinate and control this, The site management should develop a waste management plan which is included in the ToR for the Contractor for waste management during construction and operation. It will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).”For the non-hazardous solid wastes, those that cannot be recycled will be disposed in a sanitary landfill periodically (weekly or monthly depending on the volume of waste generated). Regarding the domestic waste, as the existing collection is already established and the amount to be expected is considered small.

The domestic wastes (wastewater and solid waste) generated during the construction and operation and will be collected by a licensed contractor according to the Egyptian legislation and regulations and it will be included in the ToR of the contractor.

The management and monitoring of the hazardous and non-hazardous waste, temporary internal storage and collection and transportation arrangement including the monitoring of waste management will be discussed in Chapter 8.

3.8. Overall Approach and 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.

Preparation of a RAP for the entire line including complete census, identification and valuation of affected assets in the 50-meter right of way (RoW) determined by the coordinates presented in the Detailed Line Route 2017 (See Annex 2) and publication of the cut-off date. The RAP should be a full and detailed planning report in compliance with the latest applicable Egyptian regulations regarding resettlement and World Bank OP4.12 and EIB 6 and the IFC book 5 related to involuntary resettlement action plan. The RAP should take all the relevant data from the ESIA and RPF.

All man-made structures such as roads, buildings, drainages, culverts, bridges located within the Right of Way (ROW) shall be 50 meters (divided into 25 meters each from the **Centre** of the transmission lines). Also all potential sensitive natural habitat, natural features will be captured such as rivers, creeks, canals, etc. as well as all terrain conditions and vegetation types. At surface crossings, such as roads, creeks and so on, the survey shall be conducted in such a manner as to determine the crossing width, elevation, direction and the name of the crossing. For above ground crossings such as power and high-tension lines, their elevation, type, direction of crossing shall be determined. Appropriate consideration will be given to vulnerable social groups, such as women, children, the elderly, poor and ethnic minorities, all of whom are susceptible to environmental and social impacts, and who may have little access to the decision-making process within society. Disclosure of information will be conducted at an early stage and will be incorporated into the contents of the ESIA.

4. Project Alternatives

4.1. No Go Option

The main objective of the project is to meet the steady increase in energy demand and evacuate the power generated from Banha and Ismailia power plants. Environmental and social impacts from the project are assessed and no significant impacts are anticipated. Other objectives of the proposed project includes improve the voltage level and system stability in Canal Zone area, and reinforce the 550kV and 200 kV national electricity network.

If the SS and the OHTL 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, and
- As a result, an increase in the economic activities in the region in not expected.

The site of the proposed SS at 10th Ramadan city is far from residential area and connected with a main road. Therefore, the no project alternative is not environmental/social requirements

4.2. Technology Limitation

The substation is based on GIS technology with SF₆ gas insulated is the most appropriate technology to be used based on environmentally and economically acceptable standards for similar SSs. It requires limited space (occupies only 1/10 compared to the conventional SS), especially since the site is located at an urban area (due to the aesthetic landscape as the SS will be indoor) and more reliable than conventional SS are the priorities to select the GIS system in this project. In addition, to reducing the risk of flammable materials, having long lifetime and less operation and maintenance compared to the conventional SS, the SF₆ gas insulated system is selected for this substation at 10th Ramadan City.

However, if SF₆ is released to the environment will increase the impact on ozone depletion and global warming. Therefore, the periodically check of the insulated gas has to be done properly and periodically in accordance to the specification and operation manuals.

In addition, there is no justification of interconnection underground cables instead of the overhead transmission lines. As most of the routes is far from residential zones and connecting employing OHTL proves technically more feasible and environmentally more benefit, as the excavation of OHTL is much less in comparison with underground cable which would require drilling and more land work.

4.3. Location/Routes Alternatives

10th Ramadan Substation

The selection of the SS location and the OHTL routes should be undertaken according to criteria that fulfills technical, environment as well as socioeconomic objectives in order to achieve the most feasible application.

The SS site at 10th Ramadan city is proposed to be built to serve the increase of the electricity demand from the Banha and Ismailia power plants, establishment and demand on new connections to residential area around the substation. The SS location is far from any sensitive receptors and in best location for interconnection with Banha SS and Ismailia SS. The selection of the SS location and the proposed routes have been considered length optimization thus reducing the cost as much as possible whilst at the same time the proposed routes are aligned to the existing road network as much as possible for easy access during construction and maintenance and to reduce to a minimum the number as possible the number of sensitive receptors.

500kV OHTL to Ismailia Power plant

The route is not crossing by any of the protectorates and is only crossing over Suez canal with minimal biodiversity that would have minor impact over any receptors given mitigation measures set forth in chapter 7 are followed. The final route of the OHTL will be determined in due course, subject to the final design to be produced by EETC. However, the deviations in relation to the routes depicted in this report are expected to be minor.

500kV OHTL to Banha Power plant

The route is not crossing by any of the protectorates. The final route of the OHTL will be determined in due course, subject to the final design to be produced by EETC. However, the deviations in relation to the routes depicted in this report are expected to be minor

220 kV OHTL 10th Ramadan SS /Proposed Belbees SS

The route is not crossing by any of the protectorates.

220 kV OHTL 10th Ramadan SS /Zezenia

The route is not crossing by any of the protectorates.

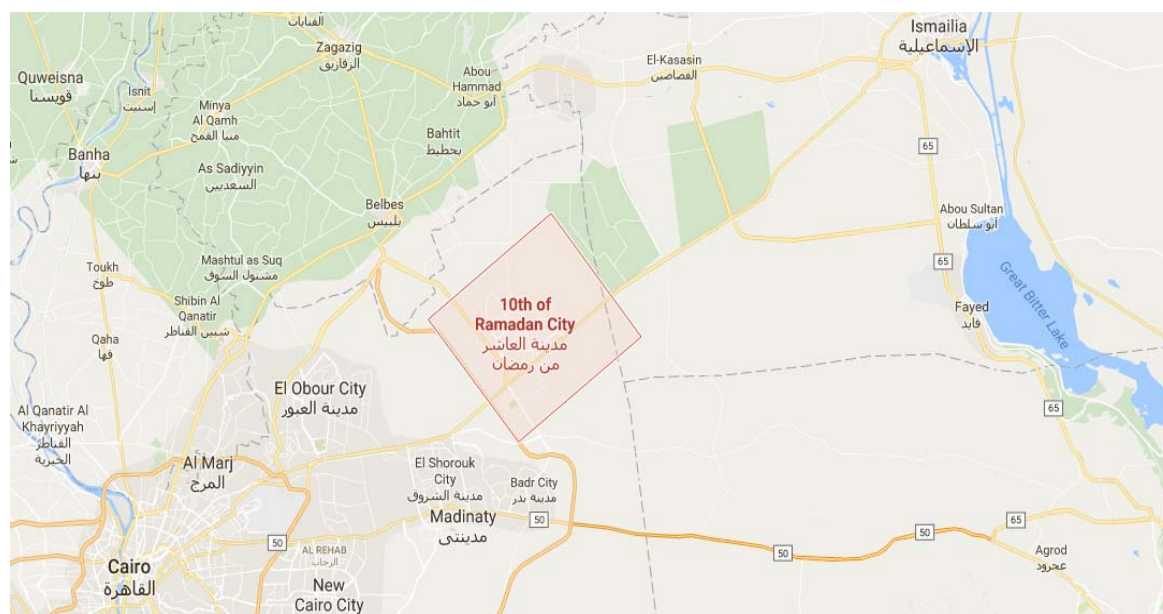
5. Environmental and Social Baseline

This section of the ESIA contains a description of the baseline physical, biological and socio-cultural characteristics of the environment at the proposed project areas.

10th of Ramadan SS is located among the boundaries of 10th of Ramadan city, Sharqiya governorate east of Nile delta, Egypt. It is surrounded from the North by Daqhaliya governorate, from the South by Qalyoubiya governorate, from the East by two Suez Canal governorates: Ismailia & Port Said, while from the West by Gharbiya governorate.



Figure 5-1 Sharqiya governorate

Figure 5-2 10th of Ramadan city location

5.1. Environmental Baseline Conditions

5.1.1. Climate

The Nile Delta is characterized with the Mediterranean climate with rainfall in winter, though not in large quantities. The relative humidity is high in the Nile Delta. July and August are among the hottest months in the Nile Delta as the average temperature in these months is about 3 °C, and the maximum temperature is 35° C.; while in winter, the temperature is usually between 8 °C and 16 °C.

Table 5-1 Metrological Data

Month	Air Temperature		Relative	Wind	Rainfall
			Humidity	Speed	
	Mean	Mean	Average	Range	Range
	(max)	(min)	%	(knots)	(mm)
Jan	20.2	8.2	59.5	4.2-6	35-0.3
Feb	21.7	8.8	56	4.4-6	14.9-0.2
Mar	27.8	11.1	53.5	5-5.7	8.1-0.3
Apr	28.4	14.0	49.5	5-5.4	2.2-0.9
May	28.9	18.2	41	4.7-5	2.5-0.3

Jun	33.8	21.1	47	4.2-5	0
Jul	35.1	22.7	52.5	3.9-4.8	0
Aug	34.9	22.8	55	3.8-5	0.6-0
Sep	33.1	21.0	56.5	3.3-5.6	0.2-0
Oct	30.7	18.3	58.5	3.5-5.7	5.1-0.7
Nov	26.1	14.5	60.5	3.2-6	8.6-1.7
Dec	20.3	11.5	60.5	4.4-6	22.3-1.8

5.1.2. Geology

The geological studies – since 1901 up to now – have helped in disclosing many facts about the geology of the Nile Delta which had started to form since the Miocene as the Nile Delta region – together with the sediments composing it – has been influenced by the changes in the sea level and region tectonics as well as the climate conditions, as there have been three sediment cycles leading to the formation of the current Delta.

The current Delta composed due to going through three sediment cycles starting from the Miocene Era as follows:

Miocene Cycle

This cycle includes the composition of detrital sediments which are found in Sidi Salem, El Qawasem and Rosetta (Rashid). Sidi Salem sediments are composed of clay with a thickness of 1000 meters containing sand stones. El Qawasem composition includes 965 meters of coarse sands and gravels topped with the Rosetta composition, including 50 meters of evaporates.

Pleio-Pleistocene Cycle

This cycle includes the compositions of Abu Madi, Kafr El Sheikh, El Westani and Meit Ghamr – from oldest to newest – where Abu Madi composition includes 250 meters of the sand penetrates and clay filled with natural gas topped with the composition of Kafr El Sheikh with a thickness of 1200 meters composed of red clay and soft sands. Then, there is El Westani composition with a thickness of 300 meters including clay, gravels and some limestone penetrates; and this cycle ends with the sediments of Meit Ghamr composition with a thickness of 700 meters of gravel sand including clay penetrates. Such rocks are the main containers of groundwater in the Delta Nile region.

Holocene Cycle

This cycle includes the composition of Belqas, representing about 50 meters of sand clay and silt, representing the vegetative agricultural cover in the region. The clay soil prevails in El Ghatbia

Governorate, El Menofia Governorate and El Dakahlia Governorate, while the sand soil increases the more we go north, i.e. in Damietta, Kafr El Sheikh, Alexandria and El Beheira Governorates to the sandy shores of the Mediterranean Sea.

The Nile Delta is featured with a low topography and is gradually sloping to the north towards the Mediterranean Sea where the costal lakes are found, such as El Manzala, El Berles and Edco, as a result of the interaction between sea and the Delta lands, high and low. The Delta basin had been extended to the east and west and the Nile had many branches that led to changes in the sea level and the tectonic which led to the disappear of such many branches and the remaining of the two current branches (Damietta and Rashid).

The Nile Delta region lands are composed of sediments that have been composed throughout thousands of years through the clay sedimentation in the Nile Delta. The land thickness in such region varies from clay lands to clay muddy lands.

5.1.3. Surface Water

The surface water resources of the Nile Delta may be classified as follows:

Rivers

The Nile River is composed of two branches pouring into the Mediterranean Sea: Damietta Branch in the east, ending at the city of Damietta; and Rashid Branch in the west ending at the city of Rashid. It is the most important water resource for the governorates as they depend on it for the irrigation of the agricultural lands as well as for some other fields. The surplus water in the Nile Delta region are poured into the Mediterranean Sea and the Northern Lakes. In addition, there is a big number of canals to meet the needs of agriculture and populations in the Delta region.

Seas

The Nile Delta governorates are located on the Mediterranean Sea with a length of about 100 KM.

Lakes

Lake Burullus is located northern of Kafr El Sheikh Governorate. It is entirely located within the borders of such governorate on an area of 120 thousand acres. It is connected to the Mediterranean Sea through Burullus strait. El Manzala Lake covers 20% of Damietta Governorate region. It is a shallow moderately saline lake connected to the Sea through three main straits. The fresh water entering the Lake is composed of the wastewater. Edco lake is located northern of El Beheira Governorate; it is bordered to the north by an agricultural road and Alexandria railway. Edco Lake is located on an area of about 20 thousand acres. The water of the lake is drinkable and the depth of the water in the lake ranges from 75 cm to 1.25 m. Edco Lake is one of the most important lakes and fisheries in the Arab Republic of Egypt as it is listed the third after El Manzala Lake and Burullus Lake with regard to the fish production. The Great Bitter Lake is a saltwater lake in Egypt, connected to the Mediterranean Sea and the Red Sea via the Suez Canal. It is connected to the Small Bitter Lake through which the canal also runs.

Rain

The monthly and annual rain quantities falling on the Nile Delta region vary. The importance of the rain and its effect on agriculture is almost absent due to that agriculture is based on irrigation by the Nile river. January is the most rainy month when the quantity of rain is almost 17 mm, followed by December with a quantity of 13.6 mm. No rains fall on July, and there are rare rains on June and September. The annual quantity of rain is about 96.6 mm. The falling waters are in positive correlation with the number of rainy days, i.e. the most rainy months are the greatest as for the number of rainy days; this is due to the nature of the rains falling on Egypt which come after low pressure.

5.1.4. Ground Water

Ground water is found in the Delta Governorates mainly due to the leakage of the Nile river waters, the rains and a big part of the irrigation water. The ground water is one of Egypt's water resources that had not receive sufficient attention until recently. Ground water is used in the Middle Delta region as a source to fill the shortage of the Nile water or at the times of the non-arrivals of the water to the ends of the canals for the works of sensitive crops irrigation as such crops require short periods of irrigation. They are also used as a direct source of drinkable water as they do not require large treatment plants.

The Nile Valley Ground Water System (Aquifer)

The aquifer dates back to the Pleistocene Era. It is generally composed of sand and gravel penetrative layers, sometimes interspersed by clay lenses of different thicknesses ranging between 200 – 900 m depending on the location. The upper limit of such layers is the semi-penetrative muddy cover while the lower part of which is the marine sediments composing thick layers of low penetrative mud. Such composition carries salt water and has no hydrological importance.

The main source that feeds the layers carrying fresh ground water in the Delta is the one leaking from the irrigation and leaching waters coming from the dense irrigation network covering all over the Nile Delta. Such waters go to those layers through their surface muddy cover.

5.1.5. Ecological (Flora and Fauna)

Due to the presence of agriculture lands near by the project's location(Substation and the route of the OHTLs), the dominating fauna in the area is farm animals and other species adapted to urban areas as feral cats and dogs, rodents, lizards, bats and birds, which depend on waste as food.

The agricultural lands includes common plants of the region such as wormwood plant trees sycamore tree, acacia, eucalyptus and different palm plants which spread on the banks of canals and drains. In addition to the cultivated crops in which the most common are wheat, rice, corn, and vegetables).

However, there are no recorded for flora and fauna found within the vicinity as the proposed site itself is an empty land within the urban area and it is considered as a desert area so the scarcity of flora is expected but not endemic flora. The local pets and pot plantations might exist at the surrounding residential area but those habitats will not be impacted from the project activities.

Bird Migration

Regarding the bird migration, the SS isn't located along the path of the birds' migration. However, 3 of the OHTLs routes (except the one connecting to the East Belbees substation) cross the path of the birds' migration as seen on the below maps. Based on Bird Life international tool's report (Annex 4) ,the

overall sensitivity of this project area is considered medium as there are 4 soaring bird species observed in the area, classified as **LC**(least concern) according to the IUCN Red List; while a further 28 soaring bird species classified as **LC**; **NT**(near threatened); **VU** (vulnerable); **EN** (endangered) are expected but not observed (classification of ‘observed’ or ‘expected’ based on presence status). Therefore, mitigation measures are required to be implemented for these particular 3 OHTLs to minimize the risk of birds’ electrocution and collision. The following figures represent the birds’ migration path versus the project’s location and routes of OHTLs.

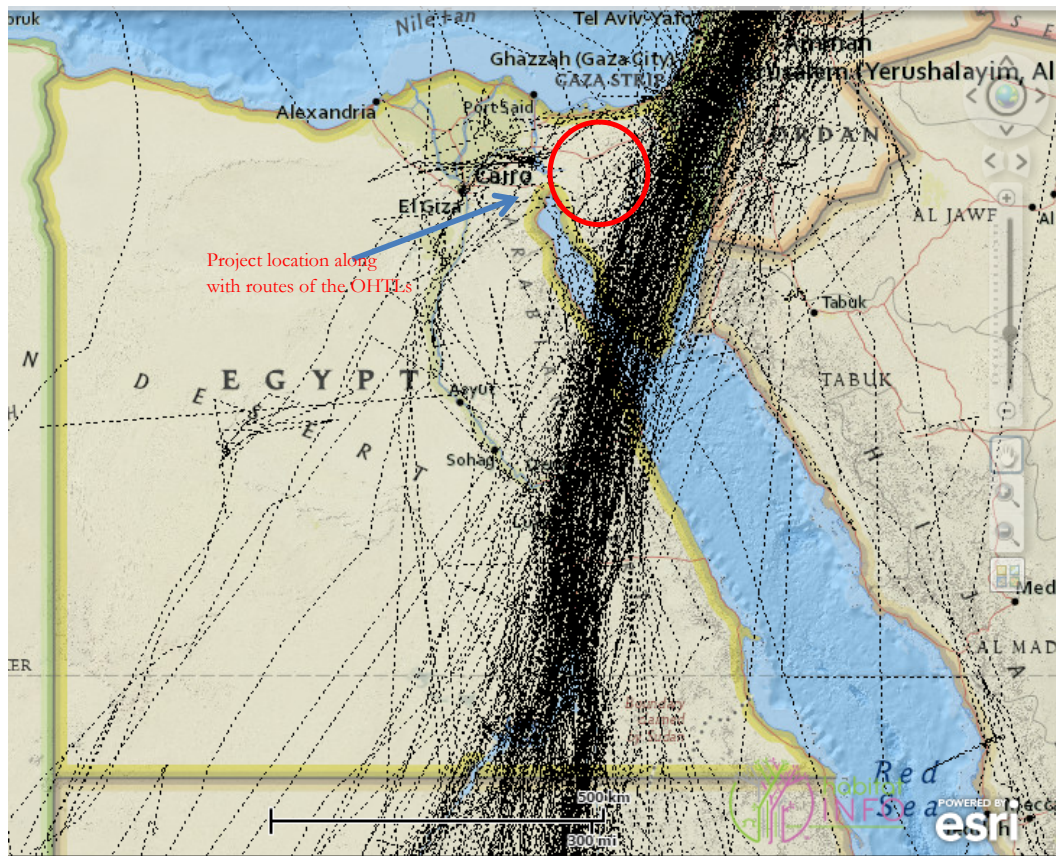


Figure 5-3 Main migration routes in Egypt

source: BirdLife International (2015)

10th of Ramadan GIS Substation & its Overhead Transmission Lines_ Final

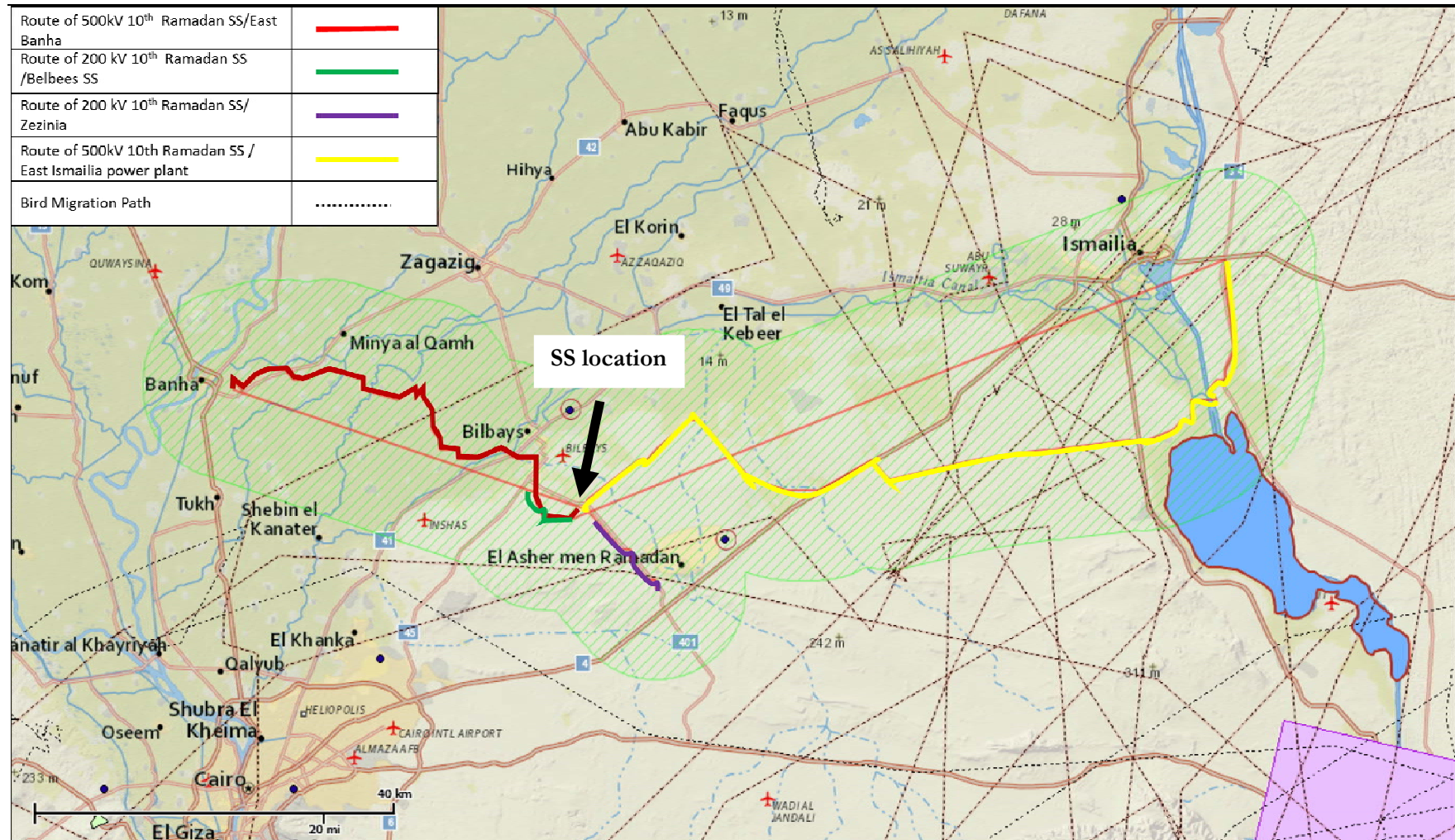


Figure 5-4 Main migration routes in Egypt versus the location of OHTLs and SS

source: BirdLife International (2019)

Table 5-2 Bird Species within the project area

Name	Presence
White Stork	Observed
Great White Pelican	Observed
Black Kite	Observed
Black-winged Kite	Observed
Saker Falcon	Expected
Sooty Falcon	Expected
Lesser Kestrel	Expected
Peregrine Falcon	Expected
Eurasian Hobby	Expected
Common Kestrel	Expected
Pallid Harrier	Expected
Glossy Ibis	Expected
Lanner Falcon	Expected
Montagu's Harrier	Expected
Osprey	Expected
Red-footed Falcon	Expected
Eurasian Sparrow hawk	Expected
Eastern Imperial Eagle	Expected
Egyptian Vulture	Expected
Eleonora's Falcon	Expected
Merlin	Expected
Griffon Vulture	Expected

Name	Presence
Dalmatian Pelican	Expected
Common Crane	Expected
European Honey buzzard	Expected
Greater Spotted Eagle	Expected
Western Marsh-harrier	Expected
Black Stork	Expected
Long-legged Buzzard	Expected
Eurasian Buzzard	Expected
Steppe Eagle	Expected



Figure 5-5 Plants found in the SS location

5.2. Baseline Socioeconomic Conditions

This section includes a description of the baseline socio-cultural characteristics of the social environment at the proposed project areas. It will highlight the following: basic information about the project areas, administrative areas, demographic characteristics, human development profile, access to basic services, health profile, economic characteristics, transportation, services, and NGOs.

The SS is located in Sharqiya governorate, which is one of the governorates of East Delta. It is surrounded from the North by Manzala Lake, from the South by Cairo & Qalyubiya governorates,

from the East by two Suez Canal governorates: Ismailia & Port Said, while from the West by Gharbiya governorate.

The Governorate's total area is around 4911 km², and representing 0.5% of the country's total area. It is divided into 13 markez, 16 cities, 2 districts distributed in Al Zakazek city (District I –District II), in addition to 105 rural local units with 396 affiliated villages. Al Zakazek city is the capital of the governorate. Sharqiya has 2 new cities; 10th of Ramadan and Salhaya cities (*Source: Egypt description by information 2014 – Sharqiya governorate*).



Figure 5-6 Illustrates the Administrative Division of Sharqiya Governorate and the Location of 10th of Ramadan City within the Governorate

Source: Egypt description by information 2014 – Sharqiya governorate,

Sharqiya Governorate stands among the largest agricultural governorates nationwide that is known for cultivating cotton, wheat, summer rice, baladi beans, sugar beet, and barely. It contributes in multiple large – scale industries including spinning and textile, chemical, building material and wood. Sharqiya is known for breeding pure Arabian horses, thus, stands as an important horse market attracting the annual horse festival. The most famous areas for breeding horses are Salhaya, Anshas, Bani Gery and Saoud Island (*Source: Egypt description by information 2014 – Sharqiya governorate*).

5.2.1. Administrative divisions

10th of Ramadan city was implemented in 1980 in order to mitigate the population pressure within Cairo governorate and within the urban areas, and to create job opportunities for youth as it is the largest industrial zone in Egypt. The area of 10th of Ramadan reaches about 398 km² which equivalent to 95 thousand feddans,⁶ the following table shows the administrative division of the city in accordance with its strategic planning in 10th of Ramadan City Authority.

Table 5-3 Administrative Division of project areas

Division	Area	
Residential	12768 Feddans	53.63 km ²
Industrial	26193 Feddans	110 km ²
Services and tourism	11222 Feddans	47.13 km ²
Green belt and agricultural lands	41357 Feddans	173.7 km ²
Regional Roads	3221.9 Feddans	13.53 km ²

Source: Database of 10th of Ramadan City Information Centre, 2017

10th of Ramadan City is located 55 km away from Cairo, passing through El Obour and El Shorouq cities. It is connected to Delta region via Sharkia governorate, and to the Canal cities via Rubiky, passing through Badr city and Ismailia desert road. It is about 65 km away from Ismailia city and 45 km away from Al Zakazek city passing through Belbees city. The population of 10th of Ramadan city reaches 650,000, in addition to 150,000 visitors, and it is expected to reach 2.1 million in 2032 (*Source: 10th of Ramadan City Information Center, 2017*).

5.2.2. SS Site-neighboring settlements

The land of the substation is located northwest of 10th of Ramadan city and close to lands division known as Knowledge City. The substation's land and its surrounding area are allocated from 10th of Ramadan City Authority (State Property) in accordance of the specifications of the Ministry of Electricity and the Egyptian Law. The site of the substation is 14,500 km away from 10th of Ramadan agency, and about 500 meters from Belbees – 10th of Ramadan road.

The Site visits to the SS site area showed that the land surrounding the substation site varied between desert lands devoid of structures, residential blocks and farmlands. The boundaries and geographical surroundings of the substation according to the site visit will be described below:

- The project land is located in the area allocated for facilities and services in the strategic planning of West area of 10th of Ramadan City. The area is devoid of facilities excluding the new water station which is adjacent to the project site from the north and about 50 meters away from it.

⁶ A feddan (Arabic: فدان, faddān) is a unit of area. It is used in Egypt, Sudan, Syria and the Sultanate of Oman. In Egypt the feddan is the only non-metric unit which remained in use following the switch to the metric system. A feddan is divided into 24 kirat (Arabic: قيراط, qīrāt) which equals 175 square metres.[1]

- There is an agricultural area adjacent to the project site from East and North. The agricultural area represents number of fruit and citrus farms. The nearest farm to the project area is Abdel Hamid Amar farm which is about 1.5 km away from it.
- The Field visits showed that the area located in the South and West of the project is devoid of facilities. The strategic planning for this area indicates that it is regional service area of 384.83 feddans(1.616 km²), and free zone of 1311.80 feddans(5.51 km²),
- The nearest residential block to the project site is located in the East and it is about 5 km away from the project site, the area represents youth housing area and land zoning of “Build your Own Home” project.

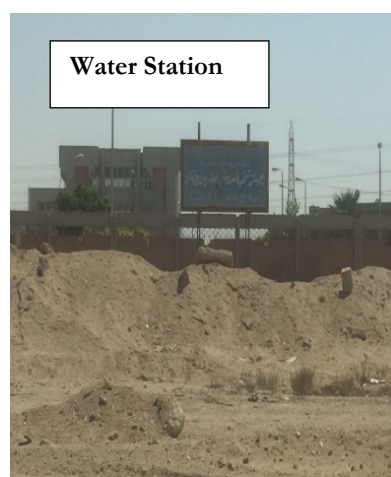
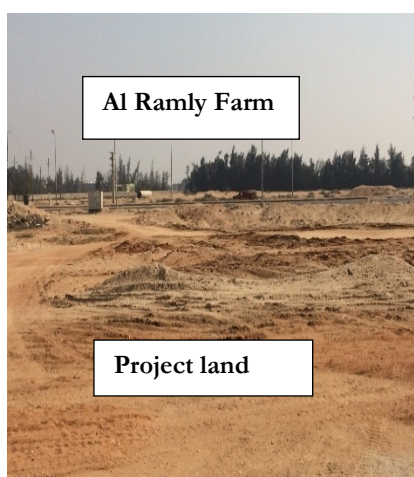
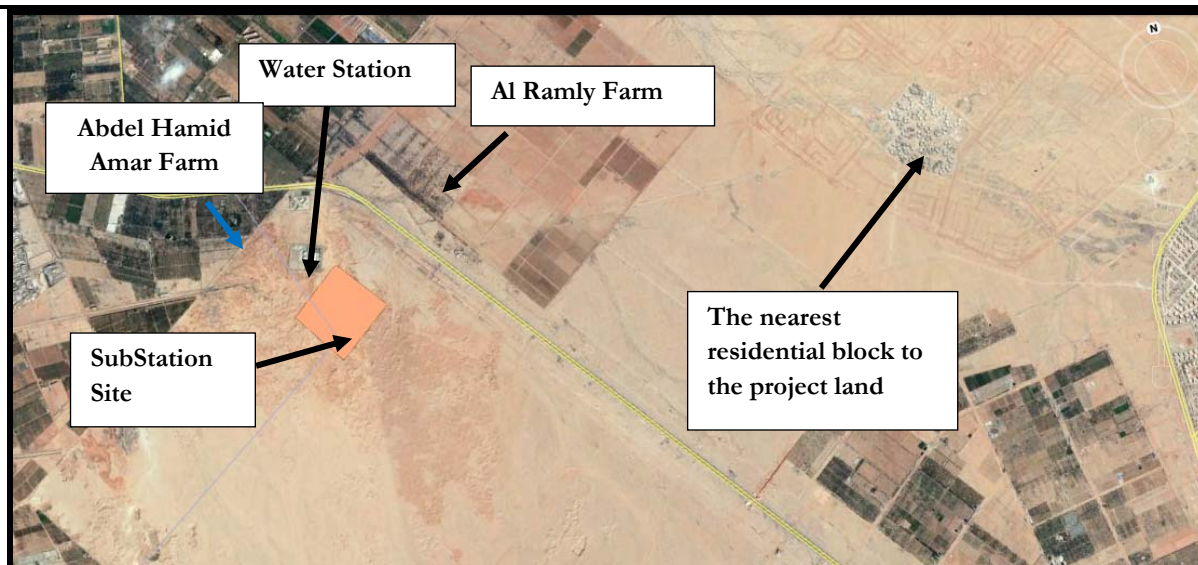


Figure 5-7: The nearest structures to the substation location



Figure 5-8: Photos from inside some farms, which located northeast the land of the substation

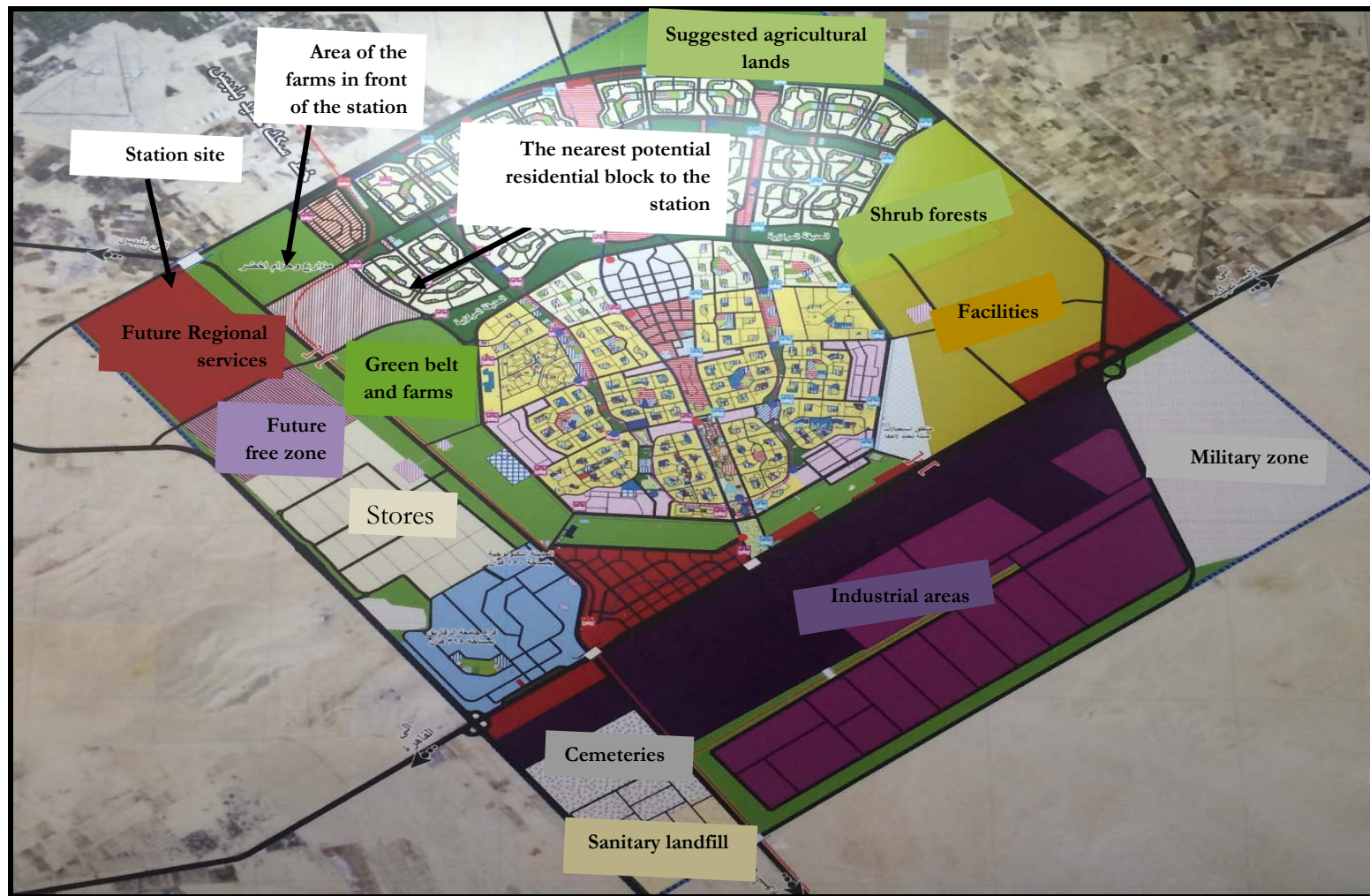


Figure 5-9: Strategic Planning for 10th of Ramadan City

Source: 10th of Ramadan City Information Center

5.2.3. Living Conditions

Household Size

A household is defined as “Family (and non-family) members who share residence and livelihood, and operate as one social and economic unit”. The average family size in Sharqiya Governorate is about 4.24 persons/ household (*Source: Egypt description by information 2014 – Sharqiya governorate*).

Access to Electricity

Access to electricity in Upper Egypt governorates is 99.0% (Egyptian Human Development Report 2010). Even squatter areas have access to electricity regardless of their legality. According to Sharqiya official website the total production of electricity in Sharqiya governorate is 7675.210 million k.w.h yearly, while the total consumption of electricity in the governorate is 8335.79 million k.w.h yearly.

For 10 of Ramadan city, 45,000 km of electricity networks have been implemented in the city. Nine power stations with a total capacity of 905 MVA have been implemented (according to New Urban Communities Authority).

Currently, 10 of Ramadan city is supplied by (2) stations with a capacity of 220 MW and 500 MW per station, this supplies 9 stations with capacity of 16/11. In view of the expansions of the city, lands were allocated for the construction of 8 stations to meet expansions, as well as (3) stations with capacity of 220/60, which required the strengthening of the existing network

Table 5-4 : Access to Electricity in Sharqiya Governorate

Item	Unit	Value
Total electricity consumption	Million kwh yearly	8335.79
Electricity consumption for lighting	Million kwh yearly	4657.16
Electricity consumption for industrial utilization	Million kwh yearly	3678.63
No. of subscribers in the electrical grid	Thousand subscribers	1868.20
Per capita share of electricity used for lighting	kwh yearly/ Person	754.31

Source: Egypt description by information 2014 – Sharqiya governorate, Sharqiya official website, New Urban Communities Authority

Access to Potable Water and Sanitation

According to Sharqiya official website, the total production of potable water in Sharqiya governorate is 403368 thousand m³/year, while the total consumption of potable water is 308995 thousand m³/year. The total number of potable water stations is 195 stations.

The capacity of sanitation in the governorate is 238.80 Thousand m³/ Day, and Per capita sanitation capacity is 38.68 Liter. Day/Person, according to Egypt description by information 2014 – Sharqiya governorate.

For 10 of Ramadan city, it is supplied by potable water from two water purification stations numbers (1 and 2) with capacity of 570 m³/ day and 20 m³/ day wells station, according to New Urban Communities Authority.

5.2.4. Services Available in 10 of Ramadan

Educational Services

According to 10th of Ramadan City Information Center 2017, there are (65) government, private, and Azhar schools in 10th of Ramadan city, and (66090) students at all academic levels.

(5) Schools of basic education, (1) experiment school, and (1) secondary school for girls are under implementation.

For university education, there are Higher Technological Institute which includes (Engineering – Administration - Computing Science and Information Systems) departments, and (14230) students. In addition to Hayat Abu Ghaly University (Azhar) which includes (Islamic studies – languages) departments, and (2230) students.

There is a branch of Al Zakazek University under implementation in 10th of Ramadan city, the land of the university had been developed in Al- Maarefa village.

Table 5-5: Number of educational structures available in 10th of Ramadan

Area	Number of Educational Structures				
	Primary	Secondary	Technical Education	Al-Azhar Education	Private High Education
10th of Ramadan	28	4	14	14	5

Source: New Urban Communities Authority

Health Services

Table 5-6: Health services available in 10th of Ramadan

Area	Number of health structures			
	Private hospital	Health centers	Health Insurance Hospital	Ambulance
10th of Ramadan	13	11	1	16

Source: New Urban Communities Authority

Commercial Services

According to 10th of Ramadan City Information Center 2017, there are (85) malls including shops and administrative units, in addition to (400) shops with various activities, other than the commercial services within real estate investment projects.

Transportation

- External Transportation

10th of Ramadan city is connected to Belbes - Al Zakazek – Cairo cities and the capitals of the surrounding governorates by (35) buses of East Delta buses and (654) private minibuses.

- **Internal Transportation**

There are 11 lines for transportation inside the city with total (580) bus, in addition to (625) taxi. A regional bus stop is under implementation (Source: 10th of Ramadan City Information Center).

Various Services

Table 5-7: Various service structures in 10th of Ramadan

Area	Number of structures							
	Bakeries	Youth center	Clubs	Department of Social Affairs	Social Units	Traffic Unit	Fire station	Police station
10th of Ramadan	22	1	3	1	5	1	12	2

Source: New Urban Communities Authority

5.2.5. NGOs

There are 72 associations working in social work in 10th of Ramadan city as follows:

Table 5-8: distribution of NGOs in 10th of Ramadan city according to work areas

Work area	Number
Local and industrial development	29
Family and childhood care	27
charitable works	32
Investment	1
Environment	1

The above table shows the intensity of the civil work in 10th of Ramadan City and the diversity of the work fields, which works on supporting the social work in the city and promoting the well-being of all sectors of the population and workers of the city, which would bring benefits to all the population of the city.

5.2.6. Archaeology and Cultural Heritage

Sharqiya governorate is rich of antiquity sites that include ancient Egyptian tombs, Islamic and Christian antiquity sites. The antiquity sites are San El Hagar, Tal Basta, Belbes, Saft El Henna, Tal El Dabaa, Tal Pharon, Al Soa, and Abbasa villages. The geographical data from 10th of Ramadan Information Center and Sharqiya Governorate showed that there are no archaeological sites or heritage areas in the project areas, and the nearest archaeological areas are more than 19 km away from the project areas.

6. Potential Environmental and Socioeconomic Impacts

To ensure the accurate determination of project impacts; environmentally and socially, the ESIA study was carried out at different levels. The selection of the most appropriate technology, the most environmental and socioeconomic advantageous and the suitable mitigation measures are presented to minimize the negative impacts and maximize the positive impacts.

As the nature and characteristics of the impacts associated to the project components (SS and interconnection overhead transmission lines) are different, the impacts assessment in this chapter is divided into each of the project components. In addition, impact assessment is also differentiated between two phase of the proposed development; during construction phase and during operation and maintenance phase.

The assessment of potential impacts has been done through analyzing different project activities and envisaging possible changes to the environment. Each potential impact was qualitatively analyzed to classify its significance to three degrees: *major impacts*, medium impacts and minor impacts⁷. *Major impacts* are impacts with a reasonable likelihood to cause violation of applicable standards. *Medium impacts* are impacts with a reasonable likelihood that are likely to cause violation of applicable standards only in combination with the impact of other sources. *Minor impacts* are impacts which are not likely to cause violation of applicable standards whether on its own or in combination with other sources. The likelihood of each impact has been qualitatively evaluated to two degrees: highly probable and low probable.

In addition, besides presenting the degree of the impacts, this Chapter will also distinguish between significant positive and negative impacts, direct and indirect impacts, and immediate (or short term) and long-term impacts during construction, operation and maintenance phases indicating their level of importance and their probability of occurrence. This chapter will identify impacts which are unavoidable or irreversible. Cumulative effects shall be also addressed taking into account other projects or actions planned in the study area. This shall include the socio – economic impact assessment.

Each potential positive and negative impact resulting directly or indirectly from the project will be assessed based on both the **Magnitude** and **Sensitivity of the receptor**.

An Environmental and Social Management Plan (ESMP), presented later in Chapter 7, includes mitigation measures that will minimize the negative impacts using available technologies and managerial procedures.

6.1. Magnitude of Impact

The impacts resulting from the project were categorized as a positive or negative impact; then latter were further analyzed and its magnitude assessed as: **Negligible, Low, Medium, or High**. Various considerations come into play as the experts assessed the impacts, the main parameters are:

- Duration - As the time duration of the impact increases, it is weighed more heavily. Special consideration is given to impacts that go beyond the project's anticipated life-expectancy.

⁷ According to EEAA EIA Guideline, January 2009

- Time – The time of which an impact commences or occurs can be vital to construction and maintenance operations.
- Spatial – The area impacted is to be considered, as some impacts may extend beyond the project's boundaries or interfere with land regulations, etc.
- Probability – The chance of an impact occurring and its frequency is to be assessed
- Reversibility - The possibility and extent to which an impact can be intervened or mitigated for a factor to return to the Baseline environment
- Compliance – National and international standards and regulations may dictate an impact's maximum allowable consequence.

After an analysis of the various parameters, an impact's magnitude is categorized as follows:

- **Negligible** – No anticipated change to the baseline environment
- **Low** – Minor anticipated change to the baseline environment
- **Medium** – Moderate anticipated change to the baseline environment
- **High** – Significant anticipated change to the baseline environment

Medium and High impacts usually cause a major temporary variance to the baseline conditions or a long-term ongoing modification.

6.2. Sensitivity of the receptor

Sensitivity of the receptor is based on the relationship between the respective project and present baseline environment (the receptor). It is assessed based on vulnerability of the receptor. These receptors include the surrounding population and environment. As the effect of an impact is more readily absorbed and easily mitigated it becomes less sensitive; on the other hand, as an impact is more challenging to mitigate and cannot be absorbed by the population or the environment it becomes more sensitive and requires an extensive management plan.

The sensitivity of the receptor is assessed as:

- **Low**- Existing capacity to absorb/mitigate impact
- **Medium** – Limited capacity to absorb/mitigate impact
- **High** – No capacity to absorb/mitigate impact

6.3. Impact Evaluation

The virtual resultant of the **magnitude of the impact** and **sensitivity of the receptor** for each impact are evaluated in order to generate the impact's significance and overall assessment. The following Table illustrates how the two factors are coupled:

		Magnitude of Impact			
		Negligible	Low	Medium	High
Sensitivity	Low	Level 1	Level 1	Level 1	Level 2
	Medium	Level 1	Level 2	Level 2	Level 3
	High	Level 2	Level 3	Level 3	Level 4

Where:

- **Level 1 – Nominal (insignificant)** impact to the baseline environment (requires no mitigation or management plan)
- **Level 2 – Minimal** impact to the baseline environment.
- **Level 3 – Medium** impact to the baseline environment.
- **Level 4 – Significant (Major)** impact to the baseline environment

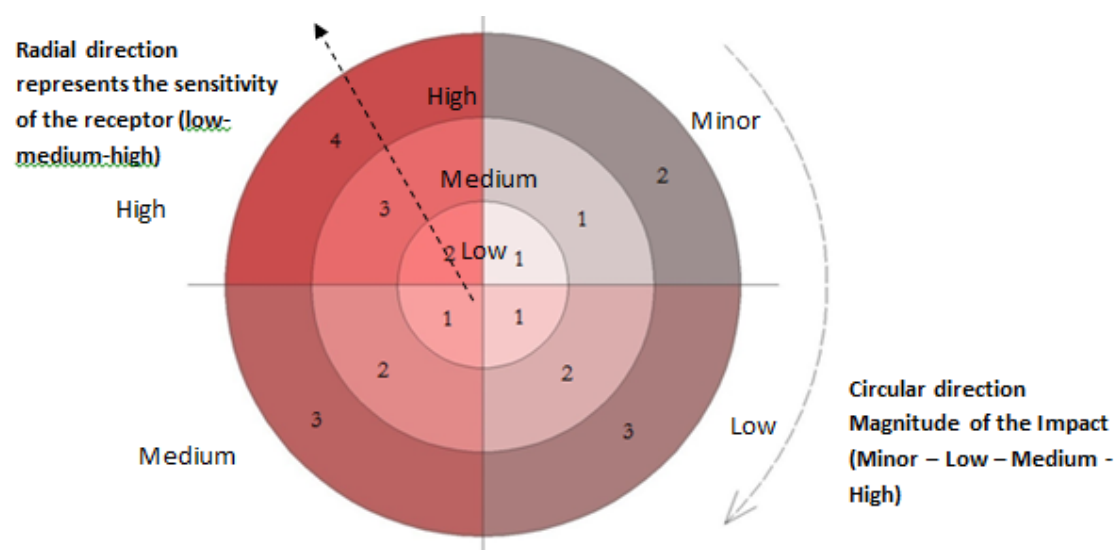


Figure 6-1 Impact Evaluation Diagram

This section will discuss the environmental impacts (both negative and positive impacts) associated with the construction and operation and maintenance phase of new substation at 10th of Ramadan and its interconnection overhead transmission lines. [Please refer to Chapter 3, Project Description.

