Initial Environmental Examination

Project Number: 46391-001
January 2016

VIE: Ha Noi and Ho Chi Minh City Power Grid Development Sector Project

Prepared by Ho Chi Minh City Power Corporation for the Asian Development Bank.

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Loan 3161 and 8286-VIE: Ha Noi and Ho Chi Minh City Power Grid Development Sector Project

Subproject: 110kv Phuoc Long Substation and Connection Line

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ABBREVIATIONS

ADB:	Asian Development Bank
AH:	Affected Household
AP:	Affected people
BOD:	Biochemical Oxygen Demand
CEMP:	Contractor Environmental Monitoring Plan
CTF:	Clean Technology Fund
COD:	Chemical Oxygen Demand
DARD:	Department of Agriculture and Rural Development
DoNRE:	Department of Natural Resources and Environment
DCST:	Department of Culture, Sports and Tourism
DoLISA:	Department of Labour, War Invalids and Social Affairs
EA:	Executing Agency
EIA:	Environment Impact Assessment
EMP:	Environment Management Plan
EVN:	Viet Nam Electricity
EVN HANOI:	Ha Noi Power Corporation
EVNHCMC:	Ho Chi Minh Power Corporation
GHG:	Greenhouse gas
GRM:	Grievance Redress Mechanism
HCMC:	Ho Chi Minh City
HN:	Ha Noi
IA:	Implementation Agency
IEE:	Initial Environmental Examination
MARD:	Ministry of Agriculture and Rural Development
MoLISA	Ministry of Labour, Invalids and Social Affairs
MoNRE:	Ministry of Natural Resources and Environment
NPA:	National Protected Area
OHL:	Overhead line
PCB:	Polychlorinated biphenyls
PCR:	Physical Cultural Resources
PIC:	Project Implementation Consultant
PPC:	Provincial Peoples Committee
PPMB:	Power Project Management Board
PECC4:	Power Engineering Consulting Joint Stock Company 4
REA:	Rapid Environment Assessment
ROW:	Right-of-way
SLDC:	Southern Load Dispatch Center
S/S:	Substation
T/L:	Transmission line
TSS:	Total Suspended Solids
UGC:	Underground cable
UXO:	Unexploded Ordnance

NOTE

In this report, "$" refers to US dollars.

CURRENCIES

(Rate of exchange of 30 December. 2015)

Currency Unit	–	VND
$1.00	=	22,280 VND

This initial environmental examination is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

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I. EXECUTIVE SUMMARY

1. The Project, financed through Asian Development Bank's (ADB) sector loan modality, will strengthen the capacity and reliability of the power infrastructure in Ha Noi and Ho Chi Minh City through the rehabilitation and development of the 110 kV and 220 kV substation and power transmission to supply their medium voltage (MV) distribution system. The Project will also strengthen the institutional capacities of Ho Chi Minh City Power Corporation (EVNHCMC), which is responsible for the power supply in its respective areas.

2. The Initial Environmental Examination (IEE) presented herein is of Phuoc Long 110 kV Substation and connection line subproject in HCMC which is one of 29 non-core subprojects of Viet Nam Electricity (EVN) proposed by Hanoi Power Corporation (EVN HANOI) and Ho Chi Minh City Power Corporation (EVNHCMC). These 29 non-core subprojects were classified Category B for environment. The subproject consists of construction of a new 110 kV substation, a new approximately 2km overhead transmission line, and a new 25m underground cable. The IEEs of the other non-core subprojects have been prepared separately.

A. Subproject Summary

3. Phuoc Long 110kV substation and connection line consists of a new 110 kV substation, approximately 2 km overhead transmission line and 25m underground cable. The transmission line will start from the tower No.7 of the existing 220kV Cat Lai – Thu Duc transmission line, and will pass over residential area, crop land, planned land and some nipa palm areas of the local people, and come to the connection point located at the tower span 12 and 13 of this 220kV Cat Lai - Thu Duc transmission line (T/L). Then it will go underground to the Phuoc Long 110kV substation with an expected length of about 25m. The transmission line route will go through the territory of Phu Huu ward, District 9, HCMC.

4. The Phuoc Long 110 kV substation will be constructed to meet the load demand of the area nearby District 9 (mainly for the wards of Phuoc Long A, Phuoc Long B, Phuoc Binh) and the neighboring areas of District 2. The substation will be located in Phu Huu ward, District 9, HCMC. The subproject site was selected by the People's Committee of District 9.

B. Potential Impacts and Mitigations

5. The IEE of Phuoc Long 110 kV Substation and connection line indicates that the potential environmental impacts of the subproject are restricted to the construction phase of the subproject components. The common construction-related disturbances such as noise, dust, erosion, sedimentation, solid and liquid waste pollution, worker camp issues, reduced access, increased vehicle and traffic disruptions, increased risk of worker and public injury can be managed with standard construction practices and management guidelines (e.g., IFC/World Bank 2007). After the field survey, interview, consultation, it is confirmed the subproject does not cross over any National Park, Nature Reserve or area planned for Nature Reserve. There are no rare or endangered wildlife, critical habitats or protected areas in the subproject site.

6. The permanently acquired land will be 1,303.5 m^2 for constructing the substation, (ii) 80 m^2 for constructing the underground cable section and (iii) 368.4 m^2 for constructing the access road. The temporary loss will affect 285 nipa palms within the ROW of 03 households when wires are stretched. No household has to resettle.

7. The lost land and compensation is addressed in detail in the Resettlement Plan (RP) prepared under separate cover.

8. The construction-related disturbances to the environment and community concern the short-term disturbances caused by constructing the new substation and transmission line. No cumulative environmental impacts will be occurred. Mitigation measures for these impacts are stated in details in Part VII of this report.

9. The Environmental Management Plan (EMP) prepared for the subproject provides comprehensive impacts, Mitigation Plan and Environmental Monitoring Plan to minimize and manage the potential impacts of the subproject. The EMP also prescribes an Emergency Response Plan for the construction sites and identifies the need for capacity development and training of the IA/EO (belonging to the PMB) in environmental management and assessment as focused on the implementation of the EMP.

C. Conclusions

10. The IEE concludes that the technical design of the subproject combined with available information on affected environments is sufficient to identify the scope of potential environmental impacts of the subproject. Providing that significant changes to the subproject description do not occur at the detailed design phase, and that new sensitive environmental, or cultural resources are not determined, further detailed environmental impact assessment (EIA) is not required.

II. INTRODUCTION

A. Background to IEE

11. Ha Noi and Ho Chi Minh City Power Grid Development aims to strengthen the capacity and reliability of the power infrastructure in Ha Noi and Ho Chi Minh City, Viet Nam through the rehabilitation and development of the 220 kilovolt (kV) and 110 kV high-voltage power transmission systems and substations and associate to medium voltage supply the power distribution system of the two cities. The Project also aims to strengthen the institutional capacity of Ha Noi Power Corporation (EVN HANOI) and Ho Chi Minh City Power Corporation (EVNHCMC). Additionally, the project includes a smart grid component financed by the Clean Technology Fund (CTF).

12. The Project in Ho Chi Minh City and Ha Noi consists of 29 non-core subprojects that were originally defined by Viet Nam Electricity (EVN).

13. This IEE is prepared for the new-constructed subproject of Phuoc Long 110 kV substation and connection line in District 9, Ho Chi Minh City. The IEEs of the other non-core subprojects are prepared in separate volumes.

B. Assessment Context

14. The subproject was classified Environmental Category B under the ADB's Safeguard Policy Safeguard Policy Statement-2009 and ADB Environmental Safeguards, A Good Practice Sourcebook, 2012. A category B project will have potential negative impacts that are less adverse than the impacts of category A project and the impacts are site-specific, largely reversible, and mitigate-able with an environmental management plan.

15. This IEE was prepared for Phuoc Long 110kV substation and connection line subproject in the technical design stage, using available data and information on sensitive ecological and cultural receptors that exist for the subproject site.

III. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

16. The Phuoc Long 110 kV substation and connection line subproject will be implemented according to the directives set down for use of Official Development Assistance (ODA) by GoV Decree No. 38/2013/ND-CP of April 23rd 2013 on management and use of Official Development Assistance (ODA) and concessional loans of Donors, and in accordance with the provisions of the Project.

A. Viet Nam Regulatory Framework for Environmental Assessment

17. The Viet Nam Law on Environmental Protection (LEP 2014) prescribes the requirements for environmental assessment for development and domestic project interventions that affect the natural and social environments.

B. Applicable Environmental Laws, Policy, Environmental Standards, and Guidelines

18. The following are key directives for environmental assessment and protection in Viet Nam:

**** Legal foundations on environment protection***

- Law on Environmental Protection No. 55/2014/QH13 passed by the National Assembly dated June 23, 2014;
- Decree No. 19/2015/ND-CP dated February 14, 2015 of the government on detailing the implementation of some Articles of the Law on Environmental Protection;

- Decree No. 18/2015/ND-CP dated February 14, 2015 of the government on Regulating Strategic Environmental Assessment, Environmental Impact Assessment and Environmental Protection Commitment;
- Decree No. 38/2015/ND-CP dated April 24, 2015 of the Government on management of waste and discarded materials;
- Circular No. 12/2011/TT-BTNMT dated April 14, 2011 of the MoNRE, stipulating hazardous waste management.
- Circular No.27/2015/TT-BTNMT dated on 29 May 2015 on strategy environmental assessment, environmental impact assessment, and environmental protection plan.

**** Legal foundations on Electricity***

- Electricity Law No. 28/2004/QH11 dated December 03, 2004;
- Amended Electricity Law No. 24/2012/QH13, passed by the National Assembly dated November 20, 2012, in effect on July 01, 2013;
- Decree No. 14/2014/NĐ-CP dated February 26, 2014 of the Government, providing details on implementing the Electricity Law on power safety, in effect on April 15, 2014;
- Decree No. 134/2013/NĐ-CP dated October 17, 2013 of the Government, providing penalty on administrative violations in Electricity sector, hydropower dam safety, using energy economically and effectively.

**** Other related legal foundations:***

- Decree No. 45/2013/ND-CP dated May 10, 2013 of the Government, elaborating a number of articles of the labor code on hours of work, hours of rest, occupational safety and occupational hygiene.
- Circular No. 22/2010/TT-BXD dated December 3, 2010 of the Ministry of Construction, providing on labour safety in works construction;
- Decision No.3733/2002/QĐ-BYT issued by the Ministry of Healthcare dated October 10, 2002 about the Application of 21 Labour Health and Safety Standards.
- Decision No.155/1999/QĐ-TTg dated July 16, 1999 of the Government on Promulgation of the Management Mechanism for Hazardous Waste.
- Decision No.505 BYT/QĐ dated April 13, 1992 of the Ministry of Healthcare on the Regulation for Allowed Concentrations.

Environmental codes and standards

- QCVN 05:2013/BTNMT – National technical regulation on quality of ambient air;
- QCVN 26:2010/BTNMT – National technical regulation on noise.
- QCVN 27:2010/BTNMT – National technical regulation on vibration .
- QCVN 08:2008/BTNMT - National technical regulation on quality of surface water.
- QCVN 14:2008/BTNMT - National technical regulation on quality of domestic wastewater.
- QCVN 01:2008/BCT: National technical regulation on electricity safety.

International Guidelines

- World Bank Group, 2007. Environmental Health and Safety Guidelines, Wash. DC.

International Environmental Management Conventions

19. Viet Nam is signatory to the following relevant international conventions:

- 1973, Convention on International Trade in Endangered Species Wild Fauna and Flora.
- 1992, United Nations Framework Convention on Climate Change.
- 1992, Convention on Biological Diversity

Directives of Electricity Industry in Viet Nam and Information for Phuoc Long 110kV Substation

20. The documents for Phuoc Long 110kV Substation are included

- Decision No. 6493/QD-BCT dated December 09, 2010, approving the Electricity Development Master plan of HCMC in period to 2015 with vision to 2020;
- Correspondence No. 1009/EPMU HLD dated November 04, 2013 of HCMC-Long Thanh-Dau Giay Highway Management Board on Agreeing the transmission line layout of subproject "Phuoc Long 110kV substation and connection line" crossing over the HCMC – Long Thanh – Dau Giay Highway;
- Correspondence No. 1108/UBND-KT dated June 25, 2014 of the People Committee of District 9 on Agreeing the site for constructing substation and transmission line of the subproject "Phuoc Long 110kV substation and connection line";
- Correspondence No. 265/Cty-4 dated August 12, 2014 of Phu Nhuan Houses Construction and Trade One Member Limited Company on responding Correspondence No. 4745/ATĐ-CBĐT dated August 11, 2014 of HCMC Power Grid Management Board (Phu Nhuan Houses Construction and Trade One Member Limited Company agrees the site agreement of Phuoc Long 110kV substation);
- Decision No. 3530/QĐ-EVN*HCMC* dated may 30, 2014 EVNHCMC on approving the tasks of designing the subproject of Phuoc Long 110kV substation and connection line.

C. ADB Safeguard Policy

21. The ADB Safeguard Policy Statement (ADB SPS, 2009) along with the recent good safeguard practice sourcebook clarify the rationale, scope and content of an PO and supported by technical guidelines (e.g., Environmental Assessment Guidelines 2003). Projects are initially screened to determine the level of assessment that is required according to the following three environmental categories (A, B, or C).

- **Category A** is assigned to projects that normally cause significant or major environmental impacts that are irreversible, diverse or unprecedented such as hydroelectric dams (an Environmental Impact Assessment is required).
- **Category B** projects have potential adverse impacts that are less adverse than those of category A, are site-specific, largely reversible, and for which mitigation measures can be designed more readily than for category A projects (an Initial Environmental Examination is required).
- **Category C** projects are likely to have minimal or no negative environmental impacts. An environmental assessment for Category C projects is not required but environmental implications need to be reviewed.