6.3.1. Impact Assessment During Construction of 10th of Ramadan SS

Typical activities of construction phase of the SS include site preparation, construction of concrete works, construction of supporting building and erection of the equipment.

The potential impacts which may result from the construction activities of the SS are:

Noise

Construction of the SS will require using various construction equipment, vehicle, etc. in addition to the other activities that generate noise. These tools signify potential major sources of different types of noise that will have an impact on the receptors who are susceptible to the generated noise.

On construction site these major sources exhibit many different types of noise such as background noise, idling noise, blast noise, impact noise, rotating noise, intermittent noise. In addition to the British standard for general construction noise, the table below lists the major expected noise generated from different construction equipment according to *Society of Automotive Engineers SAE*. This comparison indicated that the general International standard is similar to the standard used at the Egyptian standard provided by the local automotive society.

Table 6-1 Expected construction equipment and sound levels

Equipment	Sound Level at operator dB (20 feet from the equipment)	
	Average	Range
Earth Moving		
Front End Loader	88	85-91
Back Hoe	86.5	79-89
Bull Dozer	96	89-103
Roller	90	79-93
Grader	<85	
Truck	96	89-103
Material Handling:		
Concrete Mixer	<85	
Concrete Pump	< 85	
Crane	100	97-102
Derrick	<85	
Power Units:		
Generators	<85	
Compressors	<85	
Other Equipment:		
Poker Vibrator	94.5	87-98
Power Saw	88.5	78-95

The potential vulnerable groups who are susceptible to the construction noise during the construction of the SS are the following:

- Onsite Workers and
- Neighboring establishments

Impact Significance

Based on the typical construction machineries used during construction (Table 6.1 above), the large spatial distance to nearest establishments (>10 km – industrial zone), the wind direction and the duration of the noise, the average construction noise will have low impact and sensitivity. Most vulnerable group are the onsite workers, and the impact can be minimized significantly by adopting a set of health and safety measures.

Activities conducted at the worksite; during the use of the equipment for construction, will generate levels of noise which will have a considerable impact on workers. Therefore construction noise shall be mitigated to ensure a safe work environment and to fulfill the occupational health and safety requirements concerning national and international requirements (as presented at Chapter 2, Legislative and Regulatory Frameworks).

The impact on the construction workers will be medium impact.

Traffic

The greatest potential for traffic impacts to occur arises during the short period where construction works peaks. The traffic flow that will be created during construction period will to some extent depend on which type and number of trips to and from the proposed site.

The contractor require to have a time management plan to manage and schedule the traffic movement for the construction materials, equipment in addition to transporting the debris to the landfill. In addition, the notification to the traffic department should be obtained and the time management plan should be approved prior to the construction activities.

Impact Significance

It is estimated that the overall additional traffic would have insignificant impacts on the level of service on the road.

During transportation of the equipment, raw materials as well as equipment, it is anticipated that one lane will be used by the trolleys and the movement of one trip will not last more than 8 hours (during the midnight – morning). Therefore, the impact significant on traffic is considered short term, during the specific time duration and low to medium impact.

The SS site is located not directly to the main road (around 400 meter from the main road). Additional activities, such as entering and exit to the site will not have significant impacts on the main road. In addition, there is sufficient storage area adjacent to the site, next to the service road that the raw material can be placed, as well as the standby equipment, it is expected that the main road will not be impacted.

The impact is considered low to medium and the mitigation measures as well as the management plan will effectively control the traffic impact and reduce the impact to minor.

Air Quality

Construction of the SS and installation of the equipment will include several activities such as excavation, land clearing, earthworks, stock piling transportation of construction material and

equipment, burial of cables and pipes, etc. Those activities in consequence are expected to emit air pollutants to the ambient air, however it will be conducted for a short periods. The following air pollutants are foreseeable for most of the construction activities:

- **Fugitive dust emissions (PM₁₀, PM_{2.5})**
- **Exhaust of vehicles or equipment such as temporary generators, trucks, trolley, etc**

Impact Significance

Near project site, dust emissions will slightly negatively impacts the ambient air quality, particularly during the initial phases of construction. However, the impact is not significant as soil characteristic at SS site is mainly hard soil and residential areas are at a distance of above 10km.

Fugitive dust impacts from the construction activities are expected to be minimum and will be minimized with the measures and the recommendations stated in the ESMP of this study which will be done by the Contractor for the following reasons:

- Dust emissions from construction activities impact will be limited to a small area near the project site of SS (within less than 100 m) and the dust is expected to settle in close proximity to the construction site(s).
- The wind speed is considered low to moderate in the area according to the following table

Table 6-2 - Monthly mean values of wind speed

Month	Wind Speed (knots) ⁸
January	6
February	7
March	8
April	10
May	10
June	10
July	9
August	8
September	9
October	9
November	8
December	7

The project will hire a qualified contractor with the high health and safety standards. the ESIA will provide the provision of the health, safety and precaution of the environmental impacts and its mitigation measures to be followed during project activities and demonstrated in the ESMP for this

⁸ knot=1.85 km/hr

study. The ToR for the contractor should include the implementation of this ESMP. Therefore the impact is assessed as low impacts for the receptors and medium impacts for the workers in the vicinity of the project area. Therefore, the dust control should be mitigated to reduce or minimize the impact to the residents as well as the workers.

Emissions of CO₂, CO and PM will result from the operation of the construction machinery and road vehicles during construction of the Substation. However, impacts of gas emissions due to the construction activities are expected to be temporarily negatively significant for the following reasons:

- Quantities of air pollutants emitted from construction machinery are generally temporary (during the working activities) and non-permanent.
- It is expected that most of the vehicles and machineries for work activities are diesel-powered, emit nitrogen oxides (NO_x), particulate matter (PM) and carbon monoxide (CO).
- The intensity of work activities and the number of vehicles traveling onsite would be relatively low for all tasks.
- The emissions will be mostly limited to the construction phase and therefore are temporary.

Therefore, the impact is assessed as low impact. However, it is recommended that the air quality control or monitoring should be implemented in order to ensure that the emissions are within the allowable limits and there is no any violation of standard levels of pollutants. The monitoring activities and reporting are presented in details in section 8.

Vibration

Construction activities would result in varying degrees of ground-borne vibration depending on the stage of construction, the equipment and construction methods employed, the distance from the construction locations to vibration-sensitive receptors and soil conditions.

According to the proposed activities during the construction phase of SS project, the concern of vibration comes from the truck movements and construction of the infrastructures and installation of the equipment.

Based on the investigation of the sensitive receptors surrounding the project site, no sensitive establishment will be impacted due to the vibration generated during the construction phase. Consequently, minor vibration impacts could be anticipated to occur.

Impact Significance

It is estimated that the vibration has minor impact.

Hazardous Materials and Waste Management

The waste generated during construction could be categorized as follows:

- Normal construction wastes including scrap concrete, steel, bricks, wood, etc.,

- Miscellaneous non-hazardous solid wastes, including packaging waste, used drums, wood, scrap metal, and building rubble will be generated during the construction phase of the project
- Solid hazardous wastes generated include empty containers, spent welding materials, solvents, paints or adhesives, and other hazardous wastes resulting from operation and maintenance of the equipment and vehicles, i.e. spent oils, spent lube, waste oil filters, batteries, etc. Among the hazardous wastes also are the wasted or faulted materials including conductors and insulators.

Human or domestic wastes generated by construction labor, including sewage and garbage collected from the labor camp location. The wastes generated during Operation phase will be minimal and will largely consist of municipal waste (e.g. food; packaging) and over time potentially defunct parts and spare parts, cabling and control equipment etc. Waste management arrangements for the construction phase should be continued (proper control of collection, storage and final disposal via licensed contractors).

For hazardous solid and liquid wastes, proper waste collection and storage plus regular (preferably twice a week) waste collection by licensed contractors will need to be arranged by site management. To coordinate and control this. The site management should develop a waste management plan which is included in the ToR for the Contractor for waste management during construction. For the non-hazardous solid wastes, those that cannot be recycled will be disposed in a sanitary landfill periodically (weekly or monthly depending on the volume of waste generated). Regarding the domestic waste, as the existing collection is already established and the amount to be expected is considered small.

The domestic wastes (wastewater and solid waste) generated are relatively small as only small number of workers will be employed during the operation and will be collected by a licensed contractors.

Negative Impacts could result if hazardous wastes were not properly handled which is banned consequently. The management of hazardous waste should be developed in accordance with EEAA guidelines for hazardous waste handling, storage, transportation and final disposal to the designated landfill facilities.

The lubrication oils, and paint container waste could contain some hazardous components. Disposal of paint containers waste at construction waste disposal sites is the common practice in Egypt.; however it should be recognized as hazardous waste.

Impact Significance

The impact of temporary construction waste storage area onsite before transporting it to the landfill facility on the groundwater quality is considered insignificant impacts. The spillage of oil should be avoided as it could have a negative impact on the soil quality. Therefore, it is considered Medium significant. Uncontrolled waste accumulation would be visually unacceptable and would therefore be of Medium significance.

From the above, it can be concluded that the impact of solid wastes in general, if not properly managed, could be considered of Medium significance due to the potential presence of hazardous wastes and the possibility of wastes being accumulated which has a negative environmental, health and visual impact.

Health and Safety

As the site of the substation is localized with in enclosed area and entrance gate, the potential impacts may mainly occur due to the workers at the construction site. There will be no potential impacts on safety at the surrounding residential area although public health may be a concern.

Potential safety impacts to workers and health for the public community and the workers during construction of a substation, in general, are the same as those associated with any construction project involving earthmoving, use of large equipment, transportation of overweight and oversized materials, and construction and installation of facilities. In addition, health and safety issues include either working at heights or in trenches.

In addition, accidents might occur on site to workers in various construction project activities, therefore mitigation measures are developed to mitigate the risk of health and injuries to the workers.

Impact significance

Health and safety concerns for the sensitive receptors (community surrounding the SS site) have minor significant impacts, as it is described previously that the project site is localized in enclosed area. Standard prevention, i.e. clear sign at the entrance and the surrounding the project site and management of the machineries and vehicles avoiding the peak hours are sufficient to prevent the accident occur for the residential area surrounding the construction site.

Medium to major impact is identified for the health and safety of the workers. The standard protection of the workers, especially for the workers that involved in the risk due to the height has to be put into mitigation measures and in the management and monitoring plan to minimize and reduce the significant impact.

Visual Resources and landscaping

Project component installation would produce visible activity and dust in dry soils. Project construction may be progressive, persisting over a significant period of time. Ground disturbance (e.g., trenching and grading) would result in visual impacts that produce contrasts of color, form, texture, and line. Soil scars and exposed slope faces could result from excavation, leveling, and equipment movement.

The site of the SS is nearby the access road; therefore, it is visible that the construction activities are held on site. However, with the clear sign and the existing fences and possible to the temporary fences provided by the contractor will minimize the visual impact to the surrounding areas.

Impact significance:

The impact associated to the visual resource is considered minor, localized and temporary. Therefore, the standard protection for the ground disturbance, dust, wastes generated will be mitigated to ensure the proper management and to minimize the impact.

Water Resource (groundwater, geology and hydrogeology)

Impacts on groundwater would arise due to activities that cause soil erosion, discharge of sanitary water, contaminant spills (especially oil) and leaching of accumulated/dumped wastes at the event of rainfall or runoff water. Soil contamination could also occur by merely the contact between the waste and the soil. In addition, the climate study also indicated that the rate of rainfall at this specific site is not relatively high (less than 25mm/year). These will reduce the significance of the impact.

Moreover, Hydro geological cross sections were selected based upon the geological information provided about the wells in the project area at different sectors. The following figure represents the contour map showing the level of water table.

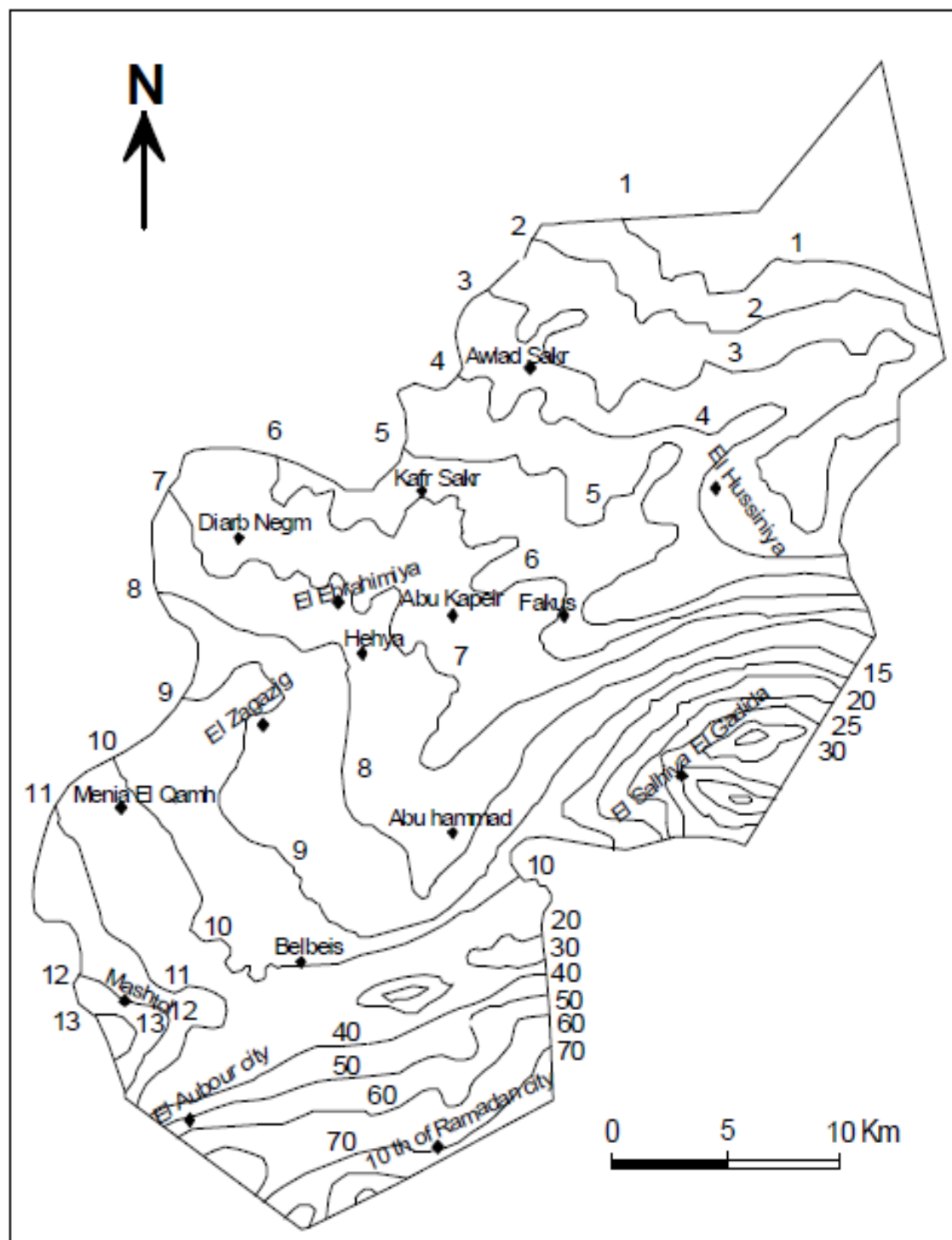


Figure 6-2 contour map showing the level of water table

Source :environmental description, EEAA,2008

From the above figure shows that the groundwater is at high depth in the 10th of Ramadan city, where the projected is located, (70 meters) which is a large distance for the contaminants of potential concern to migrate and have a considerable impact on the water quality.

Regarding the surface water and potential pollution on the drinking water, it is not expected that the construction of the SS will have significant impacts as there are no surface water as well as drinking water exist at the surrounding area.

Impact Significance

This impact could be classified as Minor Impact which is believed to be fully controlled with the implementation of proposed mitigation measures such as standard construction precaution and prevention measures; including waste management (solid and liquid, hazardous and non-hazardous) in order to avoid accidents, pollution and spillage encountered during the construction. The standard prevention or precaution measures shall be prepared by the contractor prior to the construction. It is preferable to include the waste management plan to be included in the ToR of the contractor.

Ecological (Fauna and Flora)

Due to the presence of agriculture lands near by the project's location, the dominating fauna in the area is farm animals and other species adapted to urban areas as feral cats and dogs, rodents, lizards, bats and birds, which depend on waste as food.

The agricultural lands includes common plants of the region such as wormwood plant trees sycamore tree, acacia, eucalyptus and different palm plants which spread on the banks of canals and drains. In addition to the cultivated crops in which the most common are wheat, rice, corn, and vegetables)

However, there is no recorded flora and fauna found within the vicinity as the proposed site itself is an empty land within the urban area. The local pets and pot plantations might exist at the surrounding residential area but those habitats will not be impacted from the project activities.

Bird Migration

Regarding the bird migration, the location of SS doesn't expose to the main migration path for bird as shown in the below figures. The following figure represents the birds' migration path versus the project location.

Impact Significance

According to the recorded species; no endemic or threatened species were documented during this study. In addition, the investigated habitats are not unique and are very common and widespread in neighboring areas (only several local pets and pot plantations at the residential area) which easily continue their life cycle. The bird migration pattern as well is not affected by the construction. The impact is considered insignificant Impact.

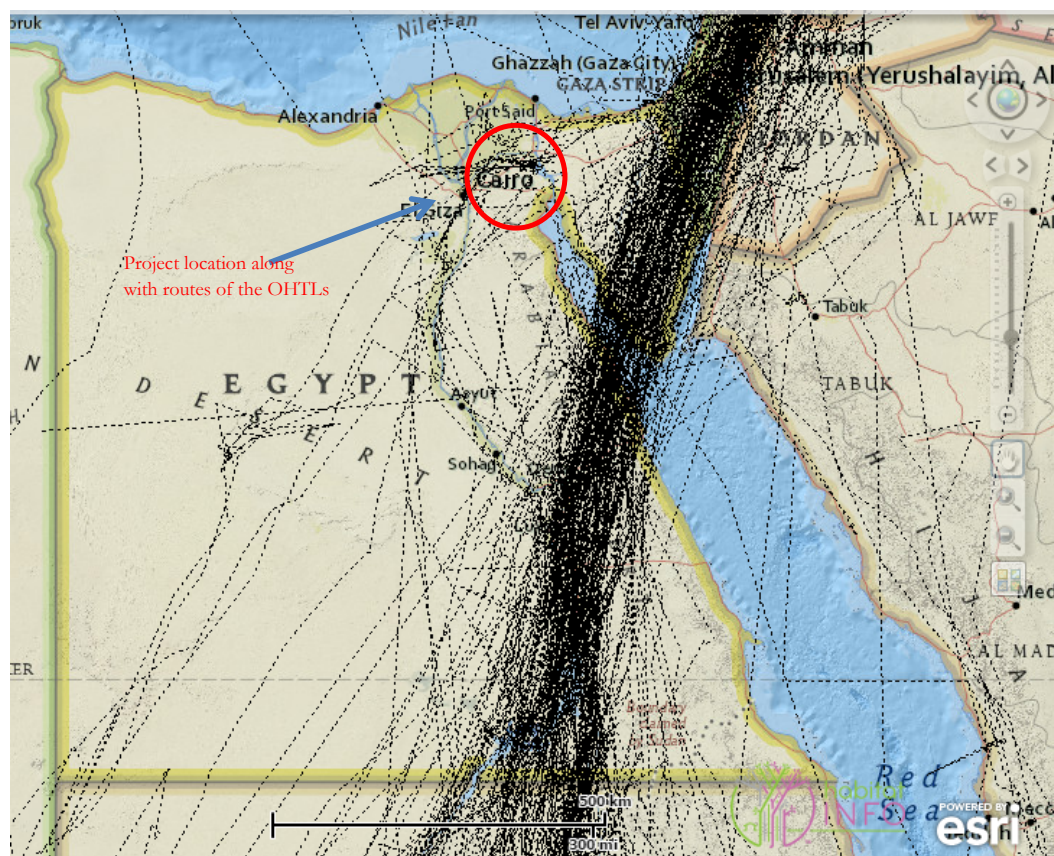


Figure 6-3 Main migration routes in Egypt
source: BirdLife International (2015)

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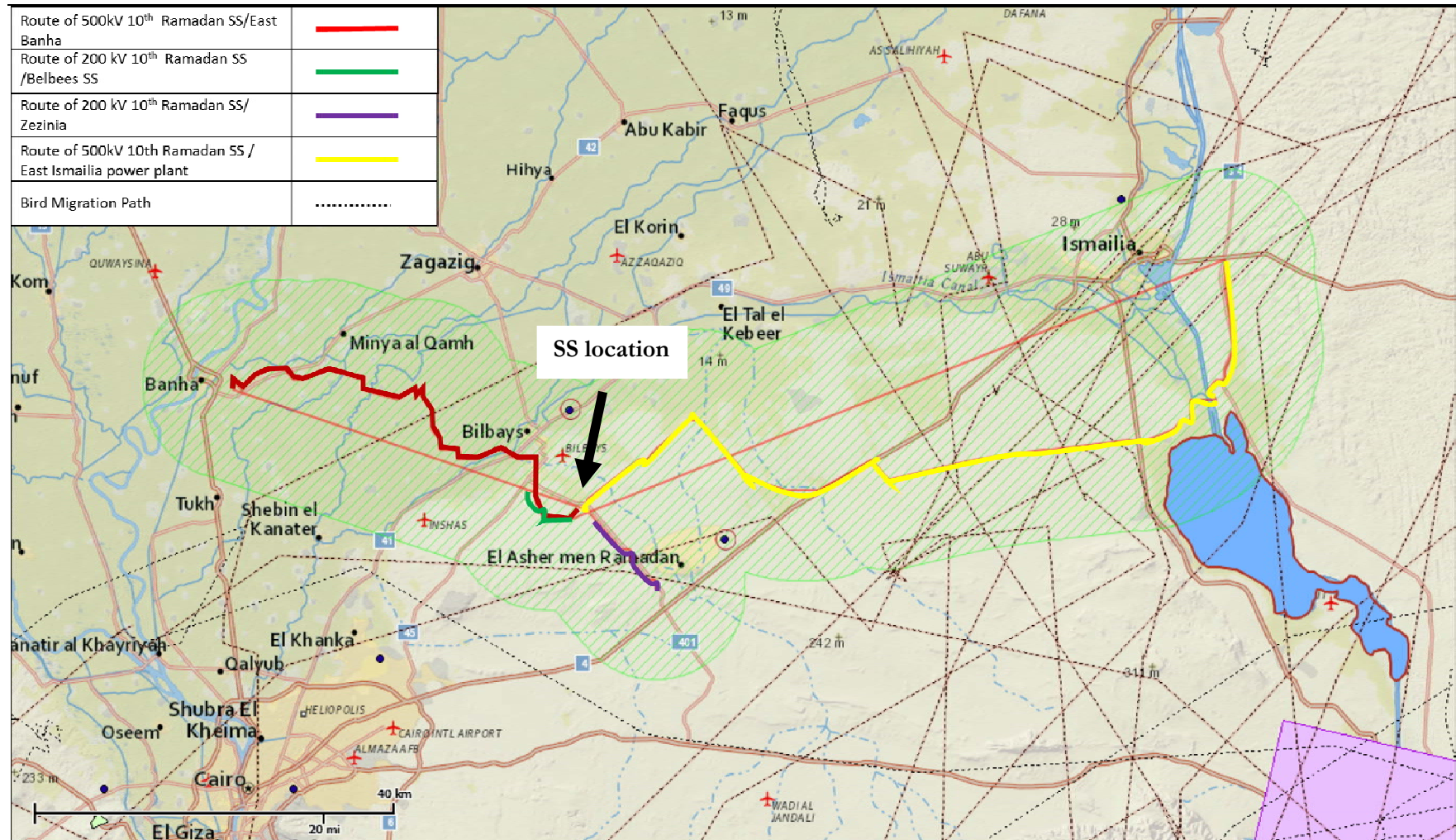


Figure 6-4 Main migration routes in Egypt versus the location of SS

source: BirdLife International (2019)

Natural disaster risks

According to the baseline information which show no recorded major or low seismic activity in the site of the proposed SS for more details please revise the baseline section. Accordingly, it has been concluded that given the engineering measures incorporated into the design of the GIS SS, the potential environmental impacts of a seismic event during the construction of SS not anticipated to be significant

Impact significance

This impact would be considered a insignificant impacts.

Land use and involuntary Resettlement

The EETC has already received the governor's decree to allocate the land for the construction of the proposed SS. From the field observation, the land is an empty flat land that has no other structures. Accordingly, there is no conflict for the future use of the land. In addition, regarding the involuntary resettlement, there will be no involuntary physical resettlement resulting from construction activities.

Impacts to land use could occur during construction if there were conflicts with existing land use plans and community goals. Long-term land use impacts would occur if existing land uses are not compatible with construction of the SS.

This impact is not significant for the construction phase of the SS, as it will be built on a land already affiliated to EETC and approved by the el Sharqia Governorate. Therefore, insignificant impact associated to the land use; therefore, no mitigation measures will be developed.

There is no potential impact of having any involuntary resettlement for this project component (SS). Similarly, there is no impact associated to the involuntary resettlement; therefore, no RAP, ARAP or RPF is necessary for the SS.

Archeological and Cultural sites

The construction site is located far from any cultural or archeological sites. It is not expected that any impacts may appear during construction on any surrounding cultural or archeological sites. This impact is considered: insignificant impact.

Creation of Job Opportunities and Flourishing Economies of Construction Sites

The project can benefit from the opportunity of the construction activities to have a better relation with the surrounding community, facilitating later the acceptance of the project operation in the area. The project may participate in creating job opportunities for local people from the neighboring residential areas as construction workers and guards during the construction process. The job opportunities offered during the construction phase represent a temporary high positive impact, as it will add to the benefits of nearby resettlements from the project.

Summary of the significance impacts during construction of SS and overhead transmission lines cables are presented at Table 6.2 and Table 6.3 respectively.

6.3.2. Impact Assessment During Construction of OHTLs

Typical activities of construction phase of the OHTL include site preparation, determining ROW, construction of concrete works, construction of supporting building and erection of the equipment. A detailed description of the potential impacts of each of the OHTLs is presented below:

East Ismailia OHTL

Noise

Normally construction works include noisy activities related to the operation of construction equipment, possible hammering and drilling works in addition to the noise generated from construction related trucks. The noise impacts could be analyzed in two main aspects: noise impact within the construction areas, and the noise impact on the neighboring receptors.

During the construction phase, noise would be generated during day and night at levels exceeding the currently recorded levels during the baseline study. At the vicinity of all identified receptors, the noise intensity should not exceed 60 Decibel during the day (7am-10pm), and 55 Decibel during the night (10pm-7am) according to the national standards and 70 decibel during day and night according to the international standards. The table below represents the expected noise levels from the different construction activities

The potential vulnerable groups who are susceptible to the construction noise during the construction of the OHTLs are the following:

- Onsite Workers and
- Neighboring establishments

Monitoring the noise emissions during the construction phase will ensure that the noise limits are within the allowable limits and there is no any violation of the standard levels.

Impact Significance:

Construction noise is not likely to affect neighboring areas because of the relatively large distance between the source (use of machinery) and the receptors along the line.

For noise impact upon workers, within the construction site, it is possible that construction workers could be exposed to relatively high levels of noise. This could be mitigated through application of the normal precautions normally taken by construction labor. Accordingly, this impact has been classified as a Minor Impact (level 3), which could be further minimized and fully controlled if construction workers used safety gear as recommended in the ESMP.

Traffic

Power lines routes will be established away from road sides and on the desert land, as well as on urban and agriculture lands. Compensation will be provided to all individuals whose assets or access to assets is affected or damaged, as a consequence of land acquisition or any other activities undertaken by the projects. The compensation for the loss of physical and nonphysical assets will vary depending on the type of loss, and eligibility of the PAPs. Compensation may come in the form of cash compensation, in-kind compensation, and/or assistance.

There will be plenty of space for storage of construction materials and construction waste on road sides, therefore there will be very little possibilities that construction contractors will actually need to store materials on road lanes.

Furthermore, the extra traffic caused by construction vehicles is not expected to effectively impact the flow of traffic on the existing roads. The limitations on access to roads during construction are temporary; it will not affect any of the inhabitants. The impacts on access to roads beside the power lines are minor as the power lines will be located on the desert land and on the side of the existing roads.

Impact Significance

The impact is therefore considered Minor Impact. Mitigation measures included in the ESMP will effectively control this impact.

Air Quality

Excavation, filling, loading, transportation and unloading of soil and raw materials cause suspension of airborne dust that raises the particulate matter concentration on ambient air. These emissions are temporary and its severity depends on the construction activity, meteorological conditions, silt content of the soil and moisture content of the soil.

Another source of air emissions during construction is the exhaust emissions of construction machinery and vehicles visiting and leaving the site. The extent of these emissions depends on the number of machinery working at the site at one time, the type and efficiency of the engines and also the climate conditions.

Impact Significance:

Most of the OHTL routes is in desert landscape far from any settlement, in addition at a relatively large distance from receptors such as residential/settlement zone. In addition, the short duration of the impact given. Consequently, this impact could be also considered Minor along the OHTL line and Medium on the workers environment along the line. Exhaust from vehicles is considered minor.

Hazardous Materials and Waste Management

Wastes generated during construction activities of OHTL comprise of excavated soil for foundations. The excavated soil will normally be accumulated besides OHTL routes, and collected after installations are completed. Other types of solid construction wastes would include the following:

- Foundations
- Trimmings of steel.
- ⊖ Cut-off trees and vegetation
- Metals, wood, cement sacks, sand and gravel, concrete spills, cut off cables, garbage from daily activities of workers.
- Hazardous wastes such as spent oils from the operation and maintenance of machinery.
- Wasted or faulted materials of the towers including conductors and insulators

Impact Significance

The impact of uncontrolled waste dumping is banned. However, if it occurs, it could have impact on groundwater but it is considered as a minor impact as according to the baseline section (5.1.4) of this study, the groundwater in the studied areas for the OHTLs and the SS is found at depth of 200-900 meters away from the source of emissions along the routes. Moreover, the impacts during construction are characterized by being short term impacts.

The impact of solid wastes in general, if not properly managed, could be considered of medium significance due to the potential presence of hazardous wastes and the possibility of wastes being accumulated which has a negative visual impact.

By implementing the mitigation measures recommended in the ESMP, the significance of the impact could be reduced to minor.

Health and Safety

Potential impacts to worker and public health and safety during construction of transmission lines are the same as those associated with any construction project involving earthmoving, use of large equipment, transportation of overweight and oversized materials, and construction and installation of facilities. In addition, health and safety issues include either working at heights. The practices of electricity companies in Egypt reflect that the health and safety procedures are relatively not abided by the workers. That might result in injuries and death. Such impacts are distributed into:

- **Community health and safety:** It is predicted to affect the community people due to moving the vehicles, dust emissions and contamination of water. As well; there was a fear that neglectful workers may cause accidents harmful to themselves or to the community members, particularly children, especially close to the construction areas. The significance of this impact is limited and of temporary nature.
- **Occupational health and safety:** the workers are predicted to get affected by accidents that might occur in the construction sites. There is a low probability of being infected by the Blood

Transmission Diseases (BTDs) through several modes of transmission, particularly, sharing the toilets, not following hygienic procedures, and using personal shaving tools.

- Adverse impacts might result in due to the bites of reptiles (snakes, lizards and scorpions)

Impact significance

Health and safety for the sensitive recipient communities surrounding the OHTL is of low and minor significance, as approximately 99% of the project site are not in the urban area or in the populated area. Therefore, the impact can be classified as minor. Standard prevention, i.e. clear sign and fences around the project area are sufficient to prevent the accident occur for the animals or inhabitants might pass the project site. In addition, the medium to high impact is identified for the health and safety of the workers.

The standard protection of the workers reported in Labor law related to occupational health and safety No. 12 of year 2003, especially for the workers that involved in the risk due to the height has to be put into mitigation measures and in the management and monitoring plan to minimize and reduce the significant impact. In addition special attention shall be paid for Working at height during crossing towers construction.

Removing trees on the Right of Way (ROW)

Tall tree removal is necessary within the ROW zone which is 25 meters from both sides for the ultra-high voltage electricity power (500 kV) in accordance to the Electricity Law 87/2015. The removal of trees, where it exists along the ROW of the proposed transmission lines and cannot be avoided, will require compensations. The compensations have to be matched with the loss to the source of income that is created by removing these trees. The EETC will have to substitute the removed trees. The ROW will also limit tall trees plantations along the transmission lines during operation in order to maintain the safety of the lines.

The compensations for trees will vary according to the type of tree, its age, productivity, type of irrigation used. The EETC will only be responsible for the compensation; however, as the EETC is not responsible for replanting trees, it will be the responsibility of Agricultural Associations as well as individuals.

Identifying the value of the removed trees should be through the valuation and compensation committee that has to consider that the price lists developed by the Agriculture Directorate are applied.

It was noted that the project will result in a temporary impact on the crops and lands. Therefore, the study team relied upon the pricing lists provided for the crops. Along price list is attached to the RAP. The pricing lists are evaluated annually in cooperation with the agriculture associations within the project areas. The lists were based on:

- 1- Quality of crop/tree
- 2- Productivity of lands
- 3- Type of irrigation system
- 4- Age of trees

5- Access to main roads

Impact significance:

Removing the trees will have a negative impact, medium to major on the environment as well as on the owners of these trees. In order to compensate the negative impact on the environment, any removed tree should be substituted by planting other trees in other areas away from the ROW by the local stakeholders. The compensation for the owners of these trees should also take place in order to minimize the significance of the impact. The RAP represents the components of a consolidated document. This document will be subject to review and acceptance as whole.

Land Use

Impacts to land use of the OHTL could occur during construction if there were conflicts with existing land use plans and community goals. Long-term land use impacts would occur if existing land uses are not compatible with transmission project. The project will penetrate several populated areas.

As discussed in chapter 2, the Electricity Law 87/2015 has identified the limits of distances to be measured from the axis of the OHTL routes in order to identify the Right of Way (ROW) zone. There will be possible effects of electromagnetic fields from the OHTL, which will create certain restrictions on some land uses under the power lines. A ROW of 25 meters from both sides for OHTL (of 500 kV and 220 kV) will be kept as a Right of Way (ROW) or buffer zone for maintaining the public safety from electric hazards and high exposure to EMFs.

The ROW zone as identified by the Electricity Law 87/2015 will restrict the construction of new buildings and plantation of high trees on the routes in order to maintain the safety of the line; therefore in case of OHTL, there will be a limitation on agriculture crops such as wheat- maize- citrus fruits- potatoes and clover as well as trees plantation.

There are no direct effects related to power lines to animals passing under them; therefore, the construction of power lines is unlikely to cause any limitations on grazing activities. Location of power lines will be most suitable to be found on sides of existing rural roads to facilitate access to these lines for construction and maintenance

Impact significance:

For the construction of the towers of the OHTL along the routes and the transmission lines, there will be an affected land due to these constructions. The construction will only affect the plant growth in the agricultural lands along the right of way, as well as, put limitation to the buildings constructions. Therefore, the significance of this impact is high in the populated areas and minor in most of the desert project areas. Limitation of land use has a direct influence on the livelihood of people.

There is potential impact of having involuntary resettlement the OHTL project component. Therefore, a RAP will be necessary. The ESIA and the RAP represent the components of a consolidated document. This document will be subject to review and acceptance as whole.

Visual Intrusion

Potential sources of visual impacts during construction of OHTL along the routes include:

- Visual contrasts in the landscape from access tracks and staging areas
- Small-vehicle traffic for worker access and frequent large-equipment traffic for project and access road construction.

Project component installation would produce visible activity and dust in dry soils. Project construction may be progressive, persevering over a period of time. Ground disturbance (e.g., trenching and grading) would result in visual impacts that produce contrasts of color, form, texture, and line. Soil scars and exposed slope faces could result from excavation, leveling, and equipment movement.

Impact significance:

The impact associated to the visual intrusion is considered minor, localized and temporary. Therefore, the standard protection for the ground disturbance, dust, wastes generated will be sufficient to mitigate to ensure the proper management and to minimize the impact.

Archeological and Cultural Sites

The OHTL route is far distance from any cultural or archeological sites. It is not expected that any impacts may appear during construction on any surrounding cultural or archeological sites. This impact is considered: insignificant impact.

Ecological (Fauna and Flora)

The proposed route of the OHTL line up is mainly located on desert margins, sand areas habitat, and agricultural lands and therefore poses no threat to endangered species. The investigated habitats at agricultural lands are not unique and are very common and widespread in neighboring areas which would provide alternative habitats for the sympatric faunal species to move to these habitats and continue their life cycle.

The potential impacts of construction are likely to be localized and good site management practices will be implemented, no significant effects are predicted.

Mitigation actions have been developed for each priority biodiversity feature or groups of features to ensure the systematic implementation of the mitigation hierarchy i.e. avoid, reduce (minimize), remedy (restore) and offset. This will allow for the careful management of risk and the best possible outcomes for the project and local communities, without compromising the health, function and integrity of the ecological system.

Impact Significance:

This impact is considered: minor impact

Bird Migration

Regarding the bird migration, the OHTL's route crosses the path of the birds' migration as seen on the below maps. Based on Bird Life international tool's report (Annex 4) ,the overall sensitivity of this project area is considered medium as there are 4 soaring bird species observed in the area, classified as

LC(least concern) according to the IUCN Red List; while a further 28 soaring bird species classified as **LC**; **NT**(near threatened); **VU** (vulnerable); **EN** (endangered) are expected but not observed (classification of ‘observed’ or ‘expected’ based on presence status). Therefore, mitigation measures are required to be implemented to minimize the risk of birds’ electrocution and collision. The following figures represent the birds’ migration path versus route of OHTL.

Impact Significance:

This impact is considered to be medium impact.

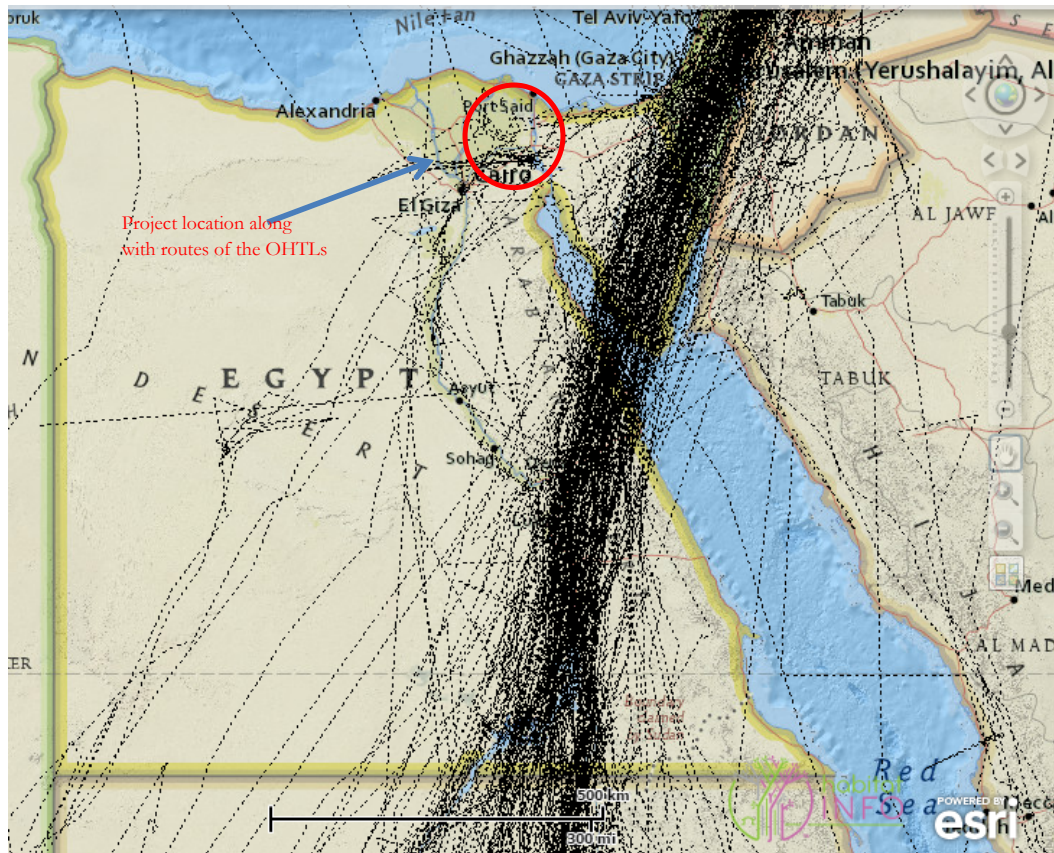


Figure 6-5 Main migration routes in Egypt
source: BirdLife International (2015)

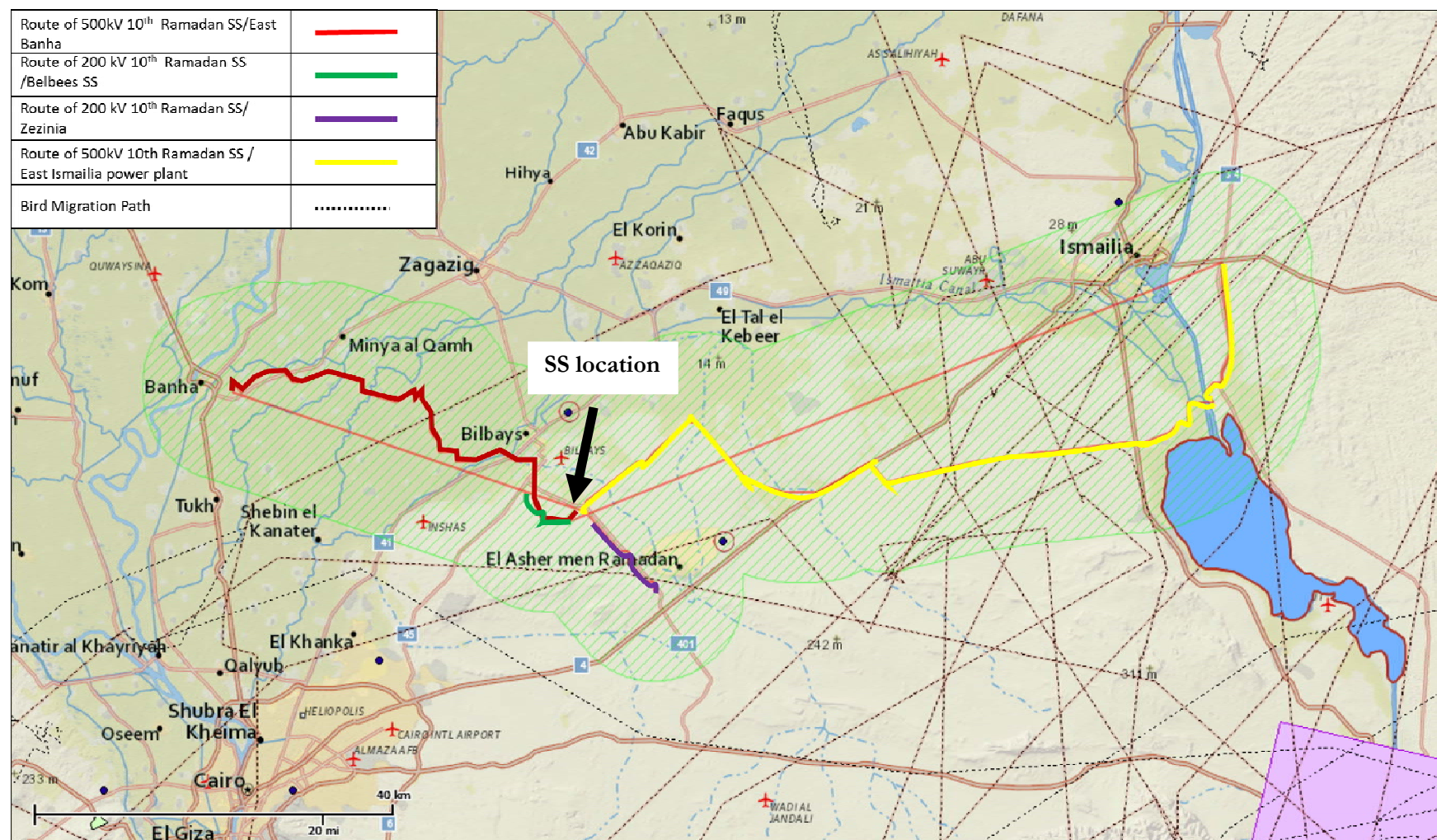


Figure 6-6 Main migration routes in Egypt versus the route East Ismailia in yellow
 source: BirdLife International (2019)

Water Resource (groundwater, geology and hydrogeology)

Similar to the impact associated to the groundwater, surface water and drinking water associated to the construction of the SS; the construction of OHTL will have Minor Impact. However, standard prevention or precaution measures shall be prepared by the contractor prior to the construction. It is preferable to include the waste management plan to be included in the ToR of the contractor.

Culture Resources and Privacy of Local Communities

EETC normally conducts construction activities through an external contractor. Therefore, in areas where the OHTL will pass through populated areas, local communities are expected to be exposed to openness and interaction with the outsiders of the project crew and workers during the construction phase. This impact is expected to be minor and temporary. Since the workers and the contractor are expected to respect the local culture of the community. As well as respect the privacy of the surrounding residential area. These impacts will end upon completion of the construction phase. It has been recommended in the ESMP to maximize the use of local labor to reduce such impact and to maximize the benefits to local communities.

Creation of Job Opportunities and Flourishing Economies of Construction Sites

The project can benefit from the opportunity of the construction activities to have a better relation with the surrounding community, facilitating later the acceptance of the project operation in the area. The project may participate in creating job opportunities for local people from the neighboring residential areas as construction workers and guards during the construction process. The job opportunities offered during the construction phase represent a temporary high positive impact, as it will add to the benefits of nearby resettlements from the project.

East Banha OHTL**Noise**

Normally construction works include noisy activities related to the operation of construction equipment, possible hammering and drilling works in addition to the noise generated from construction related trucks. The noise impacts could be analyzed in two main aspects: noise impact within the construction areas, and the noise impact on the neighboring receptors.

During the construction phase, noise would be generated during day and night at levels exceeding the currently recorded levels during the baseline study. At the vicinity of all identified receptors, the noise intensity should not exceed 60 Decibel during the day (7am-10pm), and 55 Decibel during the night (10pm-7am) according to the national standards and 70 decibel during day and night according to the international standards. The table below represents the expected noise levels from the different construction activities

The potential vulnerable groups who are susceptible to the construction noise during the construction of the OHTLs are the following:

- Onsite Workers and

- Neighboring establishments

Monitoring the noise emissions during the construction phase will ensure that the noise limits are within the allowable limits and there is no any violation of the standard levels.

Impact Significance:

Construction noise is not likely to affect neighboring areas because of the relatively large distance between the source (use of machinery) and the receptors along the line.

For noise impact upon workers, within the construction site, it is possible that construction workers could be exposed to relatively high levels of noise. This could be mitigated through application of the normal precautions normally taken by construction labor. Accordingly, this impact has been classified as a Minor Impact (level 3), which could be further minimized and fully controlled if construction workers used safety gear as recommended in the ESMP.

Traffic

Power lines routes will be established away from road sides and on the desert land, as well as on urban and agriculture lands. Compensation will be provided to all individuals whose assets or access to assets is affected or damaged, as a consequence of land acquisition or any other activities undertaken by the projects. The compensation for the loss of physical and nonphysical assets will vary depending on the type of loss, and eligibility of the PAPs. Compensation may come in the form of cash compensation, in-kind compensation, and/or assistance.

There will be plenty of space for storage of construction materials and construction waste on road sides, therefore there will be very little possibilities that construction contractors will actually need to store materials on road lanes.