22. The 110kV Phuoc Long substation and connection line is assessed into category B which is necessary to prepare an IEE. Appendix A presents the Rapid Environmental Assessment (REA) of the Phuoc Long 110kV substation and connection line

IV. DESCRIPTION OF THE SUBPROJECT

23. The Phuoc Long Substation non-core subproject consists of three major components that are a new 110kV substation, 1.9 km of 110kV overhead transmission line, and 25m of UGC.

1. Phuoc Long 110 kV substation

24. The Phuoc Long 110 kV substation will be constructed to supply power to the load demand of District 9 (mainly for the Wards of Phuoc Long A, Phuoc Long B, Phuoc Binh) and neighboring areas of District 2.

25. The substation infrastructure will be located in the scope of an uncultivated land area within the tower span 12 and 13 of the existing 220kV Cat Lai – Thu Duc transmission line. This site has been selected for the subproject site by the People's Committee of District 9.

26. The Phuoc Long 110kV substation and connection line belongs to closed substation type, including the high voltage 110kV switching devices which are GIS devices; middle voltage switching devices are cabinets which will be located indoor.

27. The location of Phuoc Long substation is presented in Figure 1 and technical parameters in Table 1

Figure 1. Proposed site to locate Phuoc Long 110kV substation

Table 1: Technical parameters of Phuoc Long 110 kV substation

Voltage level	110/22kV
Capacity	2x63 MVA (in this phase, only installing 01 transformer).
110 kV Side	• Use single busbar with bus-section by circuit breakers. • 07 bays (01 bay for reserve)
22 kV Side	• Use single busbar scheme with contacting circuit breakers. • 05 bays
Communication and SCADA	To be established signal transfer for control, management and dispatch systems; hot-line and SCADA for Phuoc Long110kV substation to the South Regional Load Dispatch Center (A2) and HCMC.
Control system	The Phuoc Long 110kV substation will be equipped with integrated system it connected remote control and operation (Power Dispatch Center-HCMPC). Besides, the integrated system will be also connected with the South Regional Load Dispatch Center as current regulations.
Protection system	The main relays of protection circuit shall be digital relays with micro-processing units. They will be interfaced with computers of the control system and SCADA system.
Lightning protection system	Lightning protection bar with length 2.5 m shall be arranged on the roof of GIS substation.
Earthing system	Earthing system will be designed from copper rods with crossed section 150 mm^2; earthing rods shall be Φ16 steel rods covered copper, with length 2.4 m and 2 wells with depth 80 m.

2. 110 kV transmission line connected with Phuoc Long 110kV substation

28. The newly constructing 110kV transmission line aims to supply power to the Phuoc Long 110kV substation from the 110kV feeder bays of 220kV Cat Lai substation through directly connecting from the 220kV Cai Lai – Thu Duc TL (at tower No.7).

29. The transmission line will be passed over Phu Huu ward, District 9, started from the tower No. 7 (G1), going over the towers from No.7 to No.12 of existing 220kV Cat Lai – Thu Duc transmission line to the newly constructing connection tower (located in span between of 12 – 13 towers of existing 220kV Cat Lai – Thu Duc transmission line). Then, it goes underground to the substation. The main technical parameters are stated in the Table 2 and the layout map of Phuoc Long 110kV substation and connection line is shown in Figure 2

Table 2. Technical parameters of 110kV T/L connected with 110kV Phuoc Long S/S

Overhead transmission line section	
Voltage level	110kV
Circuits	2 circuits
Length	1,987 m
Starting point	Tower No. 7 of 220kV Cat Lai – Thu Duc transmission line.
Ending point	Connection tower newly constructed.

Conductor	ACSR 795MCM - Drake
Insulator	Ceramic or glass, type: 70kN, 160kN
Pole	Single body steel pole with 4 circuits, hot-dip galvanized.
Foundation	Pile foundation
Earthing	Radial type, using Ø12 galvanized steel rods.

Underground cable section	
Voltage level	110kV
Circuits	2 circuits
Length	25m
Starting point	Newly constructed Connection pole.
Ending point	Phuoc Long 110kV substation.
Cable type	XLPE 1,200mm^2
Protection at cable head	Using lightning arrestor LA 96kV to be arranged at the connection pole.

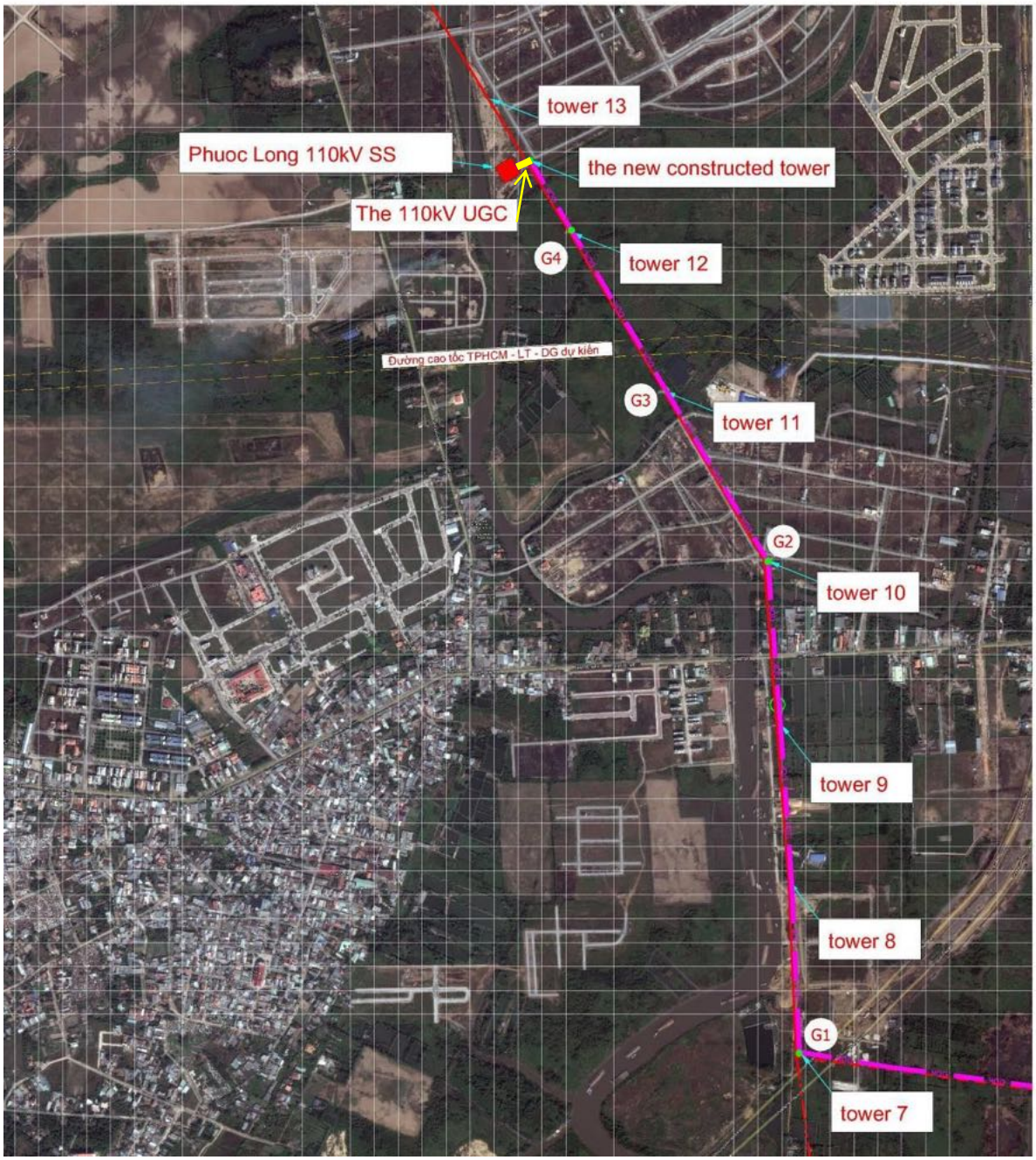

Figure 2. Project layout map with Phuoc Long 110kV substation and connection line

3. Construction works

a. Civil work volume

30. Main civil work volume of Phuoc Long 110kV substation and connection is detailed in Table 3

Table 3. Main civil work volumes

No.	Item	Quantity
Main systems in the substation		
1	Equipment and operation management house (15x36)m	300m^2
2	Access road	37m
3	Excavated volume of vegetation debris	36.16m^3

No.	Item	Quantity
4	Refilled volume of sand and soil for substation level and access road	2,263.89m^3
5	Fence and gate	145.0m
6	Transformer – 63MVA	01
Fire protection – water supply system		
1	Water tank for fire protection 80m^3	1 tank
2	Emergency oil tank 36m^3	1 tank
3	Water filter machine	1 psc.
4	Drilled well 30m in depth (including pump and engine)	01 well
5	Pump machines for fire protection	01 system
6	Pipe system	01 system
Completing the construction ground		
1	The area of trees/flowers	20m^2
2	Decorative plants	20
Connection line		
1	Tower, foundation of the new tower No. 12A	1 tower
2	Cable ditch connected to the substation	25m
3	Installing facilities, connecting the underground cable from the new tower No. 12A to the substation	system
4	Pulling conductor 110kV from the Tower No. 12A to tower No. 7-G1 of the 220kV Cat Lai – Thu Duc transmission line	system

b. Construction methods

** The substation construction:*

31. The construction methods for substation construction include the following activites:

- Substation's ground leveling: ground is filled by soil and sand which will be compacted by bulldozers at the coefficient of compaction k≥ 0.90. Volume of filled sand and soil will be taken from excavated soil and sand.
- Earthwork: foundations of control houses, water tanks, walls will be excavated by machines while other items with smaller volume of excavated will be performed by manual.
- Transformer foundation: consolidated by reinforced concrete stake
- Access road and internal road will be compacted by bulldozers with the compacted coefficient of K ≥ 0.95
- Breakdown oil tank: reinforced concrete tanks made of durable B15 levels (M200), placed underground substation platform.
- Outdoor cable ditch: buried cable ditch made of durable B15 levels (M200), lining the bottom with durable B7.5 level (M100) and was sloped towards the water sump
- Other items were built under the provisions of law and the current construction standards.

** The connection line construction*

32. Foundation of the new tower and cable ditch (25m long) will be constructed by excavation method which is under design drawings and complies with current regulations. After the concrete is finished and refilled. Refilled soil has to compacted in layers and the correct size as the design drawings. The refilled soil taken from excavated soil. Reinforced concrete piles with 250 x 250 in square cross section and 20m long are used to make pile-foundation.

33. The tower erection: the tower will be transported into the proposed position by 25-ton and ≥60m-reach crane.

34. Tension and taking the sag of conductor: conducted by hand combined with tractors and brake to keep conductor at the fix height and control velocity of pulling. At intersections of the TL with traffic roads, electric lines, etc. scaffolding will be used to bear and pull conductor.

***** *Solution of power cut at the existing transmission line during the construction of the new connecting line***:**

35. If construction of the new tower and pulling conductors can be at the same time of another project which is proposed to improve tower No. 11 and 12 of the 220kV Cat Lai – Thu Duc transmission line, the situation of power cut will be associated with the improvement project. If the construction of two projects is different, power cut at the 220kV Cat Lai – Thu Duc TL will be happened during 3 days to erect the new tower and hang conductor to the existing towers.

36. The construction need to care about the electrical safety distance as prescribed at the Decree No. 14/2014/ND-CP and relevant regulations, and to inform operational management unit of the existing TL to coordinate in monitoring and supervision .

c. Material demand and supply sources

37. Materials and equipment for the subproject's construction are expected to take from the following sources:

- Sand, gravel, cement will be bought locally.
- Reinforced foundations, grounding: taken locally and processed at the site.
- Coated steel and bolt types: taken at the processing facility in Thu Duc -TP.HCM.
- Wire, fittings, insulation, and equipment: Storage warehouse of PMB or contractors according to this category by one grade.

38. The transport of supplies and equipment is expected to be carried out as follows:

- Purchasing power equipment: transport by road, distance of 15km.
- Coated steel, bolts: transport by road, distance of 25km
- Transportation of transformers: Transformers are transported by waterways from port to port of Saigon Hanoi with 1215km distance, then transported by road on specialized trailers to position the station about 20km distance.

d. Waste treatment

39. Domestic waste of workers will be collected into the garbage container. Construction contractors will contract with the specialized unit (e.g. HCMC Urban Environment Co., Ltd.) to dispose and treat waste as stipulated by HCMC people's committee.

40. No disposal site needs to be arranged for the subproject because all excavated soil will be used to refill the substation level and foundations. The substation ground is quite low, thus high volume of soil and sand need to be filled to make higher ground. Therefore, the excavated materials need to be disposed of will be only 36.16m^3 from vegetation debris (as table 3), this will be disposed by specialized unit as described in the below diagram. Other construction waste like cement bags, clouts etc. will be classified to treat as in Figure 3

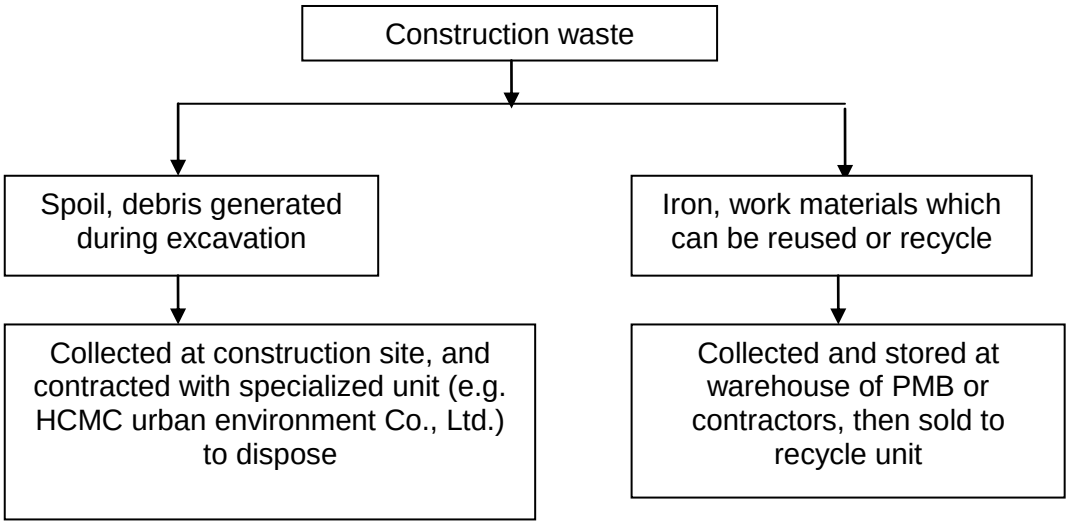

Figure 3. Management of construction waste

V. DESCRIPTION OF THE ENVIRONMENT

41. Environmental basic information was obtained primarily from HCMC Statistical Yearbooks, environmental reports prepared by HCMC DoNRE, reports prepared by PECC4. Description of the existing environment focuses on natural features and current land use

A. Physical Environment

1. Climate

42. The subproject area is situated in the Southern Climate Zone which is typified by a tropical monsoon climate and characterised by high temperatures with very little seasonal variation. Annual average temperature for lowland areas are reasonably constant within a narrow range of 27.2 - 27.7 ^{o}C. The highest temperature is 40 ^{o}C (April) and the lowest is 13.8 ^{o}C in January. Average sunshine hours are 2,489hr/yr. The subproject area belongs to wet and hot monsoon tropical climate region with characteristic of the South climate as summarized below.

a. Temperature

43. Air temperature is high and changes little in year-round. Annual average temperature is 26 – 28^{o}C, difference between the hottest month and the coldest month is about 3 – 4^{o}C. Average temperature in the coldest month is above 24^{o}C (Table 4).

Table 4. Temperature regime at Tan Son Nhat and Tan Son Hoa Meteorological Stations

Station	Feature	Months, year												
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Tan Son Nhat *(long-term average*)	T_{max} ^{o}C	36.4	38.7	39.4	40.0	39.0	37.5	35.2	35.0	35.3	34.9	35.0	36.3	40.0
	T_{min} ^{o}C	13.8	16.0	17.4	20.0	20.0	19.0	16.2	20.0	16.3	16.5	15.9	13.9	13.8
	$T_{average}$ ^{o}C	26.0	26.8	28.0	29.2	28.8	27.8	27.5	27.4	27.2	27.0	26.7	26.0	27.4
Tan Son Hoa (2013)	$T_{average}$ ^{o}C	26.5	25.8	28.6	30.0	30.5	28.9	28.9	27.7	28.1	27.9	27.8	28.1	28.2

(Source: Data of Tan Son Nhat station referred to National technical regulation on natural condition data in construction _QCVN 02:2009/BXD; data of Tan Son Hoa station referred to the statistic yearbook 2013 of HCMC)

44. According to the report of the Working Group on Climate Change and Development, (2007), in the Mekong region (including Ho Chi Minh City) average temperatures over the last century have risen between 0.3 to 0.8°C. In addition to temperature increase, there are expected with more extreme weather events, such as floods and droughts, changes in the amount and distribution of rainfall, disruption of seasonal monsoons, and rising sea levels.

b. Sunlight hours

45. Average number of sunlight hours in Ho Chi Minh City is quiet high as compared with many other provinces in the country. Number of sunlight hours in a year is of 1,800 – 2,500 hours or more. Table 5 shows the average number of sunlight hours observed in Tan Son Hoa and Tan Son Nhat meteorological station.

Table 5. Average number of sunlight hours

Station	Months, year (hour)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Tan Son Nhat	245	246	272	239	195	171	180	172	162	182	200	226	2,489
Tan Son Hoa (2013)	164.8	215.3	252.3	225.6	200.4	185.6	153.6	178.1	142.2	138.8	124.6	90.5	2,072

(Source: Data of Tan Son Nhat station referred to National technical regulation on natural condition data in construction _QCVN 02:2009/BXD; data of Tan Son Hoa station referred to the statistic yearbook 2013 of HCMC)

c. Humidity and Rainfall

46. The area is humid and there is little difference in rainfall between the monsoon seasons. Annual average humidity is about 78%- 82 %. Rainfall regime is divided into the separated two reasons such as rain season from May to October and dry season from November to the next year's April. Maximum rainfall in the region is 200 mm per day. Total annual average rainfall in the region is 1,926 mm (see Table 6).

Table 6. Monthly and annual average rainfall and Humidity in Tan Son Nhat Station

	Months, year (mm)												
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	Year
Rainfall	12	4	13	51	207	294	307	281	305	291	135	28	1,926
Humidity (%)	72.0	70.0	70.0	72.0	79.0	82.0	83.0	83.0	85.0	84.0	80.0	77.0	78.0
Humidity (%)	23	22	20	21	26	30	40	44	43	40	33	29	20

Source: Data of Tan Son Nhat station referred to national technical regulation on natural condition data in construction _QCVN 02:2009/BXD;

d. Wind velocity

47. From November to April, the wind is mainly from the northeast and dry while from May to October the wind is mainly from the southwest and brings heavy rainfall to the low-lying plains and eastern slopes of the Truong Son Mountains. The annual average wind speed recorded at Tan Son Nhat is 2.8 m/s. The high number of thunderstorm days is mainly in the rainy season from May to October (Table 7).

Table 7: Wind velocity and Number of thunderstorm-days in Tan Son Nhat station

Parameters	**Months, year**												
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Year**
Wind velocity (m/s)	2.3	3.1	3.6	3.3	2.5	2.7	2.9	3.8	2.7	2.2	2.2	2.0	2.8 (average)
Number of thunderstorm-days (day)	0.0	0.3	0.2	2.0	11.0	8.0	13.0	9.0	9.0	8.0	6.0	1.0	67.5 (total)

(Source: National technical regulation on natural condition data in construction _QCVN 02:2009/BXD).

2. Air quality

48. Air quality in HCMC has been monitored frequently and almost focused on pollutants due to traffic activity. The monitoring has been conducted at 6 stations located in the territory of Ho Chi Minh city, including Dinh Tien Hoang – Dien Bien Phu, An Suong, Go Vap, Hang Xanh, Nguyen Van Linh – Huynh Tan Phat (District 8), and Phu Lam stations. The monitoring results in 2012 and the first half of 2013 are presented in Table 8.

Table 8: Air pollutants measured in the 6 stations in 2012 and the first half of 2013

		Hang Xanh	**DTH-DBP**	**Phu Lam**	**An Suong**	**Go Vap**	**HTP-NVL**
CO (mg/m^3)	Average 2012	9.7	12.77	8.78	11.79	14.47	8.76
	% Samples over standard	1%	2%	0%	2%	1%	1%
	Average first half 2013	10.48	13.47	10.06	12.94	16.4	9.64
	% Samples over standard	0%	0%	0%	0%	3%	0%
Particle content (mg/m^3)	Average 2012	0.44	0.53	0.51	0.65	0.5	0.51
	% Samples over standard	95%	98%	99%	100%	95%	91%
	Average first half 2013	0.43	0.46	0.51	0.61	0.5	0.52
	% Samples over standard	85%	98%	98%	100%	98%	88%
Lead (mg/m^3)	Average 2012	0.28	0.32	0.28	0.32	0.28	0.31
	Average first half 2013	0.32	0.36	0.33	0.39	0.3	0.34
NO_2	Average 2012	0.17	0.21	0.18	0.21	0.18	0.17

		Hang Xanh	DTH-DBP	Phu Lam	An Suong	Go Vap	HTP-NVL
(mg/m^3)	Average first half 2013	0.15	0.19	0.17	0.2	0.17	0.17
Noise (mg/m^3)	Average 2012	77.89	78.49	76.97	80.14	77.89	77.3
	% Samples over standard	100%	100%	100%	100%	100%	98%

(Source: Reports on monitoring results of environmental quality in HCMC in 2012 and the first half of 2013, by Environmental Monitoring and Analysis Center – DONRE of HCMC)

49. Noise is the most polluting factor in HCMC's roads, with 100% of the measured values exceeding the standard limit, fluctuating from 77 to 80dB (measured in 2012), 71-88dB (measured in the first half of 2013).

50. The second pollutant is dust which is also a serious concern in the monitoring program. In 2012, the measured values at the 6 stations were from 0.44 – 0.65mg/m^3, with 96% of them over the permitted standard of 0.30mg/m^3. However, in comparison to the figures of 2011 and 2010, dust concentration tends to reduce. In the first half of 2013, the concentration of dust was measured from 0.43 – 0.61 mg/m^3, with 95% over the standard.

51. NO_2 content was 0.17 – 0.21 mg/m^3 in 2012, and 0.15-0.20 mg/m^3 in the first 6 months of 2013. Overall, this content has been declined during the period from 2010 to half of 2013.CO and Pb content measured in 2012 met the standard level and lesser than in 2011 and 2010, while these figures increased in the first half of 2013.

52. Air quality in the subproject area was measured by the South environment and meteo-hydrology Branch and PECC4 in October 2014. The results show that air quality in the area is relatively good because most of analyzed parameters are under the permitted levels of air quality. Particularly is as the Table 9:

Table 9. Analyzed results of air quality in the subproject site

No.	Parameters	Unit	Results			QCVN 26:2010/ BTNMT	QCVN 05:2013/ BTNMT
			KK1	KK2	KK3		
1	Noise	dB	57.2	58.9	61.3	70	--
2	NO_2	mg/m^3	0.012	0.027	0.033	--	0.20
3	SO_2	mg/m^3	0.014	0.019	0.025	--	0.35
4	CO	mg/m^3	3.04	3.07	4.06	--	30
5	O3	mg/m^3	KPH	KPH	KPH	--	0.20
6	Total suspended particle (TSP)	mg/m^3	0.10	0.12	0.15	--	0.30
7	Dust ≤ 10 µm (PM10)	mg/m^3	0.008	0.007	0.009	--	--
8	Pb	mg/m^3	0.002	0.003	0.003	--	--

(Source: The south environment and meteo-hydrology sub-institute, October/2014)

Note:

(KPH): Not defined

-- : Not regulated

KK1: Area proposed to construct Phuoc Long 110kV substation, belong to Phuoc Long B ward, District 9, HCMC.

KK2: Area of urban unit 2, Phu Huu ward, District 9, HCMC.

KK3: Area of Go Noi road, Tan Dien B hamlet, Phu Huu ward, District 9, HCMC.

3. Topography, Geology and Soils

53. Ho Chi Minh City belongs to a transitional region between the southeastern and Mekong Delta regions. The general topography is that the terrain gets lower from North to South and from East to West. There are three types of terrain as summarized below.

- The *high terrain* lies in the North-Northeast area and part of the Northwest area encompassing North Cu Chi, Northeast Thu Duc and District 9. This is the bending terrain with average height of 10-25 meters. Long Binh Hill in District 9 is the highest place, which is 32 meters high.
- The *depression terrain* lies in the South-Southwest and Southeast part encompassing districts 9, 8, 7, Binh Chanh, Nha Be and Can Gio. The area's height is in the range of 0.5 to 2 meters.
- The *medium terrain* lies in the middle of the city, encompassing most old residential areas, part of districts 2 and Thu Duc, and the whole of districts 12 and Hoc Mon. The area's height is 5-10 meters.

54. In general, the topography of Ho Chi Minh City is fairly diverse and therefore has good conditions for multi-faceted development. According to survey report of subproject "Phuoc Long 110kV substation and connection line" in feasibility study, the geology and geography condition in the subproject area as summarized below.

55. The subproject area's topography is accumulative relief type. The surface is relatively smooth with separation of canals and traffic roads. The topography types' formed rocks include clay, clay loam, sand, clay sand, alluvium - Quaternary (a - Q).

56. The results of geologic exploration drilling under 40m in depth at the site, in combination with relevant geological data, show that the subproject area's geological structure includes the layers described as bellow:

- The upper part are sea-river sediments (amQ $_{IV}^{2}$), with main component of clay loam, clay mud, sand....; the lower part is gravel, clay, sand...which belong to Cu Chi formation. Distributed on the whole site proposed constructing the Substation and Transmission line is divided as the following layers:
- Layer 1: It is backfilled soil with yellowish grey fined grained sand, wet soil, moderately hard. Distributed in mostly bored holes, thickness of 1-3m
- Layer 2: It is blackish grey clay mud, wet soil, doughy state. Mostly it is distributed in the bored holes, thickness of 2-7m
- Layer 3: It is whitish grey, yellowish grey clay loam, wet soil, doughy state. It is distributed at 2 manual bored holes KT1 and KT2 in the proposed site. The thickness is 1.9-2.5m
- Layer 4: It is reddish brown, yellowish brown gravel, medium to hard state. It is distributed at 2 bored holes KM1 and KM2. The thickness is 2-4m.
- Layer 5: Reddish brown, yellowish brown, bluish grey clay, moderately wet soil, soft to hard state. It is distributed at bored holes KM1, KM2, KT1, KT2. The thickness is 10-13m.
- Layer 6: Reddish yellow, yellowish grey, whitish grey coarse sand, wet soil, moderately hard state. It is distributed in bored holes KM1, KM2. Down to the depth of 35m, it has not still finished this layer.