Furthermore, the extra traffic caused by construction vehicles is not expected to effectively impact the flow of traffic on the existing roads. The limitations on access to roads during construction are temporary; it will not affect any of the inhabitants. The impacts on access to roads beside the power lines are minor as the power lines will be located on the desert land and on the side of the existing roads.

Impact Significance

The impact is therefore considered Minor Impact. Mitigation measures included in the ESMP will effectively control this impact.

Air Quality

Excavation, filling, loading, transportation and unloading of soil and raw materials cause suspension of airborne dust that raises the particulate matter concentration on ambient air. These emissions are temporary and its severity depends on the construction activity, meteorological conditions, silt content of the soil and moisture content of the soil.

Another source of air emissions during construction is the exhaust emissions of construction machinery and vehicles visiting and leaving the site. The extent of these emissions depends on the number of machinery working at the site at one time, the type and efficiency of the engines and also the climate conditions.

Impact Significance:

Most of the OHTL routes is in desert landscape far from any settlement, in addition at a relatively large distance from receptors such as residential/settlement zone. In addition, the short duration of the impact given. Consequently, this impact could be also considered Minor along the OHTL line and Medium on the workers environment along the line. Exhaust from vehicles is considered minor.

Hazardous Materials and Waste Management

Wastes generated during construction activities of OHTL comprise of excavated soil for foundations. The excavated soil will normally be accumulated besides OHTL routes, and collected after installations are completed. Other types of solid construction wastes would include the following:

- Foundations
- Trimmings of steel.
- ⊕ Cut-off trees and vegetation
- Metals, wood, cement sacks, sand and gravel, concrete spills, cut off cables, garbage from daily activities of workers.
- Hazardous wastes such as spent oils from the operation and maintenance of machinery.
- Wasted or faulted materials of the towers including conductors and insulators

Impact Significance

The impact of uncontrolled waste dumping is banned. However, if it occurs, it could have impact on groundwater but it is considered as a minor impact as according to the baseline section (5.1.4) of this study, the groundwater in the studied areas for the OHTLs and the SS is found at depth of 200-900 meters away from the source of emissions along the routes. Moreover, the impacts during construction are characterized by being short term impacts.

The impact of solid wastes in general, if not properly managed, could be considered of medium significance due to the potential presence of hazardous wastes and the possibility of wastes being accumulated which has a negative visual impact.

By implementing the mitigation measures recommended in the ESMP, the significance of the impact could be reduced to minor.

Health and Safety

Potential impacts to worker and public health and safety during construction of transmission lines are the same as those associated with any construction project involving earthmoving, use of large equipment, transportation of overweight and oversized materials, and construction and installation of facilities. In addition, health and safety issues include either working at heights. The practices of electricity companies in Egypt reflect that the health and safety procedures are relatively not abided by the workers. That might result in injuries and death. Such impacts are distributed into:

- **Community health and safety:** It is predicted to affect the community people due to moving the vehicles, dust emissions and contamination of water As well; there was a fear that neglectful workers may cause accidents harmful to themselves or to the community members, particularly children, especially close to the construction areas. The significance of this impact is limited and of temporary nature.
- **Occupational health and safety:** the workers are predicted to get affected by accidents that might occur in the construction sites. There is a low probability of being infected by the Blood Transmission Diseases (BTDs) through several modes of transmission, particularly, sharing the toilets, not following hygienic procedures, and using personal shaving tools.
- Adverse impacts might result in due to the bites of reptiles (snakes, lizards and scorpions)

Impact significance

Health and safety for the sensitive recipient communities surrounding the OHTL is of low and minor significance, as approximately 99% of the project site are not in the urban area or in the populated area. Therefore, the impact can be classified as minor. Standard prevention, i.e. clear sign and fences around the project area are sufficient to prevent the accident occur for the animals or inhabitants might pass the project site. In addition, the medium to high impact is identified for the health and safety of the workers.

The standard protection of the workers reported in Labor law related to occupational health and safety No. 12 of year 2003, especially for the workers that involved in the risk due to the height has to be put into mitigation measures and in the management and monitoring plan to minimize and reduce the significant impact. In addition special attention shall be paid for Working at height during crossing towers construction.

Removing trees on the Right of Way (ROW)

Tall tree removal is necessary within the ROW zone which is 25 meters from both sides for the ultra-high voltage electricity power (500 kV) in accordance to the Electricity Law 87/2015. The removal of trees, where it exists along the ROW of the proposed transmission lines and cannot be avoided, will require compensations. The compensations have to be matched with the loss to the source of income that is created by removing these trees. The EETC will have to substitute the removed trees. The ROW will also limit tall trees plantations along the transmission lines during operation in order to maintain the safety of the lines.

The compensations for trees will vary according to the type of tree, its age, productivity, type of irrigation used. The EETC will only be responsible for the compensation; however, as the EETC is not responsible for replanting trees, it will be the responsibility of Agricultural Associations as well as individuals.

Identifying the value of the removed trees should be through the valuation and compensation committee that has to consider that the price lists developed by the Agriculture Directorate are applied.

It was noted that the project will result in a temporary impact on the crops and lands. Therefore, the study team relied upon the pricing lists provided for the crops. Along price list is attached to the RAP. The pricing lists are evaluated annually in cooperation with the agriculture associations within the project areas. The lists were based on:

- 6- Quality of crop/tree
- 7- Productivity of lands
- 8- Type of irrigation system
- 9- Age of trees
- 10- Access to main roads

Impact significance:

Removing the trees will have a negative impact, medium to major on the environment as well as on the owners of these trees. In order to compensate the negative impact on the environment, any removed tree should be substituted by planting other trees in other areas away from the ROW by the local stakeholders. The compensation for the owners of these trees should also take place in order to minimize the significance of the impact. The RAP represents the components of a consolidated document. This document will be subject to review and acceptance as whole.

Land Use

Impacts to land use of the OHTL could occur during construction if there were conflicts with existing land use plans and community goals. Long-term land use impacts would occur if existing land uses are not compatible with transmission project. The project will penetrate several populated areas.

As discussed in chapter 2, the Electricity Law 87/2015 has identified the limits of distances to be measured from the axis of the OHTL routes in order to identify the Right of Way (ROW) zone. There will be possible effects of electromagnetic fields from the OHTL, which will create certain restrictions on some land uses under the power lines. A ROW of 25 meters from both sides for OHTL (of 500 kV and 220 kV) will be kept as a Right of Way (ROW) or buffer zone for maintaining the public safety from electric hazards and high exposure to EMFs.

The ROW zone as identified by the Electricity Law 87/2015 will restrict the construction of new buildings and plantation of high trees on the routes in order to maintain the safety of the line; therefore in case of OHTL, there will be a limitation on agriculture crops such as wheat- maize- citrus fruits- potatoes and clover as well as trees plantation.

There are no direct effects related to power lines to animals passing under them; therefore, the construction of power lines is unlikely to cause any limitations on grazing activities. Location of power lines will be most suitable to be found on sides of existing rural roads to facilitate access to these lines for construction and maintenance

Impact significance:

For the construction of the towers of the OHTL along the routes and the transmission lines, there will be an affected land due to these constructions. The construction will only affect the plant growth in the agricultural lands along the right of way, as well as, put limitation to the buildings constructions. Therefore, the significance of this impact is high in the populated areas and minor in most of the desert project areas. Limitation of land use has a direct influence on the livelihood of people.

There is potential impact of having involuntary resettlement the OHTL project component. Therefore, a RAP will be necessary. The ESIA and the RAP represent the components of a consolidated document. This document will be subject to review and acceptance as whole.

Visual Intrusion

Potential sources of visual impacts during construction of OHTL along the routes include:

- Visual contrasts in the landscape from access tracks and staging areas
- Small-vehicle traffic for worker access and frequent large-equipment traffic for project and access road construction.

Project component installation would produce visible activity and dust in dry soils. Project construction may be progressive, persevering over a period of time. Ground disturbance (e.g., trenching and grading) would result in visual impacts that produce contrasts of color, form, texture, and line. Soil scars and exposed slope faces could result from excavation, leveling, and equipment movement.

Impact significance:

The impact associated to the visual intrusion is considered minor, localized and temporary. Therefore, the standard protection for the ground disturbance, dust, wastes generated will be sufficient to mitigate to ensure the proper management and to minimize the impact.

Archeological and Cultural Sites

The OHTL route is far distance from any cultural or archeological sites. It is not expected that any impacts may appear during construction on any surrounding cultural or archeological sites. This impact is considered: insignificant impact.

Ecological (Fauna and Flora)

The proposed route of the OHTL line up is mainly located on desert margins, sand areas habitat, and agricultural lands and therefore poses no threat to endangered species. The investigated habitats at agricultural lands are not unique and are very common and widespread in neighboring areas which

would provide alternative habitats for the sympatric faunal species to move to these habitats and continue their life cycle.

The potential impacts of construction are likely to be localized and good site management practices will be implemented, no significant effects are predicted.

Mitigation actions have been developed for each priority biodiversity feature or groups of features to ensure the systematic implementation of the mitigation hierarchy i.e. avoid, reduce (minimize), remedy (restore) and offset. This will allow for the careful management of risk and the best possible outcomes for the project and local communities, without compromising the health, function and integrity of the ecological system.

Impact Significance:

This impact is considered: minor impact

Bird Migration

Regarding the bird migration, the OHTL's route crosses the path of the birds' migration as seen on the below maps. Based on Bird Life international tool's report (Annex 4), the overall sensitivity of this project area is considered medium as there are 4 soaring bird species observed in the area, classified as **LC** (least concern) according to the IUCN Red List; while a further 28 soaring bird species classified as **LC**; **NT** (near threatened); **VU** (vulnerable); **EN** (endangered) are expected but not observed (classification of 'observed' or 'expected' based on presence status). Therefore, mitigation measures are required to be implemented to minimize the risk of birds' electrocution and collision. The following figures represent the birds' migration path versus route of OHTL.

Impact Significance:

This impact is considered to be medium impact.

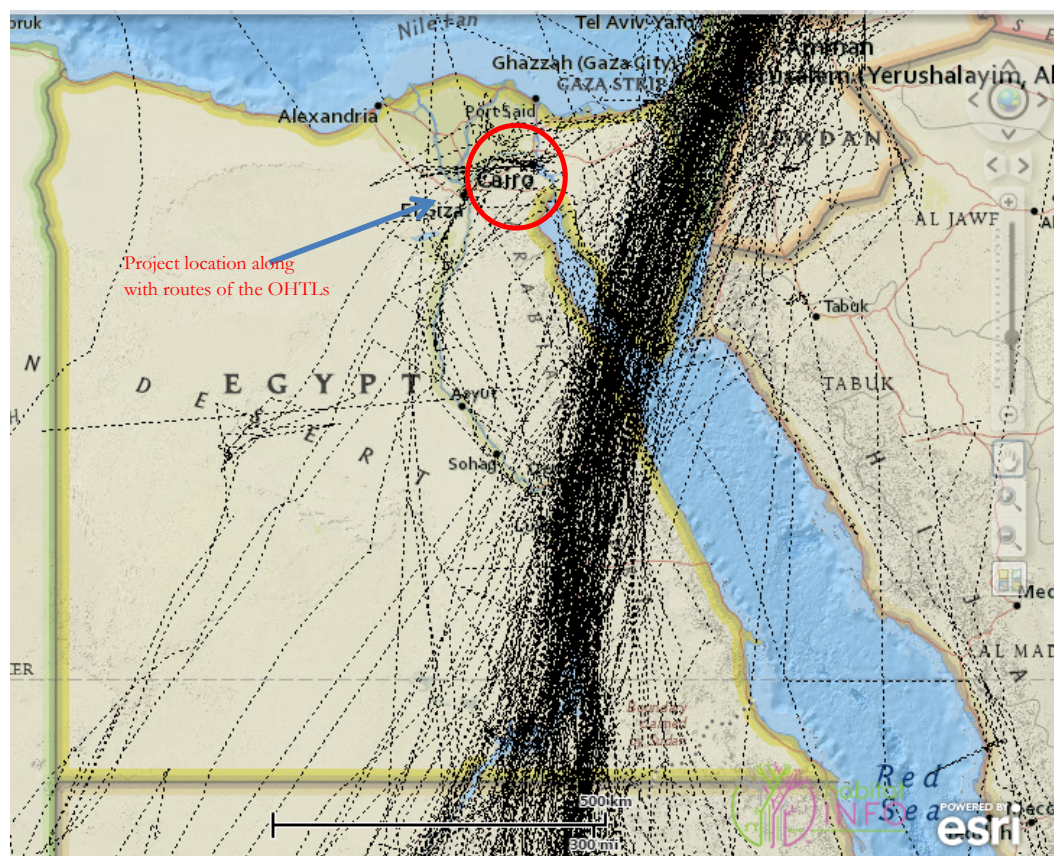


Figure 6-7 Main migration routes in Egypt
source: BirdLife International (2015)

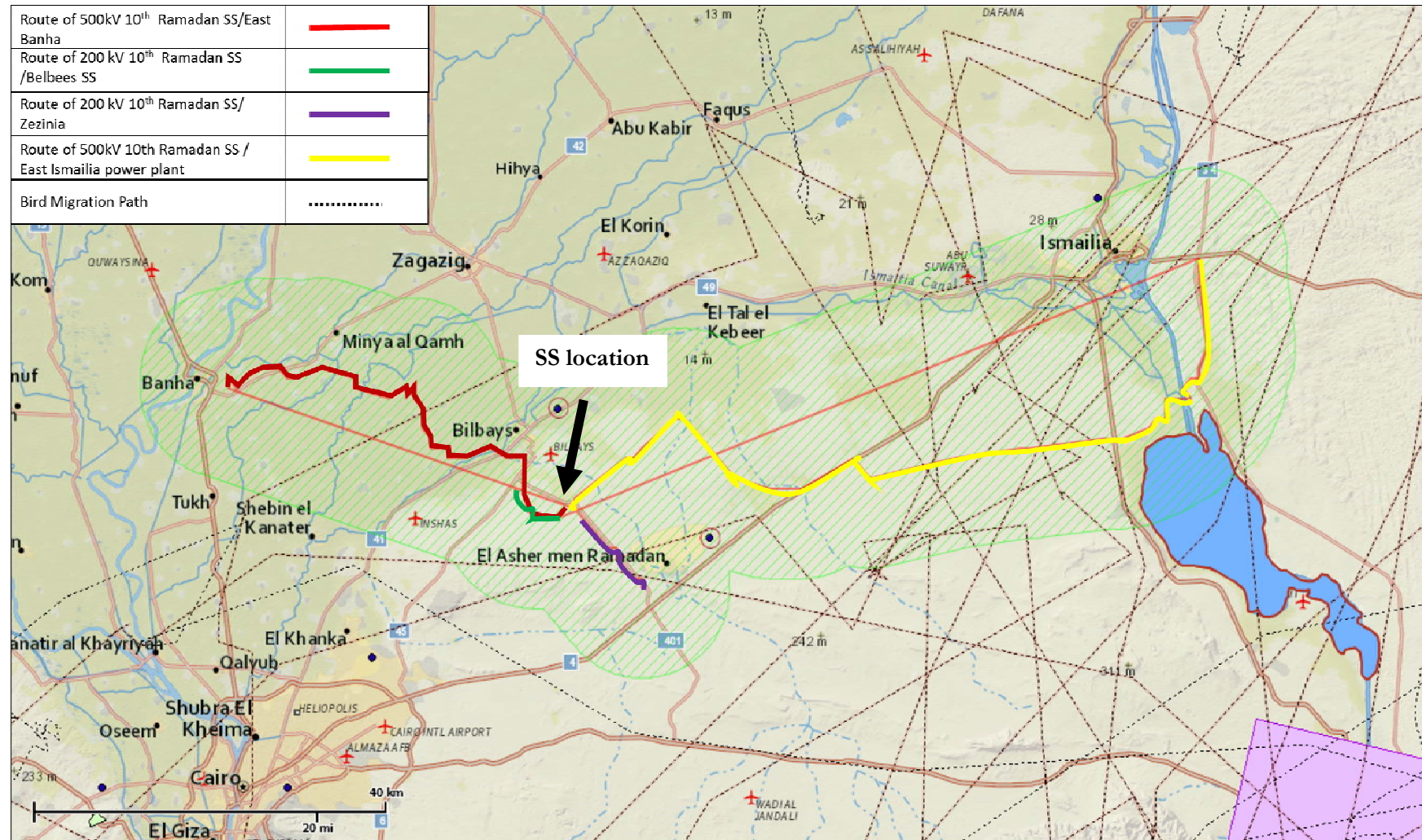


Figure 6-8 Main migration routes in Egypt versus the route of East Banha OHTL in red

source: BirdLife International (2019)

Water Resource (groundwater, geology and hydrogeology)

Similar to the impact associated to the groundwater, surface water and drinking water associated to the construction of the SS; the construction of OHTL will have Minor_Impact. However, standard prevention or precaution measures shall be prepared by the contractor prior to the construction. It is preferable to include the waste management plan to be included in the ToR of the contractor.

Culture Resources and Privacy of Local Communities

EETC normally conducts construction activities through an external contractor. Therefore, in areas where the OHTL will pass through populated areas, local communities are expected to be exposed to openness and interaction with the outsiders of the project crew and workers during the construction phase. This impact is expected to be minor and temporary. Since the workers and the contractor are expected to respect the local culture of the community. As well as respect the privacy of the surrounding residential area. These impacts will end upon completion of the construction phase. It has been

recommended in the ESMP to maximize the use of local labor to reduce such impact and to maximize the benefits to local communities.

Creation of Job Opportunities and Flourishing Economies of Construction Sites

The project can benefit from the opportunity of the construction activities to have a better relation with the surrounding community, facilitating later the acceptance of the project operation in the area. The project may participate in creating job opportunities for local people from the neighboring residential areas as construction workers and guards during the construction process. The job opportunities offered during the construction phase represent a temporary high positive impact, as it will add to the benefits of nearby resettlements from the project.

East Belbees OHTL**Noise**

Normally construction works include noisy activities related to the operation of construction equipment, possible hammering and drilling works in addition to the noise generated from construction related trucks. The noise impacts could be analyzed in two main aspects: noise impact within the construction areas, and the noise impact on the neighboring receptors.

During the construction phase, noise would be generated during day and night at levels exceeding the currently recorded levels during the baseline study. At the vicinity of all identified receptors, the noise intensity should not exceed 60 Decibel during the day (7am-10pm), and 55 Decibel during the night (10pm-7am) according to the national standards and 70 decibel during day and night according to the international standards. The table below represents the expected noise levels from the different construction activities

The potential vulnerable groups who are susceptible to the construction noise during the construction of the OHTLs are the following:

- Onsite Workers and
- Neighboring establishments

Monitoring the noise emissions during the construction phase will ensure that the noise limits are within the allowable limits and there is no any violation of the standard levels.

Impact Significance:

Construction noise is not likely to affect neighboring areas because of the relatively large distance between the source (use of machinery) and the receptors along the line.

For noise impact upon workers, within the construction site, it is possible that construction workers could be exposed to relatively high levels of noise. This could be mitigated through application of the normal precautions normally taken by construction labor. Accordingly, this impact has been classified as a Minor Impact (level 3), which could be further minimized and fully controlled if construction workers used safety gear as recommended in the ESMP.

Traffic

Power lines routes will be established away from road sides and on the desert land, as well as on urban and agriculture lands. Compensation will be provided to all individuals whose assets or access to assets is affected or damaged, as a consequence of land acquisition or any other activities undertaken by the projects. The compensation for the loss of physical and nonphysical assets will vary depending on the type of loss, and eligibility of the PAPs. Compensation may come in the form of cash compensation, in-kind compensation, and/or assistance.

There will be plenty of space for storage of construction materials and construction waste on road sides, therefore there will be very little possibilities that construction contractors will actually need to store materials on road lanes.

Furthermore, the extra traffic caused by construction vehicles is not expected to effectively impact the flow of traffic on the existing roads. The limitations on access to roads during construction are temporary; it will not affect any of the inhabitants. The impacts on access to roads beside the power lines are minor as the power lines will be located on the desert land and on the side of the existing roads.

Impact Significance

The impact is therefore considered Minor Impact. Mitigation measures included in the ESMP will effectively control this impact.

Air Quality

Excavation, filling, loading, transportation and unloading of soil and raw materials cause suspension of airborne dust that raises the particulate matter concentration on ambient air. These emissions are temporary and its severity depends on the construction activity, meteorological conditions, silt content of the soil and moisture content of the soil.

Another source of air emissions during construction is the exhaust emissions of construction machinery and vehicles visiting and leaving the site. The extent of these emissions depends on the number of machinery working at the site at one time, the type and efficiency of the engines and also the climate conditions.

Impact Significance:

Most of the OHTL routes is in desert landscape far from any settlement, in addition at a relatively large distance from receptors such as residential/settlement zone. In addition, the short duration of the impact given. Consequently, this impact could be also considered Minor along the OHTL line and Medium on the workers environment along the line. Exhaust from vehicles is considered minor.

Hazardous Materials and Waste Management

Wastes generated during construction activities of OHTL comprise of excavated soil for foundations. The excavated soil will normally be accumulated besides OHTL routes, and collected after installations are completed. Other types of solid construction wastes would include the following:

- Foundations
- Trimmings of steel.
- ⊕ Cut-off trees and vegetation
- Metals, wood, cement sacks, sand and gravel, concrete spills, cut off cables, garbage from daily activities of workers.
- Hazardous wastes such as spent oils from the operation and maintenance of machinery.
- Wasted or faulted materials of the towers including conductors and insulators

Impact Significance

The impact of uncontrolled waste dumping is banned. However, if it occurs, it could have impact on groundwater but it is considered as a minor impact as according to the baseline section (5.1.4) of this study, the groundwater in the studied areas for the OHTLs and the SS is found at depth of 200-900 meters away from the source of emissions along the routes. Moreover, the impacts during construction are characterized by being short term impacts.

The impact of solid wastes in general, if not properly managed, could be considered of medium significance due to the potential presence of hazardous wastes and the possibility of wastes being accumulated which has a negative visual impact.

By implementing the mitigation measures recommended in the ESMP, the significance of the impact could be reduced to minor.

Health and Safety

Potential impacts to worker and public health and safety during construction of transmission lines are the same as those associated with any construction project involving earthmoving, use of large equipment, transportation of overweight and oversized materials, and construction and installation of facilities. In addition, health and safety issues include either working at heights. The practices of electricity companies in Egypt reflect that the health and safety procedures are relatively not abided by the workers. That might result in injuries and death. Such impacts are distributed into:

- **Community health and safety:** It is predicted to affect the community people due to moving the vehicles, dust emissions and contamination of water As well; there was a fear that neglectful workers may cause accidents harmful to themselves or to the community members, particularly children, especially close to the construction areas. The significance of this impact is limited and of temporary nature.
- **Occupational health and safety:** the workers are predicted to get affected by accidents that might occur in the construction sites. There is a low probability of being infected by the Blood Transmission Diseases (BTDs) through several modes of transmission, particularly, sharing the toilets, not following hygienic procedures, and using personal shaving tools.
- Adverse impacts might result in due to the bites of reptiles (snakes, lizards and scorpions)

Impact significance

Health and safety for the sensitive recipient communities surrounding the OHTL is of low and minor significance, as approximately 99% of the project site are not in the urban area or in the populated area. Therefore, the impact can be classified as minor. Standard prevention, i.e. clear sign and fences around the project area are sufficient to prevent the accident occur for the animals or inhabitants might pass the project site. In addition, the medium to high impact is identified for the health and safety of the workers.

The standard protection of the workers reported in Labor law related to occupational health and safety No. 12 of year 2003, especially for the workers that involved in the risk due to the height has to be put into mitigation measures and in the management and monitoring plan to minimize and reduce the significant impact. In addition special attention shall be paid for Working at height during crossing towers construction.

Removing trees on the Right of Way (ROW)

Tall tree removal is necessary within the ROW zone which is 25 meters from both sides for the ultra-high voltage electricity power (500 kV) in accordance to the Electricity Law 87/2015. The removal of trees, where it exists along the ROW of the proposed transmission lines and cannot be avoided, will require compensations. The compensations have to be matched with the loss to the source of income that is created by removing these trees. The EETC will have to substitute the removed trees. The ROW

will also limit tall trees plantations along the transmission lines during operation in order to maintain the safety of the lines.

The compensations for trees will vary according to the type of tree, its age, productivity, type of irrigation used. The EETC will only be responsible for the compensation; however, as the EETC is not responsible for replanting trees, it will be the responsibility of Agricultural Associations as well as individuals.

Identifying the value of the removed trees should be through the valuation and compensation committee that has to consider that the price lists developed by the Agriculture Directorate are applied.

It was noted that the project will result in a temporary impact on the crops and lands. Therefore, the study team relied upon the pricing lists provided for the crops. Along price list is attached to the RAP. The pricing lists are evaluated annually in cooperation with the agriculture associations within the project areas. The lists were based on:

- 11- Quality of crop/tree
- 12- Productivity of lands
- 13- Type of irrigation system
- 14- Age of trees
- 15- Access to main roads

Impact significance:

Removing the trees will have a negative impact, medium to major on the environment as well as on the owners of these trees. In order to compensate the negative impact on the environment, any removed tree should be substituted by planting other trees in other areas away from the ROW by the local stakeholders. The compensation for the owners of these trees should also take place in order to minimize the significance of the impact. The RAP represents the components of a consolidated document. This document will be subject to review and acceptance as whole.

Land Use

Impacts to land use of the OHTL could occur during construction if there were conflicts with existing land use plans and community goals. Long-term land use impacts would occur if existing land uses are not compatible with transmission project. The project will penetrate several populated areas.

As discussed in chapter 2, the Electricity Law 87/2015 has identified the limits of distances to be measured from the axis of the OHTL routes in order to identify the Right of Way (ROW) zone. There will be possible effects of electromagnetic fields from the OHTL, which will create certain restrictions on some land uses under the power lines. A ROW of 25 meters from both sides for OHTL (of 500 kV and 220 kV) will be kept as a Right of Way (ROW) or buffer zone for maintaining the public safety from electric hazards and high exposure to EMFs.

The ROW zone as identified by the Electricity Law 87/2015 will restrict the construction of new buildings and plantation of high trees on the routes in order to maintain the safety of the line; therefore

in case of OHTL, there will be a limitation on agriculture crops such as wheat- maize- citrus fruits- potatoes and clover as well as trees plantation.

There are no direct effects related to power lines to animals passing under them; therefore, the construction of power lines is unlikely to cause any limitations on grazing activities. Location of power lines will be most suitable to be found on sides of existing rural roads to facilitate access to these lines for construction and maintenance

Impact significance:

For the construction of the towers of the OHTL along the routes and the transmission lines, there will be an affected land due to these constructions. The construction will only affect the plant growth in the agricultural lands along the right of way, as well as, put limitation to the buildings constructions. Therefore, the significance of this impact is high in the populated areas and minor in most of the desert project areas. Limitation of land use has a direct influence on the livelihood of people.

There is potential impact of having involuntary resettlement the OHTL project component. Therefore, a RAP will be necessary. The ESIA and the RAP represent the components of a consolidated document. This document will be subject to review and acceptance as whole

Visual Intrusion

Potential sources of visual impacts during construction of OHTL along the routes include:

- Visual contrasts in the landscape from access tracks and staging areas
- Small-vehicle traffic for worker access and frequent large-equipment traffic for project and access road construction.

Project component installation would produce visible activity and dust in dry soils. Project construction may be progressive, persevering over a period of time. Ground disturbance (e.g., trenching and grading) would result in visual impacts that produce contrasts of color, form, texture, and line. Soil scars and exposed slope faces could result from excavation, leveling, and equipment movement.

Impact significance:

The impact associated to the visual intrusion is considered minor, localized and temporary. Therefore, the standard protection for the ground disturbance, dust, wastes generated will be sufficient to mitigate to ensure the proper management and to minimize the impact.

Archeological and Cultural Sites

The OHTL route is far distance from any cultural or archeological sites. It is not expected that any impacts may appear during construction on any surrounding cultural or archeological sites. This impact is considered: insignificant impact.

Ecological (Fauna and Flora)

The proposed route of the OHTL line up is mainly located on desert margins, sand areas habitat, and agricultural lands and therefore poses no threat to endangered species. The investigated habitats at agricultural lands are not unique and are very common and widespread in neighboring areas which would provide alternative habitats for the sympatric faunal species to move to these habitats and continue their life cycle.

The potential impacts of construction are likely to be localized and good site management practices will be implemented, no significant effects are predicted.

Mitigation actions have been developed for each priority biodiversity feature or groups of features to ensure the systematic implementation of the mitigation hierarchy i.e. avoid, reduce (minimize), remedy (restore) and offset. This will allow for the careful management of risk and the best possible outcomes for the project and local communities, without compromising the health, function and integrity of the ecological system.

Regarding the bird migration, the OHTLs route will not impact the bird migration as the route of OHTL is not crossing the bird migration path. The following figure represents the birds' migration path versus the project location.

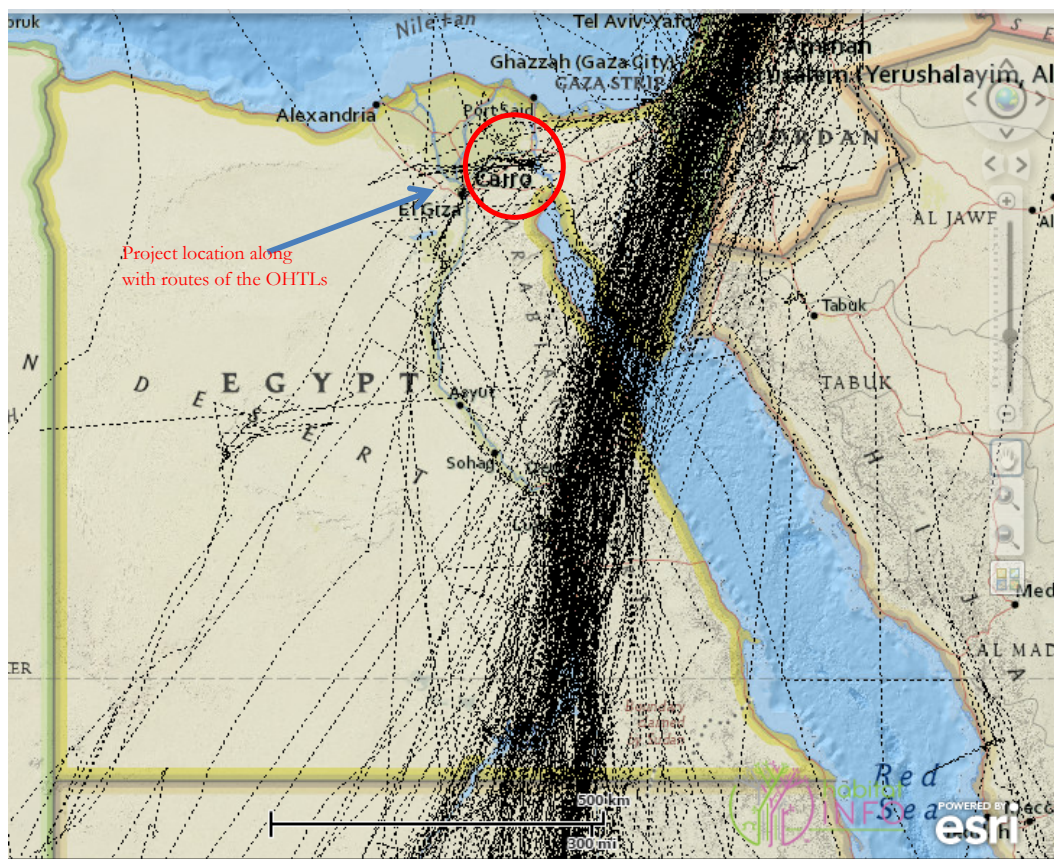


Figure 6-9 Main migration routes in Egypt
source: BirdLife International (2015)

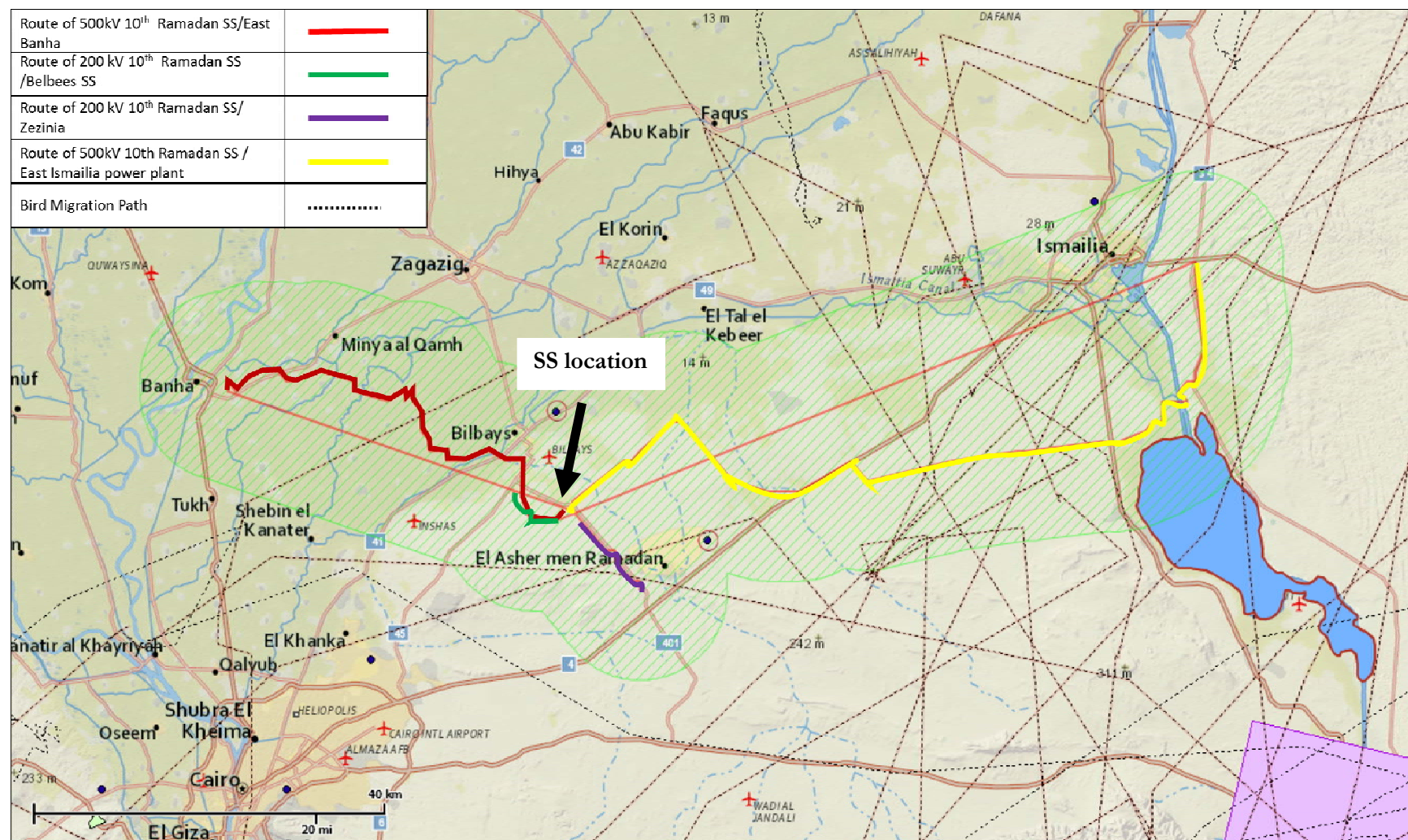


Figure 6-10 Main migration routes in Egypt versus the route of East Belbees OHTL in green

source: BirdLife International (2019)

Impact significance:

It is considered to be a Minor impact

Water Resource (groundwater, geology and hydrogeology)

Similar to the impact associated to the groundwater, surface water and drinking water associated to the construction of the SS; the construction of OHTL will have Minor Impact. However, standard prevention or precaution measures shall be prepared by the contractor prior to the construction. It is preferable to include the waste management plan to be included in the ToR of the contractor.

Culture Resources and Privacy of Local Communities

EETC normally conducts construction activities through an external contractor. Therefore, in areas where the OHTL will pass through populated areas, local communities are expected to be exposed to openness and interaction with the outsiders of the project crew and workers during the construction phase. This impact is expected to be minor and temporary. Since the workers and the contractor are expected to respect the local culture of the community. As well as respect the privacy of the surrounding residential area. These impacts will end upon completion of the construction phase. It has been recommended in the ESMP to maximize the use of local labor to reduce such impact and to maximize the benefits to local communities.

Creation of Job Opportunities and Flourishing Economies of Construction Sites

The project can benefit from the opportunity of the construction activities to have a better relation with the surrounding community, facilitating later the acceptance of the project operation in the area. The project may participate in creating job opportunities for local people from the neighboring residential areas as construction workers and guards during the construction process. The job opportunities offered during the construction phase represent a temporary high positive impact, as it will add to the benefits of nearby resettlements from the project.

East Zezenia OHTL

Noise

Normally construction works include noisy activities related to the operation of construction equipment, possible hammering and drilling works in addition to the noise generated from construction related trucks. The noise impacts could be analyzed in two main aspects: noise impact within the construction areas, and the noise impact on the neighboring receptors.

During the construction phase, noise would be generated during day and night at levels exceeding the currently recorded levels during the baseline study. At the vicinity of all identified receptors, the noise intensity should not exceed 60 Decibel during the day (7am-10pm), and 55 Decibel during the night (10pm-7am) according to the national standards and 70 decibel during day and night according to the international standards. The table below represents the expected noise levels from the different construction activities

The potential vulnerable groups who are susceptible to the construction noise during the construction of the OHTLs are the following:

- Onsite Workers and
- Neighboring establishments

Monitoring the noise emissions during the construction phase will ensure that the noise limits are within the allowable limits and there is no any violation of the standard levels.

Impact Significance:

Construction noise is not likely to affect neighboring areas because of the relatively large distance between the source (use of machinery) and the receptors along the line.

For noise impact upon workers, within the construction site, it is possible that construction workers could be exposed to relatively high levels of noise. This could be mitigated through application of the normal precautions normally taken by construction labor. Accordingly, this impact has been classified as a Minor Impact (level 3), which could be further minimized and fully controlled if construction workers used safety gear as recommended in the ESMP.

Traffic

Power lines routes will be established away from road sides and on the desert land. No Compensation is associated to this OHTL as it will run parallel to main road and will not cross by any of agricultural lands.

There will be plenty of space for storage of construction materials and construction waste on road sides, therefore there will be very little possibilities that construction contractors will actually need to store materials on road lanes.

Furthermore, the extra traffic caused by construction vehicles is not expected to effectively impact the flow of traffic on the existing roads. The limitations on access to roads during construction are temporary; it will not affect any of the inhabitants. The impacts on access to roads beside the power lines are minor as the power lines will be located on the desert land and on the side of the existing roads.

Impact Significance

The impact is therefore considered Minor Impact. Mitigation measures included in the ESMP will effectively control this impact.

Air Quality

Excavation, filling, loading, transportation and unloading of soil and raw materials cause suspension of airborne dust that raises the particulate matter concentration on ambient air. These emissions are

temporary and its severity depends on the construction activity, meteorological conditions, silt content of the soil and moisture content of the soil.

Another source of air emissions during construction is the exhaust emissions of construction machinery and vehicles visiting and leaving the site. The extent of these emissions depends on the number of machinery working at the site at one time, the type and efficiency of the engines and also the climate conditions.

Impact Significance:

Most of the OHTL routes is in desert landscape far from any settlement, in addition at a relatively large distance from receptors such as residential/settlement zone. In addition, the short duration of the impact given. Consequently, this impact could be also considered Minor along the OHTL line and Medium on the workers environment along the line. Exhaust from vehicles is considered minor.

Hazardous Materials and Waste Management

Wastes generated during construction activities of OHTL comprise of excavated soil for foundations. The excavated soil will normally be accumulated besides OHTL routes, and collected after installations are completed. Other types of solid construction wastes would include the following:

- Foundations
- Trimmings of steel.
- ⊖ Cut-off trees and vegetation
- Metals, wood, cement sacks, sand and gravel, concrete spills, cut off cables, garbage from daily activities of workers.
- Hazardous wastes such as spent oils from the operation and maintenance of machinery.
- Wasted or faulted materials of the towers including conductors and insulators

Impact Significance

The impact of uncontrolled waste dumping is banned. However, if it occurs, it could have impact on groundwater but it is considered as a minor impact as according to the baseline section (5.1.4) of this study, the groundwater in the studied areas for the OHTLs and the SS is found at depth of 200-900 meters away from the source of emissions along the routes. Moreover, the impacts during construction are characterized by being short term impacts.

The impact of solid wastes in general, if not properly managed, could be considered of medium significance due to the potential presence of hazardous wastes and the possibility of wastes being accumulated which has a negative visual impact.

By implementing the mitigation measures recommended in the ESMP, the significance of the impact could be reduced to minor.

Health and Safety

Potential impacts to worker and public health and safety during construction of transmission lines are the same as those associated with any construction project involving earthmoving, use of large equipment, transportation of overweight and oversized materials, and construction and installation of facilities. In addition, health and safety issues include either working at heights. The practices of electricity companies in Egypt reflect that the health and safety procedures are relatively not abided by the workers. That might result in injuries and death. Such impacts are distributed into:

- **Community health and safety:** It is predicted to affect the community people due to moving the vehicles, dust emissions and contamination of water As well; there was a fear that neglectful workers may cause accidents harmful to themselves or to the community members, particularly children, especially close to the construction areas. The significance of this impact is limited and of temporary nature.
- **Occupational health and safety:** the workers are predicted to get affected by accidents that might occur in the construction sites. There is a low probability of being infected by the Blood Transmission Diseases (BTDs) through several modes of transmission, particularly, sharing the toilets, not following hygienic procedures, and using personal shaving tools.
- Adverse impacts might result in due to the bites of reptiles (snakes, lizards and scorpions)

Impact significance

Health and safety for the sensitive recipient communities surrounding the OHTL is of low and minor significance, as approximately 99% of the project site are not in the urban area or in the populated area. Therefore, the impact can be classified as minor. Standard prevention, i.e. clear sign and fences around the project area are sufficient to prevent the accident occur for the animals or inhabitants might pass the project site. In addition, the medium to high impact is identified for the health and safety of the workers.

The standard protection of the workers reported in Labor law related to occupational health and safety No. 12 of year 2003, especially for the workers that involved in the risk due to the height has to be put into mitigation measures and in the management and monitoring plan to minimize and reduce the significant impact. In addition special attention shall be paid for Working at height during crossing towers construction.

Removing trees on the Right of Way (ROW)

No cut of trees is required for this OHTL as it doesn't pass any of agricultural lands

Impact significance:

Insignificant

Land Use

Impacts to land use of the OHTL could occur during construction if there were conflicts with existing land use plans and community goals. Long-term land use impacts would occur if existing land uses are not compatible with transmission project. The project will penetrate several populated areas. According to the site visit, the route of the line will not pass by or cross any land use plans or community goals.

Impact significance

Insignificant

Visual Intrusion

Potential sources of visual impacts during construction of OHTL along the routes include:

- Visual contrasts in the landscape from access tracks and staging areas
- Small-vehicle traffic for worker access and frequent large-equipment traffic for project and access road construction.

Project component installation would produce visible activity and dust in dry soils. Project construction may be progressive, persevering over a period of time. Ground disturbance (e.g., trenching and grading) would result in visual impacts that produce contrasts of color, form, texture, and line. Soil scars and exposed slope faces could result from excavation, leveling, and equipment movement.

Impact significance:

The impact associated to the visual intrusion is considered minor, localized and temporary. Therefore, the standard protection for the ground disturbance, dust, wastes generated will be sufficient to mitigate to ensure the proper management and to minimize the impact.

Archeological and Cultural Sites

The OHTL route is far distance from any cultural or archeological sites. It is not expected that any impacts may appear during construction on any surrounding cultural or archeological sites. This impact is considered: insignificant impact.

Ecological (Fauna and Flora)

The proposed route of the OHTL line up is mainly located on desert margins and sand areas habitat.

The potential impacts of construction are likely to be localized and good site management practices will be implemented, no significant effects are predicted.

Mitigation actions have been developed for each priority biodiversity feature or groups of features to ensure the systematic implementation of the mitigation hierarchy i.e. avoid, reduce (minimize), remedy (restore) and offset. This will allow for the careful management of risk and the best possible outcomes for the project and local communities, without compromising the health, function and integrity of the ecological system.

Impact Significance:

This impact is considered: minor impact

Bird Migration

Regarding the bird migration, the OHTL's route crosses the path of the birds' migration as seen on the below maps. Based on Bird Life international tool's report (Annex 4), the overall sensitivity of this project area is considered medium as there are 4 soaring bird species observed in the area, classified as **LC** (least concern) according to the IUCN Red List; while a further 28 soaring bird species classified as **LC**; **NT** (near threatened); **VU** (vulnerable); **EN** (endangered) are expected but not observed (classification of 'observed' or 'expected' based on presence status). Therefore, mitigation measures are required to be implemented to minimize the risk of birds' electrocution and collision. The following figures represent the birds' migration path versus route of OHTL.

Impact Significance:

This impact is considered to be medium impact.