4. Surface water/groundwater resources

57. Ho Chi Minh City has a diverse river system. Dong Nai River has mean flow about 20–500 m^3/s, supplying 15 billion m^3 water. This river supplies main source of fresh water for the city. In addition, Sai Gon River has 80 km in length flowing through the city; mean flow is 54 m^3/s. The river's width of the section through HCMC is 225 - 370 m with a depth of 20 m. Dong Nai and Sai Gon rivers are connected inside the city by Rach Chiec canal system. Another river in HCMC is Nha Be River, which is the confluence of Dong Nai and Sai Gon River, flowing to the East Sea through two estuaries such as Soai Rap and Ganh Rai. In addition to the main rivers, HCMC has still a tangled canal system, such as Lang The, Bau Nong, Tra, Ben Cat, An Ha, Tham Luong, Cau Bong, Nhieu Loc-Thi Nghe, etc.

58. Because of Pleistocene sediment, the north of HCM City (including the subproject area) has the plentiful source of underground water. However, at the City South part, due to Holocene sediment, underground water usually has alum or salt. The old inner city has significant reserves of underground water, although the quality is not quite good, this water is still used at three layers like 0–20 m, 60–90 m and 170–200 m (Miocene sediment).

5. Water quality

a. Surface water quality

59. Surface water in HCMC is monitored under three categories that are water for supply purpose, water for other purposes and water in canal system. There are 22 stations monitoring water surface of rivers and canals around of HCMC.

60. Overall, the quality of supply water is clean in the parameters of biochemical and chemical oxygen demand as well as coliform contents while the quality of water in canals inner the city is seriously contaminated. The results from survey show that almost all parameters of the supply water stations meet the standard (pH, BOD_5, COD, salinity, Mn) with the exception of DO, coliform and oil contents which exceed the standard level. The water for other purposes has DO and coliform exceeding the standard level. Between 2012 and the first half of 2013, the parameters such as pH, BOD_5, COD increased in the two categories of water-body (supply purpose and others).

61. The surface water quality in the subproject area has been assessed through surface water samples at 3 positions (2 positions at Phu Huu ward and 1 position at Phuoc Long B ward). The results show that the parameters mostly met permitted levels according to QCVN 08:2008/BTNMT. However, the content of Fe, E coli and Coliform are exceeded the permitted levels (Table 10).

Table 10. Results of analyzing surface water in the subproject area

No.	Parameters	Testing methods	Unit	Results			QCVN 08:2008 / BTNMT
				NM1	NM2	NM3	
1	Temperature	TCVN 6492:2011	^{o}C	29.8	28.4	29.9	--
2	Colour	Rapidly measuring by device of Hanna HI 96727	Pt-Co	30	20	20	--
3	Taste	Tasted		Not defined different			--
4	Odor	Tasted		Not defined different			--
5	pH	TCVN 6492:2011	--	7.12	7.36	7.24	5.5 – 9
6	DO	Rapidly measured by Device Hanna Ecoscan DO6	mg / l	4.9	5.3	5.0	≥4
7	TSS	TCVN 6625:2000	mg / l	12.5	13.8	15.3	50
8	COD	SMEWW 5220C:2012	mg / l	15.0	10.4	12.9	30
9	BOD_5 (20^{o}C)	TCVN 6001-2: 2008	mg / l	4.2	3.2	3.8	15
10	$N\text{-}NH_4^+$	SMEWW 4500 NH_3 –F	mg / l	0.023	0.018	0.045	0.5
11	$N\text{-}NO_3^-$	EPA 352.1	mg / l	0.056	0.070	0.067	10
12	$N\text{-}NO_2^-$	TCVN 6178:1996	mg / l	0.010	0.015	0.013	0.04
13	PO_4^{3-}	TCVN 6202:2008	mg / l	0.064	0.071	0.036	0.3
14	Cl^-	TCVN 6194 -1996	mg / l	26.24	23.6	25.8	600
15	T-Fe	TCVN 6177 -1996	mg / l	1.648	0.793	0.469	1.5
16	Lead (Pb)	SMEWW 3113B, 2012	mg / l	$1.94x10^{-3}$	KPH	$2.87x10^{-3}$	0.05
17	*T-Ecoli*	TCVN 6187 – 2:1996	(MPN/100ml)	300	170	140	100
18	T- *Coliform*	TCVN 6187 – 2:1996	(MPN/100ml)	11,000	6,300	6,400	7,500

(Source: The south environment and meteo-hydrology sub-institute, October/2014)

Note:

(KPH): Not defined

-- : Not regulated

NM1: Surface water at Ong Cay canal of Phuoc Long B ward, District 9, HCMC.
NM2: Surface water at Ong Ky canal of urban unit 2, Phu Huu ward, District 9, HCMC.
NM3: Surface water at Bau Cua canal, Tan Dien B hamlet, Phu Huu ward, District 9, HCMC.

b. Groundwater quality

62. The area of Phuoc Long 110kV substation and connection line has rich water reserve. Groundwater level is closely associated with up and down movement of tide and seasonal changes. Based on geological condition and rock characteristics of the project area, aquifers are mainly located in formation with amQIV2 sediment origin. The aquifers are rich category. Site survey of drilled holes shows that relatively shallow groundwater is average 0.3 - 0.9 m

B. Biological Environment

1. Vegetation and Land Use

63. The District 9 has agricultural land in outskirt areas larger than that in other districts. The agricultural land in this area is mainly cultivated with rice, crop, nipa palm…etc. Current land use of 1,751.9 m^2 of permanently acquired land for substation, access road and tower's foundation is vacant land. 1,987 m of overhead transmission line crosses over Nipa palms, traffic road, vacant land and residential area. However, this transmission line will hang on the existing towers of the 220kV Cat Lai – Thu Duc TL; therefore, no land will be acquired for the transmission line.

2. Wildlife

64. The area has been residential area for long-term period and therefore no original habitats remain in the area. No significant wildlife occurs within the area. There are no animals that could interfere with the underground cable.

3. Conservation Areas

65. There are no conservation areas within the proximity of the transmission line. The route does not cross or intrude into any conservation area, buffer area or any possible planned future extension of these areas.

C. Socio-economic conditions

1. Population

66. The transmission line and substation is situated within Ho Chi Minh City and includes 1 district with 2 wards. Population of the two wards is presented in Table 12.
67.

Table 12. Population of Phuoc Long B and Phu Huu ward

	Total	Male	Female
Phuoc Long B ward	65,059	31,011	34,048
Phu Huu ward	9,560	4,557	5,003

(Statistic yearbook of District 9 – Ho Chi Minh City, 2013)

2. Local Economy

68. Ho Chi Minh City leads the country on economic growth. According to the statistics of HCMC Bureau of Statistic, the GDP growth rate in 2010 was 11.8%, which in 2013 decreased to 9.7% (nearly double that of Vietnam's GDP). Ho Chi Minh City now accounts for one third of the country's GDP and is the main economic area and growth centre in the south of Vietnam where it contributes 66.1% of GDP in the southern key economic area and 30% of the total GDP of the southern region.

69. The District 9, which is located in the Northeast gate of HCMC, on the North – South traffic axis, is one of among key economic areas, which has location and relative

important traffic gate connected with the Eastern - Western – Southern Provinces. Besides, in the District area, there are some industrial, urban projects which have been constructed, contributing to rapidly increasing the social-economic development of the District.

70. Economic conditions of District 9:

a. ***Agriculture***:

The area of fruit tree in the District is 1,312.62 ha. The bonsai area in the District is 58.32 ha. The aquarium area in the District is 2.28 ha. The livestock in the District is relatively developed with 22,693 pigs and 194 buffaloes. The aquaculture area in the District is 88.94 ha, in which, shrimp area of 17.09 ha; fish area of 70.05 ha.

b. Industry

Recently, there are 1,050 production facilities, 394 private companies, 03 cooperatives and 37 FDI companies. The total industrial – handcraft production value in 2013 was 1,942.910 billion VND.

c. Commerce and services

The commerce and services sector of the District has been step by step developed the market, serving the demand of consuming and entertainment of residents. In 2013 there were 9.135 individuals, 02 cooperatives, 11 joint stock companies, 111 limited companies, 153 private companies, 01 FDI company. The turn-over of the commerce – services sector in 2013 was 7,121.235 billion VND.

3. Social Infrastructure

a. Public Health and Sanitation

71. In the District territory, there are 13 wards, which all have healthcare stations, from what 08 wards reach national healthcare standard. The socialization of Health has reached positive results. The private healthcare system has been strongly developed, presently there are 192 clinics, medicine shops in the District, that has contributed serving the demand of health examination of residents. All the residential areas can approach with healthcare services. The service quality and educated medicine staffs have been increased.

72. The works of managing common diseases have been concentrated. It has implemented various preventing and protection measures such as: SARS, bird flu, dengue fever…etc. The works of controlling and monitoring food safety has been well implemented.

b. Education

73. Up to the school year 2013, in the District territory there were 44 state schools (including 03 high schools); 12 private schools (including 01 high school); 32 kindergartens; 01 Vocational Training Centre and 01 Vocational Overall Technical Training Centre. On the whole District education sector, there were 1,269 class rooms; 1,030 classes; 44,735 pupils. The works of constructing schools attained national standard had been well implemented; there were 17 schools which attained national standard, approved by the People's Committee of HCMC.

c. Communications:

74. The subproject area is being covered by many telephone networks such as Vietel and VNPT telecoms, and some other telecom companies. Therefore, it is highly convenient for people to communicate and develop this sector.

d. Infrastructure for transportation

75. Infrastructure development for transportation is being constantly improved which has increased the standard of living and access to services. The road network is reasonably well developed throughout the subproject area. Located at the East gate of HCMC, the

District 9 has the traffic road system with National Road 52, belt highway beside National Road 1A, which have infrastructure suitable for social-economic development. Besides, the District 9 also has Dong Nai River at the East branch of Sai Gon River surrounding the South border, which is an important marine traffic route. In future, there will be Ben Thanh – Suoi Tien railway, along the National Road 52 axis, etc.

4. Cultural and Heritage Sites

76. HCMC is one of largest and oldest city in Vietnam, and has many cultural and heritage sites. The most prominent cultural and heritage sites in the city center are the Reunification Palace (Dinh Thống Nhất), and Notre-Dame Cathedral (Nhà thờ Đức Bà). The city has various museums including the Ho Chi Minh City Museum, Museum of Vietnamese History, the Revolutionary Museum, the Museum of Southeastern Armed Forces, the War Remnants Museum, the Museum of Southern Women, the Museum of Fine Art, the Nha Rong Memorial House, and Ben Duoc vestige area.

77. Within the scope 500m from the proposed site for constructing the Phuoc Long 110kV substation and along the ROW of transmission line, there are not any cultural, temple, school, public offices, cemetery, and heritage sites in the area.

5. UXO Clearance

78. After decades of war UXO remains a significant issue in Vietnam. The UXO situation in the subproject area has been noticed by Commander military zone No 7 at the letter No. 794/BTM-PCB dated 05 February 2015. District 9 is one of key areas where happened violent wars. Thus, the subproject needs clear UXO before commencement. Company No. 319 under Ministry of National Defense will clear UXO before construction. Clearing of UXO within the RoW is the responsibility of EVNHCMC/PMB and is not funded as a part of the loan.

6. Subproject affected people

79. The area of the substation, the access road, the underground cable and the new constructed tower will be located in the vacant area in Phuoc Long B residential area that belongs to Phu Nhuan Houses Trading and Construction One Member Limited Company.

80. The whole overhead transmission line will be suspended on the existing towers of 220kV Cat lai - Thu Duc T/L, therefore, there will be no land acquisition.

81. The subproject affected persons will be 01 organization and 03 households.

a. Permanent loss

82. The permanently acquired land will be: (i) 1,303.5 m^2 for constructing the substation, (ii) 80 m^2 for constructing the underground cable section and (iii) 368.4 m^2 for constructing the access road of Phu Nhuan Houses Trading and Construction One Member Limited Company, which will be acquired by HCM PC; these sites are un-cultivated land, without planted trees.

b. Temporary loss

83. It will affect 285 nipa palms within the ROW of 03 households when wires are stretched.

7. Features of Phuoc Long 110 kV substation and connection Line Sites

84. The proposed substation is located on bare land – the new expanded area of Phuoc Long B residential area. The current residential area is located on the north of Phuoc Long B ward and 500m far from the subproject site. The expanded area is planned for house, building, public works and park. Particularly, the substation will be contiguous with the following objects:

- On the East: adjacent internal roads in the residential area of Phuoc Long B; the planned residential land of Phuoc Long B is on 200m from the SS.
- On the West: adjacent Ong Cay canal (or called as Bau Cua)

- On the South: adjacent Dat Set canal. The other side of Dat Set canal is planned for villas.
- On the North: adjacent local roads in residential areas, Phuoc Long B and green park

85. This is the area of land is relatively low, flat and vacant belonging to the planned Phuoc Long B residential area, and the owner is Phu Nhuan housing business and construction Company. Environmental status of Phuoc Long 110kV substation site: vacant land and weed.

86. Access road: There is no road accessing the substation area, so 37m long road will be constructed to link the station to the residential street which is 4.5m wide. The new access road is designed for temporary scale, followed the route planning. There is Long Thanh - Dau Giay highway - a new route was built for the City at 500m on the south from the substation. Connection from this highway to the substation is by some roads such as Do Xuan Hop street (10 m wide), and the existing residential streets (4.5m wide).

87. Environmental status within the ROW: vacant land, weed and nipa palms. Some photographs about the subproject Phuoc Long 110kV substation and connection line are illustrated in Figure 3, 4, 5.