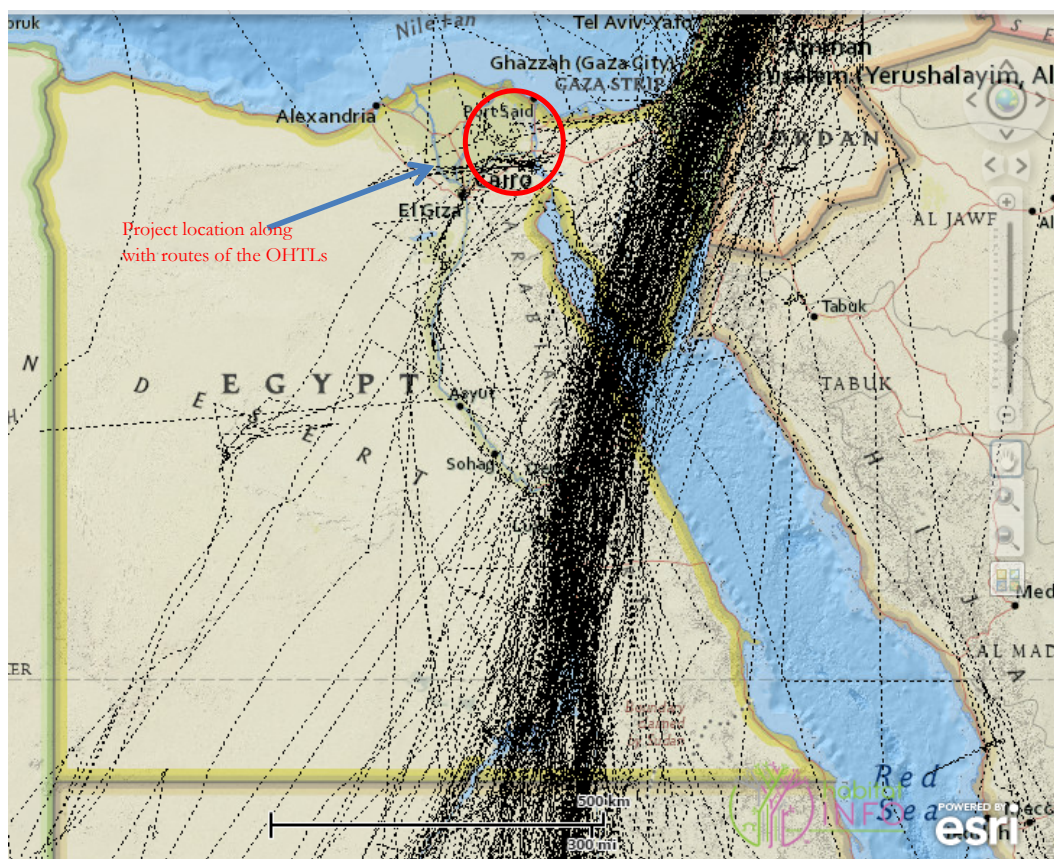


Figure 6-11 Main migration routes in Egypt

source: BirdLife International (2015)

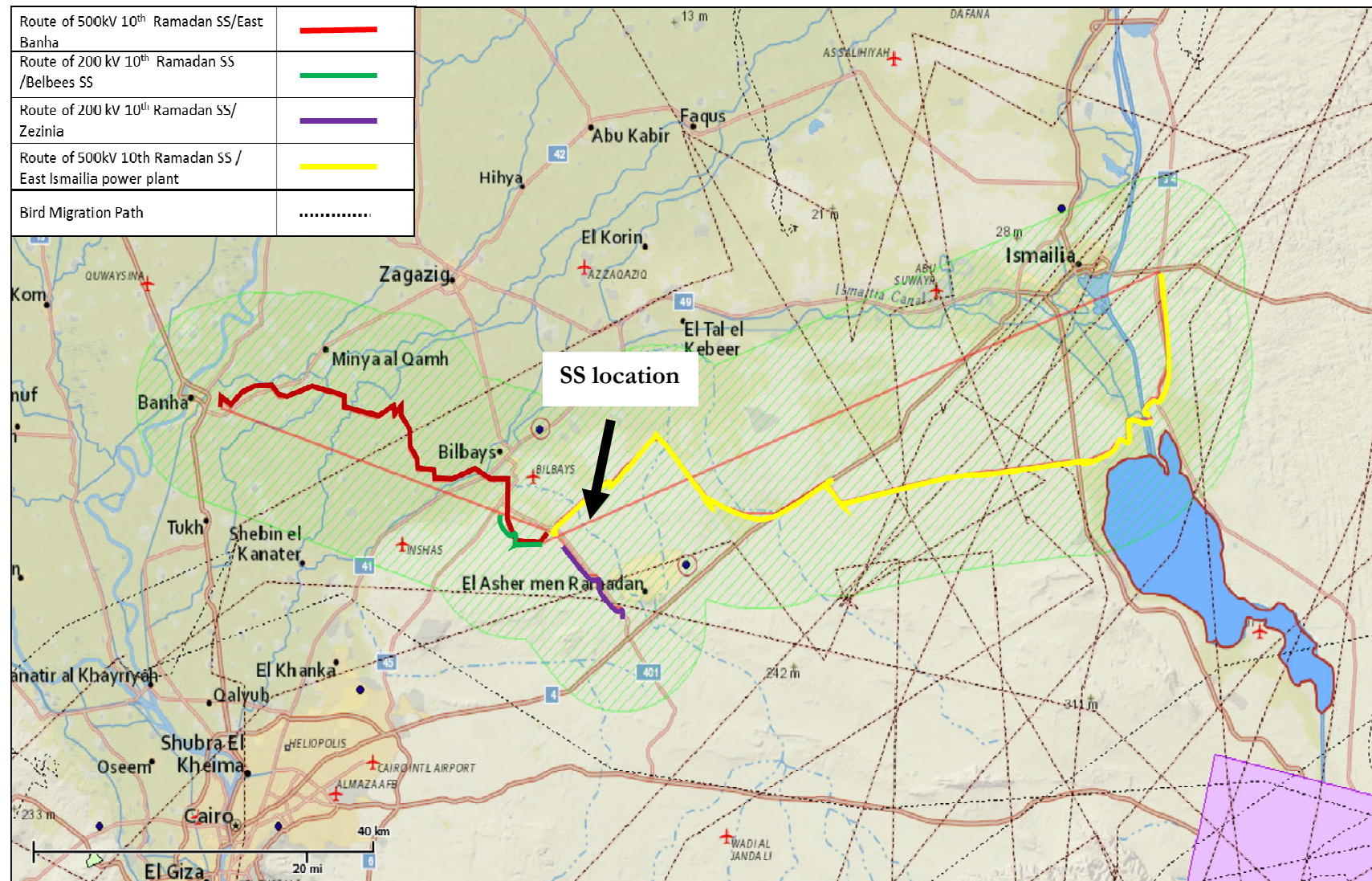


Figure 6-12 Main migration routes in Egypt versus the route of East ZeZenia OHTLs in violet

source: BirdLife International (2019)

Water Resource (groundwater, geology and hydrogeology)

Similar to the impact associated to the groundwater, surface water and drinking water associated to the construction of OHTL will have Minor Impact. However, standard prevention or precaution measures shall be prepared by the contractor prior to the construction. It is preferable to include the waste management plan to be included in the ToR of the contractor.

Culture Resources and Privacy of Local Communities

EETC normally conducts construction activities through an external contractor. Therefore, in areas where the OHTL will pass through populated areas, local communities are expected to be exposed to openness and interaction with the outsiders of the project crew and workers during the construction phase. This impact is expected to be minor and temporary. Since the workers and the contractor are expected to respect the local culture of the community. As well as respect the privacy of the surrounding residential area. These impacts will end upon completion of the construction phase. It has been recommended in the ESMP to maximize the use of local labor to reduce such impact and to maximize the benefits to local communities.

Creation of Job Opportunities and Flourishing Economies of Construction Sites

The project can benefit from the opportunity of the construction activities to have a better relation with the surrounding community, facilitating later the acceptance of the project operation in the area. The project may participate in creating job opportunities for local people from the neighboring residential areas as construction workers and guards during the construction process. The job opportunities offered during the construction phase represent a temporary high positive impact, as it will add to the benefits of nearby resettlements from the project.

Summary of the impacts during construction of SS and each of the OHTL presented in Table 6.2 and Table 6.3 respectively.

Table 6-3. Assessed significance of expected impacts during construction phase of 10th Ramadan 500 GIS substation

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction 10th of Ramadan Substation			
Noise	High likelihood to occur – short term and temporary -	Medium Impact	Application of the health and safety guide of the contractor should be 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
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 routes and movement.
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
Vibration	Low likelihood to occur	Minor impact	Schedule and time plan for vehicles movements and construction activities
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 a licensed waste collector for officially assigning a location for the disposal of construction waste. Waste management submitted by the contractor for waste management (upon the agreement with the licensed waste collector). •For The hazardous waste, it will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).” 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.

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Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction 10th of Ramadan Substation			
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
Visual Resources and landscaping	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
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 (Fauna and Flora and bird migration)	Low likelihood to occur	Negligible impact (no impact)	No mitigation measures are needed.
Natural disaster risks	Low likelihood to occur	No significant impact	No mitigation measures is prepared Technical specifications of the equipment is include the standard measures for natural disaster risks
Land use and Involuntary resettlement	Low likelihood to occur	Very low or insignificant	No mitigation measures is prepared, as EETC has already received the governor's decree to allocate the land for the construction of the proposed SS.
Archeological and cultural sites	Low likelihood to occur	Very low or insignificant	No mitigation measures is prepared
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 6-4. Assessed significance of expected impacts during construction phase of East Ismailia OHTL

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of East Ismailia OHTL			
Noise	High likelihood to occur – short term and temporary	Medium Impact	<p>Application of the health and safety guide of the contractor should be implemented by the construction workers.</p> <p>Notification to the surrounding establishment prior to the construction of the SS</p> <p>Time management and construction schedule according to the IFC regulation provided by the contractor prior to the construction phase</p>
Traffic	High likelihood to occur – short term, temporary and localized only on the main road	Low to medium impact	<p>Time management for transporting the materials, equipment, debris, etc</p> <p>Clear sign surrounding construction site and the enter / exit gate</p> <p>Coordination with traffic department (ministry of interior) for vehicles routes and movement.</p>
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.	<p>Medium impact on construction workers</p> <p>Low impact on the residents, surrounding establishment and pedestrians passing by the construction site</p>	<p>Spraying the sandy soil with water (if needed, especially during the dry period).</p> <p>Maneuver area and the parking area should be well paved</p> <p>Management of the number of vehicles at the same time for specific location and the scheduling the intensity of vehicles</p>
Hazardous Materials and Waste Management	Likely to occur - short term – Highly sensitive receptors include soil at protectorate areas and workers. Receptors with medium sensitivity include nearby settlements. Receptors with low sensitivity include groundwater.	Medium	<p>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.</p> <p>Waste management submitted by the contractor for waste management upon the agreement with the licensed waste collector. For The hazardous waste, it will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).”</p> <p>Protection of spillage including paved site for workshop or maintenance of vehicles</p> <p>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.</p>
Health and Safety	Low likelihood of major or medium impacts for workers– high likelihood of minor impact for sensitive recipient	Minor	<p>Standard protection by placing clear project signs.</p> <p>Time management for vehicles movement; especially avoiding the peak hours</p> <p>Standard protection for the workers especially working at elevated heights</p>

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Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of East Ismailia OHTL			
Removing trees on ROW	Low likelihood of major or medium impacts	Medium to Major	Reduce impact significance to minor following RAP
Land use	Medium and direct impact to livelihood	Medium	Reduce impact significance to minor following recommendations of RAP preparation
Visual intrusion	Low likelihood of major or medium impacts and localized	Minor	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
Ecological (Fauna and Flora)	Medium likelihood to occur – short term	Minor	Following the standard protection for the fauna and flora and proper waste management described on the section of waste management measures
Bird Migration	Low likelihood to occur	Medium to Minor impact	<ul style="list-style-type: none"> Installing bird diverters devices or line markers such as spheres, spiral vibrational dampers, or bird deflectors in order to attract the attention of birds and avoid collision Avoid working in seasons of bird migration, Spring (March-May) and Autumn (August to November)
Water Resources	Medium likelihood to occur – short term	Minor	Standard prevention or precaution measures shall be prepared by the contractor prior to the construction. It is preferable to include the waste management plan to be included in the ToR of the contractor.
Cultural resources	Low likelihood of major or medium impacts	Insignificant	No mitigation measures is needed
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 6-5. Assessed significance of expected impacts during construction phase of East Banha OHTL

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of East Banha OHTL			
Noise	High likelihood to occur – short term and temporary -	Medium Impact	<p>Application of the health and safety guide of the contractor should be implemented by construction workers.</p> <p>Notification to the surrounding establishment prior to the construction of the SS</p> <p>Time management and construction schedule according to the IFC regulation</p>

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Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of East Banha OHTL			
			provided by the contractor prior to the construction phase
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 routes and movement.
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
Hazardous Materials and Waste Management	Likely to occur - short term – Highly sensitive receptors include soil at protectorate areas and workers. Receptors with medium sensitivity include nearby settlements. Receptors with low sensitivity include groundwater.	Medium	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 upon the agreement with the licensed waste collector. For The hazardous waste, it will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).” 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	Low likelihood of major or medium impacts for workers– high likelihood of minor impact for sensitive recipient	Minor	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
Removing trees on ROW	Low likelihood of major or medium impacts	Medium to Major	Reduce impact significance to minor following RAP
Land use	Medium and direct impact to livelihood	Medium	Reduce impact significance to minor following recommendations of RAP preparation
Visual intrusion	Low likelihood of major or medium	Minor	Following the standard protection for the ground and soil disturbance, air

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of East Banha OHTL			
	impacts and localized		quality (and dust) measures and proper waste management described on the section of waste management measures Clear sign of the construction activities
Ecological (Fauna and Flora)	Medium likelihood to occur – short term	Minor	Following the standard protection for the fauna and flora and proper waste management described on the section of waste management measures
Bird Migration	Low likelihood to occur	Medium to Minor impact	<ul style="list-style-type: none"> Installing bird diverters devices or line markers such as spheres, spiral vibrational dampers, or bird deflectors in order to attract the attention of birds and avoid collision Avoid working in seasons of bird migration, Spring (March-May) and Autumn (August to November)
Water Resources	Medium likelihood to occur – short term	Minor	Standard prevention or precaution measures shall be prepared by the contractor prior to the construction. It is preferable to include the waste management plan to be included in the ToR of the contractor.
Cultural resources	Low likelihood of major or medium impacts	Insignificant	No mitigation measures is needed
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 6-6. Assessed significance of expected impacts during construction phase of Belbees OHTL

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of Belbees OHTL			
Noise	High likelihood to occur – short term and temporary -	Medium Impact	<p>Application of the health and safety guide of the contractor should be implemented by construction workers.</p> <p>Notification to the surrounding establishment prior to the construction of the SS</p> <p>Time management and construction schedule according to the IFC regulation provided by the contractor prior to the construction phase</p>
Traffic	High likelihood to occur – short term, temporary and localized only on the main road	Low to medium impact	<p>Time management for transporting the materials, equipment, debris, etc</p> <p>Clear sign surrounding construction site and the enter / exit gate</p> <p>Coordination with traffic department (ministry of interior) for vehicles routes and</p>

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Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of Belbees OHTL			
			movement.
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
Hazardous Materials and Waste Management	Likely to occur - short term – Highly sensitive receptors include soil at protectorate areas and workers. Receptors with medium sensitivity include nearby settlements. Receptors with low sensitivity include groundwater.	Medium	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 upon the agreement with the licensed waste collector. For The hazardous waste, it will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).” 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	Low likelihood of major or medium impacts for workers– high likelihood of minor impact for sensitive recipient	Minor	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
Removing trees on ROW	Low likelihood of major or medium impacts	Medium to Major	Reduce impact significance to minor following RAP
Land use	Medium and direct impact to livelihood	Medium	Reduce impact significance to minor following recommendations of RAP preparation
Visual intrusion	Low likelihood of major or medium impacts and localized	Minor	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
Ecological (Fauna and Flora)	Medium likelihood to occur – short term	Minor	Following the standard protection for the fauna and flora and proper waste management described on the section of waste management measures

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of Belbees OHTL			
Water Resources	Medium likelihood to occur – short term	Minor	Standard prevention or precaution measures shall be prepared by the contractor prior to the construction. It is preferable to include the waste management plan to be included in the ToR of the contractor.
Cultural resources	Low likelihood of major or medium impacts	Insignificant	No mitigation measures is needed
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 6-7. Assessed significance of expected impacts during construction phase of Zezenia OHTL

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of Zezenia OHTL			
Noise	High likelihood to occur – short term and temporary -	Medium Impact	Application of the health and safety guide of the contractor should be implemented 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
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 routes and movement.
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
Hazardous Materials and Waste Management	Likely to occur - short term – Highly sensitive receptors include soil at protectorate areas and workers. Receptors with medium sensitivity include nearby settlements. Receptors with low sensitivity include	Medium	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 upon the agreement with the licensed waste collector. For The hazardous waste, it will be

Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of Zezenia OHTL			
	groundwater.		<p>managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).”</p> <p>Protection of spillage including paved site for workshop or maintenance of vehicles</p> <p>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.</p>
Health and Safety	Low likelihood of major or medium impacts for workers– high likelihood of minor impact for sensitive recipient	Minor	<p>Standard protection by placing clear project signs.</p> <p>Time management for vehicles movement; especially avoiding the peak hours</p> <p>Standard protection for the workers especially working at elevated heights</p>
Removing trees on ROW	Low likelihood	insignificant	no cut of trees is associated to this OHTL
Land use	low likelihood	insignificant	OHTL will not pass by or cross any land use plans or community goals.
Visual intrusion	Low likelihood of major or medium impacts and localized	Minor	<p>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</p> <p>Clear sign of the construction activities</p>
Ecological (Fauna and Flora)	Medium likelihood to occur – short term	Minor	Following the standard protection for the fauna and flora and proper waste management described on the section of waste management measures
Bird Migration	Low likelihood to occur	Medium to Minor impact	<ul style="list-style-type: none"> Installing bird diverters devices or line markers such as spheres, spiral vibrational dampers, or bird deflectors in order to attract the attention of birds and avoid collision Avoid working in seasons of bird migration, Spring (March-May) and Autumn (August to November)
Water Resources	Medium likelihood to occur – short term	Minor	Standard prevention or precaution measures shall be prepared by the contractor prior to the construction. It is preferable to include the waste management plan to be included in the ToR of the contractor.
Cultural resources	Low likelihood of major or medium impacts	Insignificant	No mitigation measures is needed
Creation of Job opportunities and flourishing Economics of	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

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Impact	Likelihood and Severity	Significance	Mitigation Measures
Impacts during construction phase of Zezenia OHTL			
construction site			

6.3.3. Impact assessment during Operation of 10th of Ramadan 500 GIS Substation

During the operation of the substation, typically, beside the managerial and administration activities, the most important activities are operation and maintenance of the substation components according to their specifications, monitoring of the substation components and regular trainings (administrative, managerial, emergency plan, etc.)

It is expected that prior to the commissioning of the substation, the training of the operator staff will be done by the contractor / supplier, as a part of their contract for operation and maintenance of the substation. Normally, according to the practice done by EETC, at least 5 staff will be needed for operation and maintenance of new substation. Thus, the impact during the operation and maintenance of the substation is expected to be minimized.

However, the following potential impacts may result from the operation and maintenance of a substation:

Noise

Sources of noise during the operation and maintenance phase would include staff vehicles and GIS transformers and other supporting equipment of the substation. The primary impacts from noise would be localized disturbance. It is worth mentioning that the GIS substation is placed indoor and the transformers will be selected to have the least noise disturbance accordingly. Full noise measurements will be conduct for each new substation.

Impact significance:

The maintenance, investigation and staff and vehicles movement is not expected to be significant or consireded very low impact. The number of vehicles will be limited during operation and maintenance, the staff will be using the ear protection. However, regarding the noise generated from the operation of substation, the impact of the surrounding environment will not be highly noticable. According to the measurement for existing SS and the nearest residential area (refer to chapter 3).The impact to the sensitive reseptors surrounding is clasified as low impact.

Traffic

During the operation and maintenance of the substation, there will be no expected impact. There will be only small number of staff vehicles moving in and out from the substation. The additional number of vehicles will not impact the existing traffic at east desert highway.

Air Quality

Similarly for noise and traffic impact, vehicular traffic and machinery would continue to produce small amounts of fugitive dust and exhaust emissions during the operation and maintenance phase. These emissions would not likely exceed air quality standards nor have any impact or considered as low impact. Concerning the air emission from the GIS substation, as the substation is insulated; the gas emission is not expected and there is no impact generated from the substation during operation and maintenance phase.

Vibration

The substation will generate low vibration. Additional vibration will be associated with the staff vehicles only and it is considering low as the number of vehicles will be very small. Therefore, it is not expected there is any impact related to the vibration, thus the impact is considered very low and there is no mitigation measure is prepared.

Hazardous and non-hazardous wastes

During operation and maintenance of the substation, besides industrial hazardous and non-hazardous waste, small quantity of domestic wastes (solid and liquid waste) will be generated. Industrial hazardous wastes are generated during routine operations (e.g., lubricating oils, hydraulic fluids, coolants, solvents, and cleaning agents). These wastes are typically; according to EEAA regulations for hazardous waste management should be placed in containers, characterized and labeled, possibly stored briefly, and transported by a licensed contractor to an appropriate permitted off-site disposal facility as a standard practice.).

For hazardous solid and liquid wastes, proper waste collection and storage plus regular (preferably twice a week) waste collection by licensed contractors will need to be arranged by site management. To coordinate and control this. The site management should develop a waste management plan prepared by EETC .For the non-hazardous solid wastes, those that cannot be recycled will be disposed in a sanitary landfill periodically (weekly or monthly depending on the volume of waste generated). Regarding the domestic waste, as the existing collection is already established and the amount to be expected is considered small.

The domestic wastes (wastewater and solid waste) generated are relatively small as only small number of workers will be employed the operation and will be collected by a licensed contractors.

Impact significance:

Concerning the industrial wastes, accordingly, Medium impact shall be resulted due to the wastes generated. EEAA regulations should be followed to minimize the impact. The detailed mitigation measures are developed at the following chapter.

Concerning the domestic wastes, standard monitoring for leakage or damage for the pipeline and septic tank and it consider minimal impact of the wastes generated.

Risks of soil contamination

Risk of soil contamination is only associated with the possible spillage or leakage of the transformer oil. The possibilities of contaminating the soil during incident of oil spillage or leakage are not high although the amount of the transformers oils could be accidentally released to the environment is very high (over thousands of liters in every transformer, and, eventually, leakage of transformers oil is considered as being a great and serious environmental accident.

Impact Significance:

The soil contamination impact is considered to be high impact in case of rare leakage of the transformers oil but due to the design of transformer which is unusual to leakage so it can be considered as a minimal impact;

Health and Safety

Possible impacts to health and safety during operations include exposures to electromagnetic fields (EMF), accidental injury to workers during operation and maintenance activities. In addition; health and safety issues include working around energized equipment, and possible contact with natural hazards. However, during the operation and maintenance phase, if there is any incident or emergency situation, the impact will be negatively endanger the surrounding community and establishment.

Impact significance

Health and safety for the sensitive recipient (community surrounding the project site of substation) does not have a significant impact, as it is described previously that the project site is already far from any community or human life therefore, the impact can be classified as insignificant. In addition, the SF6 gas insulated in the SS will eliminate the EMF exposure to the environment.

In addition, the medium impact is identified for the health and safety of the workers. However; concerning the high risk impact associated to the incident or emergency situation, i.e. during the fire, leakage, or other equipment faults.

Natural disaster risks

An assessment of the risks to the operation and maintenance of the substation due to earthquake or seismic activity; concluded that the given engineering measures incorporated into the design of the SS and the potential environmental impacts of a seismic event are not anticipated to be significant. This impact would be considered as a minimal or insignificant impact. Possible mitigation measures have been already considered in the technical design.

Visual Resources and landscaping

As the substation is an indoor facility, and the transformers side will be placed in the area on the middle of the infrastructure, as well as the fences is considered high and the site itself is higher than the existing establishment, visually, there will be no indication that this site is a substation. The infrastructure within the site will be well integrated with the surrounding establishment. Therefore, the impact associated to the visual resource is considered minimal or insignificant and no measure is developed.

Ecological Resources (Flora and Fauna)

As the operation and maintenance of SS, Depending on the size and purpose of the substation, the area affected could vary from less than one Fadden. Already the area doesn't have any important flora or fauna there is no impact.

Creation of Job Opportunities and Flourishing Economies

The availability of stable electricity service may encourage members of the local community to open new business activities. This represents a positive opportunity for members of the local community. The problem that may arise can be related to increasing consumption patterns of electricity with the improvement of the service. Significance of Impact:

Positive Moderate Impact

The summary of the impact during operation of the SS will be presented in Table 6.5.

6.3.4. Impacts assessment during Operation of OHTLs

East Ismailia OHTL

Hazardous Materials and Wastes Management

There shall be different types of wastes generated during the operation phase of OHTL resulting from maintenance, repair and replacement activities. Among these types the following:

- Waste cables that will be replaced along the transmission line. Some of these cables may be covered with PVC insulators, which, if burned, cause harmful emissions including dioxins. Accordingly, waste cables could be of high risk if PVC cables were disposed in open dumps where it could be exposed to open fires.
- Scrap fittings, insulators, cross arms, conductors, and other scrap which are expected to be from inert materials that does not cause high risk in disposal/recycling procedure.

Impact Significance

Non-hazardous wastes which include domestic waste, and scrap associated with relatively low environmental risks. However, certain waste management procedures should be considered in order to avoid situations where scrap occupies large areas of land and causes aesthetic and land-use impacts.

Hazardous waste will be mainly generated from mechanical room during maintenance of equipment along the transmission line. Therefore, it is expected that the amount of generated hazardous waste will not be significant and it will be collected by a licensed waste contractor

The impact is considered of Medium significance due to the small amount of hazardous waste generated. The ESMP includes measures for establishing temporary stores (waste accumulation areas) for scrap at the project site and keeping the tidiness and cleanliness of these stores until scrap is sold for recycling or disposed as shall be detailed in the ESMP. In addition scrap, wastes shall be segregated as recommended according to the ESMP. Implementing the measures could reduce the impact to be of a minor significance.

Effect of Electromagnetic Fields (EMF)

Table 6-8. ICNIRP guidelines for EMF public and occupational exposure

Frequency	Public Exposure		Occupational Exposure	
	Electric Field (V/m)	Magnetic Field (mG)	Electric Field (V/m)	Magnetic Field (mG)
50 Hz	5,000	1,000	10,000	5,000
60 Hz	4,150	830	8,300	4,150

OHTL generate electromagnetic fields around the conductors, the intensity of such fields are proportional with the line voltage and electric current which changes in strength over time as the demand for electricity fluctuates. There are some concerns that EMFs could cause health impacts to the general public by prolonged exposure. EMFs have been considered by the International Agency for Research on Cancer (IARC) as possible carcinogenic, this classification was based on some evidences; however, there is no agreement among the scientific community about certain effects of EMFs.

In order to maintain safety of the general public and minimize exposure to EMFs some laws and guidelines require maintaining a suitable ROW distance so that the EMFs would effectively attenuate at the edge of this ROW. As mentioned in Chapter 2, The Egyptian Electricity Law 87/2015 indicates that the guidance ROW distance for transmission lines is 25 meters for high voltages from the center of the transmission

Impact Significance:

The ICNIRP has set a guideline figure that public exposure to EMF should not exceed 830 mG and occupation exposure should not exceed 4,150 mG, these figures for electric fields are 4.2 and 8.3 kV/m for public and occupational exposure respectively. By fixing a ROW distance of 50 meters (divided into 25 meters each from the **Centre** of the transmission lines(for 500 kV OHTL) the impact of EMFs on the inhabitants is expected to have a medium impact significant which will be minimized to Minor Impact if mitigations are applied.

Risk of Soil Contamination

Risk of soil contamination associated with the operation phase of the transmission lines is minimal. This could only arise if spent parts during maintenance are accidentally dumped at random sites across the line which is totally banned. The severity of such impact will depend on the local conditions where the waste is dumped and whether contaminants migration and propagation would be likely to take place in the event of a rainfall.

Impact Significance:

Along the transmission line the impact is considered minor impact if design precautions are applied. Application of appropriate mitigation will effectively control the impact and minimize it to the maximum possible extent.

Noise

OHTL are not sources of noise; however noise may be emanated due to corona effects. Corona associates with operating OHTL under certain weather conditions, rainy and foggy weather, which is not normally, occur along the proposed routes.

The baseline assessment of noise quality along the OHTL line indicated that the hourly equivalent sound levels do not exceed the 8-hr maximum limit value of 45 dB as mentioned in the Egyptian law no.4/1994.

The noise impacts could be analyzed in two main aspects: noise impact within the project areas, and the noise impact on the neighboring receptors.

Impact Significance:

Since noise may be emanate from OHTL due to corona effects only which is associated with the operation hours of the OHTL and special weather conditions, the impact is considered minor.

Archeological and Cultural Sites

Impacts during the operations and maintenance phase for cultural resources as well as visual impact does not have any significant impact and OHTL. Therefore, there are no mitigation measures to be developed.

Natural disaster risks

The potential environmental impacts of a seismic event are not anticipated to be significant in the route of the OHTLs. This impact would be considered as insignificant impact. No mitigation identified as the technical specifications of the equipment is include the standard measures for natural disaster risks

Health and Safety

There are major safety risks associated with the operation of OHTL : 1) electric shock risks, 2)the probability to fall down the towers, 3) impact of electromagnetic field under the ROW and, 4) fire risks. Electrocution could happen for maintenance operators during repairs or to the general public because of unforeseen accidents; however the normal safety precautions that are followed in the design and construction of transmission lines, transformers, etc are generally minimizing such risks both to the general public and to the maintenance workers.

A number of epidemiological studies suggest small increases in risk of childhood leukemia with exposure to low frequency magnetic fields in the home. However, scientists have not generally concluded that these results indicate a cause-effect relation between exposure to the fields and disease (as opposed to artifacts in the study or effects unrelated to field exposure). In part, this conclusion has been reached because animal and laboratory studies fail to demonstrate any reproducible effects that are consistent with the hypothesis that fields cause or promote cancer.

Fire risks could be due to connection of transmission lines to vegetation, an issue which have been previously discussed in the impacts of construction phase and it was mentioned that power line routing will avoid, as much as possible. Fields having high trees will be removed from the ROW zone of transmission lines. Another factor which could cause fires, is overloading of transmission lines, a risk that is also minimized by adequate safety precautions in the design and operation of the system.

Although electrocution accidents and fires could lead to losses in lives and properties, it is believed that the normal design, construction and operation procedures expected to be followed by the EETC, in accordance to Labor Law, No. 12 of year 2003 will provide sufficient safety precautions so that accidents will be due to unforeseen factors that could not be considered in risk estimation

Impact significance

Health and safety for the sensitive recipient (community surrounding the project site of transmission lines) does not have a significant impact, as it is described previously that the project site is already localized. Therefore, the impact can be classified as minor.

In addition, the medium to major impact is identified for the health and safety of the workers. The standard protection of the workers, especially for the workers that involved in the risk due to the height has to be put into mitigation measures and in the management and monitoring plan to minimize and reduce the significant impact. The impact has been classified as medium impact that could be reduced, following mitigation measures, to minor impact.

In addition, regarding the safety issues, EETC periodically provide the specific trainings for the operators and the workers who is responsible for the work of operation and maintenance of the transmission line. The training obtains include the civil protection, firefighting and smoke detection, besides the operation and maintenance of the transmission lines and its equipment. The map of the emergency plan in case of fire accident is also provided.

However, although EETC is already taking precaution for its operator and workers for safety standard, the ESMP is designated to minimize the impact of such accident. It is also worth noting that at Cairo 500 substation that has been established since 1964 has no recorded accidents at the substation and its interconnection lines.

In addition, the medium to major impact is identified for the health and safety of the workers. The standard protection of the workers, particularly, for the workers who get involved in the risk due to the height has to be put into mitigation measures and in the management and monitoring plan to minimize and reduce the significant impact.

Visual Intrusion

The overhead transmission lines would be highly visible in rural or natural landscapes. The artificial appearance of a transmission line may have visually intrusion associations for some, particularly in a predominantly natural landscape. Visual evidence of these projects cannot be completely avoided, reduced, or concealed.

Impact significance:

Major impact will be associated to the visual intrusion that cannot be avoided or mitigated.

Summary of significant Impact during Operation of SS and OHTL is presented on Table 6.5 and Table 6.6 respectively.

Ecological Resources (Flora and Fauna)

The impact of the OHTLs is insignificant on flora and fauna as already the area don't have any important flora or fauna. Therefore, there is no impact.

Impact Significance:

This impact is considered: minor impact

Bird Migration

Regarding the bird migration, the OHTL's route crosses the path of the birds' migration as seen on the below maps. Based on Bird Life international tool's report (Annex 4) ,the overall sensitivity of this project area is considered medium as there are 4 soaring bird species observed in the area, classified as **LC**(least concern) according to the IUCN Red List; while a further 28 soaring bird species classified as **LC**; **NT**(near threatened); **VU** (vulnerable); **EN** (endangered) are expected but not observed (classification of 'observed' or 'expected' based on presence status). Therefore, mitigation measures are required to be implemented to minimize the risk of birds' electrocution and collision. The following figures represent the birds' migration path versus route of OHTL.

Impact Significance:

This impact is considered to be medium impact.

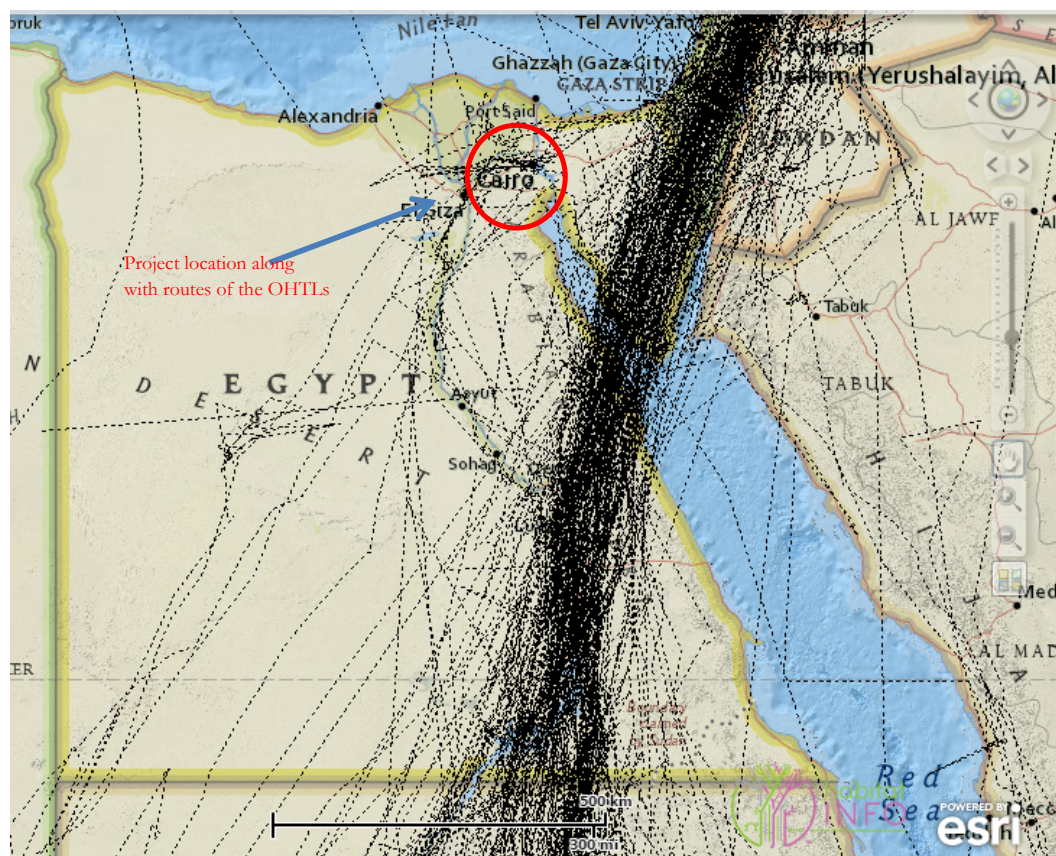


Figure 6-13 Main migration routes in Egypt
source: BirdLife International (2015)

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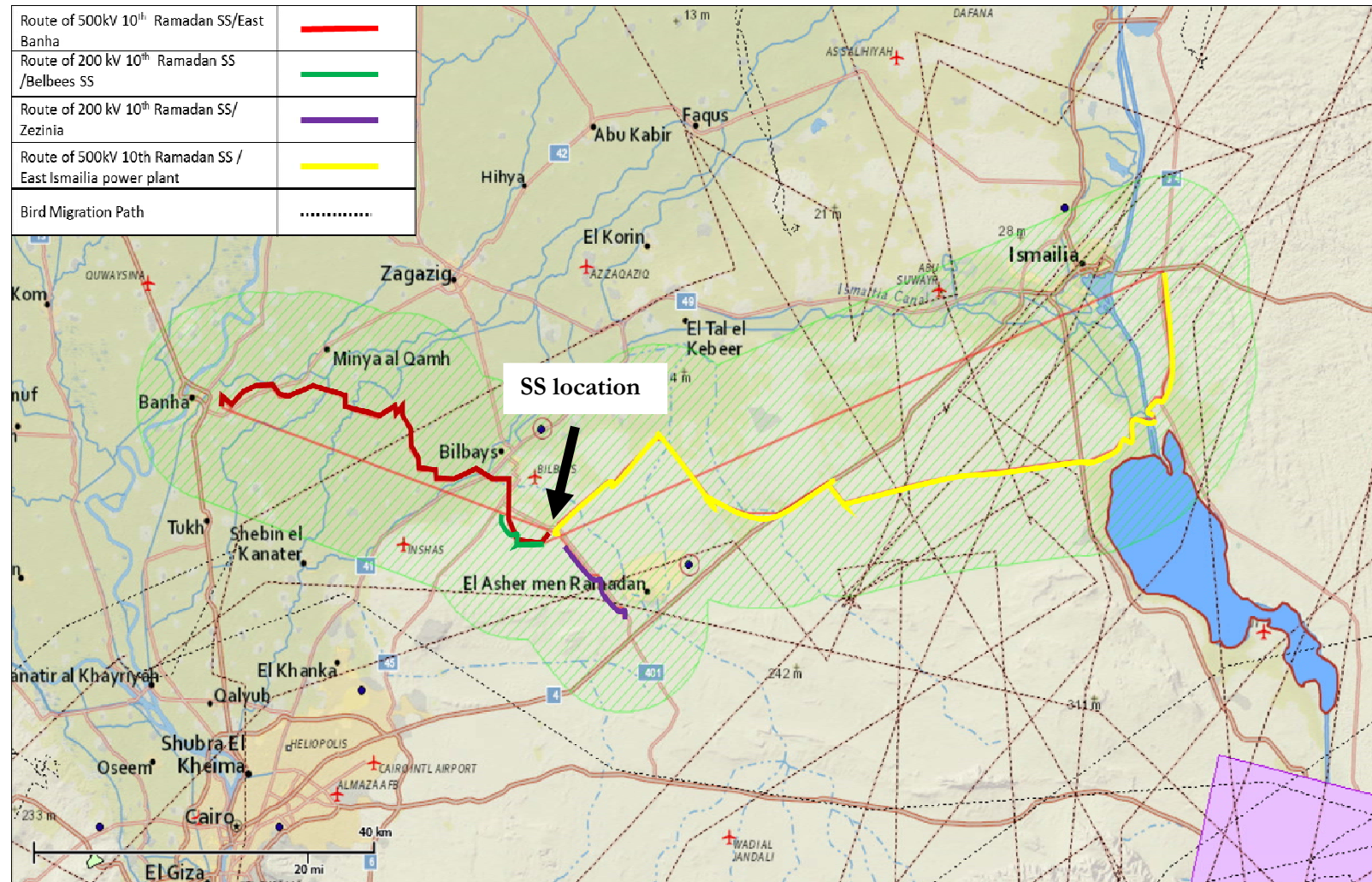


Figure 6-14 Main migration routes in Egypt versus the route of East Ismailia OHTL in yellow

source: BirdLife International (2019)

Creation of Job Opportunities and Flourishing Economies

The availability of stable electricity service may encourage members of the local community to open new business activities. This represents a positive opportunity for members of the local community. The problem that may arise can be related to increasing consumption patterns of electricity with the improvement of the service. It is a positive impact.

East Banha OHTL

Hazardous Materials and Wastes Management

There shall be different types of wastes generated during the operation phase of OHTL resulting from maintenance, repair and replacement activities. Among these types the following:

- Waste cables that will be replaced along the transmission line. Some of these cables may be covered with PVC insulators, which, if burned, cause harmful emissions including dioxins. Accordingly, waste cables could be of high risk if PVC cables were disposed in open dumps where it could be exposed to open fires.
- Scrap fittings, insulators, cross arms, conductors, and other scrap which are expected to be from inert materials that does not cause high risk in disposal/recycling procedure.

Impact Significance

Non-hazardous wastes which include domestic waste, and scrap associated with relatively low environmental risks. However, certain waste management procedures should be considered in order to avoid situations where scrap occupies large areas of land and causes aesthetic and land-use impacts.

Hazardous waste will be mainly generated from mechanical room during maintenance of equipment along the transmission line. Therefore, it is expected that the amount of generated hazardous waste will not be significant and it will be collected by a licensed waste contractor

The impact is considered of Medium significance due to the small amount of hazardous waste generated. The ESMP includes measures for establishing temporary stores (waste accumulation areas) for scrap at the project site and keeping the tidiness and cleanliness of these stores until scrap is sold for recycling or disposed as shall be detailed in the ESMP. In addition scrap, wastes shall be segregated as recommended according to the ESMP. Implementing the measures could reduce the impact to be of a minor significance.

Effect of Electromagnetic Fields (EMF)

Table 6-9. ICNIRP guidelines for EMF public and occupational exposure

Frequency	Public Exposure		Occupational Exposure	
	Electric Field (V/m)	Magnetic Field (mG)	Electric Field (V/m)	Magnetic Field (mG)
50 Hz	5,000	1,000	10,000	5,000
60 Hz	4,150	830	8,300	4,150

OHTL generate electromagnetic fields around the conductors, the intensity of such fields are proportional with the line voltage and electric current which changes in strength over time as the demand for electricity fluctuates. There are some concerns that EMFs could cause health impacts to the general public by prolonged exposure. EMFs have been considered by the International Agency for Research on Cancer (IARC) as possible carcinogenic, this classification was based on some evidences; however, there is no agreement among the scientific community about certain effects of EMFs.

In order to maintain safety of the general public and minimize exposure to EMFs some laws and guidelines require maintaining a suitable ROW distance so that the EMFs would effectively attenuate at the edge of this ROW. As mentioned in Chapter 2, The Egyptian Electricity Law 87/2015 indicates that the guidance ROW distance for transmission lines is 25 meters for high voltages from the center of the transmission

Impact Significance:

The ICNIRP has set a guideline figure that public exposure to EMF should not exceed 830 mG and occupation exposure should not exceed 4,150 mG, these figures for electric fields are 4.2 and 8.3 kV/m for public and occupational exposure respectively. By fixing a ROW distance of 50 meters (divided into 25 meters each from the **Centre** of the transmission lines (for 500 kV OHTL) the impact of EMFs on the inhabitants is expected to have a medium impact significant which will be minimized to Minor Impact if mitigations are applied.

Risk of Soil Contamination

Risk of soil contamination associated with the operation phase of the transmission lines is minimal. This could only arise if spent parts during maintenance are accidentally dumped at random sites across the line which is totally banned. The severity of such impact will depend on the local conditions where the waste is dumped and whether contaminants migration and propagation would be likely to take place in the event of a rainfall.

Impact Significance:

Along the transmission line the impact is considered minor impact if design precautions are applied. Application of appropriate mitigation will effectively control the impact and minimize it to the maximum possible extent.

Noise

OHTL are not sources of noise; however noise may be emanated due to corona effects. Corona associates with operating OHTL under certain weather conditions, rainy and foggy weather, which is not normally, occur along the proposed routes.

The baseline assessment of noise quality along the OHTL line indicated that the hourly equivalent sound levels do not exceed the 8-hr maximum limit value of 45 dB as mentioned in the Egyptian law no.4/1994.

The noise impacts could be analyzed in two main aspects: noise impact within the project areas, and the noise impact on the neighboring receptors.

Impact Significance:

Since noise may be emanate from OHTL due to corona effects only which is associated with the operation hours of the OHTL and special weather conditions, the impact is considered minor.

Archeological and Cultural Sites

Impacts during the operations and maintenance phase for cultural resources as well as visual impact does not have any significant impact and OHTL. Therefore, there are no mitigation measures to be developed.

Natural disaster risks

The potential environmental impacts of a seismic event are not anticipated to be significant in the route of the OHTLs. This impact would be considered as insignificant impact. No mitigation identified as the technical specifications of the equipment is include the standard measures for natural disaster risks

Health and Safety

There are major safety risks associated with the operation of OHTL: 1) electric shock risks, 2) the probability to fall down the towers, 3) impact of electromagnetic field under the ROW and, 4) fire risks. Electrocution could happen for maintenance operators during repairs or to the general public because of unforeseen accidents; however the normal safety precautions that are followed in the design and construction of transmission lines, transformers, etc are generally minimizing such risks both to the general public and to the maintenance workers.

A number of epidemiological studies suggest small increases in risk of childhood leukemia with exposure to low frequency magnetic fields in the home. However, scientists have not generally concluded that these results indicate a cause-effect relation between exposure to the fields and disease (as opposed to artifacts in the study or effects unrelated to field exposure). In part, this conclusion has been reached because animal and laboratory studies fail to demonstrate any reproducible effects that are consistent with the hypothesis that fields cause or promote cancer.

Fire risks could be due to connection of transmission lines to vegetation, an issue which have been previously discussed in the impacts of construction phase and it was mentioned that power line routing will avoid, as much as possible. Fields having high trees will be removed from the ROW zone of transmission lines. Another factor which could cause fires, is overloading of transmission system, a risk that is also minimized by adequate safety precautions in the design and operation of the system.

Although electrocution accidents and fires could lead to losses in lives and properties, it is believed that the normal design, construction and operation procedures expected to be followed by the EETC, in accordance to Labor Law, No. 12 of year 2003 will provide sufficient safety precautions so that accidents will be due to unforeseen factors that could not be considered in risk estimation

Impact significance

Health and safety for the sensitive recipient (community surrounding the project site of transmission lines) does not have a significant impact, as it is described previously that the project site is already localized. Therefore, the impact can be classified as minor.

In addition, the medium to major impact is identified for the health and safety of the workers. The standard protection of the workers, especially for the workers that involved in the risk due to the height has to be put into mitigation measures and in the management and monitoring plan to minimize and reduce the significant impact. The impact has been classified as medium impact that could be reduced, following mitigation measures, to minor impact.

In addition, regarding the safety issues, EETC periodically provide the specific trainings for the operators and the workers who is responsible for the work of operation and maintenance of the transmission line. The training obtains include the civil protection, firefighting and smoke detection, besides the operation and maintenance of the transmission lines and its equipment. The map of the emergency plan in case of fire accident is also provided.

However, although EETC is already taking precaution for its operator and workers for safety standard, the ESMP is designated to minimize the impact of such accident. It is also worth noting that at Cairo 500 substation that has been established since 1964 has no recorded accidents at the substation and its interconnection lines.

In addition, the medium to major impact is identified for the health and safety of the workers. The standard protection of the workers, particularly, for the workers who get involved in the risk due to the height has to be put into mitigation measures and in the management and monitoring plan to minimize and reduce the significant impact.

Visual Intrusion

The overhead transmission lines would be highly visible in rural or natural landscapes. The artificial appearance of a transmission line may have visually intrusion associations for some, particularly in a predominantly natural landscape. Visual evidence of these projects cannot be completely avoided, reduced, or concealed.

Impact significance:

Major impact will be associated to the visual intrusion that cannot be avoided or mitigated.

Summary of significant Impact during Operation of SS and OHTL is presented on Table 6.5 and Table 6.6 respectively.

Ecological Resources (Flora and Fauna)

The impact of the OHTLs is insignificant on flora and fauna as already the area don't have any important flora or fauna. Therefore, there is no impact.

Impact Significance:

This impact is considered: minor impact

Bird Migration

Regarding the bird migration, the OHTL's route crosses the path of the birds' migration as seen on the below maps. Based on Bird Life international tool's report (Annex 4), the overall sensitivity of this project area is considered medium as there are 4 soaring bird species observed in the area, classified as **LC** (least concern) according to the IUCN Red List; while a further 28 soaring bird species classified as **LC; NT** (near threatened); **VU** (vulnerable); **EN** (endangered) are expected but not observed (classification of 'observed' or 'expected' based on presence status). Therefore, mitigation measures are required to be implemented to minimize the risk of birds' electrocution and collision. The following figures represent the birds' migration path versus route of OHTL.

Impact Significance:

This impact is considered to be medium impact.