Figure 3: Land area proposed to locate 110kV Phuoc Long S/S

Figure 4: The existing 220kV Cat Lai - Thu Duc T/L and the position suspended the connection T/L

Figure 5: Some photographs about the subproject area

VI. POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

88. The assessment of potential impacts of the subproject is structured by the three development phases of the subproject defined by: *pre-construction*, *construction*, and *operational phase.* The three major components of the subproject (Substation, overhead transmission line, and underground cable) addressed within this assessment.

A. Subproject Benefits

89. The single comprehensive benefit of the subproject is the provision of needed electrical power to Eastern Ho Chi Minh City to support the rapid urban, commercial, and industrial development that is occurring. The additional electrical power will significantly reduce power outages or brownouts that occur in the area, and the need to shunt electrical power from other parts of the city.

B. Potential Impacts and Mitigation Measures during Pre-construction Phase

1. Land acquisition and compensation:

90. Impact:

- In the basic design stage, it is defined permanently and temporarily acquired land areas for constructing the subproject. Total area of permanently acquired land for constructing the subproject is 1751.9 m^2, including 1,303.5m^2 for substation, 368.4m^2 for access road, and 80m^2 for underground cable and tower foundations.
- During the construction, the project will cause temporary impacts to 540m^2 of land for material storage. Construction will use of the existing managerial road to operate the 220kV Cat Lai - Thu Duc T/L as access road to the area for wire spreading. The entire area of temporarily affected land will be borrowed from the land owners and the price for the land will be negotiated with the land owners in the presence of the third independent party as a witness. Should negotiation fail, a resettlement plan will be prepared based on the approved resettlement policy framework. No civil work shall commence until negotiations/compensation has been concluded. After construction is complete, the entire area must be restored and returned to the land users.
- There are no HHs must displace their houses/structures due to the subproject's land acquisition. The TL will be hang on the existing tower of the 220kV Cat Lai – Thu Duc TL, so the TL construction will not cut tree for tower foundation, and minimize cut trees for wire spreading and pulling. There are some trees (Mostly milpa trees) under the ROW of the existing T/L will be likely affected during construction and wire spreading, but it will be avoided and minimized as much as possible.

91. Mitigation measures

- Comply with the regulations of the Land Law 2013 and decrees, circulars, decisions on compensation, assistance and resettlement of the Government and Ho Chi Minh City People's Committee.
- Comply with the regulations of the Electricity Law, the Decree No. 14/2014/ND-CP and relevant regulations.
- Construction unit shall have to choose proper construction method to minimize the impact on trees under the ROW during pulling conductors. In case the impacts on trees are unavoidable, the construction unit will compensate for these losses by negotiating with the owners at replacement price in the presence of the third independent party as a witness. No civil work shall commence until negotiations or compensation has been concluded
- Ensure compensation payment to be implemented clearly, openly and fairly in compliance with legal regulations. Estimated cost of compensation and assistance

for AHs is proposed approximate 4,046,969,850VND ($189,820.35 USD). Budget for compensation payment will be enough and available.

- Construct completely each work item to minimize the duration of temporary land use for the project construction.
- Coordinate to address people's claims/grievances relating to compensation.
- Restore and return the temporary acquired land for owners immediately after finishing the construction.

2. UXO clearance

92. Impacts. In the project area, it may still exist UXO, thus if not implement UXO clearance, it may cause risks of worker's and people's life when conducting the project construction. The UXO clearance procedure: before preparing and clearing site for constructing the project, it is necessary to coordinate with the competent agency for UXO clearance in the proposed project area.

93. Mitigation measures

* *The proposed guidance for UXO clearance is as follows:*

- Execution of demining and UXO is done following these steps:

+ Covering UXO detection and clearance area,

+ Clearing the grounds

+ Detection by the detector to a depth of 0.3m

+ Mark, digging test and resolve signal to a depth of 0.3m

+ Detect bomb by detector to a depth of 5m (put in step with high sensitivity)

+ Excavation, checked resolve signal to a depth of 3m

+ Excavation, checked resolve signal to a depth of 5m

- Note: before detecting UXO under wet fields, marshes pond with a depth <0.5 m, it is must to embankment and drain water to avoid remaining tidy UXO. When detecting UXO on terrestrial land, warning boards and guard have to be arranged to avoid accidents due to entrance of people, animals or vehicles.

- Collecting, sorting, transportation management and destruction of mines and explosives are under strict safety standards for preservation, transport and use of explosives in TCVN 4586-1997, issued by Explosive Engineering Command Ministry, and the other current regulations.

- Competent unit shall be responsible to notify the Ministry of the military commanders in the province (Military Region 7) on the implementation mission: clearance location, construction schedules and staying time in the locality
The cost of UXO clearance is estimated to be 28.474.000VND

3. Detailed design*:*

94. Impacts: if the detailed design does not consider the environmental issues (e.g pollution and disturbance during construction, occupation and communication health safety, etc.), the subproject can cause some negative impacts during construction and operation. Particularly, (i) subproject site selection can increase the chances of encroachment on cultural or natural sensitive sites if lacking of the carefully consideration; (ii) During technology selection, if PCB transformer type is selected, the subproject will

cause pollution and negative impacts during the subproject operation. PCB is a toxic substance which can damage human being health by cancer through food chain, therefore oil with PCB component is one of substances forbidden for use in Vietnam

95. Mitigation measures: Consultants have to consider to environmental issues for the design, specifically:

- Arrange the substation site and transmission line direction to avoid cultural and historical heritages, and other sensitive areas, during the feasibility study, the project management board has to consulted Department of Industry and Trade of Ho Chi Minh City, the DPC of district 9, CPC of Phu Huu and Phuoc Long B wards to agree upon the location of the substation and connection line;
- Select transformer without PCB, design the depth to bury cable for ensure electromagnetic field not affect people health, develop methods of civil work to ensure not to acquire more land/assets, disturb traffic, pollution due to dust, noise, wastewater and solid waste.

EO of PMB with the support from PIC will be responsible to review detailed design of the subproject to ensure proposed mitigation measures included in the detailed design. Furthermore, after feasibility study was approved, notify the local authorities and people of activities and schedule of the subproject in order to them organize their production and business suitably and coordinate in environmental protection monitoring. Concurrently, notify the DoNRE of the subproject commencement to complete requirements for the environmental assessment, and give permission and certificates for the subproject in the subproject implementation process.

4. Bidding document establishment:

96. Impacts: if terms of reference content in the bidding documents of civil works and equipment supply exclude provisions for environmental protection, it will result in disturbance and pollution during construction and operation phase of the subproject.

97. Mitigation measures***:*** Bidding document and works contracts have to include provisions that require contracts to comply with the mitigation measures suggested in IEE and RP. The mitigation plan is organized into a series of mitigation sub-plans that address specific potential impact areas of the subproject. The sub-plans will assist the contractors with the development of their SEMPs as part of their bid documents, and ultimately will allow the EO/IA, PIC, and contractors to focus more or less on the different potential impact areas as they arise with the implementation of the final designs of the subproject. Mitigation sub-plans of the EMP are drafted for example for: a) Construction drainage; b) Erosion; c) Noise and Dust; d) Contaminated Spoil Disposal; e) Solid and Liquid Waste Disposal; f) Construction and Urban Traffic; g) Utility and Power Disruption; h) Worker and Public Safety; i) Tree and Vegetation Removal and Site Restoration; j) Construction Materials Acquisition, Transport, and Storage, and k) Cultural chance finds.

5. Construction site arrangement

98. Impacts: There are some impact sources such as:

- *Disposal site selection*: the subproject is proposed not to arrange a disposal site because all excavated soil will be used to fill back and leveling, other waste will be collected specialized units of HCMC
- *The planning of transportation and storage facilities*: the subprojects, particularly substation, will have some huge equipment like transformer, thus, its transportation can cause some damage for roads surface and traffic activities, (iii)
- *Material transportation will affect air environment due to dust*: Stockpile and material gathering site can cause temporary acquiring land and affect people living near the site because of the movement of vehicle in and out the stockpile, and dusty around the gathering site

99. Mitigation measures***:*** (i) The contractors have to hire/contract a specialized unit (e.g. HCMC urban environment company) to collect waste generated from the subproject's construction, (ii) Develop the transportation plan for overweight equipment and material will help to reduce the negative impacts, (iii) Contractor will arrange the temporary yards for stockpile and material gathering site within the substation area in order to avoid arising impacts due to land acquisition, (iii) Check the license for safety and environment ensure of mobilized machines and vehicles have to be done by contractors.

C. Potential Impacts and Mitigation Measures during Construction Phase

1. Potential impacts and mitigation measures for construction activities

100. Potential environmental impacts and mitigation measures of the subproject activities during the construction phase on the different environmental aspects are described as bellows:

a) Ambient air quality

101. Impacts:

- Noise, dust and exhausts generated by machines', equipment's and transportation means' activities; substation leveling, soil excavation of foundation pits or underground ditch will impact on ambient air environment. These impacts are short-term and will be stopped when the construction is completed. Specifically:

- *Dust generated by soil excavation:* volume of excavated debris is 36.16m^2, volume of filled sand for access road is 2263.73m^3. From these data, the concentration of diffused dust can be calculated, and the result shows that the data meet the standard (QCVN 05:2013/BTNMT < 300µg/m^3) at the distance of 10 m from the emission source, with the data of 0.07 mg/m^3. Therefore, dust from soil excavation and fill for civil works will not severely affect to air environmental quality. The calculation result of concentration of dust showed that outside of the scope of 20m far from the impact source, the residential areas near the site will not be affected (the nearest residential area is 500m on the north far from the subproject site). The impact will last 2 months during excavation and leveling for substation, access road, and underground cable.

- *Dust and exhausts such as NOx, SO_2, CO generated by construction machines' and equipment's, and transportation means' activities*: there will be approximate 30 vehicles which will run on roads to transport workers, fuel, towers and other materials for civil works. They will emit dust and exhausts with the concentration of 28.4 mg/Nm^3 (dust), 40.0 mg/Nm^3 (SO_2), 384.8 mg/Nm^3 (NO_x), 87.6 mg/Nm^3 (CO), and 31.6 mg/Nm^3 (VOC) lower than the allowable limits under QCVN 19:2009/BTNMT (column B), so impacts from this activity will be negligible. Dust and exhausts from vehicles will affect to ambient air environment in the construction site and along the transport roads (Long Thanh - Dau Giay highway, Do Xuan Hop street, and roads near to the subproject site). The impact will be last 07months during construction phase

- *Noise generated by construction and transportation activities:* Noise will be generated by activities of machines, equipment and means such as truck, crane, bulldozer, excavator,… According to calculation results, noise generated by these machines, equipment and means will reduce lower than the allowable limit (70dB) at the distance of above 200m. The subproject area is far from the crowded residential areas. In addition the machines, equipment and means will be only operated in the daytime. Thus, noise impact is insignificant and short term. It impacts only on some households living along transport roads within the distance of 200 m, there is no residential area near to the construction site

102. Mitigation measures:

- Construction units will frequently spray water at the construction sites and along the transport roads to minimize dust.
- All vehicles used for construction, and equipment and machines emitting noise, exhausts, fume will be maintained properly to minimize emission, and not operated at night if impossible to minimize noise.
- Contractors will ensure that transportation means, machines and equipment must have effective certificate of environmental standards achievement (QCVN 04: 2009/BGTVT and QCVN 05: 2009/BGTVT) issued by the register department before using for the subproject construction.- Construction materials (e.g., sand, gravel, and stone) that are transported by trucks will be covered by canvas.
- Temporary stockpiles/storage yards will be covered, or sprayed regularly to prevent dust and erosion.
- Reduce excavation and filling duration, and excavated soil will be used to fill right after complete work.
- Replace equipment, machines and vehicles causing large noise.

b) Water environment:

103. Impacts: Sources causing impacts on water environment include domestic wastewater and construction wastewater.

- *Domestic wastewater* is generated by worker's life activities. Number of workers is about 30 people. Thus domestic sewage volume generated is small, about 3.6m^3. Components of domestic sewage include residues, SS, organic matters (BOD/COD), nutrient matters (N, P) and micro-organisms. Workers live in the camp area. therefore domestic sewage generated will be collected in movable toilets. For this reason, impacts of domestic sewage will be mitigated, emission source can be managed and controlled.

- *Construction wastewater*: includes mainly water pumped from the underground cable ditches and tower foundation pits, abundant water from concrete maintenance of tower foundation pits, abundant water from concrete mixing. Components of tower foundation pit pumped sewage are mainly SS, mineral salt and organic matters washed from the ground surface, thus it can cause increase in the turbidity of surface water sources near to the subproject site. Sewage from concrete maintenance of tower foundation pits, concrete mixing only include SS without hazardous substances impacting on environment. Furthermore, the construction works will take place in dry season, so the volume of construction sewage will be small

- *Refused oil, lubricant and grease*; clouts with oil, grease, lubricant; waste sewage from washing machines, equipment and means with oil, gearse and SS will cause surface water source pollution if not collected and treated. According to research result of "Research of refused lubricant, oil recycle into liquid fuel" conducted by military science and technology center – Ministry of National Defense in 2002, the average volume of oil, lubricant refused from construction machines and vehicles is 7 liters for every changing time. Period for changing lubricant and maintenance is 3÷6 months depending on machines' and vehicles' intensity of activity. With about 10 types of machines and vehicles, construction duration of 7 months, volume of refused oil and lubricant is about 23.33 litres.

104. Mitigation measures: Water environmental impact mitigation measures include:

* For domestic wastewater: hire mobile toilet (type used for civil works) with

collected and treated tank with three sections such as containing, depositing and filtering. Dimension of the collected and treated tank can be 4.2m^3 in totally, with containing section – 2.1 m^3, deposited section – 1.4 m^3, and filtering section – 0.7 m^3. The mobile toilet have to put beside the worker's camp to workers use conveniently.