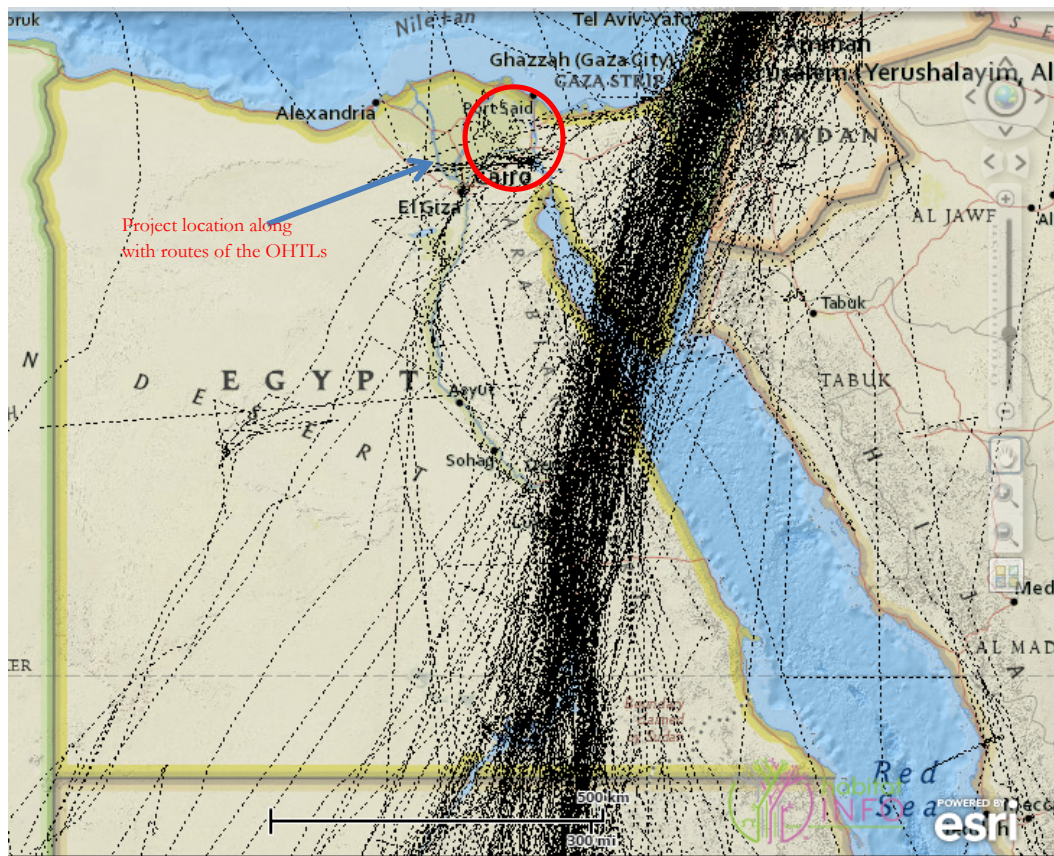


Figure 6-15 Main migration routes in Egypt

source: BirdLife International (2015)

10th of Ramadan GIS Substation & its Overhead Transmission Lines_ Final

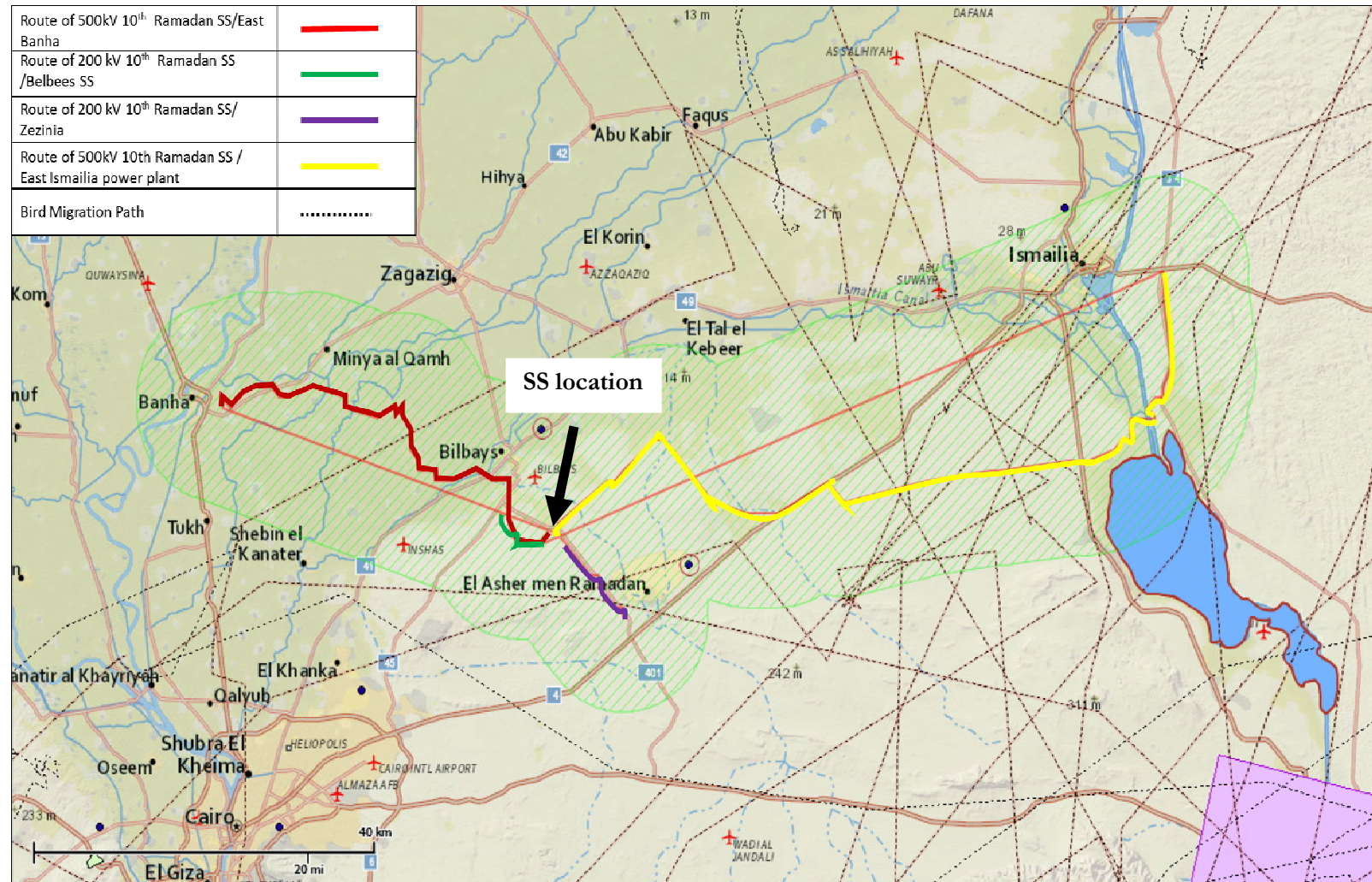


Figure 6-16 Main migration routes in Egypt versus the route of East Banha OHTL in red

source: BirdLife International (2019)

Creation of Job Opportunities and Flourishing Economies

The availability of stable electricity service may encourage members of the local community to open new business activities. This represents a positive opportunity for members of the local community. The problem that may arise can be related to increasing consumption patterns of electricity with the improvement of the service. It is a positive impact.

Belbees OHTL

Hazardous Materials and Wastes Management

There shall be different types of wastes generated during the operation phase of OHTL resulting from maintenance, repair and replacement activities. Among these types the following:

- Waste cables that will be replaced along the transmission line. Some of these cables may be covered with PVC insulators, which, if burned, cause harmful emissions including dioxins. Accordingly, waste cables could be of high risk if PVC cables were disposed in open dumps where it could be exposed to open fires.
- Scrap fittings, insulators, cross arms, conductors, and other scrap which are expected to be from inert materials that does not cause high risk in disposal/recycling procedure.

Impact Significance

Non-hazardous wastes which include domestic waste, and scrap associated with relatively low environmental risks. However, certain waste management procedures should be considered in order to avoid situations where scrap occupies large areas of land and causes aesthetic and land-use impacts.

Hazardous waste will be mainly generated from mechanical room during maintenance of equipment along the transmission line. Therefore, it is expected that the amount of generated hazardous waste will not be significant and it will be collected by a licensed waste contractor

The impact is considered of Medium significance due to the small amount of hazardous waste generated. The ESMP includes measures for establishing temporary stores (waste accumulation areas) for scrap at the project site and keeping the tidiness and cleanliness of these stores until scrap is sold for recycling or disposed as shall be detailed in the ESMP. In addition scrap, wastes shall be segregated as recommended according to the ESMP. Implementing the measures could reduce the impact to be of a minor significance.

Effect of Electromagnetic Fields (EMF)

Table 6-10. ICNIRP guidelines for EMF public and occupational exposure

Frequency	Public Exposure		Occupational Exposure	
	Electric Field (V/m)	Magnetic Field (mG)	Electric Field (V/m)	Magnetic Field (mG)
50 Hz	5,000	1,000	10,000	5,000

Frequency	Public Exposure		Occupational Exposure	
	Electric Field (V/m)	Magnetic Field (mG)	Electric Field (V/m)	Magnetic Field (mG)
60 Hz	4,150	830	8,300	4,150

OHTL generate electromagnetic fields around the conductors, the intensity of such fields are proportional with the line voltage and electric current which changes in strength over time as the demand for electricity fluctuates. There are some concerns that EMFs could cause health impacts to the general public by prolonged exposure. EMFs have been considered by the International Agency for Research on Cancer (IARC) as possible carcinogenic, this classification was based on some evidences; however, there is no agreement among the scientific community about certain effects of EMFs.

In order to maintain safety of the general public and minimize exposure to EMFs some laws and guidelines require maintaining a suitable ROW distance so that the EMFs would effectively attenuate at the edge of this ROW. As mentioned in Chapter 2, The Egyptian Electricity Law 87/2015 indicates that the guidance ROW distance for transmission lines is 25 meters for high voltages from the center of the transmission

Impact Significance:

The ICNIRP has set a guideline figure that public exposure to EMF should not exceed 830 mG and occupation exposure should not exceed 4,150 mG, these figures for electric fields are 4.2 and 8.3 kV/m for public and occupational exposure respectively. By fixing a ROW distance of 50 meters (divided into 25 meters each from the **Centre** of the transmission lines(for 500 kV OHTL) the impact of EMFs on the inhabitants is expected to have a medium impact significant which will be minimized to Minor Impact if mitigations are applied.

Risk of Soil Contamination

Risk of soil contamination associated with the operation phase of the transmission lines is minimal. This could only arise if spent parts during maintenance are accidentally dumped at random sites across the line which is totally banned. The severity of such impact will depend on the local conditions where the waste is dumped and whether contaminants migration and propagation would be likely to take place in the event of a rainfall.

Impact Significance:

Along the transmission line the impact is considered minor impact if design precautions are applied. Application of appropriate mitigation will effectively control the impact and minimize it to the maximum possible extent.

Noise

OHTL are not sources of noise; however noise may be emanated due to corona effects. Corona associates with operating OHTL under certain weather conditions, rainy and foggy weather, which is not normally, occur along the proposed routes.

The baseline assessment of noise quality along the OHTL line indicated that the hourly equivalent sound levels do not exceed the 8-hr maximum limit value of 45 dB as mentioned in the Egyptian law no.4/1994.

The noise impacts could be analyzed in two main aspects: noise impact within the project areas, and the noise impact on the neighboring receptors.

Impact Significance:

Since noise may be emanate from OHTL due to corona effects only which is associated with the operation hours of the OHTL and special weather conditions, the impact is considered minor.

Archeological and Cultural Sites

Impacts during the operations and maintenance phase for cultural resources as well as visual impact does not have any significant impact and OHTL. Therefore, there are no mitigation measures to be developed.

Natural disaster risks

The potential environmental impacts of a seismic event are not anticipated to be significant in the route of the OHTLs. This impact would be considered as insignificant impact. No mitigation identified as the technical specifications of the equipment is include the standard measures for natural disaster risks

Health and Safety

There are major safety risks associated with the operation of OHTL : 1) electric shock risks, 2)the probability to fall down the towers, 3) impact of electromagnetic field under the ROW and, 4) fire risks. Electrocutation could happen for maintenance operators during repairs or to the general public because of unforeseen accidents; however the normal safety precautions that are followed in the design and construction of transmission lines, transformers, etc are generally minimizing such risks both to the general public and to the maintenance workers.

A number of epidemiological studies suggest small increases in risk of childhood leukemia with exposure to low frequency magnetic fields in the home. However, scientists have not generally concluded that these results indicate a cause-effect relation between exposure to the fields and disease (as opposed to artifacts in the study or effects unrelated to field exposure). In part, this conclusion has been reached because animal and laboratory studies fail to demonstrate any reproducible effects that are consistent with the hypothesis that fields cause or promote cancer.

Fire risks could be due to connection of transmission lines to vegetation, an issue which have been previously discussed in the impacts of construction phase and it was mentioned that power line routing will avoid, as much as possible. Fields having high trees will be removed from the ROW zone of transmission lines. Another factor which could cause fires, is overloading of transmission lines, a risk that is also minimized by adequate safety precautions in the design and operation of the system.

Although electrocution accidents and fires could lead to losses in lives and properties, it is believed that the normal design, construction and operation procedures expected to be followed by the EETC, in

accordance to Labor Law, No. 12 of year 2003 will provide sufficient safety precautions so that accidents will be due to unforeseen factors that could not be considered in risk estimation

Impact significance

Health and safety for the sensitive recipient (community surrounding the project site of transmission lines) does not have a significant impact, as it is described previously that the project site is already localized. Therefore, the impact can be classified as minor.

In addition, the medium to major impact is identified for the health and safety of the workers. The standard protection of the workers, especially for the workers that involved in the risk due to the height has to be put into mitigation measures and in the management and monitoring plan to minimize and reduce the significant impact. The impact has been classified as medium impact that could be reduced, following mitigation measures, to minor impact.

In addition, regarding the safety issues, EETC periodically provide the specific trainings for the operators and the workers who is responsible for the work of operation and maintenance of the transmission line. The training obtains include the civil protection, firefighting and smoke detection, besides the operation and maintenance of the transmission lines and its equipment. The map of the emergency plan in case of fire accident is also provided.

However, although EETC is already taking precaution for its operator and workers for safety standard, the ESMP is designated to minimize the impact of such accident. It is also worth noting that at Cairo 500 substation that has been established since 1964 has no recorded accidents at the substation and its interconnection lines.

In addition, the medium to major impact is identified for the health and safety of the workers. The standard protection of the workers, particularly, for the workers who get involved in the risk due to the height has to be put into mitigation measures and in the management and monitoring plan to minimize and reduce the significant impact.

Visual Intrusion

The overhead transmission lines would be highly visible in rural or natural landscapes. The artificial appearance of a transmission line may have visually intrusion associations for some, particularly in a predominantly natural landscape. Visual evidence of these projects cannot be completely avoided, reduced, or concealed.

Impact significance:

Major impact will be associated to the visual intrusion that cannot be avoided or mitigated.

Summary of significant Impact during Operation of SS and OHTL is presented on Table 6.5 and Table 6.6 respectively.

Ecological Resources (Flora and Fauna)

The impact of the OHTLs is insignificant on flora and fauna as already the area don't have any important flora or fauna. Therefore, there is no impact.

Regarding the bird migration, the OHTL doesn't cross bird migration path. The following figure represents the birds' migration path versus the project location.

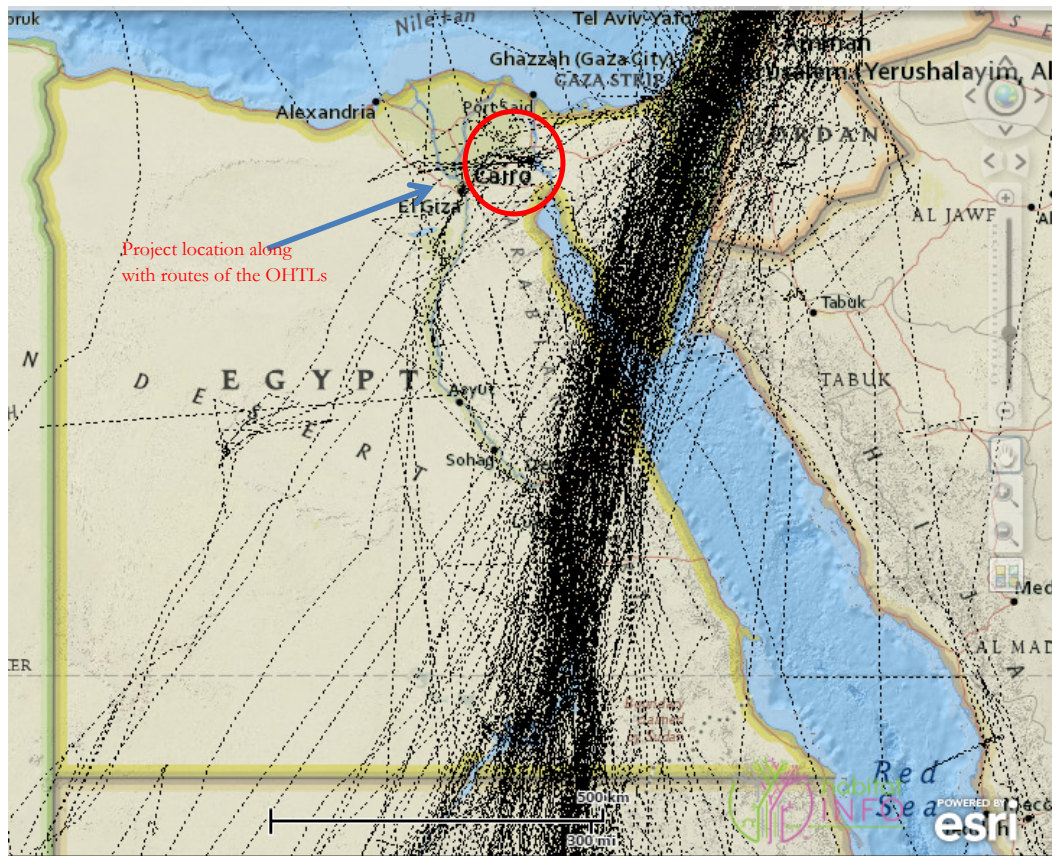


Figure 6-17 Main migration routes in Egypt

source: BirdLife International (2015)

10th of Ramadan GIS Substation & its Overhead Transmission Lines_ Final

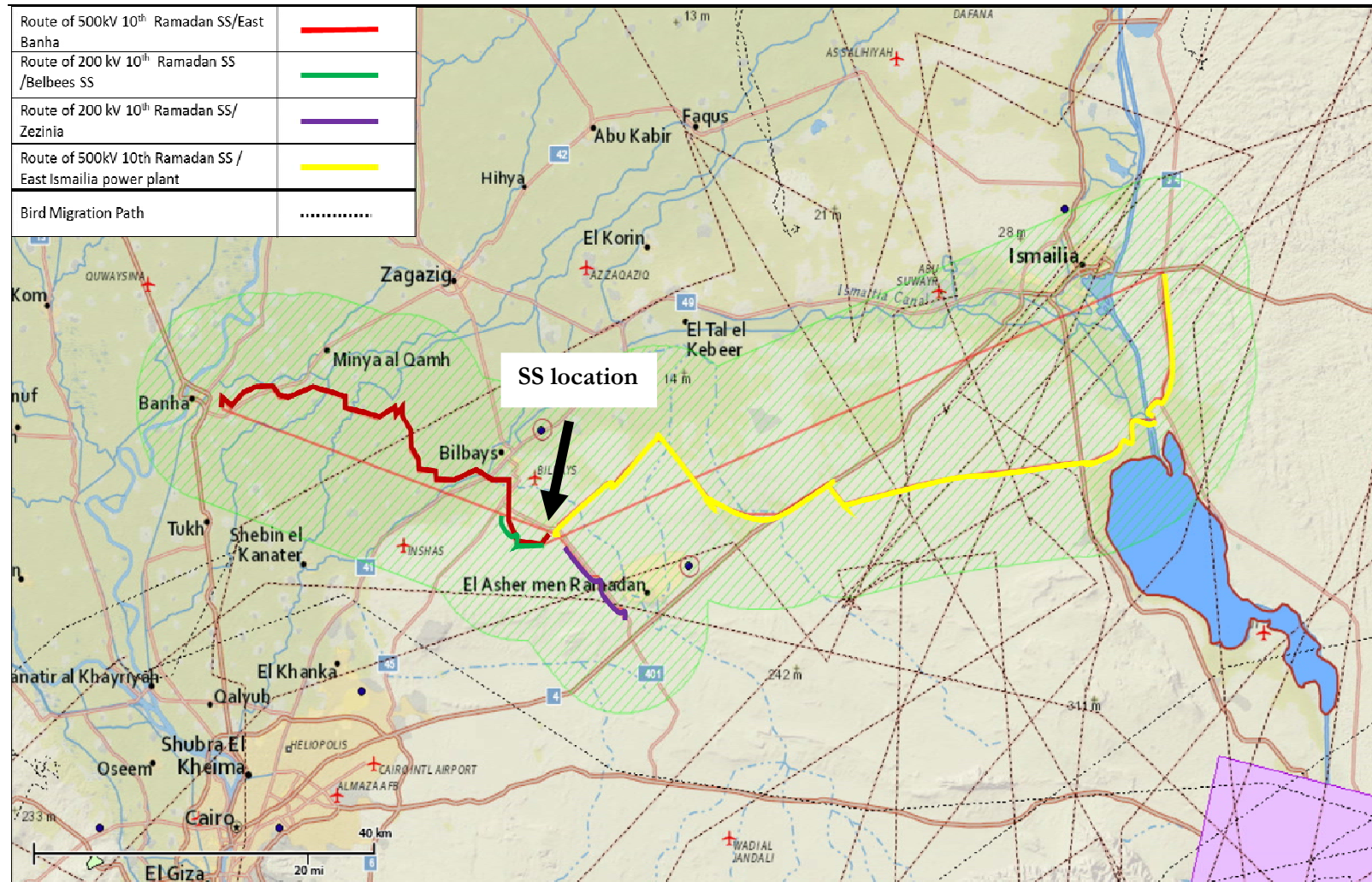


Figure 6-18 Main migration routes in Egypt versus the route of Belbees OHTL in green

source: BirdLife International (2019)

Impact significance:

This impact is considered as Minor impact

Creation of Job Opportunities and Flourishing Economies

The availability of stable electricity service may encourage members of the local community to open new business activities. This represents a positive opportunity for members of the local community. The problem that may arise can be related to increasing consumption patterns of electricity with the improvement of the service. It is a positive impact.

Zezenia OHTL

Hazardous Materials and Wastes Management

There shall be different types of wastes generated during the operation phase of OHTL resulting from maintenance, repair and replacement activities. Among these types the following:

- Waste cables that will be replaced along the transmission line. Some of these cables may be covered with PVC insulators, which, if burned, cause harmful emissions including dioxins. Accordingly, waste cables could be of high risk if PVC cables were disposed in open dumps where it could be exposed to open fires.
- Scrap fittings, insulators, cross arms, conductors, and other scrap which are expected to be from inert materials that does not cause high risk in disposal/recycling procedure.

Impact Significance

Non-hazardous wastes which include domestic waste, and scrap associated with relatively low environmental risks. However, certain waste management procedures should be considered in order to avoid situations where scrap occupies large areas of land and causes aesthetic and land-use impacts.

Hazardous waste will be mainly generated from mechanical room during maintenance of equipment along the transmission line. Therefore, it is expected that the amount of generated hazardous waste will not be significant and it will be collected by a licensed waste contractor

The impact is considered of Medium significance due to the small amount of hazardous waste generated. The ESMP includes measures for establishing temporary stores (waste accumulation areas) for scrap at the project site and keeping the tidiness and cleanliness of these stores until scrap is sold for recycling or disposed as shall be detailed in the ESMP. In addition scrap, wastes shall be segregated as recommended according to the ESMP. Implementing the measures could reduce the impact to be of a minor significance.

Effect of Electromagnetic Fields (EMF)

Table 6-11. ICNIRP guidelines for EMF public and occupational exposure

Frequency	Public Exposure		Occupational Exposure	
	Electric Field (V/m)	Magnetic Field (mG)	Electric Field (V/m)	Magnetic Field (mG)
50 Hz	5,000	1,000	10,000	5,000
60 Hz	4,150	830	8,300	4,150

OHTL generate electromagnetic fields around the conductors, the intensity of such fields are proportional with the line voltage and electric current which changes in strength over time as the demand for electricity fluctuates. There are some concerns that EMFs could cause health impacts to the general public by prolonged exposure. EMFs have been considered by the International Agency for Research on Cancer (IARC) as possible carcinogenic, this classification was based on some evidences; however, there is no agreement among the scientific community about certain effects of EMFs.

In order to maintain safety of the general public and minimize exposure to EMFs some laws and guidelines require maintaining a suitable ROW distance so that the EMFs would effectively attenuate at the edge of this ROW. As mentioned in Chapter 2, The Egyptian Electricity Law 87/2015 indicates that the guidance ROW distance for transmission lines is 25 meters for high voltages from the center of the transmission

Impact Significance:

The ICNIRP has set a guideline figure that public exposure to EMF should not exceed 830 mG and occupation exposure should not exceed 4,150 mG, these figures for electric fields are 4.2 and 8.3 kV/m for public and occupational exposure respectively. By fixing a ROW distance of 50 meters (divided into 25 meters each from the **Centre** of the transmission lines(for 500 kV OHTL) the impact of EMFs on the inhabitants is expected to have a medium impact significant which will be minimized to Minor Impact if mitigations are applied.

Risk of Soil Contamination

Risk of soil contamination associated with the operation phase of the transmission lines is minimal. This could only arise if spent parts during maintenance are accidentally dumped at random sites across the line which is totally banned. The severity of such impact will depend on the local conditions where the waste is dumped and whether contaminants migration and propagation would be likely to take place in the event of a rainfall.

Impact Significance:

Along the transmission line the impact is considered minor impact if design precautions are applied. Application of appropriate mitigation will effectively control the impact and minimize it to the maximum possible extent.

Noise

OHTL are not sources of noise; however noise may be emanated due to corona effects. Corona associates with operating OHTL under certain weather conditions, rainy and foggy weather, which is not normally, occur along the proposed routes.

The baseline assessment of noise quality along the OHTL line indicated that the hourly equivalent sound levels do not exceed the 8-hr maximum limit value of 45 dB as mentioned in the Egyptian law no.4/1994.

The noise impacts could be analyzed in two main aspects: noise impact within the project areas, and the noise impact on the neighboring receptors.

Impact Significance:

Since noise may be emanate from OHTL due to corona effects only which is associated with the operation hours of the OHTL and special weather conditions, the impact is considered minor.

Archeological and Cultural Sites

Impacts during the operations and maintenance phase for cultural resources as well as visual impact does not have any significant impact and OHTL. Therefore, there are no mitigation measures to be developed.

Natural disaster risks

The potential environmental impacts of a seismic event are not anticipated to be significant in the route of the OHTLs. This impact would be considered as insignificant impact. No mitigation identified as the technical specifications of the equipment is include the standard measures for natural disaster risks

Health and Safety

There are major safety risks associated with the operation of OHTL: 1) electric shock risks, 2) the probability to fall down the towers, 3) impact of electromagnetic field under the ROW and, 4) fire risks. Electrocution could happen for maintenance operators during repairs or to the general public because of unforeseen accidents; however the normal safety precautions that are followed in the design and construction of transmission lines, transformers, etc are generally minimizing such risks both to the general public and to the maintenance workers.

A number of epidemiological studies suggest small increases in risk of childhood leukemia with exposure to low frequency magnetic fields in the home. However, scientists have not generally concluded that these results indicate a cause-effect relation between exposure to the fields and disease (as opposed to artifacts in the study or effects unrelated to field exposure). In part, this conclusion has been reached because animal and laboratory studies fail to demonstrate any reproducible effects that are consistent with the hypothesis that fields cause or promote cancer.

Fire risks could be due to connection of transmission lines to vegetation, an issue which have been previously discussed in the impacts of construction phase and it was mentioned that power line routing will avoid, as much as possible. Fields having high trees will be removed from the ROW zone of

transmission lines. Another factor which could cause fires, is overloading of transmission lines, a risk that is also minimized by adequate safety precautions in the design and operation of the system.

Although electrocution accidents and fires could lead to losses in lives and properties, it is believed that the normal design, construction and operation procedures expected to be followed by the EETC, in accordance to Labor Law, No. 12 of year 2003 will provide sufficient safety precautions so that accidents will be due to unforeseen factors that could not be considered in risk estimation

Impact significance

Health and safety for the sensitive recipient (community surrounding the project site of transmission lines) does not have a significant impact, as it is described previously that the project site is already localized. Therefore, the impact can be classified as minor.

In addition, the medium to major impact is identified for the health and safety of the workers. The standard protection of the workers, especially for the workers that involved in the risk due to the height has to be put into mitigation measures and in the management and monitoring plan to minimize and reduce the significant impact. The impact has been classified as medium impact that could be reduced, following mitigation measures, to minor impact.

In addition, regarding the safety issues, EETC periodically provide the specific trainings for the operators and the workers who is responsible for the work of operation and maintenance of the transmission line. The training obtains include the civil protection, firefighting and smoke detection, besides the operation and maintenance of the transmission lines and its equipment. The map of the emergency plan in case of fire accident is also provided.

However, although EETC is already taking precaution for its operator and workers for safety standard, the ESMP is designated to minimize the impact of such accident. It is also worth noting that at Cairo 500 substation that has been established since 1964 has no recorded accidents at the substation and its interconnection lines.

In addition, the medium to major impact is identified for the health and safety of the workers. The standard protection of the workers, particularly, for the workers who get involved in the risk due to the height has to be put into mitigation measures and in the management and monitoring plan to minimize and reduce the significant impact.

Visual Intrusion

The overhead transmission lines would be highly visible in rural or natural landscapes. The artificial appearance of a transmission line may have visually intrusion associations for some, particularly in a predominantly natural landscape. Visual evidence of these projects cannot be completely avoided, reduced, or concealed.

Impact significance:

Major impact will be associated to the visual intrusion that cannot be avoided or mitigated.

Summary of significant Impact during Operation of SS and OHTL is presented on Table 6.5 and Table 6.6 respectively.

Ecological Resources (Flora and Fauna)

The impact of the OHTLs is insignificant on flora and fauna as already the area don't have any important flora or fauna. Therefore, there is no impact.

Impact Significance:

This impact is considered: minor impact

Bird Migration

Regarding the bird migration, the OHTL's route crosses the path of the birds' migration as seen on the below maps. Based on Bird Life international tool's report (Annex 4), the overall sensitivity of this project area is considered medium as there are 4 soaring bird species observed in the area, classified as **LC**(least concern) according to the IUCN Red List; while a further 28 soaring bird species classified as **LC**; **NT**(near threatened); **VU** (vulnerable); **EN** (endangered) are expected but not observed (classification of 'observed' or 'expected' based on presence status). Therefore, mitigation measures are required to be implemented to minimize the risk of birds' electrocution and collision. The following figures represent the birds' migration path versus route of OHTL.

Impact Significance:

This impact is considered to be medium impact.

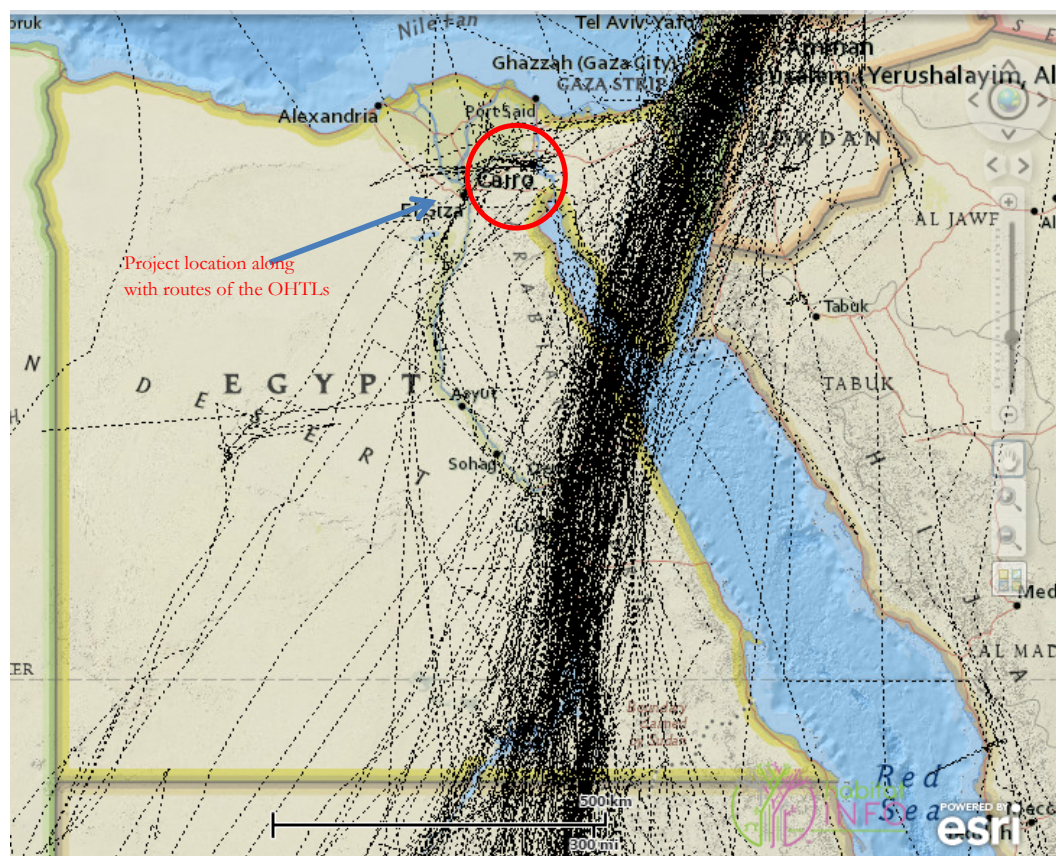


Figure 6-19 Main migration routes in Egypt
source: BirdLife International (2015)

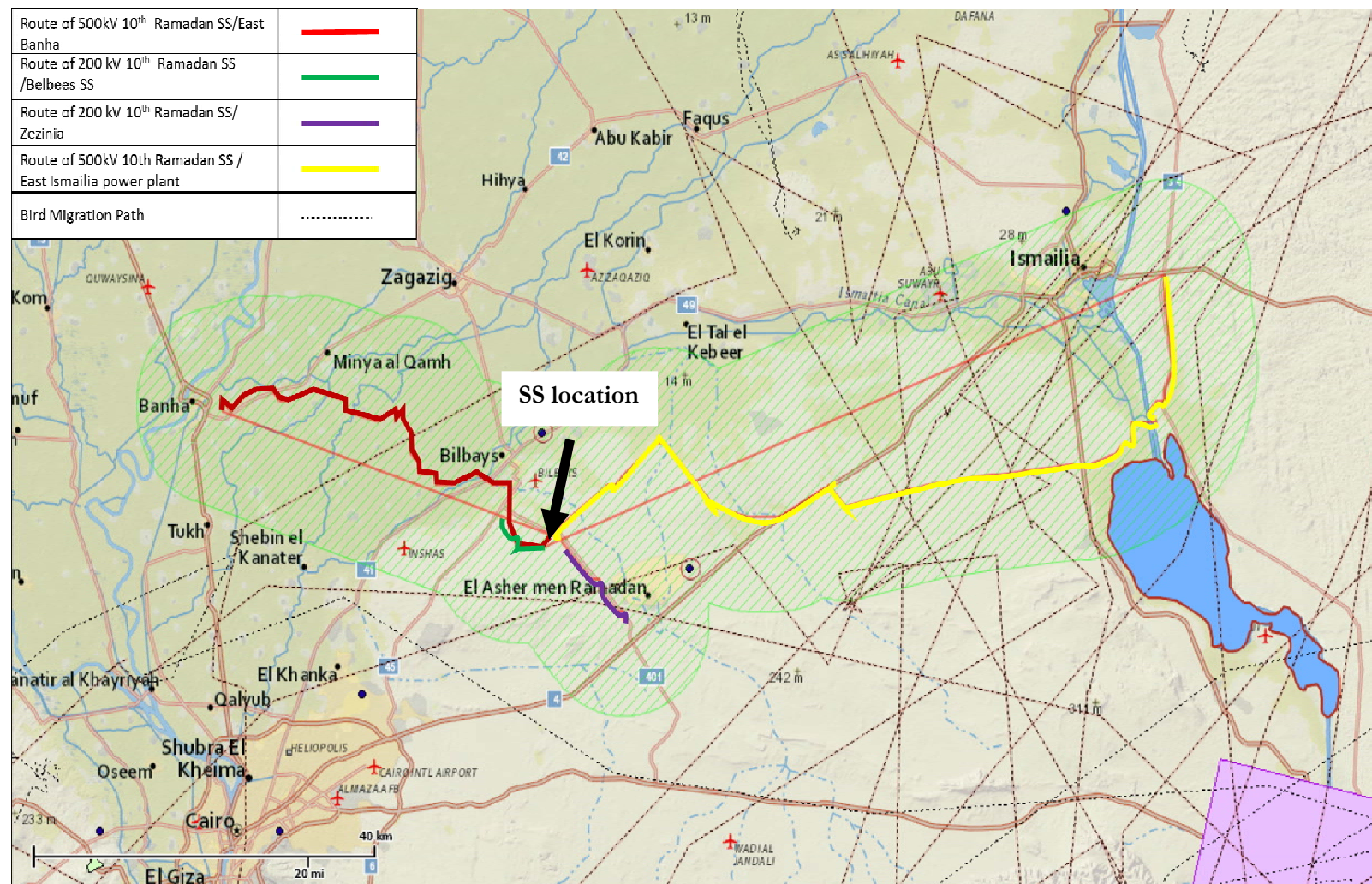


Figure 6-20 Main migration routes in Egypt versus the route of Zezenia OHTLs in violet
source: BirdLife International (2019)

Creation of Job Opportunities and Flourishing Economies

The availability of stable electricity service may encourage members of the local community to open new business activities. This represents a positive opportunity for members of the local community. The problem that may arise can be related to increasing consumption patterns of electricity with the improvement of the service. It is a positive impact.

Table 6-12. Assessed significance of expected impacts during operation phase of 10th Ramadan 500 GIS substation

Impact	Likelihood and severity	Significance	Mitigation Measures
During operation and maintenance of 10 th of Ramadan substation			
Noise	Low likelihood to occur –receptors include nearby settlements (residential) are far at a distance above 10km.	Low impact on settlement and nearby establishment :Low 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 provided at the substation.
Traffic	Low likelihood to occur	Low impact	No mitigation identified
Air quality	Low likelihood to occur	Low impact	No mitigation identified
Vibration	Minor or very low likelihood to occur	Very minor	No mitigation identified
Hazardous Materials and Wastes Management	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)	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 upon the agreement with the licensed waste collector. For The hazardous waste, it will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).”
Soil contamination	High likelihood to occur, only during the incident of oil spillage from the transformers and possible vehicles.	Low to medium impact	Standard design of precaution for the site of transformers Paved within surrounding site of substation especially at the area for parking and movement of vehicles

Impact	Likelihood and severity	Significance	Mitigation Measures
During operation and maintenance of 10 th of Ramadan substation			
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. Please refer to Annex 1 for the health and safety guide
Natural disaster risks	Low likelihood to occur	Negligible impact	No mitigation identified Technical specifications of the equipment is include the standard measures for natural disaster risks
Visual Resources	Low likelihood to occur	Very low impact or negligible impact	No mitigation measure is prepared
Ecological Resources	Low likelihood to occur	No significant impact	No mitigation identified
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

Table 6-13. Assessed significance of expected impacts during operation phase of East Ismailia OHTL

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of East Ismailia OHTL			

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of East Ismailia OHTL			
Risk of Waste generated	Likely to occur - short term – Highly sensitive receptors include soil and workers. Receptors with medium sensitivity include nearby projects/settlements. Receptors with low sensitivity include groundwater.	Medium	Waste management implemented according to EEAA 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. Disposal means of the hazardous wastes will be according to the Egyptian laws and regulations regarding the disposal.
Exposure to EMFs	Likely to occur - long term impact	Medium	In order to maintain safety of the general public and minimize exposure to EMFs some laws and guidelines require maintaining a suitable ROW distance of 25 meters (for 500 kV OHTL) so that the EMFs would effectively attenuate at the edge of this EMF
Risk of soil contamination	Low likelihood of occurrence - short term impact	Minor	Following standard protection for the soil and proper waste management described on the section of waste management measures
Noise	Low likelihood of occurrence - short term impact	Minor	Minimizing impact significance
Cultural resources	Low likelihood of major or medium impacts	insignificant	Standard mitigation measures of recording and reporting
Health and Safety	Low likelihood of minor impact for the sensitive recipient and medium to major for the workers	Medium to Major	Standard protection for the workers especially working at elevated heights
Natural disaster risks	Low likelihood to occur	Negligible impact	No mitigation identified Technical specifications of the equipment is include the standard measures for natural disaster risks
Visual Resources	Low likelihood to occur	Very low impact or negligible impact	No mitigation measure is prepared
Ecological	Low likelihood to occur	No significant impact	No mitigation identified

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of East Ismailia OHTL			
Resources(Fauna and Flora)			
Bird Migration	Low likelihood to occur	Medium to Minor impact	<ul style="list-style-type: none"> Installing bird diverters devices or line markers such as spheres, spiral vibrational dampers, or bird deflectors in order to attract the attention of birds and avoid collision Avoid working in seasons of bird migration, Spring (March-May) and Autumn (August to November)
Creation of Job opportunities	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

Table 6-14. Assessed significance of expected impacts during operation phase of East Banha OHTL

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of East Banha OHTL			
Risk of Waste generated	Likely to occur - short term – Highly sensitive receptors include soil and workers. Receptors with medium sensitivity include nearby projects/settlements. Receptors with low sensitivity include groundwater.	Medium	Waste management implemented according to EEAA 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. Disposal means of the hazardous wastes will be according to the Egyptian laws and regulations regarding the disposal.
Exposure to EMFs	Likely to occur - long term impact	Medium	In order to maintain safety of the general public and minimize exposure to EMFs some laws and guidelines require maintaining a suitable ROW distance of 25 meters (for 500 kV OHTL) so that the EMFs would effectively attenuate at the edge of this EMF
Risk of soil	Low likelihood of occurrence - short term impact	Minor	Following standard protection for the soil and

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of East Banha OHTL			
contamination			proper waste management described on the section of waste management measures
Noise	Low likelihood of occurrence - short term impact	Minor	Minimizing impact significance
Cultural resources	Low likelihood of major or medium impacts	insignificant	Standard mitigation measures of recording and reporting
Health and Safety	Low likelihood of minor impact for the sensitive recipient and medium to major for the workers	Medium to Major	Standard protection for the workers especially working at elevated heights
Natural disaster risks	Low likelihood to occur	Negligible impact	No mitigation identified Technical specifications of the equipment is include the standard measures for natural disaster risks
Visual Resources	Low likelihood to occur	Very low impact or negligible impact	No mitigation measure is prepared
Ecological Resources(Fauna and Flora)	Low likelihood to occur	No significant impact	No mitigation identified
Bird Migration	Low likelihood to occur	Medium to Minor impact	<ul style="list-style-type: none"> Installing bird diverters devices or line markers such as spheres, spiral vibrational dampers, or bird deflectors in order to attract the attention of birds and avoid collision Avoid working in seasons of bird migration, Spring (March-May) and Autumn (August to November)
Creation of Job opportunities	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

Table 6-15. Assessed significance of expected impacts during operation phase of Belbees OHTL

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of Belbees OHTL			

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of Belbees OHTL			
Risk of Waste generated	Likely to occur - short term – Highly sensitive receptors include soil and workers. Receptors with medium sensitivity include nearby projects/settlements. Receptors with low sensitivity include groundwater.	Medium	Waste management implemented according to EEAA 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. Disposal means of the hazardous wastes will be according to the Egyptian laws and regulations regarding the disposal.
Exposure to EMFs	Likely to occur - long term impact	Medium	In order to maintain safety of the general public and minimize exposure to EMFs some laws and guidelines require maintaining a suitable ROW distance of 25 meters (for 500 kV OHTL) so that the EMFs would effectively attenuate at the edge of this EMF
Risk of soil contamination	Low likelihood of occurrence - short term impact	Minor	Following standard protection for the soil and proper waste management described on the section of waste management measures
Noise	Low likelihood of occurrence - short term impact	Minor	Minimizing impact significance
Cultural resources	Low likelihood of major or medium impacts	insignificant	Standard mitigation measures of recording and reporting
Health and Safety	Low likelihood of minor impact for the sensitive recipient and medium to major for the workers	Medium to Major	Standard protection for the workers especially working at elevated heights
Natural disaster risks	Low likelihood to occur	Negligible impact	No mitigation identified Technical specifications of the equipment is include the standard measures for natural disaster risks
Visual Resources	Low likelihood to occur	Very low impact or negligible impact	No mitigation measure is prepared
Ecological Resources(Fauna	Low likelihood to occur	No significant impact	No mitigation identified

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of Belbees OHTL			
and Flora)			
Bird Migration	Low likelihood to occur	Medium to Minor impact	Installing visibility enhancements objects or line markers such as bird deterrent, spheres, spiral vibrational dampers, or bird deflectors in order to attract the attention of birds and avoid collision
Creation of Job opportunities	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

Table 6-16. Assessed significance of expected impacts during operation phase of Zezenia OHTL

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of Zezenia OHTL			
Risk of Waste generated	Likely to occur - short term – Highly sensitive receptors include soil and workers. Receptors with medium sensitivity include nearby projects/settlements. Receptors with low sensitivity include groundwater.	Medium	Waste management implemented according to EEAA 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. Disposal means of the hazardous wastes will be according to the Egyptian laws and regulations regarding the disposal.
Exposure to EMFs	Likely to occur - long term impact	Medium	In order to maintain safety of the general public and minimize exposure to EMFs some laws and guidelines require maintaining a suitable ROW distance of 25 meters (for 500 kV OHTL) so that the EMFs would effectively attenuate at the edge of this EMF
Risk of soil contamination	Low likelihood of occurrence - short term impact	Minor	Following standard protection for the soil and proper waste management described on the section of waste management measures
Noise	Low likelihood of occurrence - short term impact	Minor	Minimizing impact significance
Cultural resources	Low likelihood of major or medium impacts	insignificant	Standard mitigation measures of recording and reporting
Health and Safety	Low likelihood of minor impact for the sensitive recipient and medium to major for the workers	Medium to Major	Standard protection for the workers especially working at elevated heights
Natural disaster risks	Low likelihood to occur	Negligible impact	No mitigation identified Technical specifications of the equipment is include the standard measures for natural disaster risks
Visual Resources	Low likelihood to occur	Very low impact or negligible impact	No mitigation measure is prepared
Ecological Resources(Fauna and Flora)	Low likelihood to occur	No significant impact	No mitigation identified
Bird Migration	Low likelihood to occur	Medium to Minor impact	<ul style="list-style-type: none"> Installing bird diverters devices or line markers such as spheres, spiral vibrational dampers, or bird deflectors in order to

Impact	Likelihood and severity	Significance	Mitigation Measures
Impacts during operation phase of Zezenia OHTL			
			attract the attention of birds and avoid collision <ul style="list-style-type: none"> • Avoid working in seasons of bird migration, Spring (March-May) and Autumn (August to November)
Creation of Job opportunities	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

7. Resettlement Action Plan (RAP)

Based upon the impacts identified during the environmental and social impact assessment phase, the project is foreseen to incur negative impacts on the use of land in the project area where limited lands will be acquired for the erection of the towers, trees and buildings along the right of way. EETC approaches land acquisition in the form of consensual sale rather than resettlement as per the electricity law.

In order to identify potential Project Affected Persons and mitigate the impacts of resettlement activities, a Resettlement Action Plan Report shall form integral part of the ESIA with the following objectives.

- Mitigate the negative impacts and identify potential development benefits;
- Establish the entitlements of all categories of affected people, including the host communities;
- Document all compensation measures and relocation activities (if any);
- Establish procedures to guarantee fair process to the affected people; and;
- Establish procedures to monitor and evaluate the implementation of resettlement plans and take corrective action as necessary.

The RAP shall employ a participatory bottom-up approach. Various qualitative and quantitative data collection tools shall be used in order to engage all categories of PAPs. The RAP represent the components of a consolidated document. This document will be subject to review and acceptance as whole.

8. Environmental and Social Management Plan (ESMP) and Monitoring Plan

This chapter presents Environmental and Social Management Plan (ESMP) developed for EETC and the contractor for 10th of Ramadan Substation. This chapter consists of the following sections:

- ESMP during construction and operation phase (including detailed mitigation measures) of Substation and OHTLs (500 kV and 220 kV)
- Guidance on Emergency Response Plans
- Roles and responsibilities in the implementation of the ESMP (during construction and operation phase) of Substation .
- Trainings
- Cost Estimation

8.1. Objective of the environmental and social management plan (ESMP)

This ESMP has been prepared as supporting documentation and it includes an Environmental Monitoring Plan. The ESMP is to provide:

- a practical framework for establishing best practice environmental management standards to mitigate potential environmental harm for each activity undertaken.
- assist managers, supervisors and construction crews from the contractor to comply with applicable legislation.
- A mechanism to reduce the potential impacts of the construction and operation of the facility

8.1.1. Definition of ESMP

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, compensate or offset any adverse social and environmental impacts analyzed. The ESMP has distinguished between mitigation measures that should be implemented during the construction and operation of the project(SS and OHTLs).

ESMP defines procedures to ensure that the management of environmental and social issues during the different project phases are undertaken in accordance with national legislation and best practice procedures. The ESMP presented in this reflects the implementation procedures and mechanisms for the mitigation measures and monitoring activities of the potential impacts previously discussed in Chapter 6. The ESMP assigns certain tasks for different stakeholders according to their roles and responsibilities in the project.

The following sections beside the environmental mitigation, it will present the socioeconomic mitigation measures and the social management and monitoring plan as well. The management and monitoring plan mainly involves the EETC technical team who will be appointed under the health and safety department in the Substation. Reference is made to these measures in their place

The successful implementation of the ESMP will depend on a range of different elements. To ensure the ESMP incorporates and successfully integrates with other interfacing documents, the following elements must be considered and acted upon:

The environmental and Social Management unit should be adequately staffed with competent personal to ensure the proper implementation and monitoring of the ESMP.

The development and management of second tier documentation that facilitates the necessary tracking and performance monitoring all social and environmental risks and complaints will be developed and firmly implemented..

8.1.2. Management Responsibilities

Roles and responsibilities for implementing the ESMP during the construction phase have been proposed based on the following set-up:

- EETC will contract an authorized and specialized consultant to prepare detailed designs and tender documents, for construction of substation and its interconnection, which will include the environmental measures that should be undertaken by the construction contractor
- During tenders evaluation EETC will assure that the winning offer includes the required environmental mitigation measures to be implemented during construction. This will include the management of traffic and management of wastes (solid and liquid; hazardous and non-hazardous wastes)
- EETC will assign supervision staff who will undertake supervision over the contractor to make sure that the mitigation measures specified in the design/tender document are implemented on field
- The site supervisor consultant from EETC will produce the monthly report about the performance of the contractor in implementing the ESMP measures

During the operation phase, the substation and the OHTLs shall have permanently at least one staff member for health, environmental and safety during operation and maintenance of the substation. HSE staff of the substation appointed by EETC (under environmental safety and health department) will be responsible for monitoring the ESMP. He/She will be responsible for implementing the mitigation measures and providing periodic reports to EETC.

8.2. Environmental Management Plan (ESMP) and Monitoring Plan during Construction Phase of SS

Management of noise and vibration during construction

Mitigation measures

General measures should be done to reduce the impact on construction to surrounding establishments nearby the construction, the measures are:

- Prior to the preparation of the construction of substations, the notification letter should be sent to the sensitive receptors for the project introduction and the duration of the project.
- Clear sign for construction sites label and warning signs should be placed. The signs should be clear during the night as well.
- The construction should be done during the day (between 7 AM to 5 PM).
- Although the transportation of the materials and the other equipment (that need the big trolley) will be done during the night (after midnight) to avoid the traffic congestion.

For mitigation measures of construction workers, within the construction site, it could be mitigated through application of the normal precautions normally taken by construction labor. The safety measures have to be taken for standard protection of the construction workers and according to the HSE general guideline of IFC, in addition the schedule of the machineries used for the construction activities and for transporting the equipment or materials should be managed properly.

According IFC General EHS Guidelines, the mitigation measures that should be implemented are the following:

- No employee should be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection. Hearing protective devices provided should be capable of reducing sound levels at the ear to at least 85 dB(A).
- The use of hearing protection should be enforced actively when the equivalent sound level over 8 hours reaches 85 dB(A), the peak sound levels reach 140 dB(C), or the average maximum sound level reaches 110dB(A).
- No unprotected ear should be exposed to a peak sound pressure level (instantaneous) of more than 140 dB(C).
- Limiting the duration of noise exposure.
- Construction of the structure and the installation of the equipments should be conducted at daytime.
- The management of the use of heavy machineries and the equipment (at the same time and concentrated at the same place) to avoid the vibration accumulation.

Monitoring activities:

- Ensure the warning signs and the construction site labels are placed and clearly seen.
- Reviewing contractor's policy for EHS and ensure that all the National and international requirements are fulfilled.
- Random inspection on contractors during SS construction and installation of the equipment.
- Review the contractor's project progress, accident and the complaint from the surrounding establishment, if any, due to the noise and vibration disturbance.

Reporting:

- Monthly report for the implementation of the ESMP submitted by the contractor to EETC
- Monthly report on incident and complaint from the surrounding establishments and residents nearby the construction site.

Management of ambient air emission during construction

Mitigation measures:

- Localize and minimize the vehicles movements
- In areas of loose sandy soils the contractor should provide source of water for spraying soil before excavation, filling, loading and unloading. If the site supervisor consultant noticed visual/sensible increase of dust emissions, he should ask for additional spraying of water in the spot generating high emissions. Roads on site shall be graveled when necessary
- All vehicles and heavy equipment working in the site should be effectively maintained. Any vehicle that has high smoke emissions visibly detected should be promptly repaired.

- Limiting trucks and other vehicles speed on site
- Construction materials and stock piles of material should be carefully managed to minimize the risk of windblown material and dust.
- Removing excavated material promptly
- Storage pile activity should be conducted downwind and covering storage piles and properly shape storage piles

Monitoring Activities:

- Ensure that the contractor is applying mitigation measures on site
- Daily visual monitoring of the increase dust and exhaust emission
- Immediate action if there is complaint from the surrounding establishment.

Reporting:

- The Site Supervisor prepares a monthly progress report, which would be submitted to EETC, on implementation of mitigation measures. This report should include any incidents of high dust emissions or smoke during construction works including the natural dust that might be encountered.

Management of traffic

Mitigation measures:

- Approval from the traffic department prior to the construction of the substation should be obtained by the contractor prior to the construction preparation
- Clear signs and warning at the construction site and surrounding.
- The trucks and trolleys movement for equipment, construction materials and disposal of the construction debris should be done during the night. The loading and unloading should be done within the site of the SS or at the empty land adjacent to the SS site (if needed and upon the agreement for temporary storage).
- An agreement between contractors and supervisor consultants should be reached about the suitable location for temporary storage of construction materials, equipment, tools and machinery prior to starting construction
- The contractors should make sure that the employed drivers of construction machinery (such as trucks and loaders) have received sensitization/training on safety utilization of their machines in order to minimize accidents risks.

Monitoring activities:

- Ensure the mitigation measures are done by the contractor

Reporting:

- Unusual traffic delays or accident caused during construction or any complaints received should be reported in the monthly report prepared by the construction supervisor.

Management of Wastes (hazardous and non-hazardous; liquid and solid wastes)

Mitigation measures:

- The nearby landfill that is used to receive the non-hazardous waste has to be notified if there are bigger or different amounts of waste generated resulting from the construction activities. Agreement on these disposal sites should be reached prior to commencing construction works
- The non-hazardous waste has to be separated from hazardous waste at storage area. The separation will be done to identify the parts that can be recycle or sell.
- A certain location in the construction site should be assigned for temporary storage of construction waste; this location will be within the construction area of the substation. This location should be agreed between the contractor and supervisor prior to starting the project.
- Separate area should be dedicated for temporary storage before sending it to the hazardous waste landfill has to be defined prior to the construction activities. The hazardous waste management has to be developed by contractor before the construction. In addition, the management plan can be added as a part of ToR.
- Construction waste should be hauled at the end of each business day to the officially approved disposal sites. Adequately equipped trucks should undertake waste transportation. The supervisor consultant should make-sure that the trucks are not overloaded and that the waste is adequately contained inside the rear box or covered to prevent dust or particles movements from the truck. The supervisor should also occasionally inspect that the truck drivers are disposing the waste in the approved location and not through practicing open dumping in the midway, through irregular visits and inquiries in the disposal site.
- Regarding the hazardous waste, the contract with the hazardous waste landfill shall be applied before starting the construction
- For the hazardous waste, the management and monitoring plan is in accordance with EEAA's requirements for hazardous waste handling, disposing and transporting.
- As the domestic solid waste is already established, the contractor only provides temporary storage onsite before collection done by the municipality.
- For the sanitation or wastewater generated, before the site is connected to the existing sewage network, onsite sanitation facility has to be provided by the contractor for their workers. In general, a proper waste collection and storage plus regular (preferably twice a week) waste collection by licensed contractors will need to be arranged by site management. To co-ordinate and control this, The site management should develop a waste management plan which is included in the ToR for the Contractor for waste management during construction and operation. For The hazardous waste, it will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA)."

Monitoring Activities:

- Ensure the collection; transportation and disposal of wastes are according to the measures.

- Regarding the hazardous waste generated, the management, temporary storage, transportation and disposal to the designated landfill should be in accordance to EEAA regulations for hazardous waste.

Reporting:

- There should be a form prepared by EETC for the contractor to keep records of quantities, types of wastes received and the location where it has been received from.
- The monthly report of supervisor from EETC should include how well does the contractor abide to the above measures and any comments noticed by the site supervisor about mismanagement of construction waste during the month.

Safety during Excavation and Trenching

Mitigation measures:

- All excavations shall be conducted in accordance with the approved drawings.
- The sides of all excavations, which might expose personnel or facilities to danger resulting from shifting earth shall be protected by providing slope to the appropriate angle of repose or benching in the sides and ends of the excavation or ladders must be used and secured, enough to withstand at least 1 meter above the top of the excavation.
- All excavation deeper than 1.5 meters must have barriers and toe boards around the outside to prevent persons and material falling into the excavation. Barriers must be of a strength that is capable of withstanding the weight of a person falling against the barrier. Barriers shall be readily visible by day or night.
- All persons in excavation must wear safety helmets and safety boots
- Vehicles and other machineries or construction equipment must not be allowed to come within 2 meters of an excavation unless working in connection with the excavation.

Monitoring Activities

- An inspection must be conducted at the end of the works to ensure that the excavation has been left in a safe manner. Heavy loads shall not be put on the edge of the excavation.
- The observer must conduct monitoring of the safety tools for the workers and the vehicles restrictions along the excavation and trenching sites.

Reporting

- The observer should report on the monthly basis of the accident or the worker's obedience.

Safety of Mechanical Equipment

Mitigation measures:

- All mobile mechanical equipment shall be operated by authorized personnel and has a valid license.
- All equipment shall be checked prior to use by qualified personnel.
- Brakes, lights, tire pressure and battery shall be inspected before using the equipment. Revolving lights must be used for heavy duty vehicles.
- The design capacity of any equipment shall never be exceeded. The equipment shall not be modified to alter its capacity.

- All drivers shall have valid driving license.
- Equipment that could present a hazard to personnel, if accidentally activated during the performance of installation, repair, alteration, cleaning or inspection, work shall be made inoperative prior to state of work.
- Equipment, which is subject to unexpected external physical movement such as rotating, turning, dropping, sliding etc., mechanical and/or structural constraint, shall be applied to prevent such movement.
- All equipment, which is locked or taken out of service, because of potentially hazardous condition, shall be appropriately tagged indicating the reason for taken out of service.

Monitoring Activities

- A safety observer during using heavy mobile equipment, which may be hazardous, by its movement. The observer shall ensure that people are kept away of mobile equipment.
- Observer shall appointed specific place for heavy equipment standby area when it is not been used or taken out of service.
- Observer shall ensure the performance of the heavy equipment, tagged the equipment which are locked or taken out of service and reported on monthly basis

Reporting

- Reporting on the monthly basis, the total number and the type of heavy equipment use during the construction phase.
- Reporting on the monthly basis the number of heavy equipment that are locked or taken out of service and the reason of the damages.

Health and safety of the construction workers

As the site of the substation is localized, the significant impact on health and safety concerns are for the construction works mainly.

Mitigation measures:

- Workers should wear standard protection for the construction site.
- Workers should be trained to cover the completed parts and keep their work areas safe. In case of causing an accidents, the workers should be penalized either by deduction of salaries or dismissal.
- Existing utilities would be located and staked before construction begins, including and at intersections of other pipes and crossings. This would confirm the location and depth to ensure new construction does not impact the existing utilities.
- Following the measures above, the identification of the existing infrastructure (other pipelines, cables, etc.) have to be identified prior to the construction phase.
- Heavy equipment should not normally be operating above the existing utilities during construction. If heavy equipment or trucks must cross the existing utilities, additional soil cover will be needed to protect the existing pipe.
- Workers should take the following steps to protect themselves from falls during high construction:
 - a) Use 100% fall protection when working on higher construction sites
 - b) Participate in all training programs offered by the employer (contractor).
 - c) Follow safe work practices identified by worker training programs.

Monitoring Activities:

- Inspect equipment daily and report any damage or deficiencies
- Onsite inspectors should be present during construction to verify that the construction contractor is following engineering specifications and meeting regulatory requirements.

Reporting:

- Monthly report on health and safety performance. This report will include any incident and complaint regarding health and safety measures perform by the contractor.

Management of water resources

Mitigation measures:

- Include the precaution and prevention of waste management to avoid ground water resources and soil pollution
- Emergency plan during accident due to oil spillage or other possible pollution on soil and water resource
- If needed, the site is paved or graveled to reduce to direct contact of the possible soil contamination during the workshop of the equipment and vehicles and their movements

Monitoring Activities:

- Proper implementation of waste management done by contractor

Reporting:

- Monthly report of any accident due to oil spillage, etc.

Management of Possible Impacts on Culture and Privacy of Local Communities

Mitigation measures:

- The contractor should be advised to use construction labor from the areas where construction works will take place. The incentives to contractors for such measure include reducing accommodation and transportation for his workers. The contractor could be advised to seek the help of local Nongovernmental organizations (NGOs) or community leaders for recruiting labor from the local communities

Monitoring Activities:

- The contractor should provide list of construction workers and their addresses from the surrounding area on quarterly basis.

Reporting

- Reporting on percentage of labor recruited from local governorates should be presented by the contractor to the supervisor consultant and to EETC on a quarterly basis.

Other socioeconomic impacts

Mitigation measures:

The Distribution Company may be advised to start some awareness raising campaigns about the importance of legal connections at the area. As well as awareness campaigns to rationalize consumption of electricity. The company may network with the local NGO's to participate in conducting the awareness activities.

Monitoring Activities:

- The number of posters and awareness events held by the company and by the local NGO's. A staff member (social development officer) from the distribution company may attend the events held by the NGO's.

Reporting

- Reporting on percentage of attendance and response to awareness events.
- Reporting on the numbers of new requests for electricity legal connections.

Table 8-1 presents the ESMP matrix during construction of the SS and the Table 8-2 presents the Monitoring Plan during Construction phase of the SS.

Table 8-1 Environmental and Social Management Plan (ESMP) during Construction Phase of the SS

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
During Preparation and Construction of the SS				
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	Contractor (through tendering activity)	None as a part of tender process	

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
	management of concentration works of heavy machineries			
	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 materials, construction waste, equipment and movement of project vehicles and machineries	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	
	Movement of vehicles (for transporting materials, construction waste and SS equipment done during the night and loading and uploading 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	
	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	None as a part of contractor responsibility	

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
		operators		
	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	
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			

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
	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 waste before its collection and temporary onsite sanitation facilities should be provided within the construction site for the workers	Contractor	None, as a part of waste management	According to the waste management plan submitted to EETC
Safety impacts during excavation and trenching for the workers and surrounding communities and	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	Contractor	None as a part of contractor offers related to EHS requirements	

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
establishments	moving nearby the site			
	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 of the construction workers	Standard protection for the construction site workers	Contractor	None as a part of 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			

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
	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) pollution	Contractor	None, as a part of waste management	According to the waste management plan submitted to EETC

Table 8-2 Environmental and Social Monitoring Plan

Project activities	Parameters to be monitored	Locations	Measurements (methods and equipment)	Frequency of measurements	Cost Estimates (\$)**	Responsibilities
During Pre-Construction / Preparation and Construction phase						
Site clearance	Worker's injuries	Construction site location	Preparation of recording form of workers injury during the construction	Monthly	None	

Project activities	Parameters to be monitored	Locations	Measurements (methods and equipment)	Frequency of measurements	Cost Estimates (\$)**	Responsibilities
Base camp preparation for the workers	Neighbors farm , /projects complaints	Project construction sites	Recording of complaint and type of complaint	Once during the preparation and prior to start the construction phase	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
Monitoring the traffic disturbance due to the vehicles and machineries movement and other related construction activities	Traffic complaint	Within 500 m from the construction site	Visual observation and recording complaint received	During the duration of the 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	Noise complaints from the	Project locations	Visual investigation and recording and	during the construction	As a part of contractor's	

Project activities	Parameters to be monitored	Locations	Measurements (methods and equipment)	Frequency of measurements	Cost Estimates (\$)**	Responsibilities
vibration Impacts at the project sites	neighboring farm/project		documentation of complaints	activities at different locations	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

8.3.Environmental Management Plan (ESMP) During Construction of the Overhead Transmission Lines

8.3.1. Management of Wastes [Hazardous and Non-Hazardous]

During the construction of the OHTL the following mitigation measures shall be applied

Mitigation measures:

- EETC should communicate with the local authorities including protectorates for officially assigning location for the disposal of construction waste within the three governorates. Agreement on the disposal sites and the collection means should be reached prior to commencing construction works.
- A specified (one or multiple) locations along the proposed routes for the transmission line should be assigned for temporary accumulation of construction waste. This location should be agreed upon with the contractor prior to starting the project.
- Ensure that excavation done for steel towers does not unnecessarily exceed the designed diameter of the butt of the tower and that the excavation is exactly as deep as the foundation design requirements. This will minimize to the extent possible the volume of excavated soil.
- Make sure that the anchors are fixed at the designed depth and at the designed angle so that they provide the required support to the tower and prevent its early failure. It will be required that construction supervisor makes sure that contractors do not fix the anchor vertically and then bend it during the site survey. Premature partial or complete failure, besides the associated risks, would increase the volume of wastes generated and would result in additional construction works/reinforcements.
- Maintain the correct tensioning of the conductor so that it will not have high tension loads, line vibrations and premature failure. During construction phase the supervisor engineer has to make sure that after the conductor has been properly stung, it is brought up to the initial tension within 4 hours, and that it sits in the rollers for at least two hours, after being tensioned, to give it chance to equalize itself prior to tying the conductors to the insulators.
- Construction waste should be hauled at the end of each working day to the officially approved disposal sites or to the specified interim on site accumulation area. Adequately equipped trucks should undertake waste transportation. The supervising Consultant should make-sure that the trucks are not overloaded and that the waste is adequately contained inside the rear box or covered to prevent dust or particles movements from the truck. The supervising Consultant should also occasionally inspect that the truck drivers are disposing of the waste at the approved location, and regular checks to the disposal site.
- The on-site waste accumulation area (WAA) along the transmission lines shall be designed to accommodate the expected amounts and different types of wastes. It shall be covered and provided with adequate flooring for possible access of forklifts and small trucks. The waste officer should keep separate areas for each type of waste, keep internal passages inside the WAA for facilitating access and should order for regular cleansing of the area. Records of the admitted waste shall be kept in a register and before the WAA is full, the waste officer should organize to sell or dump the scrap to recycling contractors or at the authorized landfill respectively.
- Domestic waste generated on site shall be segregated and not mixed with any other type of waste.
- Construction contractor shall provide portable water cabinets on site to provide hygienic work environment for the work force. The Portable water cabinets shall equipped with an external tank for sewage storage.

- Construction contractor shall contract competent authority at each governorate premises for safe disposing of generated sewage

Mitigation measures for hazardous waste management:

For the management of HW, A hazardous waste management plan (HWMP) is proposed which will direct actions to be undertaken to ensure environmentally sound management of hazardous wastes. The plan identifies the roles and responsibilities for EETC staff and/or the Contractor's staff, how hazardous wastes can be identified and safely handled, the places where the hazardous wastes could be accumulated and the training requirements for the staff involved. The HWMP and the HWM-SOP shall apply to all hazardous wastes generated at the sites managed by EETC and apply to the EETC staff and contractors.

8.3.2. Management of Excavation

During the construction of the OHTL the following mitigation measures shall be applied

Mitigation measures:

- All excavations shall be made in accordance with the approved drawings.
- The sides of all excavations, which might expose personnel or facilities to danger resulting from shifting earth shall be protected by providing slope to the appropriate angle of repose or benching in the sides and ends of the excavation or ladders must be used and secured, enough to withstand at least 1 meter above the top of the excavation.
- All excavation deeper than 1.5 meters must have barriers and toe boards around the outside to prevent persons and material falling into the excavation. Barriers must be of a strength that is capable of withstanding the weight of a person falling against the barrier. Barriers shall be readily visible by day or night.
- All persons in excavation must wear safety helmets and safety boots
- Vehicles and other machineries or construction equipment must not be allowed to come within 2 meters of an excavation unless working in connection with the excavation.

Monitoring Activities

- An inspection must be conducted at the end of the work to ensure that the excavation has been left in a safe manner. Heavy loads shall not be put on the edge of the excavation.
- The observer must conduct monitoring of the safety tools for the workers and the vehicles restrictions along the excavation and trenching sites.

Reporting

The observer should report on the monthly basis of the accident or the worker's obedience.

8.3.3. Management of Ambient Air Emission

During the construction of the OHTL the following mitigation measures shall be applied

Mitigation measures:

- In areas of loose sandy soils the contractor should provide source of water for spraying soil before excavation, filling, loading and unloading. If the site supervisor consultant noticed visual/sensible increase of dust emissions, he should ask for additional spraying of water in the spot generating high emissions.

Monitoring activities:

- Frequent monitoring of dust emissions and the amount of water sprayed on soil, under the supervision of the Consultant.

Reporting

- The Site Supervisor Consultant shall prepare a monthly progress report, which would be submitted to EETC, on implemented mitigation measures. The Consultant should report on any incident of high dust emissions or smoke during construction works including the natural dust that might be encountered especially at the site that most of the area is desert land.

8.3.4. Management of Noise

During the construction of OHTL the following mitigation measures shall be applied

Mitigation measures:

- Workers that operate noisy machines and nearby workers should be supplied with earmuffs and should be instructed to put them on when they get into noisy zones. Contractors should be responsible to instruct their workers to abide to this role, and the site supervisor should make sure the Contractor is compliant with this role
- Working hours for workers exposed to noise equipment should be designed so that noise exposure periods do not exceed the safe limits
- Coordinate and Inform inhabitants/employees at the nearby sensitive receptors about the peak time and hours for construction activities.
- Avoid construction activities at night

Monitoring activities:

- No monitoring measures shall be undertaken since the noise emissions are temporary.

Reporting

- The monthly report should include how well does the contractor abide to the above measures and any comments noticed by the site supervisor about high noise levels.
- A monthly report on any observations or complaints about high noise level.

8.3.5. Management of Traffic

During the construction of OHTL the following mitigation measures shall be applied

Mitigation measures:

- An agreement between contractors and supervisor consultants should be reached about the suitable location for temporary storage of construction materials, equipment, tools and machinery prior to starting construction of each reach of the power lines. No storage of construction materials or electric tools should be allowed in traffic lanes.
- Find suitable locations for temporary storage of conventional construction wastes.
- In case a narrow access road needs to be occupied for limited period (for example by loading/unloading trucks or loaders) the occupation time should be minimized. The additional measure is to have a careful turn (if needed) for the heavy trucks or loaders due to the high-speed vehicles passing by the highway.
- The contractors should make sure that the employed drivers of construction machinery (such as trucks and loaders) have received sensitization/training on safety utilization of their machines in order to minimize accidents risks.

Monitoring Activities:

- No monitoring of physical indicators is required

Reporting

Unusual traffic delays or accident caused during construction or any complaints received should be reported in the monthly report prepared by the construction supervisor consultant

8.3.6. Health and Safety of Construction Workers

Potential impacts to worker and public health and safety during construction of a the proposed project are the same as those associated with any construction project involving earthmoving, use of large equipment, transportation of overweight and oversized materials, and construction and installation of industrial facilities. In addition, health and safety issues include either working at heights. The practices of electricity companies in Egypt reflect that the health and safety procedures are relatively not abided by the workers. That might result in injuries and death.

Mitigation measures:

- In accordance with Labor law related to occupational health and safety No. 12 of year 2003 the workers should be oriented about the health and safety procedures.
- All safety procedures reported in the Law should be abided to by the workers and the top management.
- The contractor should assign a health and safety supervisor who ensures the workers are abided to the H&S procedures
- The contractor should make health and safety facilities available in the project site
- Contracts should be signed with the health facilities close to the construction site
- Implementation of a fall protection program that includes training in climbing techniques and use of fall protection measures; inspection, maintenance, and replacement of fall protection equipment; and rescue of fall-arrested workers
- Safety belts should be provided to workers working at height and should be of not less than 16 millimeters (mm) (5/8 inch) two-in-one nylon or material of equivalent strength. Rope safety belts should be replaced before signs of aging or fraying of fibers become evident.

- When operating power tools at height, workers should use a second (backup) safety strap
 - Testing structures for integrity prior to undertaking work
- A guard should be assigned to assure that the community people are not stepping into the project sites. He should pay attention to children and old people.

Monitoring Activities:

- The resident health and safety supervisor should follow the commitment of workers to use the protective equipment.
- Health and Safety officer should record on a daily bases the activities and accidents occur among the community people.
- The lists of injured workers and community people should be documented and reported to the H&S supervisor on daily bases
- The Grievance log should be monitored, particularly, the cases regarding injuries among the community and the workers
- All workers should attend an orientation session about health and safety procedures

Reporting

- Monthly reporting should be prepared by the H&S supervisor and handed to the H&S manager within the PMU
- Orientation session reports should be prepared by the H&S consultant
- A report should be prepared by the H&S manager within the PMU and shared with the funding agencies on quarterly bases. That report should include the following parameters:
 - Total injured workers distributed by their type of work and project site
 - Total injured people among the community people distributed by age category, sex and area
 - Total complaints related to H&S procedures. The grievances should be segregated by the type, area and the aggrieved person sex.

8.3.7. Safety of Mechanical Equipment

Similar measures as described for 10th of Ramadan substation construction

8.3.8. Management of Flora and Fauna Impacts

At the OHTL routes no mitigation measures are required to be implemented to protect endangered species except along the tracks that will be made to facilitate transportation for raw materials and equipment at Faiyum governorate.

Mitigation measures

- Tracks routes required for transporting equipment, raw material, etc, from main roads to the construction locations within protectorates shall be located to avoid impacts.
- Minimize noise and artificial lighting at night during construction
- Inform construction staff on the importance of natural habitats and notable plant species
- No hunting or poaching by Contractor staff in the Project area and surroundings during construction and operation
- Construction and vehicle movement should be made to minimum

- Prepare and implement a habitat/soil removal and re-instatement plan
- Undertake pre-construction surveys to minimize impacts on natural habitats and protected and threatened plants
- Prepare habitat maps for project sites using aerial photography and high resolution satellite imagery

Monitoring Activities

- EETC health and Safety Officer shall ensure that tracks routes that will be made by the construction contractor are avoiding locations where endangered species may be present
- Evidence of provisions for minimizing light and noise practices during construction
- Reported incidents of staff violating the hunting ban to Wildlife Officer
- Provision of information through staff induction, toolbox talks, leaflets, office posters, wildlife photo competition
- Report on habitats and locations of protected/threatened plant species
- Habitat maps prepared and issued one month before construction

Reporting

- No reporting is required

Bird Migration

The impact of the operational phase of the OHTLs on the bird migration is considered of medium significance. The transmission towers' design and distribution can pose fatal risk to birds through collisions and electrocutions. Birds collision can occur with power lines in case of presence of transmissions lines along migratory routes, at night or during low light conditions (e.g. dense fog).

Mitigation measures:

- Installing bird diverters devices or line markers such as spheres, spiral vibrational dampers, or bird deflectors in order to attract the attention of birds and avoid collision
- Avoid working in seasons of bird migration, Spring (March-May) and Autumn (August to November)

Monitoring activities and reporting:

Carrying out Bird monitoring surveys including caracass observations and mortality surveys, as part of the seasonal monitoring, during spring and autumn seasons.

8.3.9. Management of Possible Impacts on Culture and Privacy of Local Communities

Potential impacts on cultural resources include visual impacts resulting from large areas of exposed surface, increases in dust, the presence of large-scale equipment, machinery, and vehicles for cultural resources that have an associated landscape component that contributes to their significance, such as a sacred landscape or historic trail.

The EETC is normally constructing such projects through specialized construction firms working in the field of energy. Therefore, local communities are expected to be exposed to openness and interaction

with the outsiders of the project crew and workers during the construction phase. This is not a significant concern in urban areas. However, in the conservative rural areas and Bedouin this may affect the local people's cultural privacy.

Mitigation measures:

- Minimizing the number of workers from outside the project areas is highly recommended. The contractor should be advised to employ construction labor from the areas where construction works will take place. The incentives to contractors for such measure include reducing accommodation and transportation for his workers.
- The community leaders could take part in the process of employment in terms of informing their local community about job opportunities
- The newly employed persons and non-Egyptian experts should be oriented about the norms and traditions of the surrounding communities, particularly, the Bedouin ones.
- In case of any violation of norms, the site engineer should handle meetings with the community leaders in order to settle any disputes
- Enable grievance and redress mechanism in order to receive people concerns about such impact

Monitoring Activities:

- The contractor should provide lists of construction workers and their governorates of origin on quarterly basis.
- The Social Development Officer (SDO) should provide reports about any stakeholder engagement activities (meetings- interviews- group discussions) conducted with the communities in case of any problem occurred with the residence of project areas.
- The SDO should provide reports about any training sessions conducted with the workers and the non-Egyptian personnel.

Reporting

- Reporting on percentage of labor recruited from local governorates should be presented by the contractor to the supervisor consultant and to EETC on quarterly basis
- Reporting on meetings conducted with the community people
- Reports about training sessions conducted with the workers

8.3.10. Management of Land Use Restrictions

The ROW zone as identified by the Electricity Law 87/2015 will restrict the construction of new buildings and plantation of high trees on the routes of the OHTL (25 m from the center of the line from both sides) in order to maintain the safety of the line; therefore in case of OHTL, there will be a limitation on agriculture crops such as wheat- maize- citrus fruits-potatoes and clover as well as trees plantation. The habitats of nesting birds should be identified first before any construction to take place in order to avoid the demolition of these habitats.

Mitigation measures:

- The main mitigation measure to be adopted is exerting the maximum effort to minimize the impact on land. Avoidance mechanism should be applied to the maximum possible. Routes of power lines should be placed in vacant desert lands. However,

- Select ROW for locating routes of power lines, and seek alternatives whenever the routes are rejected by community people. The ROW is 25 meters from the center of the power line from both sides. That is in accordance with Electricity Law 87/2015.
- Access roads for the vehicles and storage areas during construction have to be defined during the preparation of the construction phase.
- Inform the local people and raise their awareness about the importance of the project. Mobilizing the community people is essential in terms of raising their awareness about the importance of the project and the compensation mechanism to be adopted
- The contractor is responsible for clearing the tower site after completing his work. EETC shall help the contractor if any problem with the landowner in the agriculture area or with any other authority / agency along the line routes would arise.
- An area of 25 meter from the center of the OHTL should be evacuated from tall trees and buildings. Such area will be kept as a Right of Way (ROW) for maintaining the public safety from electric hazards and high exposure to EMFs. Appropriate compensation should be paid to the owner of trees
- In case of resettlement, a proper Resettlement Action Plan or Abbreviated Resettlement Action Plan (ARAP) should be adequately prepared depends on the number of the project affected persons
- Form a committee of local people and involve them in the compensation process.
- Develop an adequate Grievance mechanism that enable people to voice their concerns and worries, particularly, the ones related to involuntary

Monitoring activities:

- Conduct regular monitoring visits to verify that no encroachment took place under the ROW.
- A field visit should take place by the designer of the project in order to identify the areas of restricted uses and to identify different habitat locations, to be reported by the designer in his design report.
- Monitoring of ROW maintenance activities to apply proper control methods.
- Areas of restricted uses should be monitored along with the type and reason for the restriction and identification of the different habitat locations. The designer in his design report should report these areas.

Reporting

- The designer should identify the locations of intersection between OHTL ROW with areas of restricted uses. In case where this intersection could not be avoided, the designer should justify reasons for selecting this routes in his design report.
- Reporting associated with the land acquisition problems could arise along the routes line.
- Reporting possible resettlement procedures are detailed in the RAP

8.3.11. Management of Socio-economic Impact

Direct impacts would include the creation of new jobs for construction workers and the associated income and taxes generated by the project. Such impact is positive in nature; however, it might be a negative impact in case of not managing employing activities efficiently and wisely. As well as, paying attention to employing some of the community members might put limitation to community disturbance. As stated by the representatives of the electricity companies, it is cheaper for the company to find local workers from each community in order to save the costs of transporting workers from outside. The workers who are needed for such construction works are those with low and medium skills, who represent a high proportion of the residents in the targeted areas.

Mitigation measures:

- Job opportunities should be primarily provided to the community people adjacent to the OHTL
- Community leaders should be represented in a Steering Committee. They should be informed about the job opportunities available for the community people
- The community should voice their concerns through an appropriate grievances and redress mechanism
- The workers should be fully aware about their nature and duration of their work
- Reducing the value of residential units is an unavoidable impact along the OHTL routes. However, it is strongly recommended that EETC should provide awareness raising among the community that the EMF impact is limited in case of respecting the ROW

Monitoring Activities:

- Monitoring the lists of workers and their origins
- Site visits to be paid to the surrounding areas in order to investigate the prices of properties pre and post construction
- Review the grievances log in order to verify whether there are any grievance related to economic impacts

Reporting

- Monthly report should be developed by the contractor including the workers employed during the previous month. Information included should be segregated by: 1) type of work, 2) workers, 3) the living area of workers
- Total complaints related to economic impacts. The grievances should be segregated by the type, area and the aggrieved person sex and age.

The ESMP for SS and OHTL is presented in the following tables during construction phase.

Table 8-3 Environmental Management Plan (ESMP) during Construction Phase of the SS

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
During Preparation and Construction of the SS				
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	Contractor (through tendering activity)	None as a part of tender process	

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
	management of concentration works of heavy machineries			
	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 materials, construction waste, equipment and movement of project vehicles and machineries	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	
	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	
	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	None as a part of contractor responsibility	

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
		operators		
	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	
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			

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
	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 waste before its collection and temporary onsite sanitation facilities should be provided within the construction site for the workers	Contractor	None, as a part of waste management	According to the waste 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	Contractor	None as a part of contractor offers	

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
	the workers		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 of the construction workers	Standard protection for the construction site workers	Contractor	None as a part of 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			

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
	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) pollution	Contractor	None, as a part of waste management	According to the waste management plan submitted to EETC

Table 8-4 Environmental and Social Monitoring Plan during Construction phase of the SS

Project activities	Parameters to be monitored	Locations	Measurements (methods and equipment)	Frequency of measurements	Cost Estimates (\$)**	Responsibilities
During Pre-Construction / Preparation and Construction phase						
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
Base camp preparation for the workers	Neighbors farm /projects complaints	Project construction sites	Recording of complaint and type of complaint	Once during the preparation and prior to start the	None	

Project activities	Parameters to be monitored	Locations	Measurements (methods and equipment)	Frequency of measurements	Cost Estimates (\$)**	Responsibilities
				construction phase		been done to purchase the standard procedure for site clearance. However, the contractor shall put into consideration on their budget proposal
Monitoring the traffic disturbance due to the vehicles and machineries movement and other related construction activities	Traffic complaint	Within 500 m from the construction site	Visual observation and recording complaint received	During the duration of the 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 farm/project	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	Amount of	Project site	Estimation of the	Weekly or	As a part of	Contractor

Project activities	Parameters to be monitored	Locations	Measurements (methods and equipment)	Frequency of measurements	Cost Estimates (\$)**	Responsibilities
construction waste and handling of hazardous waste	hazardous and nonhazardous waste generated	locations	hazardous waste and non-hazardous waste in relation to the handling and transporting to the landfill	monthly depending on the volume of waste	contractor's financial offer for wastes handling	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
Storage of the machines and construction materials of the project	Complaints from neighboring communities and records and documentation of the temporary area	Project sites	Recording and documentation	monthly	-	contractor

Project activities	Parameters to be monitored	Locations	Measurements (methods and equipment)	Frequency of measurements	Cost Estimates (\$)**	Responsibilities
components	for storage of materials or machineries					
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 8-5 Environmental Management Plan (ESMP) during Construction Phase of OHTLs

Potential Impact	Proposed Mitigation Measures	Project Phase	Institutional Responsibility for Implementation	Responsibility of direct supervision	Means of supervision
During preparation and construction of OHTL					

Potential Impact	Proposed Mitigation Measures	Project Phase	Institutional Responsibility for Implementation	Responsibility of direct supervision	Means of supervision
During preparation and construction of OHTL					
Effects of construction waste	<ul style="list-style-type: none"> • Identify disposal sites for construction waste approved by the local authority • Identify a Waste Accumulation Area (WAA) within the construction site for temporary storage of construction waste , including a secured area for the interim accumulation of hazardous wastes • Adequate transportation and disposal of construction waste • Allocate and prepare areas for temporary storage of scrap • Keeping tidiness and cleanliness of the WAA • Construction contractor shall provide portable water cabinets on site to provide hygienic work environment for the work force. The Portable water cabinets shall equipped with an external tank for sewage storage. 	Pre-construction– construction	EETC- Waste officer nominated by EETC Construction contractor	EETC- Construction supervisor consultant	<ul style="list-style-type: none"> • Review local authority approvals • Site supervision • occasional inspection of disposal site • Auditing of allocated WAA • Auditing of stores
Excavation	<ul style="list-style-type: none"> • Identify the excavation depth and width according to the drawing design • Clear safety signs and boundary for the excavation sites • Safety and clear area around the excavation site • safety helmets and boots compulsory for workers 	Pre-Construction	Construction Contractor	Construction supervisor	<ul style="list-style-type: none"> • Site supervision and occasional inspection

Potential Impact	Proposed Mitigation Measures	Project Phase	Institutional Responsibility for Implementation	Responsibility of direct supervision	Means of supervision
During preparation and construction of OHTL					
Construction air emissions	<ul style="list-style-type: none"> • Spraying soil before excavation in loose sandy soil 	Construction	Construction contractor	Construction supervisor consultant	<ul style="list-style-type: none"> • Site supervision
Construction noise	<ul style="list-style-type: none"> • Provide ear muffs to construction workers usually located near noisy machines • Organize working hours so that noise exposure to workers will be minimized • Coordinate and Inform inhabitants/employees at the nearby sensitive receptors about the peak time and hours for construction activities. • Avoid construction activities at night close to residential areas 	Construction	Construction contractor	Construction supervisor consultant	<ul style="list-style-type: none"> • Site supervision

Potential Impact	Proposed Mitigation Measures	Project Phase	Institutional Responsibility for Implementation	Responsibility of direct supervision	Means of supervision
During preparation and construction of OHTL					
Impacts of Flora and Fauna	<ul style="list-style-type: none"> • Tracks routes required for transporting equipment, raw material, etc, from main roads to the construction locations in protectorates shall be located to avoid sensitive areas • Construction and vehicle movement should be made to minimum • Access road has to be defined prior to the construction phase to avoid the resettlement or compensation • Minimize noise and artificial lighting at night during construction • Prepare and implement a habitat/soil removal and re-instatement plan • No hunting or poaching by Contractor staff in the Project area and surroundings during construction and operation • Undertake pre-construction surveys to minimize impacts on natural habitats and protected and threatened plants • Inform construction staff on the importance of natural habitats and notable plant species 	Pre-Construction & Construction	Construction contractor Design consultant	EETC- Construction supervisor consultant- EHS officer	<ul style="list-style-type: none"> • Site supervision • Access road map and access road management of the vehicles to the towers. • Evidence of provisions for minimizing light and noise practices during construction • Provision of information through staff induction, toolbox talks, leaflets, office posters, wildlife photo competition • Report on habitats and locations of protected/threatened plant species

Potential Impact	Proposed Mitigation Measures	Project Phase	Institutional Responsibility for Implementation	Responsibility of direct supervision	Means of supervision
During preparation and construction of OHTL					
Impacts of culture and privacy of local communities	<ul style="list-style-type: none"> • Maximize the use of local workers as much as possible • Provide information sessions to the outsider • Engaging community people in employment process 	Construction	Construction contractor	Construction supervisor consultant	<ul style="list-style-type: none"> • Review of contractor's reports related to workers • Stakeholder engagement activities • Capacity building reports and orientation sessions reports

Potential Impact	Proposed Mitigation Measures	Project Phase	Institutional Responsibility for Implementation	Responsibility of direct supervision	Means of supervision
During preparation and construction of OHTL					
Human health and safety	<ul style="list-style-type: none"> • Restrict application to the health and safety procedures • The contractor should make health and safety facilities available in the project site • Contracts should be signed with the health facilities close to the construction site • Drivers should have a certified and valid license • All mechanical equipment should be checked prior to use • Appropriately tag all mechanical equipment that are locked or out of service • Implementation of a fall protection program that includes training in climbing techniques and use of fall protection measures; inspection, maintenance, and replacement of fall protection equipment; and rescue of fall-arrested workers • Safety belts should be provided to workers working at height and should be of not less than 16 millimeters (mm) (5/8 inch) two-in-one nylon or material of equivalent strength. Rope safety belts should be replaced before signs of aging or fraying of fibers become evident. • A guard should be assigned to keep community people out of the construction site 	Construction	Construction contractor	Construction supervisor consultant	<ul style="list-style-type: none"> • Review of contractor's reports related to health and safety measures as well as the lists of injured workers • Capacity building reports and orientation sessions related to health and safety measures

Potential Impact	Proposed Mitigation Measures	Project Phase	Institutional Responsibility for Implementation	Responsibility of direct supervision	Means of supervision
During preparation and construction of OHTL					
Land use restrictions and possible resettlement	<ul style="list-style-type: none"> • Avoidance mechanism should be fully adopted • If the resettlement occur, information and RPF should be implemented accordance with WB and EIB standard • A RAP study should be prepared to inform about best strategies to compensate the poor • Access roads and storage areas to be defined • Rehabilitating the construction site • Engaging the stakeholder during the process of compensation 	Design, planning and implementation	Design consultant Contractor	Construction supervisor consultant A RAP consultant EETC and local authorities	<ul style="list-style-type: none"> • RAP results • The design consultant report • Site visits reports • Compensation reports and receipts
Trees removal for power lines right-of-way	<ul style="list-style-type: none"> • Avoiding of trees is essential • Plantation of trees near removed trees • Agriculture association should orient the farmers about the best strategy to move their trees 	Construction	Contractor in cooperation with the farmers and the agriculture associations	EETC	<ul style="list-style-type: none"> • Review reports and occasional audits
Socioeconomic impacts	<ul style="list-style-type: none"> • Job opportunities to be provided to the community workers • Integration of community leaders during the employment procedures • 	Construction phase	Contractor and sub-contractors in cooperation with the community leaders	EETC (site engineer and the SDO)	<ul style="list-style-type: none"> • Reports about the workers employed • • Complaints raised about employment

Potential Impact	Proposed Mitigation Measures	Project Phase	Institutional Responsibility for Implementation	Responsibility of direct supervision	Means of supervision
During preparation and construction of OHTL					
Traffic	<ul style="list-style-type: none"> • Prevent storage of construction materials, equipment and machineries on traffic lanes • Capacity building of the drivers about safety utilization should be assured 	Preconstruction and Construction	Construction Contractor	Construction supervisor consultant	<ul style="list-style-type: none"> • Site supervision and grievance log related to traffic impacts

Table 8-6.Environmental Monitoring Plan During Construction Phase for OHTLs

Potential Impact/Activity	Monitoring Indicator	Monitoring Location	Monitoring Methods	Monitoring Frequency	Monitoring Responsibility
During preparation and construction of OHTL					
Disposal of waste during construction	<ul style="list-style-type: none"> Quantities of scrap item by type Segregated waste weight 	WAA	<ul style="list-style-type: none"> Inspection and recording of admitted items 	<ul style="list-style-type: none"> Quarterly reporting 	EETC storekeeper/Waste officer
Excavation impacts	<ul style="list-style-type: none"> Areas of excavations and trenching Safety areas around the excavation 	Construction site	<ul style="list-style-type: none"> Inspection and marking of the safety areas for excavation 	<ul style="list-style-type: none"> Upon excavation and trenching 	Site supervisor consultant Construction contractor
Impacts of culture and privacy of local communities	<ul style="list-style-type: none"> Number of workers from within the project areas Number of stakeholder engagement activities Training sessions and capacity building trainees 	Desk work	<ul style="list-style-type: none"> Reports about the workers Reports about stakeholder engagement activities Reports about capacity building activities 	<ul style="list-style-type: none"> Quarterly during the construction phase 	EETC SDO
Human health and safety	<ul style="list-style-type: none"> Total number of injured workers Total number of injured community people Total received 	Construction site Desk work	<ul style="list-style-type: none"> Site visits to the construction site H&S monthly reports 	<ul style="list-style-type: none"> Quarterly during the construction phase 	Site engineer and EETC SDO

Potential Impact/Activity	Monitoring Indicator	Monitoring Location	Monitoring Methods	Monitoring Frequency	Monitoring Responsibility
	<ul style="list-style-type: none"> grievances related to health and safety • Total number of attendance to the orientation sessions about health and safety 		<ul style="list-style-type: none"> • Reports about stakeholder engagement activities • Reports about H&S capacity building activities 		
Safety of mechanical equipment	<ul style="list-style-type: none"> • Performance of the equipment and the visible damage 	Construction site	<ul style="list-style-type: none"> • Inspection and recording of the performance 	<ul style="list-style-type: none"> • Upon the use of the mechanical and heavy machineries 	Construction contractor
Land use restrictions and possible resettlement	<ul style="list-style-type: none"> • Total areas of restricted use penetrated by ROWs and access road to the towers for the materials • Total affected persons • Total compensation paid to the PAPs 	Construction site	<ul style="list-style-type: none"> • Area measurements on maps and on ground using surveying tools 	<ul style="list-style-type: none"> • During the construction and operation phase • The resettlement consultant should conduct a mid-term and final monitoring 	Design consultant Resettlement consultant EETC SDO
Trees removal for power lines right-of-way	<ul style="list-style-type: none"> • Number of removed trees • Total number of affected farmers 	Construction site Desk work	<ul style="list-style-type: none"> • Visual counting of removed trees 	<ul style="list-style-type: none"> • Upon removal of trees, reporting will 	Site supervisor consultant Compensation committee EETC SDO

Potential Impact/Activity	Monitoring Indicator	Monitoring Location	Monitoring Methods	Monitoring Frequency	Monitoring Responsibility
	<ul style="list-style-type: none"> • Total cost of compensation for trees 		<ul style="list-style-type: none"> • Reports related to compensation 	<ul style="list-style-type: none"> • be once monthly • Quarterly report to be developed about the compensation activities 	
Socioeconomic impacts (job opportunities and reducing the value of residential units)	<ul style="list-style-type: none"> • Number of jobs provided to the community people • Total number of complaints raised by workers • 	<p>Construction site</p> <p>Desk work</p>	<ul style="list-style-type: none"> • Reports about the workers and employment 	<ul style="list-style-type: none"> • Quarterly 	EETC SDO
	<ul style="list-style-type: none"> • Number of affected units • Number of complaints raised 	<p>Construction site</p> <p>Desk work</p>	<ul style="list-style-type: none"> • Reports about the cost of units 	<ul style="list-style-type: none"> • Quarterly 	EETC SDO
Traffic	<ul style="list-style-type: none"> • Storage sites areas • Complaints related to traffic • Total number of drivers attended training about safety utilization • Total number of complaints raised due to traffic problems 	<p>Construction site</p> <p>Desk work</p>	<ul style="list-style-type: none"> • Reports about the capacity building received by drivers • Complaints reports • Reports about capacity building to the drivers 	<ul style="list-style-type: none"> • Quarterly 	<p>Site supervisor consultant</p> <p>EETC SDO</p>

8.4.Environmental Safeguard Training

The Project Company (EETC) will ensure that the substation is manned 24 hours 7 days per week. Typically, a substation of this type employs around 25 staff with around 10 engineers with 3 shifts per day. All staff employed will be trained in the following:

- Specific job roles and procedures;
- Occupational health and safety; and
- Contingency plans and emergency procedures.

Training will include:

- Induction training on appointment;
- Specialist training (as required for their prescribed job role); and
- Refresher training as required.

The training program will be designed to ensure that appropriate skilled staff is used to operate and maintain the substation at all times. Aspects of occupational health and safety and emergency procedures are to be emphasized.

Furthermore, environmental training will be given to all staff employed at the project and special environmental training will be given to the staff during the operation phase to implement the ESMP. They will receive training in the following:

- Day-to-day monitoring activities;
- Collection and analysis of data;
- Use of monitoring equipment, operation and maintenance;
- Industrial hygiene;
- Occupational health and safety; and
- Emergency and contingency procedures.

During the consultation with one of the operators of an existing substation, a safety standard and regular training for staff is already established. However, regular refreshment training held besides the operation and maintenance training are:

- Administration skills
- Civil protection
- Firefighting and fire accident
- Smoke detection
- Fire equipment maintenance

In addition, at every substation EETC provides an emergency plan map including the responsibility of each staff during emergency and their contacts.