* For construction wastewater:

- Arrange construction sewage collection holes for depositing SS before wastewater flows into surface water sources. The common dimensions can be 0.5mx0.5mx0.4m (height x wide x deep).
- Make an earth dyke to prevent construction wastewater flows directly to the water bodies or create a vegetation buffer zone along lake/pond/river to treat preliminarily construction wastewater before discharging into water bodies

* For Refused oil, lubricant and grease

- All the reparation and, maintenance of machines, equipment and transportation means will be implemented at garages not in the construction sites. Refused oil and grease, waste sewage from washing machines, equipment and means, clouts with oil, grease will be collected and treated at these garages as stipulated.

c) Soil environment:

105. Impacts: Sources causing impacts on soil environment include:

- *Impacts due to domestic solid wastes* created by workers' daily-life activities. The number of workers is about 30 people. Thus, domestic solid waste volume is small, about 9-12kg/day and it can be controlled. The composition of domestic solid wastes includes: organic matters, plastic, paper, glass and other inorganic matter, of which organic matters are accounted for the main part. The domestic solid waste can contain pathogenic bacteria/viruses that are harmful for human health and domestic animals. Therefore, it is necessary to collect and treat rubbishes effectively.

- *Impacts due to construction solid wastes* created by construction activities. These wastes include: excavated waste, fallen materials; empty cement sacks, wooden barrel used for packaging equipment and devices, clouts etc.

+ Excavated waste is proposed to be 36.16m^3. Refused construction materials, empty cement sacks, steel, lubricants, fuels, and wood debris will be generated during the construction process. Packaging materials such as wooden barrel, plastic, foam, cardboard boxes used for equipment and devices, electrical parts will also be generated. These wastes can cause disturbance for the project site if they are not collected and treated.

+ Oil may be leaked from machines and equipment during operation and maintenance activities or from changing fuel and lubricants. These can cause soil pollution.

- *Earthwork* includes excavation, filling back, leveling for substation and access road, excavation for underground cable and the connecting tower foundation. These activities will cause soil become loose and easily erode or slide if it's rain.

106. Mitigation measures:

- Contractor will set up dust bins for collecting rubbish at the worker camp sites. Then hiring HCMC Urban Environment Company Limited to collect, transport for treatment as regulations.

- Earthworks will be conducted during dry periods.
- Utilize salvage excavated soil, rock for filling cable trench, compacting tower foundations according to excavation and filling balance method.
- For excavated soil which cannot be reused, it will be collected and transported by competent unit to treat under Vietnam regulations.
- Collect, salvage materials such as steel pieces, cement sacks, wooden barrels, etc. to reuse or sell. For other construction materials which can not be reused, it will be collected and transported to the disposal site for burying along with rubbish.
- Hazardous wastes such as paint containing can, clouts with oil and grease, failed fluorescent lamp, etc. must be collected into tanks and kept temporarily at the construction site, then hiring competent unit for transporting to treat in accordance with current regulations.
- Compact at places with soil filling and excavation activity to mitigate soil erosion and washing.
- Completely finish each work item before start other one. Conduct site cleaning, leveling and compaction after construction completion to return the ground for local people to continue their production or grow trees on the site.
- Present and past land use will be reviewed to assess whether excavated soils are contaminated. If any, contaminated soil should be treated, disposed at a disposal area or a location approved by the DoNRE.
- Earthworks should be conducted during dry periods.
- Salvage excavated soil, rock for filling cable trench, leveling substation and access road, and strengthen tower foundations according to excavation and filling balance method. For excavated soil which cannot be reused, it will be collected and transported to the disposal site agreed by the local authorities through consultation with them. Compact at places with soil filling and excavation activity to mitigate soil erosion and washing.
- Completely construct each work item. Construction completion to where, site cleaning, leveling and compaction to return the ground for local people to continue their production or grow trees to that.

d) Other underground works:

107. The subproject has 25m long of the underground cable section. According to survey in August 2014, there are no any underground works likely existing in the subproject area.

e) Traffic activities and quality of road:

108. Impacts:

- Impacts on road traffic: The overhead transmission line will cross over traffic road 12 times, including Long Thanh – Dau Giay highway, concrete and asphalt roads with the low traffic density. Therefore, process of wire spreading and pulling for the TL can cause existing road surface and foundation collapse, especially at small concrete and asphalt roads. Also, increase in the quantity of transportation means on roads can lead to increase in traffic jam and risk of traffic accidents. However, scaffolding will be used for wire pulling at cross-section with traffic roads, especially with Long Thanh – Dau Giay highway. Thus, impact on traffic activities is accessed at medium level.

- Impact on road quality: Overloaded vehicles transport on the road can cause road

damage

109. Mitigation measures

- Prepare implementation alternative for the TL at every inter-cross location, completely install scaffolding system in prior to pulling wire at these inter-cross positions.
- Contact with management unit of the roads for coordination to ensure construction safety and uninterrupted traffic activities.
- Arrange reasonable work to avoid traffic obstacle.
- At the locations where the overhead TL section crossing over the roads, it need to set up scaffolding during wire scatter and pull process.
- Set up signal light when constructing at night.
- Put up warning boards at dangerous road sections where traffic accidents can occur.
- Speed limits should be posted and adhered to by transportation means serving the subproject construction.
- Limit transportation of materials in rush-hours to avoid traffic jam.
- Transport materials with the allowable load. Not expand trucks' body.
- Conduct road upgrading or repairing if collapse occurs due to the subproject construction.
- Clear soil and construction materials on road surface; level, compact, recover and return the initial status of the roads just after completing the construction.

f) Other TLs and communication lines

110. *Impacts*:

According to survey, the TL will cross over low, medium at 0.4-22kV transmission lines 08 times. Thus, wire pull and scatter at positions where this TL crosses over other TLs, power of those TLs may be cut off. However, time for wire pull and scatter is short and only during the day, therefore power will be only cut off in each local area at specific time. Impact is assessed insignificantly.

Furthermore, during wire spreading and hanging on the existing tower of the 220kV Cat Lat – Thu Duc TL, this existing TL will also be cut power for safety. This will affect to citizens living due to power cut.

111. *Mitigation measures*:

- Coordinate with management unit of the TLs to cut off power to ensure safety during wire pull and scatter process .
- Inform people for their life and production arrangement before cut-off power.
- Put up scaffolding during wire scatter and pull process. Put warning boards. Have protection measures to prevent impact on other TLs. Ensure safety distance to those TLs.
- Concentrate the worker and equipment forces to pull and hang wire as fast as possible in order to minimize the time of power cut on the extisting 220kV transmission line.

g) Occupational health and safety of workers

112. *Impacts*:

Construction activities may cause health harm and danger of the workers' lives, specifically: i) Workers can get some disease due to unhygienic condition of worker camp; ii) Accidents can be happened during operation of machines, vehicles or working at height; iii) Traffic accident during transportation of facilities, materials for construction of the subproject; and iv) Electric shocks during connecting and test electric with the existing substations. These impacts last during the construction phase and will stop when the subproject construction phase finishes.

113. *Mitigation measures*:

- Health and safety plan (HSP) will be prepared and implemented by the contractor.
- All workers will be examined health, especially people working at height, and equipped sufficiently labor protection tools such as hard hats, safety gloves, safety belt, ear protection etc. This must be strictly imposed.
- All construction equipment, tools will be carefully examined for quality and quantity before used. For people working at height, the suspending cables will be carefully checked before climbing on the tower; no work at height will be permitted when it is going dark; it has fogs; it has strong wind with above class V. Workers who climbs on towers must have Safety Certificate of Class 3 or above, and sufficient conditions for working at height. Safety belts will be attained use standard of the nearest inspection, not exceed over 6 months. During movement and working at height, workers will wear safety belts and the safety leather belts must be tightly tied with the tower.
- Carefully check boom guy, cable clip before load heavy objects.
- For excavation and leveling works: apply measures to consolidate the slope of tower foundation pits in dangerous positions during construction in order to avoid soil erosion;
- Use suitable means of transport. Check the load of the vehicles before use, fasten and comply with safety regulations on transportation.
- Strictly comply with safety norms for installation of electrical equipment and relative regulations.
- Workers conducting transport and installation of electrical equipment must understand regulations on installation and transport safety of electrical equipment.
- Use specialized tools and devices to anchor, fasten electrical equipment during movement and installation process. Not use steel wires, cables, chains to tie the insulation parts, the connectors of the base holes.
- Before switching on power to test the power grid and electrical equipment, it must stop all relative works and people not on the duty must go out of the danger area.
- Fuse of the electrical networks connected to electrical equipment which will be installed must be disconnected during the connection time. Fuse is only closed to adjust the equipment after everyone is in a safe location.
- All towers, steel structures and equipment must have earthing system.
- Contractors will prepare emergency measures on time. When accident occurs, conduct in-site first aid, then quickly drive the wounded to hospital for treatment. It must keep a phone number of the nearest hospital to call ambulance. Besides, it must be equipped medicine cabinet for aid.

- As existing commune health services are unable to accommodate additional patients from the construction workforce, the contractor will be required to provide first-aid facilities for the workers. At least one trained first-aid worker should be available at each construction camp.
- PMB will be responsible for including these requirements in the contract documents.

h) Community health and safety:

114. *Impacts:*

Subproject construction would cause impacts to community health and safety as followings: i) Accidents due to increased traffic activities from the transport of materials; ii) Fires, emergency spills of materials; iii) Accidents of residents if they enter into work areas without permission, for example, falling into holes, electric shock during testing electric, etc. These impacts are insignificant and short-term, they occur only in the construction phase (about 07 months) and will stop when the project construction finishes.

115. Mitigation measures:

- To mitigate these potential impacts, the civil contractor will develop a community health and safety plan (CHSP) that incorporates good international best practice and recognized standards. The CHSP should include emergency response and preparedness procedures to be developed in close consultation with potentially affected communities and local authorities. The plan should include specific emergency response procedures, communication systems and protocols, interaction with local and regional emergency and health authorities, provision of emergency equipment and facilities such as fire truck, emergency service vehicles,…. The CHSP should also include the requirement for the erection of safety barriers either as tape or fencing as determined by the risk to prevent unauthorized access to the construction areas. Warning signs around sites are to be printed clearly in Vietnamese language.
- Set up warning boards on all high voltage towers to warn people not to be in contact with them.
- Installation of lightning protection systems in all towers as stipulated. Paint color (as defined) on tower with the height of 50m and above.
- When fire occurs due to electricity, first notice immediately to authorized unit to cut off power, then comply with the procedures of fire fighting.
- Check periodically trees outside the ROW which may potentially affect to the safety of the tower.
- Coordinate with the local government of district and commune to propaganda and disseminate knowledge about safety of the ROW to communities living near areas where the TL crosses over.

Implementation of these measures will be the responsibility of the contractor. PMB will be responsible for including these requirements in the contract documents.

i) Social aspect:

116. *Impacts*:

Concentration of workers (30 people) in the subproject site can cause disorder and insecurity, disturbance in the locality due to conflicts between workers and local people, social evils; increase infectious diseases generation etc. These impacts are insignificant, short-term, only occur in the construction phase (about 07 months) and will stop when the

project construction finishes.

117. Mitigation measures:

- Local labors will be hired as much as possible to prevent or minimize influx of migrant workers, and incidence of social diseases and community chaos.
- Examine periodically workers' health.
- Manage and educate workers to enhance their awareness of environmental sanitation and health protection.
- In order to minimize the risk of injury to the local residents and the workers, it needs to comply with the GOV's regulations on Occupation, Safety, and public health, or the World Bank's Environment, Health, and Safety Guidelines (2007) that govern the safe and orderly operation of civil works should be followed.
- Equip medicine cabinet for protecting workers' health in time.
- Establish the specific food safety regulations for construction workers.
- Construction units will implement temporary residence registration and provide accurate information about the quantity and stay time of all construction workers to CPCs within the project area during the construction phase. They should also establish the relationship with the local authorities to discuss and take decisions necessary for their management.
- Require workers not to take part in or cause social evils; any contravener shall be strictly treated in accordance with laws.
- Establish rules in camp. Propagandize, educate workers and create good relations with local people in order to avoid conflicts arising. HIV/AIDS education should be given to workers.
- Require workers to respect and not to violate the cultures, habits and customs, religious beliefs, historical and cultural parks, pagodas, and temples in the localities.
- Make a good relationship and proper coordination with the local authorities to manage their workers.

2. Protect areas, rare and precious species, and cultural resources

118. Phuoc Long 110kV substation and connection line is not located in any protected area without rare, precious and endangered animal/plant species. Chances of detection of valuable relics and cultural values will be anticipated by contractors, especially during excavation process. When detection of valuable relics and cultural values, stop immediately all work, untouched to anything of them. And EA/IA informs the authorized agency (DoCST) to determine their value and treat appropriately. Work at the found site will be stopped until DoCST allows to be continued working.

3. Repair, restore, and return the ground after construction completion

119. Repair, restore, and return the ground after construction completion need to implement to mitigate impacts on environment after construction. The activities and measures are:

- Repair, recover, and return the road sections, culverts, drainage system and public infrastructures damaged by the subproject construction.
- Clear, level and restore the ground after construction completion. Grow trees in temporarily acquired areas.

- Grow trees in temporarily acquired areas.