8.5. Environmental Management Plan (ESMP) and Monitoring Plan during Operation and Maintenance (O&M) Phase for the SS

Generally, during Operation and Maintenance (O&M) of the substation is related to the noise generated from the transformers, possible EMF exposure, and other related accident that has to be managed by the proper emergency plans. The emergency plans should be prepared and periodically trained to the SS staff include fire accident, emergency of possible leakage of the transformers, the smoke detection. The mitigation measures, monitoring activities as well as reporting expected during O&M of the SS are the following:

Management of Noise

Transformers typically produce harder to mitigate low frequency noise, especially during the night as the SS location is rural developed area so it is hard to disturbed any neighbors; however birds and fauna in the area can be disturb. Accordingly, regarding the noise level during the operation phase, the standard specifications for the transformers are already included at the tender documents.

Mitigation measures:

- Standard specification written of expected noise from the transformers has to be strictly followed by the supplier. Accordingly, the expected noise level of the transformers measured at the residential area will not exceed the permissible noise level (55 dB(A) during the day and 45 dB(A) during the night).

Monitoring Activities and Reporting:

- Monitor and report if there is any complaint related to the noise generated from the SS and disturb the surrounding establishments.

Management of the wastes (hazardous and non-hazardous waste)

Mitigation measures:

- The non-hazardous waste generated is very limited and can be disposing with the domestic waste to be transported to the landfill.
- Regarding the hazardous waste, it is also considered limited. When the transformers need to be replaced due to the increased of the capacity, the transformer will be reuse and installed at the SS that has the needed capacity.
- Temporary storage area will be defined to separate the storage area of the hazardous wastes with the non-hazardous waste before transporting it to the designated landfill.
- Domestic waste is connected to the existing network. Regular check for pipeline connection will be done to avoid the leakage and the dis-function of the network.
- In general, a proper waste collection and storage plus regular (preferably twice a week) waste collection by licensed contractors will need to be arranged by site management. To co-ordinate and control this, The site management should develop a waste management plan which is included in the ToR for the Contractor for waste management during construction and operation. For The hazardous waste, it will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).”

Monitoring Activities and Reporting:

- Implementation of the ECAA regulation for temporary storage, collection, transportation and disposal of hazardous waste
- Record keeping of the admitted waste and their quantity. When the waste is considered sufficient, the management shall dispose it to the designated landfill for solid waste.

Management of EMF

Mitigation measures:

- Periodic maintenance of the GIS SS and its interconnections. This includes the regular tightening, SS efficiency, oil quality, gas pressure, etc.

Monitoring Activities and Reporting:

- Regular EMF monitoring, quarterly at several place inside the SS area and surround the establishment. This measurement can be done together with the EMF monitoring of the interconnections underground cables.

Management of risks during the emergency situations (fire, soil contamination, water resource contamination and smoke)

Mitigation measures:

- Providing the safety equipment and regular check of the equipment
- Design of the foundation of the transformers to include the side for possible oil leak collection (including concrete and gravel surrounding the transformers area.

Monitoring Activities and Reporting:

- Regular visual monitoring for possible leak at surrounding the transformers area
- Regular visual monitoring for possible damage on the foundation and isolated area surrounding the transformers

In addition, regarding the safety issues, EETC periodically provide the specific trainings for the operators and the workers who are responsible for the work of operation and maintenance of the SS. The training obtains include the civil protection, firefighting and smoke detection, besides the operation and maintenance of the SS and its equipment. The map of the emergency plan, responsible persons and their contacts in case of fire accident is also provided.

Table 8-7 Environmental and Social Management Plan(ESMP) during Operation and Maintenance of SS

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
During Operation and Maintenance of the SS				
Noise	<i>Mitigation measures for operators and staff of SS</i>			
	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 10,000 LE annually for standard protection of staff	
	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			

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
	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 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			

Table 8-8 Environmental and Socioeconomic Monitoring Plan

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

8.6. Environmental Management Plan (ESMP) and Monitoring Plan during Operation and Maintenance (O&M) Phase for the OHTLs

During the operation of the OHTLs (500 kV and 220 kV), the operator of OHTLs will be responsible for management and monitoring activities for operation and maintenance phases

Management of the hazardous and non-hazardous waste generation

Mitigation measures:

- Regarding the hazardous waste, it is also considered limited. When the OHTLs need to be replaced
- Temporary storage area will be defined to separate the storage area of the hazardous wastes with the non-hazardous waste before transporting it to the designated landfill.
- In general, a proper waste collection and storage plus regular (preferably twice a week) waste collection by licensed contractors will need to be arranged by site management. To co-ordinate and control this, The site management should develop a waste management plan which is included in the ToR for the Contractor for waste management during construction and operation. For The hazardous waste, it will be managed and disposed in accordance with applicable Egyptian regulations and legislations by a specialized authorized company under the control of the Environmental authorities (EEAA).”

Monitoring Activities and Reporting:

- Implementation of the EEAA regulation for temporary storage, collection, transportation and disposal of hazardous waste
- Record keeping of the admitted waste and their quantity. When the waste is considered sufficient, the management shall dispose it to the designated landfill for solid waste.

Management of Electromagnetic Fields (EMFs)

Energized OHTLs generate electromagnetic fields around the conductors, the intensity of such fields are proportional with the line voltage and electric current which changes in strength over time as the demand for electricity fluctuates. So the only way to know how strong the field is at a given distance, at any particular moment, is to measure it with a magnetic field meter.

Mitigation measures:

- Routes of OHTLs are designed so that maximum possible distances could be maintained between the lines and developed areas
- A suitable ROW should be kept on both sides of power lines where no development buildings should be constructed. The Egyptian Electricity Law 87/2015 indicated that the guidance ROW distance is 25 meters.

- Maintaining standard safety procedures for the transmission lines. The EETC will be distributed the safety standard procedures during the operational phase that put in detailed of the safety measurements include:
 - Maintain minimum clearance between ENF generators and the ground according to the standard allowed
 - Provide climbing space to allow linemen to work more safely on the structures while they are energized
- Carry out an awareness raising campaign that should target the different communities where the project will be implemented in order to educate them about the precautions that they should be considering in order to ensure their safety on both community and household or family level. There should be special attention for accessing women, who are so close to issues of energy rationalization on the households' level. In addition, also to some associated risks outside house (e.g. herding activities near substation and the risk of electric shocks), and children because they are one of the most vulnerable groups to the risks of electric shocks both outside homes i.e. by playing near substations or inside homes. The awareness raising will be undertaken through local NGOs who can be trained by a specialized training consultant.

Monitoring Activities and reporting:

- EMF should be measured frequently in different locations especially at the areas where sensitive receptors are located (along the transmission line). This monitoring should be undertaken by a specialized expert on quarterly basis .The detailed EMF monitoring plan will be better left to the EETC and local authorities to identify.
- Results of the EMFs monitoring plan should be reported to the head of environmental department on the local authorities, with the ESMP quarterly progress report.
- Grievances raised by the community people regarding the EMF
- Design consultant should present the safety precautions, which have been considered, as a separate section of his design report
- The training consultant appointed by EETC should report to the head of the substation (after he is appointed) of training courses that have been conducted, while the NGOs should report on the implemented awareness activities both on quarterly bases

Management of Soil Contamination

Mitigation measures:

- In case a leakage occurred, the soil should be removed and sent for disposal as hazardous waste to a certified hazardous waste landfill as previously mentioned.

Monitoring activities and reporting:

- The amount and management methods of contaminated soil, should be undertaken by the Contractor include locations and reasons for such incidents.

Management of Noise Impacts

Noise impact on workers, and along the OHTLs route will occur during maintenance only. Workers could be exposed to relatively high levels of noise. This could be mitigated through application of the normal precautions normally taken by operator (PPE)

Mitigation measures:

- Workers that operate at the OHTLs be supplied with earmuffs and should be instructed to put them on when they get into noisy zones. Operator EHS officer should be responsible to instruct their workers to abide to this role.
- Working hours for workers exposed to noise equipment should be designed so that noise exposure periods do not exceed the safe limits

Monitoring activities and reporting:

- Measuring noise levels at on quarterly to assure that noise levels within the work environment within the transmission lines is complying with legal limits (kindly refer to chapter 2)

Management of Natural Risks

Mitigation measures:

Before commencement of construction of the OHTLS, the following mitigation measures shall be applied by EETC.

OHTL route considerations

- Careful attention should be taken to select the exact locations of the transmission towers at the area of protectorates
- Avoid locating any of transmission line towers at flood runoffs routes or exits within protectorate.
- Design of Foundations of the towers located at protectorate shall consider the flood runoffs risks

Monitoring Activities and reporting:

- No monitoring activities are required for the recommended mitigation measure as long as the above they are implemented

Management of the Land Use limitations

Land use impacts would be minimal, as many activities could continue within the ROW (e.g., agriculture and grazing). However, the limitation of construction activities might impose the residents and the owners of lands under the ROW. The restrictions of land use might shed light on the economical situation of the households due to the high probability of not being able to trade in land. As well as, in case of urbanization, the lands under the ROW will not be used for the construction activities.

Mitigation measures:

- Developing a Resettlement Action Plan (RAP) that identifies both short and long term impacts
- Provide detailed information to the populated agriculture lands' community in order to inform about the results of the RAP
- In case of any urbanization, the project affected persons who might face limitation of his land should be properly compensated as reported in the RAP
- The EETC should pay compensation according to the full replacement value

Monitoring activities and reporting:

- The number of project affected persons
- Type of compensation to be provided to those group
- Due diligence is required to validate the willingness of the project affected persons who approve to apply restrictions of use to their lands with no intimidation and coherence
- Quarterly report to be developed by the compensation committee during the construction phase
- Quarterly report of the grievances received by the Social Development Officers

Management of Socioeconomics impact

The potential loss of economic wellbeing might result in due to:

- The temporary workers who will lose their jobs after the construction, consequently, their source of income will be affected. That might result in severe impact on their social status. Additionally, the workers might resort to raising conflict with the project.
- The second major economic impact will result in due to the restriction of land use. It is well- known that the construction lands are of much higher value than the agriculture lands. In case of restricting the use of lands, the project affected persons will lose the value of their lands.

Mitigation measures:

- Workers should be fully informed about the duration of work.

- Developing a Resettlement Action Plan (RAP) that identifies both short and long term impacts
- Provide detailed information to the populated agriculture lands' community in order to inform about the results of the RAP
- In case of any urbanization, the project affected persons who might face limitation of his land should be properly compensated as reported in the RAP
- The EETC should pay compensation according to the full replacement value
- The key issue for mitigating this impact is the community participation in all phases of the project. The consultation activities conducted during the ESIA was a key point that stretched communication channels with the community. Continuous dialogue with the community might provide a better idea about the impacts of the project.
- Adopting the proposed service provider (NGOs or women leaders) will maximize their involvement in the project; therefore, to understand it properly.
- Form a committee representing by the natural leaders inside each community to be responsible for reconciliation in case of having any conflict arise.
- Informing the consumer and communicating with him/her is essential as it keeps them informed and gives them the sense that their interests are respected.

Monitoring activities and reporting:

- Total number of workers who complain due to losing their temporary work.
- The number of project affected persons who will lose the benefit of their lands.
- Type of compensation to be provided to those group.
- Due diligence is required to validate the willingness of the project affected persons who approve to apply restrictions of use to their lands with no intimidation and coherence
- Quarterly report to be developed by the compensation committee during the construction phase
- Quarterly report of the grievances received by the Social Development Officers
- Consult community through different meetings, Focus Group Discussions, and workshops on the current situation, perceived impacts, service providers...etc. This is being undertaken through the activities of the ESIA.
- Involve some selected members from the local community to be part of the assessment and scoping phase.
- The grievance and redress mechanism should be adequately reviewed, particularly, in case of any complains are raised due to the misconceptions. Reviewing GRM log will be useful as a monitoring tool.

Health and Safety

Possible impacts to health and safety include exposures to electromagnetic fields (EMF), accidental injury to workers during operation and maintenance activities. Additionally, health and safety issues include working at heights, working around energized equipment, working in potential weather extremes, and possible contact with natural hazards and either working at heights or in trenches.

Mitigation measures:

- In accordance with Labor law related to occupational health and safety No. 12 of year 2003 the workers should be oriented about the health and safety procedures.
- All safety procedures reported in the Law should be abided to by the workers and the top management.
- The operator should assign a health and safety supervisor who ensures the workers are abided to the H&S procedures
- The operator should make health and safety facilities available in the project site
- Implementation of a fall protection program that includes training in climbing techniques and use of fall protection measures; inspection, maintenance, and replacement of fall protection equipment; and rescue of fall-arrested workers
- Safety belts should be provided to workers working at height and should be of not less than 16 millimeters (mm) (5/8 inch) two-in-one nylon or material of equivalent strength. Rope safety belts should be replaced before signs of aging or fraying of fibers become evident.
 - When operating power tools at height, workers should use a second (backup) safety strap
 - Testing structures for integrity prior to undertaking work
- A guard should be assigned to assure that the community people are not stepping into the project sites. He should pay attention to children and old people.

Monitoring Activities and reporting :

- The resident health and safety supervisor should follow the commitment of workers to use the protective clothes.
- He should follow on day to day bases the accidents occur among the community people.
- The lists of injured workers should be documented and reported to the H&S supervisor on daily bases
- The Grievance log should be monitored, particularly, the cases regarding injuries among the workers
- All workers should attend an orientation session about health and safety procedures
- Monthly reporting should be prepared by the H&S supervisor and handed to the H&S manager
- A quarterly report should be prepared by the H&S manager and shared with the funding agencies on quarterly bases. That report should include the following parameters:
 - Total injured workers distributed by their type of work and project site
 - Total injured people among the community people distributed by age category, sex and area
 - Total complaints related to H&S procedures. The grievances should be segregated by the type, area and the aggrieved person sex.

Bird Migration

The impact of the operational phase of the OHTLs on the migratory birds is considered to be medium to minor significance. The transmission towers' design and distribution can pose fatal risk to birds through collisions and electrocutions. Birds collision can occur with power lines in case of presence of transmissions lines along migratory routes, at night or during low light conditions (e.g. dense fog).

Mitigation measures:

- Installing bird diverters devices or line markers such as spheres, spiral vibrational dampers, or bird deflectors in order to attract the attention of birds and avoid collision
- Avoid working in seasons of bird migration, Spring (March-May) and Autumn (August to November)

Monitoring activities and reporting:

- Carrying out Bird monitoring surveys including carcass observations and mortality surveys, as part of the seasonal monitoring, during spring and autumn seasons.

Table 9-1 Environnemental Management Plan during Operation and maintenance Phase of OHTLs

Potential Impact	Proposed Mitigation Measures	Institutional Responsibility for Implementation	Estimate Cost	Comments
Exposure to EMF	<ul style="list-style-type: none"> Select final routes of transmission lines as far as possible from residential areas In case EMF monitoring results gave high EMF readings in populated areas, EMF reduction measures should be taken according to recommendations of an engineering consultant 	Design consultant/ Specialized Engineering Consultant	Undefined	<ul style="list-style-type: none"> Review design reports Review consultant reports and implementation of measures
Management of Natural Risks	<ul style="list-style-type: none"> Avoid locating any of transmission line towers at flood runoffs routes or exits. Design of Foundations of the towers shall consider the flood runoffs risks It should be noted that in protectorates, placing the transmission towers shall not alter at any condition the flood runoffs route Consider other mitigation measures factors 	Designer contractor	Undefined	<ul style="list-style-type: none"> Review the design of the towers Ensure implantation of proposed measures
Land use restrictions and possible resettlement	<ul style="list-style-type: none"> Developing a Resettlement Action Plan (RAP) RAP/RPF should be implemented accordance with IFC and EIB standard A RAP study should be prepared to inform about best strategies to compensate for the loss of lands due to the restrictions of use Access roads and storage areas to be defined Rehabilitating the construction site Engaging the stakeholder during the process of compensation 	EETC operator staff Compensation committee	Undefined	<ul style="list-style-type: none"> RAP results The design consultant report Site visits reports Compensation reports and receipts

Potential Impact	Proposed Mitigation Measures	Institutional Responsibility for Implementation	Estimate Cost	Comments
Socioeconomic impacts	<ul style="list-style-type: none"> • losing of temporary jobs • Workers should be fully informed about the duration of work • Losing of land value • Developing a RAP that identifies both short and long term impacts • Provide detailed information about the results of the RAP • Compensation to be paid to the PAPs as reported in the RAP • The EETC should pay compensation according to the full replacement value • Inform the community about the different stages of the project, safety measures and transportation route 	EETC operator staff with the community leaders	Undefined	<ul style="list-style-type: none"> • Reports about the workers employed • Complaints raised about employment • Reports about information dissemination
Health and safety	<ul style="list-style-type: none"> • Restrict application to the health and safety procedures • The contractor should make health and safety facilities available in the project site • Contracts should be signed with the health facilities close to the construction site • Drivers should have a certified and valid license • All mechanical equipment should be checked prior to use • Appropriately tag all mechanical equipment that are locked or out of service • Implementation of a fall protection program that includes training in climbing techniques and use of fall protection measures; inspection, maintenance, and replacement of fall protection 	EETC operator	Undefined	<ul style="list-style-type: none"> • Review of EHS officer reports related to health and safety measures as well as the lists of injured workers • Capacity building reports and orientation sessions related to health and safety measures

Potential Impact	Proposed Mitigation Measures	Institutional Responsibility for Implementation	Estimate Cost	Comments
	<p>equipment; and rescue of fall-arrested workers</p> <ul style="list-style-type: none"> • Safety belts should be provided to workers working at height and should be of not less than 16 millimeters (mm) (5/8 inch) two-in-one nylon or material of equivalent strength. Rope safety belts should be replaced before signs of aging or fraying of fibers become evident. • A guard should be assigned to keep community people out of the construction site 			
Bird Migration	<ul style="list-style-type: none"> • Installing bird diverters devices or line markers such as spheres, spiral vibrational dampers, or bird deflectors in order to attract the attention of birds and avoid collision • Avoid working in seasons of bird migration, Spring (March-May) and Autumn (August to November) 	EETC operator	Undefined	Carrying out Bird monitoring surveys including caracass observations and mortality surveys, as part of the seasonal monitoring, during spring and autumn seasons.

9. Stakeholder Engagement Activities

The Stakeholder Engagement chapter aims at highlighting the key consultation and community engagement activities and their outcomes, in addition to outlining the validity and reliability of the collected data. The Stakeholder engagement activities were conducted with reference to the standard 10 of the environmental and social standards of EIB⁹

In summary, the following system of stakeholder engagement is applicable to the project:

- Identification of project stakeholder groups including members of the public who could be affected (directly or indirectly) by project construction and operation.
- Stakeholder engagement process. Timely and ongoing provision of information to stakeholders on the environmental and social issues that could potentially affect them
- Meaningful consultation and disclosure which will be based on the disclosure of information relevant project activities, and will be undertaken in a manner that is inclusive and culturally appropriate for all stakeholders.
- Grievance mechanism by which the general public and other stakeholders can raise concerns, which the Company will handle in a prompt and consistent manner.

In order to achieve that:

- Community engagement plan has been developed for the different Stakeholders through Two phases :
 - Phase I: Consultation activities conducted on the SS and the surrounding areas (August 2017),
 - Phase II: During the preparation of the RPF study, the areas located along the routes of the OHTLs; were included on April 2018.
- Based on the identification of stakeholders, various questionnaires and guidelines were prepared in order to engage:
 - The residents in the project area
 - Major Investors and the Head of 10th of Ramadan city, Fayed, Belbes, and Banha Authorities
 - The community people
 - Women
 - Young people and Elderly
 - Owners of farms and workers
 - Governmental Organizations and Authorities
 - 10th of Ramadan city Authority
 - Fayed
 - Belbees
 - Banha NGOs

⁹ http://www.eib.org/attachments/strategies/environmental_and_social_overview_en.pdf

- Environmental administrations
- Contractors
- Project owners (Egyptian Electricity Transmission company)

The consultation outcomes will be used in:

- 1- Define/refine potential project stakeholders and suggest their possible project roles
- 2- Identify the most effective outreach channels that support continuous dialogue with the community

Thereafter the results will provide proper documentation of stakeholder feedback and enhance future stakeholder engagement activities accordingly.

9.1 Stakeholder Identification

The project is recognized as an important electricity distribution project, accordingly, it is essential to realize, within the context of this project the importance of engaging the wide base of ‘stakeholders’ in the process which aims to bring these stakeholders together from the local and national levels to inform and support project implementation.

A stakeholder is defined, in the IFC Guidance Note 1, 2012 as:

“Persons, groups or communities external to the core operations of a project who may be affected by the project or have interest in it. This may include individuals, businesses, communities, local government authorities, local nongovernmental and other institutions, and other interested of affected parties”. The following table summarizes all potential project stakeholders.

Table 9-110th of Ramadan Substation Stakeholders

Categories	Stakeholder groups	Role
<i>Primary stakeholders</i>		
Potential affected communities 10th of Ramadan City	Major Investors and Head of 10th of Ramadan city Fayed, Belbes, and Banha Authorities	<ul style="list-style-type: none"> • They are the community leaders of the project affected communities • They will be responsible of communicating with the Project and sharing information with their community people
	The community people living in 10th of Ramadan City Fayed, Belbes, and Banha	<ul style="list-style-type: none"> • Households and communities that will receive impacts (positive/negative) as a result of the project.
	Women	<ul style="list-style-type: none"> • They will receive the impacts of the project. Additionally given their vulnerable status they might be severely affected by positive or negative impacts

Categories	Stakeholder groups	Role
	Young people (from age of 18 to 35 year)	<ul style="list-style-type: none"> They have interests in the project as they might get a job opportunities
	Elderly	<ul style="list-style-type: none"> They will receive the impacts of the project. Additionally given their vulnerable status they might be severely affected by positive or negative impacts
	Owners of farms, and workers	<ul style="list-style-type: none"> They will receive the impacts of the project. they might be severely affected by positive or negative impacts
	10th of Ramadan City Authority	<ul style="list-style-type: none"> Permissions for the road cut during the implementation Rehabilitation of roads, which is one of the major issues raised by the community.
	Information Centers in 10th of Ramadan City	<ul style="list-style-type: none"> Provide the project with the underground utilities and infrastructure maps. As well as, providing information about the surrounding communities
Environmental sector	Ministry of Environment - Egyptian Environmental Affairs Agency (EEAA)	<ul style="list-style-type: none"> Responsible for reviewing and approving ESIA's, and monitoring implementation of the Environmental Management Plan
	Environmental Office within the governorate	<ul style="list-style-type: none"> Responsible for monitoring the compliance to environmental requirements
Project owner	Egyptian Electricity Transmission company	<ul style="list-style-type: none"> Project owner
Financial institutes	European investment bank (EIB)	<ul style="list-style-type: none"> Financiers and regulators
Contractors	Contractor	<ul style="list-style-type: none"> Manage the design, engineering, procurement and construction works for the project

Categories	Stakeholder groups	Role
Other governmental entities	The General Authority for Roads, Bridges & Land Transport	<ul style="list-style-type: none"> • Permissions for the road cut during the implementation of the associated projects
	Ministry of Defense	<ul style="list-style-type: none"> • Permitting the location of plant and the routes of the associated overhead transmission line
<i>Secondary stakeholders</i>		
Civil society	Local NGOs (Two NGOs) - 10th of Ramadan Investors Association - 10th of Ramadan Environmental Guards Association	<ul style="list-style-type: none"> • They are responsible of sharing information with the community. • NGO's are a good method for spreading awareness messages to the local community. Regular meetings are held regularly every two months with the NGO's and community leaders. Publications will be distributed (project fact sheets and grievance forms).
Traders and suppliers	Traders (small scale stores) within 10th of Ramadan City (unofficial suppliers)	<ul style="list-style-type: none"> • Provide workers with food and amenities.
	Small contractors within 10th of Ramadan City (unofficial suppliers)	<ul style="list-style-type: none"> • From the project adjacent areas, may be affected.

9.2 Defining/refining the stakeholder

In order to ensure an inclusive and meaningful consultation process, a stakeholder's analysis was conducted to get better understanding of the various groups and their roles, interests and influence on the project. Full list of the stakeholders on the governorate level is included in Annex 3

A focused stakeholders' identification was conducted to identify the key groups of relevance to the project in this specific location. The main identified groups are very similar to those identified on the governorate level but on a smaller scale (elaborated details on that are include in the Governorate level ESIA). In the meantime, local communities of both men and women of projects beneficiaries, local NGOs (Two) were among the key stakeholders on the local level.

The abovementioned stakeholders were consulted using various tools (i.e. Individual Interviews, Group Meetings, and Focus Group Discussion).

Various interviews were conducted with the stakeholders in the consultation activities in August 2017; the diversity of community representation was taken into account.

9.3 Methodology of Conducting Field Work

The Consultant carried out stakeholder engagement activities through one phase in August 2017 through the following methods: Focus Group Discussions (FGDs) with community members and surrounding farming-related stakeholders, Group Meetings and Semi-Structured Interviews with community stakeholders.



Figure 9-1 Summary for the tools used to

9.4 Consultation Methodology and Activities

The research team for this study has adopted multi-dimensional consultation activities that enable the marginalized, voiceless, youth and women to gain information about the project. As well as, gaining information about their concerns and worries that regarding the project during various implementation phases. Following are the main consultation activities to date:

- 1- The study team visited the project area in order to define various stakeholders.
 - Stakeholder engagement plan has been developed for the different communities which is the consultation activities that conducted in August 2017, at this phase study aims to publish comprehensive information on the project, in order to enable the entities concerned to determine the fears, needs and recommendations
- 2- The study team divided the various engagement activities of the project to:
 - Data collection phase and,
 - Consultation activities.
- 3- All activities conducted were documented with photos and lists of participants in order to guarantee an appropriate level of transparency.
- 4- All information disclosure took place by presenting non-technical executive summary, note document on grievance mechanism and explaining their contents verbally.

Table 9-2: Summary of Consultation Activities in Project Areas

Stakeholders		Number		Method	No. of Meeting	Date
		Males	Females			
Governmental Organizations and Authorities	10th of Ramadan Fayed, Belbes, and Banha Authorities	12	5	¹⁰ In-depth interviews	10 In-depth interviews	August 2017 April 2018
The residents in the project area	Women	0	37	- In-depth interviews	15 In-depth interviews	
				- ¹¹ Focus group Discussions	6 Focus group Discussion	
	Young people	48	7	- In-depth interviews	17 In-depth interviews	
					5 Focus group Discussion	
	Elderly	24	0	- Focus group Discussions	15 In-depth interviews	
					4 Focus group Discussion	
Local Governmental Unit (LGU) and NGOs	Environmental administrations	4	0	- In-depth interviews	4 In-depth interviews	
	Local NGOs	3	2		5 In-depth interviews	
	Information Center in 10th of Ramadan City, Banha	0	1		1 In-depth interview	
Contractors	Contractor	2	0	- In-depth interviews	2 In-depth interviews	
Project owners	Egyptian Electricity Transmission company	2	0	- In-depth interviews	2 In-depth interviews	
	EETC- Delta	0	2		2 In-depth	

¹⁰ In-depth interviews: In depth interviews are one to one meeting and with clear objective where the findings are used in the research. A number of in-depth interviews with project stakeholders have been performed, also an interview agenda has been prepared to guide through the topics that require to be discussed during the interview.

¹¹ Focused group discussion (FGD): Are group discussion of 5 to 10 participants that are chosen based on their common background or selected based on sharing common interest. FGD allows knowing the practices and setting of the area. It is effective tool in delivering local community facts in relatively short period which can vary from 45 min to 60 min depending on the participants' time availability.

Stakeholders	Number		Method	No. of Meeting	Date
	Males	Females			
zone				interview	



hoto 9-1: Interview with the assistant of Roads and the official of Information Center in 10th of Ramadan Authority



hoto 9-2: interview with one of the electrical engineers in 10th of Ramadan city in the project area



hoto 9-3: Interview with the official of planning administration in 10th of Ramadan Authority



hoto 9-4: Focus Group with the officials of Electric Administration and Engineering Department in 10th of Ramadan Authority



Photo 9-5: Interview with one of the workers in Al Ramly Farm



Photo 9-6: Interview with the official of environmental administration in 10th of Ramadan Authority



Photo 9-7: Interview with one of the workers in Al Sawaf Farm



Photo 9-8: Interview with one of the farmers in Abdel Hamid Amar Farm



Photo 9-9: Focus Group in one of the farms in 10th of Ramadan city



Photo 9-10: Interview with one of the women of Al Halal farm

photos of some meetings with the project stakeholders

9.5 Consultation processes

9.5.1 The results of the consultation activities are presented as follows:

Table 9-3: Key comments and concerns that raised during the Consultation activities

Stakeholders	Comments/Concerns Raised
<ul style="list-style-type: none"> - Governmental entities and Authorities in 10th of Ramadan city - NGOs 	<ul style="list-style-type: none"> - According to the interviews with the Governmental entities, Authorities, and NGOs in 10th of Ramadan city, all of the officials emphasized on the importance of the project and its role in development. They reported that the project will have public benefits, and solve the problem of the electricity high costs especially on the productive factories in the city which number reaches 2056 factories and create about 353,000 job opportunities, in addition to, 1028 factories are under implementation which is expected to create 5374 job opportunities. This is emphasized on the importance of implementation of the station and other development projects. - NGOs, especially 10th of Ramadan Investors Association confirmed on the importance of the project in investment in the industrial fields in 10th of Ramadan city, the cost of investments in the city reached about 16 billion. - The officials emphasized that there will be expansions in the electricity sector, which will be the implementation of the new stations (as mentioned in the baseline), and this confirms on the importance of implementation the substation. - The planning administration confirmed that the future planning of the project area will not include residential blocks adjacent to the station. - The majority of the officials stressed on the importance of monitoring the implementation of the international standards through the implementing entities, and implementing the projects with modern techniques in order to achieve the desired benefits of the project. - For NGOs, the meetings with them showed that, they are interested in the project and in raising the awareness of the community people about the project and the adopted grievance Mechanism, as well as, how the individuals can obtain their rights in case of any impacts occurred.
<p>The residents in the project area</p> <ul style="list-style-type: none"> • Major Investors • The community people <ul style="list-style-type: none"> ○ Women ○ Young people ○ Elderly • Owners of farms and workers 	<ul style="list-style-type: none"> - The meetings with the stakeholders in the project areas revealed their remarkable and overwhelming acceptance of the project, due to its importance to the electricity sector in the 10th of Ramadan City. - The stakeholders reported that the project will improve the social conditions of the community people in the project areas as the electricity is considered one of the basic infrastructures, as well as, the 10th of Ramadan city Authority interests in the social housing projects such as youth housing and “Build your Own House” project. - They reported that the implementation of the station will help in establishing new projects, constructing factories and workshops, therefore the project will provide job opportunities in all fields. - Major Investors confirmed on the importance of placing warning signs around the station in order to maintain public health.

	<ul style="list-style-type: none"> - The owners of the farms reported that, the implementation of the project will not have adverse impacts on them, however, they said that the construction of the station will be associated with the extension of high pressure lines which may affect their lands, - They confirmed on not being affected by the extending of the electricity networks, especially that their lands are cultivated in fruit trees such as (mango-citrus- guava- and palms) and they should have fair compensations in case of their lands are affected. - The owners of the farms reported that there are no stable families in the farm area except some farmers and guards (who are not exceed 10 persons in each farm). - All of the stakeholders in the project areas agreed to participate in disclosure information about the importance of the projects and its impacts through conduct social meetings in the places that are preferred by the population such as mosques, cafes, restaurants, and NGOs
Project owner Egyptian Electricity Transmission company	Meetings were held with the officials of the Egyptian Electricity Transmission Company, in order to: <ul style="list-style-type: none"> • Provide possible facilities for field work and extract the necessary permits to facilitate the task of researchers • Discuss the cognitive information to be disseminated among citizens about the project, and to clarify it in a simple way and in a language that appropriate with their culture, • Discuss and explain the grievance system in the Egyptian Electricity Transmission Company, in order to be discussed and explained to citizens in a simple way and in a language appropriate with their culture.
Contractors	Some meetings were conducted with the officials in the implemented company in order to follow up the construction works and their impacts on the surrounding society

9.5.2 Summary of consultation outcomes

The consultation outcomes revealed that:

- A. The key message from the consultation events carried out for this project is that Public and government acceptance for and support to the project are very strong.
- B. The community people expressed their need to understand more about the projects. In order to reduce the concerns of the community people and spread the knowledge the following is recommended:
 - Conduct orientation session in the project area, especially in the places that are preferred by the population such as mosques that guarantee the presence of large number of people.
 - Engage the stakeholders from NGOs that are working in the project area in the awareness programs, due to their ability to communicate with large number of citizens.
- C. The interviews and the focus group discussion revealed some concerns raised by the community regarding the project such as:

- The owners of the farms reported that they have future concerns related to the construction of the station as it will be associated with the extension of high pressure lines which may affect their lands, therefore, they should have fair compensations in case of their lands are affected.
 - Actual need to provide clear information about the project
 - Actual need to response to grievances in timely manner
- D. The station is 1 to 2 km away from the farms, in addition to; there are no stable families in the farm area except some farmers and guards (who are not exceed 10 persons in each farm).
- E. The interviews with the implemented companies revealed that, they are fully aware about security and safety procedures. As well as, the excavation work dates in accordance with the nature of the region, the traffic density and the population.
- F. The study recommends the participation of the community people in sharing information about project with the other people especially the illiterate groups. (the recommendation is not obligated for the project)
- G. The study tried to raise awareness about the importance of the project, and inform the community people about grievance mechanism through individual and public consultation activities with the stakeholders.
- H. The study recommended to spread information among citizens through the stakeholders by using snowball method that enables them to exchange information verbally
- I. The study aimed to identify the most effective outreach channels that support continuous dialogue with the community, these channels are represented in:
- Major investors
 - NGOs in the project area
 - Some government officials in the local units.

10. Grievances and Redress Mechanism

Objectives: The objective of a grievance procedure is to ensure that all comments and complaints from any project stakeholder are considered and addressed in an appropriate and timely manner.

Disclosure of the GRM: The Community people are fully informed about the Grievance procedures in simple language. The Consultant has disclosed information about GRM during the stakeholder engagement activities in May 2017 explaining the procedure, presenting the form structure, time frame and etc. Community people and the governmental units were all informed about GRM through individual meetings. NTS and GM notes was presented during the engagement activities. Illiterate people were also engaged among the community people as well as the head of families and head of Beni Salama Arab tribe.

Mode of Grievance: The contractor will accept all comments and complaints associated with the project from any stakeholder. Comments can be made via email, post, fax, on the telephone or in person. The comments and complaints will be summarized and listed in a Complaints/Comments Log Book, containing the name/group of commenter/complainant, date the comment was received, brief description of issues, information on proposed corrective actions to be implemented (if appropriate) and the date of response sent to the commenter/complainant. A telephone number will be available for the community people to tell their complaints. The site manager/EETC company will register all types of complaints.

Response to grievances: All comments and complaints will be responded to either verbally or in writing, in accordance to preferred method of communication specified by the complainant. The grievance should be responded to within a month maximum. Comments will be reviewed and taken into account in the project preparation; an individual response should be presented to each aggrieved person. The grievances should be documented in a Grievance log.

Registration of GRM: All grievances will be registered and acknowledged within 6 working days and responded to within one month. The project management will keep a grievance log and report on grievance management, as part of annual project progress reports, which will be available on the company (Misr El Wosta Distribution Company) website.

Grievance channels:

Comments and concerns regarding the project can be submitted verbally or in writing to EETC through the following channels.

- By telephone : 00202 22616537
- By post or hand delivered to: Egyptian Energy Transmission Company, Emtedad Ramsis St., Abbasiya, Cairo
- Using grievance boxes that are installed at the LGU/NGOs in the nearby villages
- During construction to site manager (Contractors' side, who will be responsible to relay the grievance to EETC's project management):
Site Manager : Eng. Ahmed Mohamed Saeed El Qadi

Mobile : +2 01285529888

Confidentiality: Individuals have the right to submit their grievance anonymously if they wish to do so, and in case they agree to include their name they have the right for their name to be kept confidential.

Management of GRM: During construction of the project, grievances in relation to construction activities will be managed by the Company and the construction contractor(s). The Consultant has provide contact information for the contractor to residents of near hamlets.

A separate grievance mechanism is available in the same manner for workers, including employees of both the project-employed and contractors.

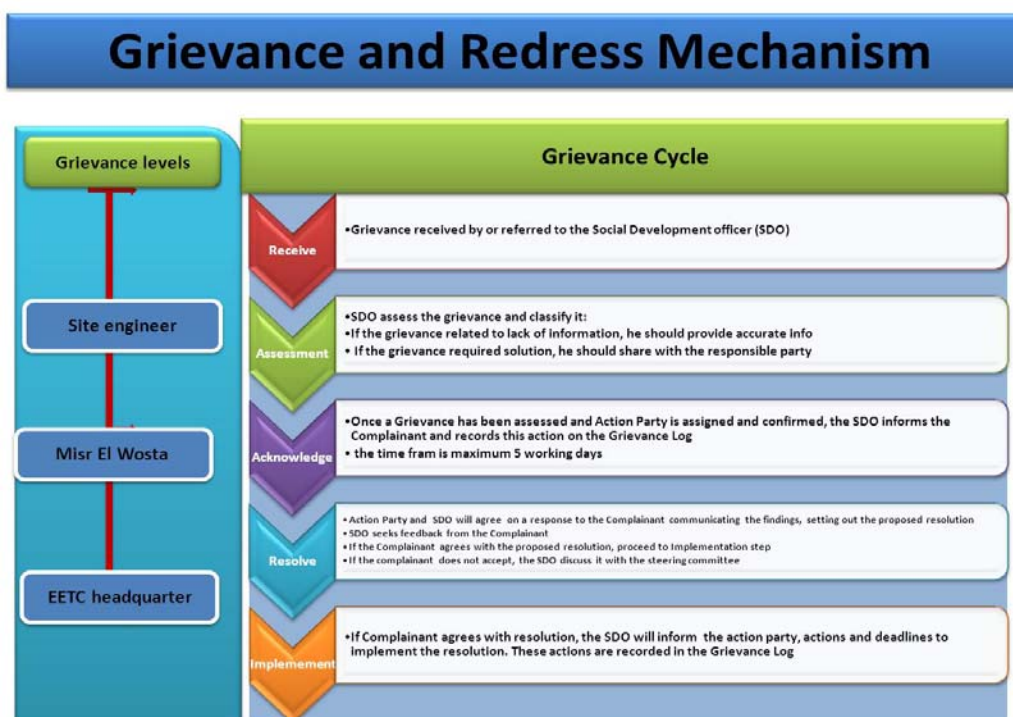


Figure 10-1: Grievance mechanism

a. Resources and Responsibilities

The Contractor site manager will take the overall responsibility for handling the consultation and information disclosure process and maintaining ongoing communication with identified stakeholders, collecting and processing comments/complaints, and responding to any such comments and complaints.

Depending on the nature of a comment/complaint, some comments or complaints will be given to the appropriate person in the company for a response.

b. Monitoring and Reporting

10.1.1. Monitoring of Grievances

All grievance activities should be monitored in order to verify the process. The monitoring process should be implemented on the level of EETC- Alex and west delta zone,

The following parameters will be monitored:

1. Efficiency of grievances recipients monthly (Channel, gender, age, basic economic status of the complainants should be mentioned)
2. Type of grievance received (according to the topic of the complaint)
3. Number of grievances solved
4. Number of unsolved grievances and the reasons behind not solving them
5. Satisfaction levels with proposed solutions
6. Documentation efficiency
7. Time consumed to solve the problem
8. Efficiency of response to received grievance dissemination activities undertaken

All grievances received verbally or in written shall be documented in a grievance register. They should be analyzed and reported to the funding agency.

10.2. Monitoring of Community Engagement Activities

All Engagement activities shall be documented e.g. photo documentation, shared documents/NTS. All engagement activities shall outline

- 1- Groups to be engaged
- 2- Objective of engagement
- 3- Method or tool of engagement
- 4- Engagement activities
- 5- Responsible entity for engagement activity
- 6- Main information to share with them

For the construction phase, the Consultant has performed the engagement activities as outlined in Figure 9.1. During operation phase the plan shall be carried forward by EETC regional branch.

10.3. Reporting

During both construction and operation phase, the site manager of respective phase shall maintain track of all community engagement and grievances records and populate semi-annual report on each period findings and recommendations. The report shall provide summary of the ongoing communication with community stakeholders, mode and frequency. The SEP will be updated to reflect the transition of activities and responsibilities of EETC regional branch company from construction phase to operation phase once the substation is formally commissioned by the Contractor.

Environmental and Social Impact Assessment (ESIA) for 10th of Ramadan GIS Substation and its interconnecting Overhead Transmission Lines

Annex 1 Site EHS Management Manual

Site EHS Management Manual

1 Purpose and scope

The purpose of this document is to provide a reference manual for site management activities. It encompasses the requirements for site set up, civil, erection, mechanical and electrical Installation and commissioning stages at the site.

2 Site Manager's Responsibilities and Duties.

Ref	Responsibility and Duty
1	Must ensure that control of site safety and good environmental practice is in accordance with the EHS Management System and any customer requirements.
2	Shall instruct the immediate cessation of work, which he/she considers to present an immediate, or imminent safety hazard / risk or a major impact on the environment.
3	Shall ensure that site accommodation and facilities are provided and maintained in accordance with statutory requirements.
4	Shall anticipate hazards by ensuring Risk Assessments are carried out. Plan the work accordingly, produce or arrange method statements and monitor performance to ensure that these plans and documents are followed and are achieving their objectives. Significant risks, particularly those likely to affect others on site and the environment, are to be notified to the Project Manager for incorporation in the Construction Phase Plan and Environmental Plan.
5	Shall pay due regard to the H&S hazards and environmental aspects and impacts identified within the Pre-Construction information and Construction Phase Plan when carrying out Risk Assessments.
6	That the works are carried out in compliance with the safe system of work contained within the Method Statements.
7	All personnel entering a construction site must sign the Attendance Register Note – Persons under 18 years old are not allowed on site. Note – Visitors/delivery drivers are to undergo a mini induction and be escorted at all times whilst on site.
8	Ensure that Site Induction Courses and Toolbox Talks are implemented and recorded.
9	Shall ensure that an internal accident, ill health and environmental reporting procedure is maintained to ensure the prompt reporting, recording and investigation of accidents/incidents so as to enable control action to be taken to prevent a recurrence. All injuries, accidents, incidents, near misses and Road Traffic Accidents are to be reported using the accident and incident reporting system.

10	Shall implement a Permit to Work procedure where appropriate and/or ensure that client Permit to Work procedures are understood and implemented where applicable.
11	No vehicle, plant or equipment, is allowed to be used on site until all relevant documentation has been inspected and a record made. All cranes entering site under the control of Site Management are to have documentation checked using Crane Checklist.
12	All substances which are, hazardous to health are correctly identified, stored and their issue is controlled. Copies of COSHH assessments will be made available at all times
13	No portable electrical tools or appliances are put to use on site until they have been tested and inspected by a competent person.
14	Shall carry out a weekly inspection of the site and complete and circulate a report of the findings. Any actions arising from the report shall be monitored and closed out in a timely manner.
15	Ensure that all safety documentation is read and understood by all members of the working party and that they sign onto both the risk/method statements and the safety documentation. The importance of NOT carrying out any work outside of the safety documentation shall be stressed.
16	Ensure that all waste that is disposed of from site is in line with agreed processes
17	Ensure that a Safety Management System Monitoring process is established and maintained.

3 Pre Site Set - up Meeting

The Project Manager shall arrange the time and venue for the meeting, normally 4 weeks prior to site commencement, and will be responsible for inviting the relevant personnel typically:

- Project Manager
- Civil Engineering Manager or representative, if applicable.
- Site Manager.
- Division/BU EHS Lead.
- Any other personnel deemed necessary by the Project Manager i.e.Civil consultant, etc.

Any actions arising from the meeting must be expedited on an urgent basis by the Project Manager.

Actions shall be closed where possible prior to of site works and follow up meetings convened if necessary. A copy of the minutes shall be retained on site.

4 Site Establishment and Welfare (for guidance depending on site size)

Site Office and Welfare

It is a requirement of the Construction Regulations that suitable and sufficient welfare facilities are provided.

This section assists in identifying the size, number and agreed location of cabins/welfare facilities and need for energy supplies.

Site Offices / Mess Room

The Site Offices should be of a suitable size to allow persons to work comfortably.

Adequate lighting and ventilation must be provided. The contents should include a suitable number of filing cabinets, desks, chairs, notice board, photocopier, electricity supply and phones.

The Mess Room should be of suitable size with adequate lighting, heating and ventilation.

The rooms should be equipped with an adequate number of tables and seating (with backs) for the number of people to use at any one time, notice board and energy supply.

Facilities for providing food/drink such as, a supply of fresh drinking water, sink unit, kettle and fridge should be available.

Sanitary and Washing Facilities

Adequate water closets and urinals shall be available for the number of personnel on site.

Within the vicinity of the sanitary provisions adequate washing facilities should be provided which would include a supply of clean running hot and cold, or warm water, a supply of soap and a means of drying

The facilities should be readily accessible and kept in a clean and orderly condition. Adequate lighting and ventilation ideally should be available.

Changing/Drying Rooms

Provision should be made for workers to change into clothing for the purposes of their work.

Meeting Room

Should a separate meeting room be a requirement on site the room should be adequately lit and ventilated. A table, chairs, notice board and electrical supply should be available.

First Aid

A first aid box must be present site which will accommodate the number of persons on site.

Sufficient first aiders should be present on site at all time with suitable arrangements being made for holidays and sickness.

Note: A minimum of 1 first aider for 5 to 50 and 1 extra first aider for every 50 there after.

EHS Requirements

Copies of the following are to be provided:

Description	Site File Reference
Scope of Work	
Site Safety signage at Site Gate / Notice Board.	
Accidents log sheet	
EHS Policy Statement	
Site Waste Management	
Site fire and emergency evacuation plan	
Emergency contact details	

Notice Board Display

Minimum Information to be held and displayed

Description	Form Ref
HSE Posters	
Evacuation and fire assembly points including locations of fire Extinguishers	
Emergency contact details	
Named responsibilities	
Latest toolbox talks (as applicable)	
Site Safety Rules and Safety Alerts (as applicable)	
Steps to be taken prior to work	
Work Permits	
Site fire and emergency evacuation plan	
Safety alerts (as applicable)	
Steps to be taken prior to work	

EHS Support

Throughout the project representatives of the EHS Department is available for assistance and advice from site set up to close out. For further information please refer to the Division/BU EHS Manager.

Safe Access & Egress

Safe access and good visibility for plant and vehicles entering and leaving the site must be ensured. Where possible, pedestrians should be excluded from vehicle access ways and routes should be marked with suitable signs.

Where it is necessary, a Site Traffic Plan should be developed and agreed with the client. Details should be communicated at induction.

5 Site Diary

The Site Manager/Supervisor shall maintain a site diary, may be hard copy or electronic, in which to record any events, actions and occurrences that relate to health, safety or welfare matters on site.

These matters can include items such as the following:

1 Site activities carried out that day.

2 Site Deliveries

3 What equipment is on site?

4 Follow up action required from site set up checklist.

5 Record of meetings held/attended

6 Remedial/follow up action from daily inspections or meetings

7 Disciplinary matters regarding health and safety performance on site

8 Visits of safety inspection personnel

9 Lost time

10 Summary of conversations with client or contractors on things which are useful or where action has being agreed.

Detailing health and safety matters in a site diary helps to provide information for the enforcing authorities should a health and safety related incident take place.

5.1 PPE

The Site Manager is responsible in ensuring that minimum PPE shall be worn at all times in line with both project manager and the Clients Site Safety Rules and Policies.

Any additional PPE required protecting an employee from hazards and risk when carrying an operation of work shall be detailed in the specific task Risk assessment and Method of Statement.

Requests for PPE should be made via the Procurement.

6 Construction Phase Health, Safety and Environmental File (Red Files)

The contents of the construction phase health, safety and Environment file includes references and documentation relating to details of the project, clients considerations, management arrangements, environmental restrictions, existing on site risks, construction hazards and controls and health and safety.

Health, Safety and Environmental File Contents, but not limited to:

1. All Hazard identification and Risk Assessments.
2. COSHH and Risk Assessments, Method Statements, Suppliers Data and Information Sheets.
3. Equipment and maintenance facilities within the structure.
4. Health & Safety and Environmental Reports.
5. Statutory and other test certificates with all commissioning information for structures and plant.
6. Site Emergency Plan.

7 Construction Phase, Environmental and Site Waste Management Plans

7.1 Health and safety Plan

The plan shall set out how health and safety is to planned, managed and co-ordinated during the construction phase.

It is the responsibility of the Site Manager to ensure that:-

- The plan contents and hazards / risks are communicated to all parties.
- The plan is reviewed, monitored and kept up to date as the project progresses

7.2 Environmental Plan

On all projects an Environmental Plan should be issued to the Site Manager by the Project Manager together with the Division/BU EHS manager.

The plan should provide environmental information about the site and identify significant environmental aspects associated with reasonably foreseeable and emergency situations.

Recommended controls with monitoring activities will be documented.

It is the responsibility of the Site Manager to ensure that:-

-
- The plan contents, hazards, risks and impacts are communicated to contractors
 - Checks and inspections are carried out in-line with the plan
 - The plan is reviewed, monitored and kept up to date as the project progresses

7.3 Site Waste Management

The plan should provide a structure for waste delivery, reduction, recycling, reuse, segregation, and disposal in relation to all stages of the project.

The plan is a live document and it is the responsibility of the Site Manager to ensure that:-

- The plan is reviewed, monitored and kept up to date in line with site conditions and arrangements.
- That construction site waste is properly managed, recorded, segregated and disposed of.

8 Site Security and Access Control

For health, safety and security requirements, all personnel either attending or visiting the site / work place are required to sign both IN and OUT of the site using the attendance register.

The Site Attendance Register is retained in the site office or gatehouse, as applicable. The completion of the register is vital, if the site has an emergency or evacuation, Site Manager will be able to establish who is on site and also, to be able to account for personnel, during an emergency situation.

The importance of this requirement is strongly emphasized. Consistent failure to comply will result in the person(s) being removed from the site.

No person will be allowed on site unless they are in possession of a duly authorized permit / pass issued by the client(s).

Personnel deployed on the construction site are only allowed access in that particular area of the site in which their work activities are carried out. Personnel are not allowed free access to areas which are not part of the scope of works or not part of their duties.

9 Meetings with Subcontractors

9.1 Initial Safety Co-ordination Meeting

Prior to the commencement of their work on site, the subcontractors site manager/ representative shall be required to attend a meeting at which the Construction Services/Civil Manager and/or the Site Manager shall ensure that the subcontractors are made aware of their responsibilities with regard to site safety and environmental aspects including any relevant hazards and HS&E precautions. The following can be used for this meeting:

1. Information for Subcontractor
 - EHS policy
 - general site rules and conditions
 - permits to work
 - details of significant hazards identified in the Construction Plan

-
- details of environmental aspects as identified in the Environmental Plan
 - nature of information for the H, S & Environmental File.
 - details of lifting operations
2. Information to be obtained from subcontractor.
 - EHS policy
 - Name of safety/environmental adviser
 - Risk Assessments and method statements
 3. Identify hazards / hazardous work plus possible environmental impacts and agree appropriate precautions and work methods.
 4. Agree codes, standards and interfaces with the Principal Contractor.
 5. Consider what equipment is necessary and agree who provides, maintains, uses and inspects.
 6. Identify the Safety/Environmental Representatives.
 7. Training - arrange for induction training plus any specialist training.
 8. Liaison with the Principal Contractor
 9. H&S and Environmental Plan input requirements on site activities.
 10. Site Waste Management

The Site Manager is responsible for the implementation of the Site EHS plan and any system issued as part of the pre site set-up meeting.

Ongoing Safety, Health & Environmental Co-ordination Meetings

Meetings shall take place on a weekly basis to co-ordinate the activities of project manager / Clients staff and sub- contractors on site to ensure safe and efficient working.

The Site Manager shall hold and minute the meeting – with the contractors, to which the client's representative may be invited.

10 Risk Assessments

It is the responsibility of the Site Manager to ensure that suitable and sufficient risk assessments are carried out in relation to the scope, of the project works and site based work activities, throughout the lifecycle of the contract.

All sub-contractors shall carry out risk assessments in relation to the scope of the project and the site based activities.

The Site Manager will ensure that any Risk Assessments or Method Statements carried out by the project team or submitted by a Contractor are reviewed, evaluated and agreed prior to the commencement of the works.

10.1 Daily Risk Assessment (Not Mandatory)

It is the responsibility of the Site Manager to ensure that prior to commencing work on site each day a daily site risk assessment is completed and that all team members sign on to it to confirm their understanding. Should there be any revisions to the daily risk assessment all team members should resign on to it.

11 Method Statements

11.1 Method Statement

A method statement is a step by step account of how to execute work safely and shall detail how the control measures identified by the risk assessment will be put into effect.

Method Statements and Risk Assessments are not only intended for the persons doing the work activity, but to demonstrate that the task has been fully evaluated, the risks have been assessed and the essential / necessary controls have been established and initiated.

Copies shall be submitted to the Site Manager, where an evaluation against this Work Instruction will be carried out using the Contractor RAMS Assessment Form.

11.2 Standard Checklists

When completing risk assessments / method statements a number of standard forms and checklists are available to assist in ensuring that the work is executed safely.

The standard forms and checklists can be issued in disc format. A hard copy is available to site where 'IT' facilities are not available.

They shall be identified as one of the control measures in both project manager Energy Management and sub- contractors documentation.

These may be used for guidance purposes only. RAMS must be site and task specific only.

11.3 Submission of Method Statements & Risk Assessments

When the Site Manager is satisfied that the RAMS are in order, he/she shall approve them together with the Site EHS officer/representative.

Requests for Safety Documents with the RAMS must be submitted in a timely manner.

Work shall not proceed unless the RAMS have been agreed and approved.

11.4 Responsibilities

The approval of a Method Statement does not relieve Project manager or the contractor of any of their responsibilities to comply with all statutory and contractual obligations.

11.4.1 Project manager / Contractors

Project manager and their Contractors are responsible for:

- Preparing the Method Statement and risk assessments for works to be undertaken.
- In the case of contractors RAMS shall be submitted to the Site Manager for review and agreement before commencement of works.
- Revising the RAMS if necessary, particularly after a variation to contract has been issued to cover any new or changed items of work.
- Ensuring that no work is started before review and approval of the method statement.
- Distributing and making readily available copies for use in relation to the works and site.

11.4.2 Project manager - Responsible Person

Project manager nominated person is responsible for:

- Advising the contractor of any safety requirements, permits or licenses required.
- Reviewing the RAMS before any work begins.
- Ensuring the systems are in place to prevent any contractor working without a RAMS
- Arranging site supervision of the contractor to identify and prevent deviations from the method statement.
- Ensure that the RAMS are revised or re-issued and approved should any relevant circumstances change.
- Ensuring that all personnel working under a method statement signs the Signing-on sheet.

11.4.3 Site Supervision

The site person in charge of the work area shall:

- Keep a copy or have ready access to the risk assessments & method statement whilst carrying out the work.
- Ensure that all work is carried out in accordance with the method statement, including any approved revisions.
- Identify any change, which may be required and submit to the contractor for review.

12 Site Induction Training, and Site Rules

12.1 The Safety Induction

The induction shall be administered by Project manager, the Contractor or the client where applicable. All persons employed on the site shall be required to attend.

After induction, a record of attendees will be made on a Personnel Register.

The Induction Course must include, as a minimum, the following topics –

- HS and Environmental Policy
- Personal Protective Clothing
- First Aid Procedure
- Site Attendance

-
- Security
 - Fire Prevention
 - Fire Alarms and Emergency Procedures.
 - Method Statements / Risk Assessments.
 - Danger Notices
 - Accident and Incident Reporting (Health & Safety and Environmental).
 - Site Housekeeping.
 - Material Storage
 - Site Messing and Welfare Facilities
 - Smoking.
 - Drugs and Alcohol
 - Site Contacts

When induction is carried out by Project manager an induction program template and test sheet are available. Details should be added to convert the documents to make them site specific.

Employees' details should be completed and copies of relevant training obtained by the Site Manager or the Site EHS representative at the time on induction and retained in the site files.

All persons must sign the form to confirm their understanding of both site project manager and the client's site rules.

A copy of the Site Rules shall be displayed on the site notice board.

A Personnel Register template is available for completion for quick reference of site skill availability

12.2 Training, Qualification and Competence

During the induction process on the construction site, the site manager will request, check and obtain records of training, qualification and competence of all individuals who are to be carrying out work activities on site on behalf of Project manager, prior to been allowed on the construction site.

Should the individual not be able to show suitable training records the individual will not be allowed on the construction site and will be asked to leave until suitable records can be presented and confirmed.

All training, qualification and competence records of individuals are to be stored and maintained on the construction site for reference.

Should it be suspected that any training, qualification or competence records presented by the individual are invalid or forgeries, access to the site will not be allowed until the individual can proved the authenticity and validity of the records.

12.3 Site Discipline

Failure to comply with any of the below mentioned items may result in the relevant access permit being withdrawn, and the person shall be required to leave site.

-
- Alcohol or non-prescribed drugs being brought on to, or used at site.
 - Unsafe working practices causing danger to self and/or others
 - Offensive manner or behavior.
 - Refusal to obey EHS instructions in the workplace

13 Toolbox Talks/ Safety Contact Meetings

Safety Contact / Toolbox Talks are a useful method of providing information and a forum to promote the safety message and environmental awareness.

These meetings should take place on a regular basis and be conducted by the respective Site Manager or Site EHS officer and should take no more than 20-30 minutes.

It is customary to commence the meeting with a review of the health, safety and environmental performance to date and any issues that may have arisen recently. This shall then be followed by a talk/discussion on a health, safety or environmental topic.

Existing toolbox talks can be used also, if a new toolbox talk is required the site manager with the support of EHS may develop and introduce a new toolbox talk.

The Site Manager or Site Supervisor must ensure that an attendance sheet is completed, signed and stored as a Health & Safety Record. A record of attendees, date held and topic covered shall be maintained

14 Permit to Work System

14.1 Permit to Work

A Permit to Work is issued by the Project Management Responsible Person. This form shall identify any safety precautions and other relevant information required to carry out the specified work safely. The time period that the document is valid shall be specified on the Permit to Work.

The issue of a formal document is an essential part of any Permit to Work System and should include –

- a) The designated location, machinery or plant is safe to work on.
- b) That nothing is done during the course of the operations to endanger the safety of other workers.
- c) That all concerned are aware of the strict limitations to their activities

14.2 Site project manager Responsible Person

The control of a Permit to Work throughout any workplace is the responsibility of the site project manager Responsible Person, who will have the ability and knowledge to recognize the existence of hazards and the action required to reduce and eliminate them, and also, the authority to obtain safety recommendations from specialist personnel.

In order to maintain and improve safe working conditions, a site project manager must have the authority to co-ordinate the duties and responsibilities of the site project manager/construction site staff and also of the sub-contractors that are responsible to site project manager.

The site Responsible Person is defined as: Site Manager or delegated competent person.

14.3 Permit to Work Distribution

After completion of the Permit copies of the form are distributed as follows:-

- a. A copy is retained / maintained by the site project manager Responsible Person
- b. A copy - a paper copy shall be issued to the person in immediate charge of the works as specified by the Permit.
- c. A copy – a paper copy shall be issued to the Site EHS representative (if applicable).
- D. Each permit is consecutively numbered by the Authorized Person.

The maintenance, issue and control of the Permit System are the responsibility of the Site project Responsible Person.

14.4 Operation of the Permit to Work System

14.4.1 The information stated on the permit must be precise, detailed and accurate and must state which location / apparatus / plant has been made safe, the steps by which safety has been achieved and exactly which is to be carried out.

14.4.2 The permit must define the validity period (i.e. Start and Finish Date, Start and Finish Time) the permit will remain in force, until:

- a) It is cancelled by the Site project Responsible Person.**
- b) The work has been completed and signed off by the Site project Responsible Person.**
- c) The specified date and time has expired.**

14.4.3 The Responsible Person who issues a permit, must before signing, make sure that all actions specified within the permit to ensure that the workplace, machinery, apparatus or plant has been made safe. And that no tools, equipment etc remain in the designated area

14.4.4 (As a general rule this should be carried out by personal inspection of the area).

14.4.5 Where a permit to work is required, no one, in any circumstances, shall work at a place which is not specified on the permit as having been made safe. This prohibition shall apply to all concerned on the construction site and includes Site project staff and sub-Contractors.

14.4.6 Work that is not specified on the permit must not be carried out. If a change of programme is required the permit should be cancelled and another permit issued by the Responsible Person.

14.4.7 Any person taking over the responsibility of the Permit System, from the original Responsible Person, must assume full responsibility until any issued or existing permit has been cancelled.

14.4.8 The person accepting the permit, (i.e. the individual in immediate charge of the operations) becomes responsible for:

-
- a) Ensuring all specified safety precautions are maintained.
 - b) Only permitted work is being carried out.
 - c) The permitted work is confined to the area specified on the permit.
 - d) Ensure only persons who have received instructions/briefing on the permit and have signed onto the 'Working Party Register' be allowed work on any works covered by the permit to work.
 - e) Ensure that any demarcation detailed in the permit to work is displayed and maintained.

14.5 Hot Work Permits

Should any hot work be required on site reference to Health and Safety Process – Hot Working and hot working practices should be made.

14.6 Safe Digging Work Permit

If activities such as:

- Excavation of trenches for direct buried cables.
- Excavation of trenches for ducted cable systems
- Trench-less systems, all types of drilling / boring operations
- Excavation for surface and buried cable troughs are to be carried out on site. .

14.7 Confined Space Work Permit

Should any work be required on site within confined spaces reference to Health and Safety Process – Confined Spaces and Confined Spaces – Cable Tunnels and Culverts should be made.

14.8 Low Voltage Work Permit Scheme

A Low Voltage Work Permit shall be issued to enable work to be carried out on isolated LV equipment safely.

Low voltage shall be taken to be less than 1000Vac or 120V dc.

The Low Voltage Work Permit issued by a Nominated Duty Holder, typically a test / commissioning engineer and shall provide written instructions to the person who is to be given permission to carry out work.

15 Control of Substances Hazardous to Health (COSHH) – Assessment

Where a hazardous substance or activity is introduced into the work place, a COSHH Assessment shall be made and available on site. It is the responsibility of the Site Manager/Supervisor to ensure that all substances in relation to the site works are assessed and recorded.

The Site Manager/Supervisor is responsible for checking that an assessment is available for the material in use, determining its suitability for the site activity and communicating the details to the site staff.

All contractors to Project Management who are involved in the use of hazardous substances shall supply COSHH Assessments to the Site Manager before the hazardous substance is stored or used on site.

16 EHS Inspection Reports

It is the responsibility of the Site Manager/ Supervision to carry out and complete a weekly site inspection report. Any problems highlighted in the report must be reviewed / corrected by the appropriate means.

A copy of all inspections must be held on site and made available for review.

The report will identify any Health, Safety & Environmental issues that require addressing in relation to the site. Any corrective actions raised shall be progressed and closed out by the Site Manager.

Safety Walks shall also be undertaken from time to time by a Senior Manager visiting the site – see checklist attached. The findings of the walk should be discussed with the Site Manager prior to leaving site. A copy of the report shall be retained by the Site Manager and copies circulated as stated on report.

17 Inventories of Equipment / Portable & Hand Power Tools/Calibrated Instruments

It is the responsibility of the Site project Site Manager to ensure that the above inventories are maintained and completed.

The two separate inventories – Equipment plus Portable & Hand Power Tools/Calibrated Equipment should be used to list all equipment on site.

17.1 Hire Plant

All hired plant shall also be accompanied by specific documentation which details its recent maintenance/repair history. Operators must be fully trained and hold the appropriate license.

When the need arises for “hired plant” to be maintained and/or repaired by the plant-hire company their personnel must report to the Site Manager and present their competency qualifications before undertaking any work.

17.2 Site Equipment Testing

All equipment that may constitute a hazard or items that require weekly or daily inspection or instruments that require calibrating must be recorded and on the relevant registers/sheets. These shall be retained in the site filing system.

The inventories must be periodically reviewed and updated to suit any changes in circumstances and to ensure that equipment is maintained as necessary.

17.3 MEWP – Daily Inspection Check List and Record

Any MEWP arriving at site must have the relevant certification, have its functionality demonstrated and familiarization training delivered prior to handover to any competent operative.

17.4 PAT Testing & Calibration

Project Management field staff that are issued with portable hand tools &/or measuring equipment shall ensure that the PAT and calibration certificates are up to date. Records of the certification are held at the relevant Site project office.

All equipment that is not PAT tested shall be withdrawn, labeled and quarantined and arrangements made for testing to be carried out.

PAT testing is normally carried out by an external source however in emergency cases testing may be carried by a competent person and details recorded

Any calibrated equipment, which has sustained damage or has been demonstrated to be outside its designated accuracy limits shall be labeled and quarantined until it has been repaired and re-calibrated

17.5 Harnesses and Lanyards

The Personal Protective Equipment at Work Regulations (PPE Regs.) includes a requirement to “ensure

that any personal protective equipment provided employees is maintained (including replaced or cleaned as appropriate) in an efficient state, in efficient working order and in good repair.

The Lifting Operations and Lifting Equipment Regulations (LOLER) also require that lifting equipment for lifting people to be examined by authorized third party

Safety Harnesses and Lanyards are issued as personnel equipment to individual users. It is the responsibility of the user to ensure that the equipment is maintained, properly stored and inspected.

The inspection requirements for safety harnesses and lanyards comprise the following:

• User Inspections	each time the equipment is used
• Weekly Inspections	by Supervisor or other appointed person
• 3 monthly Inspection	by an independent competent organization or "in house" by a suitably trained and authorized person
• At 3 years from date of Manufacture and annually thereafter	Returned inspection and re-certification

Environmental and Social Impact Assessment (ESIA) for 10th of Ramadan GIS Substation and its interconnecting Overhead Transmission Lines

Annex 2 Coordinates of OHTLs

Coordinates of OHTL 10th of Ramadan / East Ismailia (500kV)



Done

إحداثيات الخط الكهربائي
العاشر الجديدة / شرق الإسكندرية جند 500 ك. ف.
بدلول حوالي 100 كم

(1/2)

POINT NO;	N	E	NO.GPS	REMARKES
1	30 20 32.80	31 37 47.70		
2	30 21 03.70	31 38 01.00		
3	30 23 26.90	31 41 32.10		
4	30 23 19.50	31 42 09.10		
5	30 23 26.20	31 42 17.10		جزء معدل
6	30 24 00.70	31 42 22.10		
7	30 25 41.50	31 44 50.90		
8	30 25 30.90	31 45 46.60		
9	30 22 07.40	31 48 59.40		
10	30 21 48.10	31 51 23.50		
11	30 21 48.20	31 52 18.10		
12	30 21 33.60	31 53 44.40		
13	30 21 26.30	31 54 03.20		
14	30 21 57.30	31 55 05.30		
15	30 21 57.52	31 55 13.30		جزء معدل
16	30 23 07.07	31 57 27.80		
17	30 22 19.12	31 58 44.70		
18	30 23 13.60	32 04 53.20		
19	30 23 42.64	32 09 50.70		
20	30 23 51 40	32 10 03.90		
21	30 24 29.36	32 15 44.30		
22	30 24 26.70	32 16 13.40		
23	30 24 31.03	32 16 52.90		
24	30 24 44.05	32 17 04.10		
25	30 24 59.95	32 18 30.70		
26	30 25 30.05	32 19 02.40		
27	30 25 43.30	32 19 45.00		
28	30 25 57.64	32 19 51.00		
29	30 26 17.90	32 19 49.90		
30	30 26 48.30	32 19 56.70		

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22613316

التاريخ: 2017/11/14

إحداثيات الخط الكهربائي

العاشر الجديدة / شرق الإسماعيلية جهد 500 ك . ف
بطول حوالي 100 كم

(2/2)

POINT NO;	N	E	NO.GPS	REMARKES
31	30 26 54.35	32 20 10.40		
32	30 27 11.50	32 20 27.70		
33	30 27 12.80	32 20 83.70		
34	30 27 28.16	32 21 06.30		
35	30 28 18.12	32 21 53.70		
36	30 28 23.23	32 22 10.60		
37	30 28 40.90	32 22 16.00		
38	30 30 09.65	32 22 57.00		
39	30 34 24.60	32 22 00.10		
40	30 34 48.80	32 22 07.40		
41	30 35 13.00	32 21 56.10		

Coordinates of OHTL 10th of Ramadan / East Banha (500kV)

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التاريخ 2017/11/14

أحداثيات الخط الكهربى العاشر الجديدة / شرق بنها جهد 500 ك.ف

بطل حوالى 55 كم

Point no;	N			E			Remarks
1	30	20	8.00	31	37	28.4	point front Al Asher station
2	30	19	53.70	31	36	20.1	
3	30	20	0.07	31	34	38.8	
4	30	20	54.80	31	34	15.3	
5	30	21	56.80	31	34	2.7	
6	30	22	23.60	31	34	23.2	
7	30	23	4.60	31	34	18.5	
8	30	23	18.20	31	34	7.8	
9	30	23	16.40	31	33	40.3	
10	30	23	18.50	31	33	20	
11	30	23	41.90	31	32	56.6	
12	30	23	56.83	31	31	53.35	
13	30	23	24.76	31	30	5.56	
14	30	23	25.80	31	29	4.7	
15	30	24	2.60	31	28	32.7	
16	30	24	14.70	31	27	36.6	
17	30	24	46.70	31	27	29.2	
18	30	25	27.20	31	26	58.4	
19	30	26	18.90	31	26	53.9	
20	30	27	14.10	31	26	20.5	
21	30	27	22.60	31	26	11.4	
22	30	27	15.20	31	25	46.2	
23	30	27	21.30	31	25	30.4	
24	30	27	4.80	31	24	21.4	
25	30	27	43.00	31	22	27.6	
26	30	28	9.50	31	22	5.5	
27	30	28	33.70	31	19	54.8	
28	30	28	1.40	31	18	15.7	
29	30	28	17.90	31	17	21.3	
30	30	28	51.10	31	16	36.7	
31	30	28	55.70	31	15	20.9	
32	30	28	26.00	31	14	36.1	نقطة تقاطع مع خط سمود شرق بنها E=31 14 27.21 N=30 28 17.36
33	30	27	58.12	31	14	7.7	
34	30	27	56.60	31	13	20	
35	30	27	49.7	31	13	9.7	point front Banha East station

Coordinates of OHTL 10th of Ramadan / Zezinia (220kV)

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22613316

إحداثيات مسار الخط الكهربائي
العاشر 500 / زيزينيا جهد 220 ك . ف

Don

2017/10/25

POINT NO;	N	E	NO.GPS	REMARKES
1	30 20 14.05	31 38 01.89		
2	30 18 31.58	31 39 44.67		
3	30 17 48.29	31 40 28.64		
4	30 17 44.00	31 40 40.39		
5	30 17 22.09	31 41 00.08		
6	30 16 08.86	31 42 15.53		
7	30 15 56.35	31 42 26.35		
8	30 15 42.73	31 42 46.98		نهاية الهوائي

Coordinates of OHTL 10th of Ramadan / Belbees (220kV)

10th Ramadan

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إحداثيات مسار الخط الكهربائي
العاشر 500 / بلبيس المقترحة جهد 220 ك . ف

2017/9/10

POINT NO;	N	E	NO.GPS	REMARKES
1	30 20 01.63	31 36 49.70		بعد م . م العاشر 500 بحوالي 1.00 كم
2	30 19 55.60	31 36 14.48		بداية موازاة التربة
3	30 20 01.48	31 34 50.71		
4	30 20 14.70	31 34 45.08		
5	30 20 24.00	31 34 04.02		
6	30 20 52.40	31 33 51.53		
7	30 21 25.08	31 33 48.77		قبل تعديده خط أبو زعبل / العاشر 220 ك . ف
8	30 21 31.69	31 33 38.40		قبل م . م بلبيس المقترحة بحوالي 500 م
9	30 21 51.94	31 33 27.07		م . م بلبيس المقترحة

Environmental and Social Impact Assessment (ESIA) for 10th of Ramadan GIS Substation and its interconnecting Overhead Transmission Lines

Annex 3 List of the stakeholders on the governorate level

No.	Governorate	Markez/ City	Area	Name	Age	Job	Marital Status	Telephone
In-depth interviews								
1	Sharqiya	10 th of Ramadan	10 th of Ramadan City Authority	Eng. Muhammad Gad	54	Director of Canal Area Electricity	Married	01021112656
2	Sharqiya	10 th of Ramadan	10 th of Ramadan City Authority	Eng. Eslam Lashen	48	Director of 10 th of Ramadan city Electricity	Married	0101884346
3	Sharqiya	10 th of Ramadan	10 th of Ramadan City Authority	Eng. Osama Nada	51	General director of 10 th of Ramadan city Electricity	Married	01277990379
4	Sharqiya	10 th of Ramadan	10 th of Ramadan City Authority	Dr. Ahmed Abdel Moly	52	Deputy Head of EEAA	Married	01005204688
5	Sharqiya	10 th of Ramadan	10 th of Ramadan City Authority	Fatma Khatab	53	Director of Planning Department	Married	01000281196
6	Sharqiya	10 th of Ramadan	10 th of Ramadan City Authority	Suzan Abdel Maasoud	47	Director of Engineering Management	Married	01233691012
7	Sharqiya	10 th of Ramadan	10 th of Ramadan City Authority	Fathy Abdel Alem	37	Employee at environmental Department of EEAA	Married	01001114578
8	Sharqiya	10 th of Ramadan	10 th of Ramadan City Authority	Mustafa Fekry Adel Ghany	35	Employee at Electricity Department of EEAA	Married	01020121520
9	Sharqiya	10 th of Ramadan	10 th of Ramadan City Authority	Muhammad Aly Al Safty	42	Employee at Planning and Follow-Up Department of EEAA	Married	01225006001
10	Sharqiya	10 th of Ramadan	10 th of Ramadan City Authority	Abdel Hamid Al-Sharkawy	45	Assistant to Head of 10 th of Ramadan City Authority for Electricity and Roads	Married	01022261977
11	Sharqiya	10 th of Ramadan	10 th of Ramadan City Authority	Malak Abdel Hady	63	Secretary General of Environmental Guards Association at 10 th of Ramadan City	Married	01222129960
12	Sharqiya	10 th of Ramadan	10 th of Ramadan City Authority	Halal Salah	38	Director of 10 th of Ramadan Investors	Married	01003456450

13	Sharqiya	10 th of Ramadan	10 th of Ramadan City Authority	Dr. Mohy Hafez	57	Association Chairman of 10 th of Ramadan Investors Association	Married	-
14	Sharqiya	10 th of Ramadan	10 th of Ramadan City Authority	Nadia Moghes	46	Director of Information Center in 10 th of Ramadan City	Married	-
15	Sharqiya	10 th of Ramadan	10 th of Ramadan City	Abdullah Al-Gharabawy	45	Guard	Married	-
16	Sharqiya	10 th of Ramadan	10 th of Ramadan City	Magdy Al-Sawaf	30	Farm Guard	Married	01145123011
17	Sharqiya	10 th of Ramadan	10 th of Ramadan City	Om Muhammad	35	Farm Guard	Married	-
18	Sharqiya	10 th of Ramadan	The 10 th district	Samya Abdel Salam Aly	46	Employee at Health Center	Married	-
19	Sharqiya	10 th of Ramadan	The 10 th district	Shaimaa Fawzy Abdel Rahman	30	Housewife	Married	-
20	Sharqiya	10 th of Ramadan	The 6 th district	Wafaa Khalel Mahmoud	37	Employee at Family Medical Center	Married	-
21	Sharqiya	10 th of Ramadan	The 6 th district	Aza Muhammad Ghaly	37	Teacher	Married	-
22	Sharqiya	10 th of Ramadan	The 6 th district	Nabila Khairallah	45	Teacher	Married	-
23	Sharqiya	10 th of Ramadan	The 8 th district	Hend Aly Nour Edin	28	Worker in Factory	Married	-
24	Sharqiya	10 th of Ramadan	The 8 th district	Mona Muhammad Badr Edin	30	Worker in Factory	Married	-
25	Sharqiya	10 th of Ramadan	The 8 th district	Maha Muhammad Basyouny	34	Employee at School	Married	-
26	Sharqiya	10 th of Ramadan	The 1 st district	Eslam Eid Abdel Fatah	29	Teacher	Married	-
27	Sharqiya	10 th of Ramadan	The 1 st district	Khaled Mostafa Marey	49	Director of school	Married	-

28	Sharqiya	10 th of Ramadan	The 1 st district	Abdel Hamed Goda Hussein	39	Accountant	Married	-
29	Sharqiya	10 th of Ramadan	The 3 rd district	Hamed Mahmoud Rashwan	45	Accountant	Married	-
30	Sharqiya	10 th of Ramadan	The 3 rd district	Fayez Hussein Muhammad	42	Supervisor	Married	-
31	Sharqiya	10 th of Ramadan	The 3 rd district	Mahdy Mostafa Al-Nagar	33	Worker in Factory	Married	-
32	Sharqiya	10 th of Ramadan	The 4 th district	Abdelah Mahmoud Metwaly	28	Worker in Factory	Married	-
33	Sharqiya	10 th of Ramadan	The 4 th district	George Galal Rezkalah	36	Electrician	Married	-
34	Sharqiya	10 th of Ramadan	The 4 th district	Mina Galal Rezkalah	32	Electrician	Married	-
35	Sharqiya	10 th of Ramadan	The 6 th district	Muhammad Abdel Azem Foda	45	Owner of Foodstuff Shop	Married	-
36	Sharqiya	10 th of Ramadan	Belbes- 10th of Ramadan Road	Youssef Mustafa Muhammad	66	Watchman at Abdel Hamid Amar Farm	Married	-
37	Sharqiya	10 th of Ramadan	Belbes- 10th of Ramadan Road	Muhammad Hasanen Ashour	56	Worker in Abdel Hamid Amar Farm	Married	-
38	Sharqiya	10 th of Ramadan	Belbes- 10th of Ramadan Road	Tawfek Abdel Azem Mahmoud	42	Farmer in Al- Sawaf Farm	Married	-
39	Sharqiya	10 th of Ramadan	Belbes- 10th of Ramadan Road	Abdel Aziz Muhammad Mahmoud	48	Farmer in Al- Sawaf Farm	Married	-
40	Sharqiya	10 th of Ramadan	Belbes- 10th of Ramadan Road	Ibrahim Al-Halawany	58	Manager of Mariam farm	Married	-
41	Sharqiya	10 th of Ramadan	Belbes- 10th of	Magdy Abdel Salam	43	Agricultural Engineer in Mariam Farm	Married	-

42	Ramadan Road							
	Sharqiya	10 th of Ramadan	Belbes- 10th of Ramadan Road	Tarek Muhammad Al Saied	25	Worker in Mariam Farm	Married	-
	43	Sharqiya	10 th of Ramadan	Belbes- 10th of Ramadan Road	Mustafa Muhammad Darder	29	Worker in Al Ramly Farm	Married -
	44	Sharqiya	10 th of Ramadan	Belbes- 10th of Ramadan Road	Muhammad Aly Radwan	33	Worker in Al Ramly Farm	Married -
	45	Sharqiya	10 th of Ramadan	Belbes- 10th of Ramadan Road	Ahmed Gad Al Moly	38	Agricultural Engineer in Al Ramly Farm	Married -
	46	Sharqiya	10 th of Ramadan	Belbes- 10th of Ramadan Road	Aly Mahmoud Metwaly	36	Farmer in Al Halal Fram	Married -
Focus Group Discussion								
47	Sharqiya	10 th of Ramadan	Minya Al-Qamh	Mahmoud Saied	24	Storekeeper	Married	01090934430
48	Sharqiya	10 th of Ramadan	Minya Al-Qamh	Mahmoud Ahmed Muhammad	23	Storekeeper	Married	01098889802
49	Sharqiya	10 th of Ramadan	Minya Al-Qamh	Ehab Mustafa	32	Accountant	Married	01098889803
50	Sharqiya	10 th of Ramadan	Minya Al-Qamh	Hazem Ramadan Ali	28	Accountant	Married	-
51	Sharqiya	10 th of Ramadan	Minya Al-Qamh	Muhammad Hussein Abdel Latef	24	Accountant	Married	01119280454
52	Sharqiya	10 th of Ramadan	Minya Al-Qamh	Ahmed Al-Ayat	50	Accountant	Married	-
53	Sharqiya	10 th of Ramadan	The 11 th district	Awny Ayad Khashana	48	Technician	Married	-
54	Sharqiya	10 th of Ramadan	The 11 th district	Soad Shenoda Al Sohagy	43	Employee	Married	-
55	Sharqiya	10 th of Ramadan	The 11 th district	Christen Ayad Khashana	20	Student	Single	-
56	Sharqiya	10 th of Ramadan	The 11 th district	Faten Ayad Khashana	23	Secretary	Single	-
57	Sharqiya	10 th of Ramadan	The 11 th district	Nabil Ayad Khashana	17	Student	Single	-

58	Sharqiya	10 th of Ramadan	The 11 th district	Ramadan Al Sayed	57	Driver	Married	-
59	Sharqiya	10 th of Ramadan	The 11 th district	Aliya Marzok	50	Housewife	Married	-
60	Sharqiya	10 th of Ramadan	The 11 th district	Essam Ramadan	29	Owner of clothes shop	Married	-
61	Sharqiya	10 th of Ramadan	The 11 th district	Muhammad Ramadan	23	Accountant	Married	-
62	Sharqiya	10 th of Ramadan	The 11 th district	Haitham Ramadan	21	Technician	Single	-
63	Sharqiya	10 th of Ramadan	The 11 th district	Sahar Ramadan	26	Manager at school	Married	-
64	Sharqiya	10 th of Ramadan	The 11 th district	Samar Hasanen	23	Supervisor at school	Single	-
65	Sharqiya	10 th of Ramadan	The 5 th district	Entsar Farghaly	55	Housewife	Married	-
66	Sharqiya	10 th of Ramadan	The 5 th district	Safeya Muhammad Al Nagar	47	Housewife	Married	-
67	Sharqiya	10 th of Ramadan	The 5 th district	Zeinab Abdel Ghany	53	Housewife	Married	-
68	Sharqiya	10 th of Ramadan	The 6 th district	Rowida Ahmed Khalel	25	Saleswoman	Married	-

Environmental and Social Impact Assessment (ESIA) for 10th of Ramadan GIS Substation and its interconnecting Overhead Transmission Lines

Annex 4 Bird Life international Report



Soaring Bird Sensitivity Map:

A planning tool for wind energy and other sectors

SEARCH SUMMARY

Countries: Egypt

Centroid: N30.370 E31.820 with 10 km buffer

Combined Sensitivity: **Medium (0.0037425524731370388)**

4 soaring bird species observed while a further 28 soaring bird species are thought to occur in this area.

2 soaring bird observation locations.

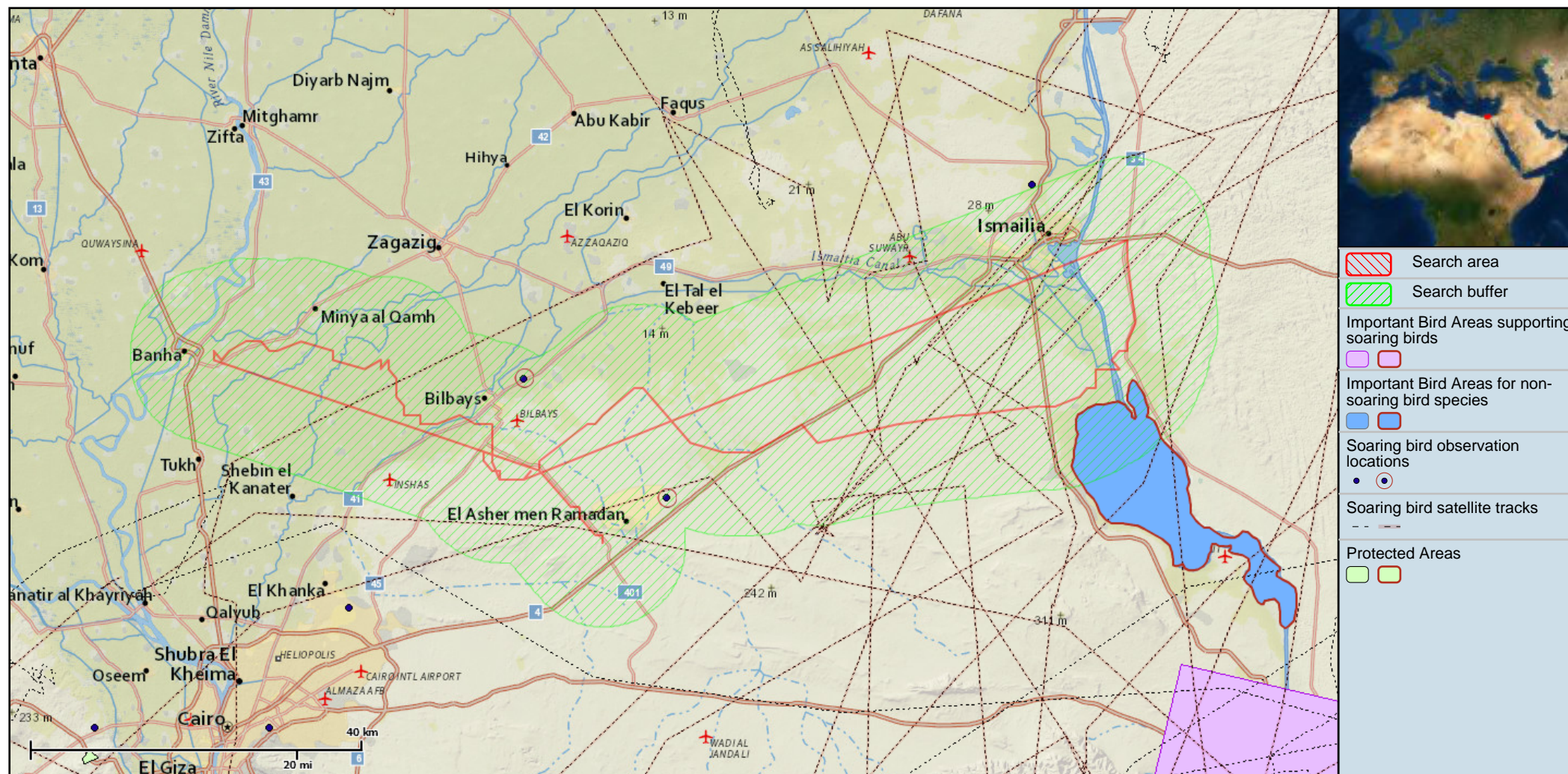
0 IBAs supporting soaring birds plus a further 1 IBAs for non-soaring bird species.

0 protected sites.

7 satellite tracked migratory routes.

Soaring Bird Sensitivity Map: A planning tool for wind energy and other sectors

MAP





Soaring Bird Sensitivity Map:

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GUIDANCE ON INTERPRETING SEARCH RESULTS

For each search that a user performs, the tool calculates a sensitivity value based on the available soaring bird data and assigns the location to one of six sensitivity categories (defined in more detail below). This calculation takes into account the proportion of each species' global population present, the global conservation status (IUCN Red List) of each species and the inherent collision vulnerability of each species based on their morphology and flight behaviour.

Information for this region is incomplete and an appropriate Environmental Impact Assessments (EIA) should always be undertaken to fully assess the sensitivity of a site. Further information on the underlying methodology can be found in the Instructions section of the web tool.

Sensitivity category: UNKNOWN

There are insufficient soaring bird data on which to base a sensitivity score. This should not, however, be interpreted as meaning that a site has no or low sensitivity.

Sensitivity category: POTENTIAL

A small number of soaring bird records exist within the defined search area suggesting that the site could be sensitive.

Sensitivity category: MEDIUM and HIGH

Soaring bird species are known to be present in significant numbers. Caution advised as development at this location may result in significant impacts on the populations of species present. Development may not be appropriate at or near to this location or may be appropriate only if special mitigation measures are put in place.

Sensitivity category: VERY HIGH and OUTSTANDING

Soaring bird species are known to be present in very significant numbers. Caution advised as development at this location may result in considerable impacts on the populations of species present. Wind energy development is unlikely to be appropriate at or near to this location.

SPECIES (32)

Name	Peak Count	Presence	SVI	Status	Global population	Source
White Stork	150	observed	10	LC	702000	WorldBirds
Great White Pelican	16	observed	10	LC	282500	WorldBirds
Black Kite	6	observed	8	LC	1750000	WorldBirds
Black-winged Kite	2	observed	6	LC	1000000	WorldBirds
Saker Falcon	-	expected	6	EN	21800	BirdLife species range map
Sooty Falcon	-	expected	6	NT	22500	BirdLife species range map
Lesser Kestrel	-	expected	6	LC	170000	BirdLife species range map
Peregrine Falcon	-	expected	6	LC	300000	BirdLife species range map
Eurasian Hobby	-	expected	6	LC	750000	BirdLife species range map
Common Kestrel	-	expected	6	LC	5250000	BirdLife species range map
Red-footed Falcon	-	expected	6	NT	550000	BirdLife species range map
Osprey	-	expected	7	LC	300000	BirdLife species range map
Montagu's Harrier	-	expected	8	LC	100000	BirdLife species range map
Lanner Falcon	-	expected	6	LC	550000	BirdLife species range map
Glossy Ibis	-	expected	6	LC	1250000	BirdLife species range map
Pallid Harrier	-	expected	8	NT	27000	BirdLife species range map

SPECIES (32)

Name	Peak Count	Presence	SVI	Status	Global population	Source
Eurasian Sparrowhawk	-	expected	6	LC	2750000	BirdLife species range map
Eastern Imperial Eagle	-	expected	9	VU	9250	BirdLife species range map
Steppe Eagle	-	expected	9	EN	95000	BirdLife species range map
Eurasian Buzzard	-	expected	7	LC	2900000	BirdLife species range map
Long-legged Buzzard	-	expected	7	LC	300000	BirdLife species range map
Black Stork	-	expected	10	LC	34000	BirdLife species range map
Western Marsh-harrier	-	expected	8	LC	750000	BirdLife species range map
Greater Spotted Eagle	-	expected	9	VU	9100	BirdLife species range map
European Honey-buzzard	-	expected	7	LC	350000	BirdLife species range map
Common Crane	-	expected	10	LC	497500	BirdLife species range map
Egyptian Vulture	-	tracked	10	EN	37500	Bounas et al.
Dalmatian Pelican	-	expected	10	VU	11950	BirdLife species range map
Griffon Vulture	-	expected	10	LC	750000	BirdLife species range map
Merlin	-	expected	6	LC	1250000	BirdLife species range map
Eleonora's Falcon	-	tracked	6	LC	29400	Urios & Mellone
Egyptian Vulture	-	expected	10	EN	37500	BirdLife species range map



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OTHER IBAS (1)

Name	Distance	Source
Bitter Lakes	1.59 km	Birdlife



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SOARING BIRD OBSERVATION LOCATIONS (2)

Name	SI	Type	Distance	Source
10th Ramadan sewage ponds	Medium	Site	7.25 km	WorldBirds
Abassa Fish Ponds	Potential	Site	6.75 km	WorldBirds



Soaring Bird Sensitivity Map:

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SATELLITE TRACKS (7)

Count	Species	Source
4	Egyptian Vulture	Bounas et al.
1	Eleonora's Falcon	Urios & Mellone
1	White Stork	Ilias et al.
1	White Stork	Flack et al. (1)



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SPECIES BY LOCATION

Name	SI	Type	Distance	Source
10th Ramadan sewage ponds	Medium	Site	7.25 km	WorldBirds

Name	Peak Count	SVI	Status	Year	Season	% of Global Population	Global population	Source
White Stork	150	10	LC	1995	Spring	%	702000	WorldBirds
Great White Pelican	16	10	LC	1995	Spring	%	282500	WorldBirds

Abassa Fish Ponds	Potential	Site	6.75 km	WorldBirds
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Name	Peak Count	SVI	Status	Year	Season	% of Global Population	Global population	Source
Black Kite	6	8	LC	2011	Spring	%	1750000	WorldBirds
Black-winged Kite	2	6	LC	2011	Spring	%	1000000	WorldBirds



Soaring Bird Sensitivity Map:

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LOCATIONS BY SPECIES

Name	Peak Count	Presence	SVI	Status	Global population	Source
White Stork	150	observed	10	LC	702000	WorldBirds
Name		SI		Type	Distance	Source
10th Ramadan sewage ponds		Medium		Site	7.25 km	WorldBirds
Great White Pelican	16	observed	10	LC	282500	WorldBirds
Name		SI		Type	Distance	Source
10th Ramadan sewage ponds		Medium		Site	7.25 km	WorldBirds
Black Kite	6	observed	8	LC	1750000	WorldBirds
Name		SI		Type	Distance	Source
Abassa Fish Ponds		Potential		Site	6.75 km	WorldBirds
Black-winged Kite	2	observed	6	LC	1000000	WorldBirds
Name		SI		Type	Distance	Source
Abassa Fish Ponds		Potential		Site	6.75 km	WorldBirds
Saker Falcon	-	expected	6	EN	21800	BirdLife species range map
Sooty Falcon	-	expected	6	NT	22500	BirdLife species range map
Lesser Kestrel	-	expected	6	LC	170000	BirdLife species range map



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LOCATIONS BY SPECIES

Name	Peak Count	Presence	SVI	Status	Global population	Source
Peregrine Falcon	-	expected	6	LC	300000	BirdLife species range map
Eurasian Hobby	-	expected	6	LC	750000	BirdLife species range map
Common Kestrel	-	expected	6	LC	5250000	BirdLife species range map
Red-footed Falcon	-	expected	6	NT	550000	BirdLife species range map
Osprey	-	expected	7	LC	300000	BirdLife species range map
Montagu's Harrier	-	expected	8	LC	100000	BirdLife species range map
Lanner Falcon	-	expected	6	LC	550000	BirdLife species range map
Glossy Ibis	-	expected	6	LC	1250000	BirdLife species range map
Pallid Harrier	-	expected	8	NT	27000	BirdLife species range map
Eurasian Sparrowhawk	-	expected	6	LC	2750000	BirdLife species range map
Eastern Imperial Eagle	-	expected	9	VU	9250	BirdLife species range map
Steppe Eagle	-	expected	9	EN	95000	BirdLife species range map
Eurasian Buzzard	-	expected	7	LC	2900000	BirdLife species range map
Long-legged Buzzard	-	expected	7	LC	300000	BirdLife species range map
Black Stork	-	expected	10	LC	34000	BirdLife species range map



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LOCATIONS BY SPECIES

Name	Peak Count	Presence	SVI	Status	Global population	Source
Western Marsh-harrier	-	expected	8	LC	750000	BirdLife species range map
Greater Spotted Eagle	-	expected	9	VU	9100	BirdLife species range map
European Honey-buzzard	-	expected	7	LC	350000	BirdLife species range map
Common Crane	-	expected	10	LC	497500	BirdLife species range map
Egyptian Vulture	-	tracked	10	EN	37500	Bounas et al.

Name	SI	Type	Distance	Source
Flight - 71	Unknown	Track	unavailable	Bounas et al.
Flight - 67	Unknown	Track	unavailable	Bounas et al.
Flight - 82	Unknown	Track	unavailable	Bounas et al.
Flight - 85	Unknown	Track	unavailable	Bounas et al.

Dalmatian Pelican	-	expected	10	VU	11950	BirdLife species range map
Griffon Vulture	-	expected	10	LC	750000	BirdLife species range map
Merlin	-	expected	6	LC	1250000	BirdLife species range map



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LOCATIONS BY SPECIES

Name	Peak Count	Presence	SVI	Status	Global population	Source
Eleonora's Falcon	-	tracked	6	LC	29400	Urios & Mellone
Name	SI		Type	Distance	Source	
Flight - 22	Unknown		Track	unavailable	Urios & Mellone	
Egyptian Vulture	-	expected	10	EN	37500	BirdLife species range map



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