D. Potential Impacts and Mitigation Measures during Operation Phase

120. The expected adverse impacts during the operational phase of the substation and transmission line are generally related to the tree cutting, occupational and community health and safety issues and worker's waste and hazardous waste. The impacts are reversible, manageable, and can be mitigated with proper engineering and management controls. HCMC high voltage Company will be responsible for the operation of the subproject and its ancillary services

a) Biological environment

121. Impacts: During the operation phase, the process of periodic maintenance and repair of the TL, branches and tops of the trees violating the TL safety inside the ROW, and trees outside the ROW with the risk of falling down or branches affecting to the ROW must be trimmed and cut down. According to the survey result, the transmission line mainly crosses over residential area, crop land, planned land and some nipa palm areas. Therefore, after the TL is come into operation, the cutting of branches and/or top of trees in the maintenance and repair process will have little impact on biodiversity of ecological environment.

After the construction is completed, and the TL is come into operation, people are allowed to cultivate again within the ROW area, but to a limited extent under the Electricity Law, Decree 14/2014/ND-CP to ensure safe operation of the transmission line.

122. Mitigation measures: Cut down only trees and branches which will get risk of the safety of the transmission line as specified in the Decree No. 14/2014/ND-CP of the Government dated February 26th, 2014. Take care of plants inside and outside the scope of the ROW are as follows:

Trees, crops in the ROW: According to Decree No.14/2014/ND-CP, rice and crops must be away from electric tower foundations at least 0.5m. Trees can be grown within the ROW but the vertical distance from the highest point of tree to the height of the lowest conductor of 110kV transmission line while in maximum deflection state must not be less than the distance from the following regulations:

For the transmission line outside city, town, the vertical distance from the highest point of the tree to the height of the lowest conductor while in maximum deflection state must not be less than 3.0 m for 110kV voltage level and 4.0m for 220kV voltage level.

Trees outside the ROW: In case where there are trees outside the ROW of the overhead transmission line and outside city, town, the distance from any part of the fallen tree to any part of the transmission line must not be less than 1.0m for 110kV and 220kV voltage level. For valuable trees growing rapid in the short term with the risk of causing unsafety for the TL, they must cut down and forbid to be grown newly in order to not impact on economic effect.

- It will be not allowed to cut down or trim trees and branches of trees which locate outside the ROW without affecting to the safety of the TL during operation.
- Use manual method to clear plants. Not use herbicide for plant clearance.
- Trees and branches of trees which are cut down will be collected by local people for firewood or the operation agency will contact to local authorities to collect, transport and handle them as stipulated.
- Recommend local people to grow trees theirs height meets the requirements of height as stipulated. Local people will not be allowed to grow valuable trees growing

rapidly and their height might exceed the allowable limits, affect to the safety of the TL.

- Propagandize, train operation workers on prevention measures from forest fire; Strictly control fire use of operation workers during the TL maintainenance and repair process to avoid forest fire occurence.
- Apply adequately fire fighting and protection requirements during installation and construction to avoid forest fire. Set up rules, fire forbidding signs in places where fire is forbidden.
- Operation unit is responsible for establishing rules on fire fighting and prevention. Arrange necessary tools and means for firefighting as stipulated.
- Be legal responsible for the occurrence of forest fire during the maintainenance and repair process.
- In case forest fire occurrence, stop all works to forcus workforce, tools and means on fire fighting. Inform immediately to firefighting police, local authority and people for coordinating firefighting. The PO will be responsible for all cost of firefighting and forest recovery.

b. Occupational health and safety of the workers during the TL periodic maintenance process:

123. Impacts: The occupational health and safety issues inherent to the operation of high voltage substation include hazards due to exposure to live high voltage systems, working in heights and risks of accidents, potential exposure to electric and magnetic fields. Accidents that may occur include; electrocution, lightning strike, fire and explosion, tower collapse etc.

- Exposure to High Voltage Systems. Workers may come in contact with live power lines/equipment during the maintenance of the facilities and electrocution from direct contact with high-voltage electricity is a hazard directly related to transformer and facilities.

- Working in Heights. Accidents may happen when working in heights. However, a worker safety plan may be implemented to reduce risks that include testing of structural integrity prior to proceeding with the work and the use of fall protection measures.

- Worker Exposure to Electric and Magnetic Fields (EMF). Typically, electric utility workers have higher exposure to EMF than the general public because of working in close proximity to electric power equipment. The electric fields of the 110kV substation is calculated for several positions and compared to regulations (see Table 13).

Table 13. Calculated electric field intensity at positions within the 110kV substation and connection line

No.	The 110kV substation	Calculated maximum intensity (kV/m)	Permitted standard (kV/m)	
			Under Decree 14/2014/NĐ-CP	
			Indoor	outdoor
1	Substation's yard	4.31		5
2	Under the 110kV TL	0.57		5
3	Within control house	0.68	1	

Table 13 shows that electric field intensity of the substation is meet the standard as regulated in Decree No. 14/2014/ND-CP on electricity safety. Furthermore, this decree also stipulate that allowable limits of working time per day for workers who work in EMF, which is summarized in Table 14

Table 14: EMF intensity and allowable limits of working time during one day

EMF intensity (E) (kV/m)	< 5	5	8	10	12	15	18	20	20 <E<25	≥25
Allowable limits of working time during one day (minutes)	Not limited	480	255	180	130	80	48	30	10	0

Shortly, EMF in the substaion meets the stardard, and operators are arranged to work in shifts, crews, which ensures working time as stipluated, and time for contacting with EMF. Thus EMF will not impact on operators' health.

For the transmission line: workers only expose EMF during maintenance process, and the time per day for maintenance is also about 8 hours per day. Risk of negative effects to health due to electromagnetic fields caused by the operation of the underground cable section is essentially zero, but also not affirms because negative effects to health due to electromagnetic fields have not been proved by the medical profession.

124. Mitigation measures. HCMC high voltage Company will be follow the IFC (2007) and EVN guidelines when carrying out maintenance of the transmission line and substation facilities.

* Some of the prevention and control measures when working with electrical systems are:

- Restricting access to electrical equipment to only those workers who are trained and certified to work on electrical equipment.
- Adherence to electrical safety standards.
- Proper grounding and deactivation of live power distribution lines during maintenance work or if working in close proximity to the lines.
- Provision of PPE for workers, safety measures, personal safety devices, and other precautions
- Observe guidelines regarding minimum approach distances for excavations, tools, vehicles, pruning, and other activities when working around power lines and the substation.
- The entrance to all buildings, vaults, rooms, or enclosures containing exposed live parts or exposed conductors should be kept locked unless such entrances are under the observation of a qualified person at all times.
- Switchboards, panel boards, industrial control panels, meter socket enclosures, and motor control centres that are likely to require examination, adjustment, servicing, or maintenance while energized should be field marked to warn qualified persons of potential electric arc flash hazards.

* Follow safety measures when working on height, particularly:

- All workers must be examined health for working on height, equip sufficiently labour protection tools.
- Workers who climbed on poles must have Safety Certificate of Class 3 or upper and sufficient conditions for working on height. Safety belts should be attained used standard of the nearest inspection, not exceeding over 6 months. During movement and working on height, workers must wear safety belts and the safety leather belts must be tightly tied with the pole.
- All construction equipment, tools should be carefully examined for quality and quantity before used. It should carefully check the suspending cables before climbing on the pole.

- Not permitted to work on height when it is going in night; it has fogs; it has strong wind with upper class V.

* The occupational EMF exposure should be minimized through the implementation of an EMF safety program that includes:

- Identification of potential exposure levels in the work area including surveys of exposure levels and establishment of safety zones
- Limit access to properly trained workers and those equipped with appropriate PPE when entering safety zones.
- Utilization of personal monitors during work activities.
- Posting of safety signs and warning signs.

c. *Community Health and Safety*

125. Impacts.

- *Electrocution Hazards*: the community can be exposed to electrocution hazards as a result of direct contact with high voltage electricity or from contact with tools, vehicles, or other devices that come in contact with high-voltage electricity.
- *Exposure to Electromagnetic Field (EMF).* The transmission frequency commonly used in transmission systems ranges from 50 Hz - 60Hz which is considered to be an extremely low frequency (IFC, 2007). Effects reduce with distance and electric fields also become shielded by trees, buildings, and other materials that conduct electricity. In general electric fields are strongest close to the source and diminish with distance.

The subproject will be designed and constructed in compliance with regulations on technique and high voltage network, EMF must be ensured ≤ 5kV/m at any point outside the houses at the height of 1m from the ground and ≤ 1kV/m at any point inside the houses at the height of 1m from the ground. Furthermore, refer to observation results for existing TLs near to the subproject, EMF intensity of Cat Lai – Thu Duc Dong 110kV TL, section under the intervals between tower 8 – tower 9, Nguyen Duy Trinh st. is 0.13 kV/m and Cat Lai – Sao Mai 110kV TL, section under the intervals between tower 10 – tower 11, Nguyen Thi Dinh st. is 0.08 kV/m. All these observation results of EMF intensity are lower than the allowable limits (≤ 5kV/m). Impact on local people caused by forcasted EMF of this subproject's operation will be insignificantly

126. Mitigation measures

* To prevent electrocution hazards, HCMC high voltage Company will implement the following:

- Provision of signs and anti-climbing devices on all transmission towers.
- Conduct earthing for the TL, especially all towers.
- Ensure absolute safety, operators must comply to operating procedures and safety requirements;
- Worker must be equipped with electromagnetic coats to work in areas with high electromagnetic fields. Also, when working in areas with high influence of the electric field, operators must comply with industry standards for permissible level of intensity electric fields of industrial frequency regulation and inspection work place;
- Fully equipped labor protection instruments, compliance with regulations on working time in areas with high field strength to ensure safety;
- Perform work shifts to ensure the contact time with the electric field strength in the specified limits.

* To prevent impacts of EMF: The World Health Organization (WHO) reported that there is inconclusive evidence about substantive long-term health issues related to radiation

emanating from low frequency electric fields at levels generally encountered by members of the public. The potential health effects associated with exposure to EMF is not well-established due to lack of empirical data demonstrating adverse health effects. However, the public should be warned about the safety distances from the transmission system and power lines through warning signs and the restrictions on erecting any houses or buildings within the RoW and earth zone are to be enforced by operation unit.

d. Worker's waste and hazardous waste

127. Impacts. Substation is designed to be an automatic mode with remote control, no permanent staffs. There is no domestic wastewater and rubbish during substation operation.

Hazardous waste includes transformer oil and clouts stuck oil due to cleaning equipment. Transformer oil will cause pollute soil and water environment if releasing outside, this can severely affect ecology and other relevant activities.

According to operation procedure, transformer oil will only be discharged and refilled by new oil after 10-15 years of operation. Every year, the oil will be tested and filtered and then reused. Therefore the volume of waste oil from transformer is negligible.

128. Mitigation measures:

- Transformer operation regulation does not allow releasing oil outside of the environment. This oil will be checked annually and filtered to continuous use. Oil will be only released outside when the transformer get at risk, but it will be collected into the tank built under the transformer.
- In case of transformer failure or oil change, the emergency oil and waste oil will be collected and stored in the emergency oil tank with the volume of 36m3. Then the operation unit (HCMC high voltage grid company) will contract with competent unit having license for hazardous waste treatment. The competent unit will pumped the oil into tankers then transport to factories for treat under regulation for hazardous waste.
- In the annual test for transformer oil, if the oil sample is analyzed to not meet technical specification for operation, the oil will be filtered under the regulated procedure and conducted by the specialized and licensed unit.

e. Climate Change

129. Regional Global Circulation Modeling project greenhouse-climate change induced changes to the frequency and severity of rainfall events in the subproject area. The design of the substation and transmission line includes sufficient infilling to a grade that will be resilient to flooding associated from a 50 year storm.

VII. GRIEVANCE REDRESS MECHANISM

130. A well-defined grievance redress and resolution mechanism will be established to address affected persons (AP) grievances and complaints regarding environmental issues. All APs will be made fully aware of their rights, and the detailed procedures for filing grievances and an appeal process will be published through an effective public information campaign. The grievance redress mechanism and appeal procedures will also be explained in a subproject information booklet (PIB) that will be distributed to all subproject communes PC to deliver to AHs for their reference.

131. APs complaints can be made verbally or in written form. In the case of verbal complaints, the committee on grievance will be responsible to make a written record during the first meeting with the APs.

132. All meetings shall be recorded by the grievance committee and copies shall be provided to APs. A copy of the minutes of meetings and actions undertaken shall be provided to the PO/PPMB, and ADB upon request.

133. The procedures for grievance redress is defined below and summarized in Figure 6.The procedure described below should apply easily to environmental issues and be consistent with the legal process for resolution of disputes in Viet Nam.

i) Step 1: Complaints from APs for the first time shall be lodged verbally or in written form to contractor, PPMB because initial environment issues will be most likely be construction-related. Contractor and PPMB are responsible to resolve the issue within 15 days from the date when the complaint is received. All meetings shall be recorded and copies of the minutes of meetings will be provided to APs.

ii) Step 2: If no understanding or amicable solution can be reached or if no response is received from the Contractor or PPMB within 15 days from filing the complaint, the APs can elevate the case to the Ward People's Committee (WPC). The WPC will respond within 15 days upon receipt of APs complaints. All meetings shall be recorded and copies of the minutes of meetings will be provided to APs.

iii) Step 3: If the AP is not satisfied with the decision of the Grievance Committee within 15 days since the date of submitting complaints, or in the absence of any response, the APs can appeal to the District People's Committee (DPC) and/or district court. The DPC will respond within 15 days from the day the complaint is received.

iv) Step 4: If the AP is still not satisfied with the decision of the District Office or in the absence of any response within the stipulated time, the APs, as a last resort may submit his/her case to the Provincial People Committee (PPC). PPC will review and issue a decision on the appeal within 15 days from the day the complaint is received.

v) Step 5: If the AP is still not satisfied with the decision of the PPC or in the absence of any response within the stipulated time, the APs, as a last resort may submit his/her case to the court at city level. The court will address the appeal by written decision and submit copies to the respective entities which include the Project Owner, PPC, DPC, WPC and the APs. If, however, the AP is still not satisfied with the court's decision, the case may be elevated to the provincial court. If however, the decision of the provincial court is still unsatisfactory to the APs, the APs may bring the complaints to the Higher Court.

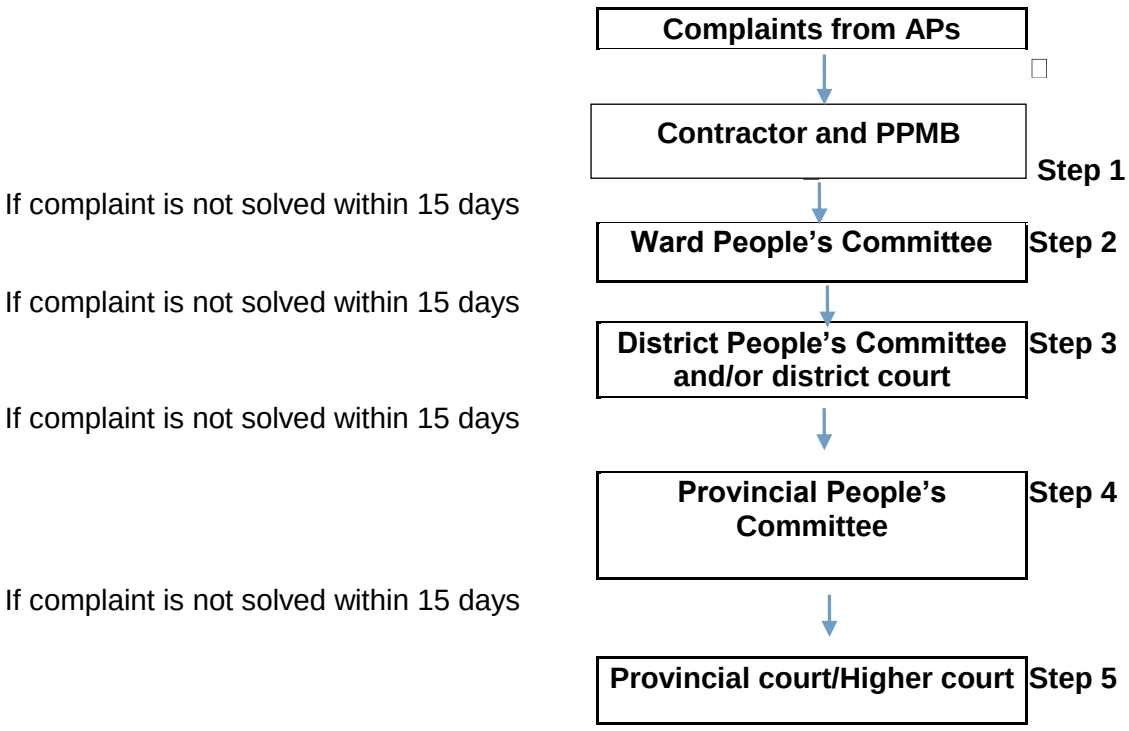

Figure 6. The public grievance redresses process

134. The EA and EVN will be responsible for checking the procedures and resolutions of grievances and complaints. The EVN/EA must have expertise and experience in social and environmental issues associated with infrastructure developments. The EVN/EA may recommend further measures to be taken to redress unresolved grievances. The environmental specialists will provide the necessary training to improve grievance procedures and strategy for the grievance committee members when required.

135. In cases where APs do not have the writing skills or are unable to express their grievances verbally, they are encouraged to seek assistance from the recognized local groups, NGOs, or other family members, village heads or community chiefs to have their grievances recorded in writing, and to have access to documentation, and any survey or valuation of assets, to ensure that where disputes do occur, all the details have been recorded accurately enabling all parties to be treated fairly. Throughout the grievance redress process, the responsible committee will ensure that the concerned APs are provided with copies of complaints and decisions or resolutions reached.

136. If efforts to resolve disputes using the grievance procedures remain unresolved or unsatisfactory, APs have the right to directly discuss their concerns or problems with the ADB Southeast Asia Department through the ADB Viet Nam Resident Mission (VRM). If APs are still not satisfied with the responses of VRM, they can directly contact the ADB Office of the Special Project Facilitator (OSPF).

VIII. ENVIRONMENTAL MANAGEMENT PLAN

137. An EMP is developed for the implementation of the Phuoc Long 110 kV substation and connection line subproject. The purpose of the EMP is to integrate the results of the IEE into a formal management plan that is implemented in parallel with the subproject to prevent or minimize the potential environmental impacts and issues that were identified by the IEE. The EMP addresses the results of the public consultations on the subproject that were convened as part of the IEE.

138. The EMP, consists of an Impacts Mitigation Plan, a Monitoring Plan, and an Emergency Response Plan. The EMP also prescribes the institutional responsibilities for the implementation of the EMP. The EMP is a management tool that provides a set of directives and guidelines that the subproject owner follows to prevent or minimize unnecessary environmental impacts of the subproject.

139. Environmental impact mitigation plan has been developed based on each subproject activities with respective impact and mitigation measure. Also, the plan identifies the reports, responsibility of subproject's stakeholders as well as estimated cost for implementing mitigation measures. Detailed contents are shown in Table 15.

Table 15. Environmental Impact Mitigation Plan

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
Preparation phase, detailed design								
Detailed designs, bidding document establishment, the project approval and submission	No impacts. But the activities will design and proposed mitigation measures for impacts during construction and operation phase	1. Work with the PIC[2] to supervise the subproject detailed designs. Ensure the following contents: 2. Select the substation site and transmission line direction to avoid cultural and historical heritages, and other sensitive areas; during the feasibility study, the project management board has to consulted Department of Industry and Trade of Ho Chi Minh City, the DPC of district 9, CPC of ward Phu Huu to agree upon the location of the substation and connection line. 3. Select transformer without PCB, design the depth to bury cable for ensure electromagnetic field not affect people health 4. EO of PMB with the support from PIC will be responsible for reviewing detailed design of the subproject to ensure proposed mitigation measures included in the detailed design. 5. After feasibility study was approved, notify	Subproject location	Before the commencement construction	When designing details, establishing bidding documents, and when feasibility study is approved	No marginal cost	PIC	IA/EO

[1] Costs will need to be updated during detailed design phase.
[2] PIC is Project Implementation Consultant at technical design phase to be determined

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
		the local authorities and people of activities and schedule of the subproject so that they can organize their production and business suitably. Coordinate in environmental protection monitoring, and notify the DoNRE the subproject commencement to complete requirements for the environmental assessment, and give permission and certificates for the subproject in the subproject implementation process. 6. State in bidding documents that contractor must have experience in EMP implementation, or provide staffs with sufficient experience; bidding document and construction contracts have to include provisions that require contracts to comply with the mitigation measures proposed in IEE 7. Ensure that the civil work contracts are included mitigation sub-plans of the EMP.						
Land acquisition and compensation	Impacts on local people's life and economy	8. Comply with the regulations of the Land Law 2013 and decrees, circulars, decisions on compensation, assistance and resettlement of the Government and Ho Chi Minh City People's Committee. 9. Comply with the regulations of the Electricity Law, the Decree No. 14/2014/ND-CP and relevant regulations.	All affected persons in the subproject areas	Before implementing the subproject	See the RDDD	See the RDDD	IA/EO	Compensation and resettlement committee

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
		10. Ensure compensation payment to be implemented clearly, openly and fairly in compliance with legal regulations 11. Budget for compensation payment must be enough and available. 12. Conduct design of tower height to minimize impacts due to crops and trees clearance. 13. Construct completely each work item to minimize the duration of temporary land use for the project construction. 14. Coordinate to address people's claims/grievances relating to compensation. 15. The subproject's Resettlement Due Diligence Document has been clearly describe and resolved the impacts due to land acquisition and compensation						
UXO clearance (bombs, mines and other explosives)	Impact on people's and worker's safety (maybe injured or dead if UXO still exist in the subproject area without cleared)	16. Before preparing and clearing site for constructing the project, it is necessary to coordinate with the competent agency for UXO disarmament in the proposed project area	All construction sites	At the beginning of the subproject construction	Once	See monitoring plan below	EO/IA	EO/GOV
Environmental management	No impact. This activity help to	17. Develop and implement training plan on environmental management capacity and	IA/EO office	From before the beginning	01 time before the beginning	No marginal	PIC	PIC

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
capacity development and enhancement	prevent or avoid impacts by training/education and help good management of environmental issues of the subproject	awareness enhancement and development for staffs of IA/EO/ES to be able to fully implement the EMP, and to manage implementation of mitigation measures by contractors. 18. Develop and implement training plan for contractors in order to enhance/improve awareness of environmental protection and implement effective mitigation measures.		of the subproject construction	of the subproject construction, 02 times afterward (if necessary) or after each event	cost		
Construction site arrangement	No impact. This activity help to prevent or avoid impacts by disposal and civil works	19. The PMB requires civil contractor to prepare a disposal plan. Based on this disposal plan, civil contractor is responsible for contracting with specialized unit to collect, transport and dispose the refused excavated materials as regulations. PMB is responsible for supervision and include this content in civil work contracts 20. Constructor develops transportation plan for equipment and materials to reduce negative impacts. 21. Constructor will arrange the temporary yards for stockpile and material gathering site within the tower foundation area or the ROW. 22. Constructors must have the license for safety and environmental requirements of mobilized machines and vehicles.	Subproject site	Before construction begins	01 time Before construction begins	No marginal cost	PO/PMB/PIC	PMB/contractors

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
Construction Phase of Subproject								
Initiate SEMP and sub-plans.	No impact. This activity help avoid, prevent or minimize impacts	23. Initiate updated SEMP including individual management sub-plans for different potential impact areas	All construction sites	Beginning of construction	Once	Included in the contracts document	IA/PIC	EO and contractors
Tree cutting and site clearance	Cause the loss of vegetation and landscape deformation	24. Trees and other vegetation in all construction locations and along the traffic road are in need of protection, minimize cutting. 25. Clear and return site, especially the temporary acquired areas to pour construction materials 26. The PO in coordination with the local authorities to monitoring the tree cut down and clearance for subproject construction.	All construction sites	From the beginning to completing the subproject construction	Monthly	Included in the contracts document	PIC/EO	ES/contractor
Concentration of workers and domestic wastes generated	Generate domestic wastes causing environmental pollution; generate social problems, spread diseases	27. Contractors consider unskilled jobs for hiring local labors to conduct to prevent or minimize influx of migrant workers, and incidence of social diseases and community unrest. 28. Hire mobile WC with septic tank for camps and put dustbins at camps for collecting domestic sewage, rubbish and treating them adequately. 29. Worker camps must have adequate	All worker camps	Throughout construction phase	Monthly	Included in the contracts document	IA/EO	ES/contractor

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
		rainwater drainage system. 30. Examine periodically worker health. Equip medicine cabinet for protecting workers' health in time. 31. Manage, propagandize and educate to enhance the awareness of environmental sanitation and health protection for workers. 32. Establish the specific food safety regulations for construction workers. 33. Construction units should implement temporary residence registration for all construction workers to CPCs within the project area. They should also establish the relationship with the local authorities to discuss and take decisions necessary for their management 34. Require workers not to take part in or cause social evils; any contravener shall be strictly treated in accordance with laws. 35. Establish rules in camp. Propagandize, educate workers and create good relations with people in order to avoid conflicts arising. HIV/AIDS education should be given to workers. 36. Require workers to respect and not to violate the cultures, habits and customs, religious beliefs, historical and cultural parks,						

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
		pagodas, and temples in the localities.						
Refused rock and soil, debris, other hazardous wastes generated by rock and soil filling and excavation for tower foundation pits, cable trenches, tower installation, and equipment, devices, machines and transportation means	Cause soil and surface water pollution by refused rock and soil, debris, other hazardous wastes	37. Max. salvage excavated soil, rock for filling cable trench, leveling substation foundation, strengthen the connecting tower foundation according to excavation and filling balance method. 38. For excavated waste, it will be collected and treated by competent units hired by civil contractors 39. Collect, salvage matters such as steel pieces, cement sacks, wooden barrels,… to reuse or sell. For other refused construction materials which can not be reused, hire local competent unit for collecting and treating. 40. If excavated soil is suspected contamination, it must be tested, and disposed in designated sites and identified as per local regulations. <u>Hazardous waste impact mitigation</u> 41. For refused grease, oil: implement equipment, machines and vehicles repair and maintenance at local garage. Waste grease, oil will be collected to treat at this garage as stipulated. 42. Other wastes such as paint containing can; clouts with oil, grease; failed fluorescent	All construction sites	Throughout construction phase	Monthly	Included in the contracts document See Environmental Monitoring Plan (EMoP)	PIC / EO and DONRE	ES/contractor

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
		lamp ect. must be collected into tanks and kept temporarily at the construction site, then hiring competent unit for transporting to treat in accordance with current regulations.						
Earthwork, leveling work at substation, connection tower and underground cable	Increase risk of soil erosion that will rise the turbidity of surface flow, the loss of soil nutrients	43. Earthworks should be conducted during dry periods. 44. Salvage excavated soil, rock for filling cable trench, leveling substation and access road, and strengthen tower foundations according to excavation and filling balance method. 45. For excavated soil which can not be reused, it will be collected and transported to the disposal site agreed by the local authorities through consultation with them. 46. Compact at places with soil filling and excavation activity to mitigate soil erosion and washing. 47. Completely construct each work item. Construction completion to where, site cleaning, leveling and compaction to return the ground for local people to continue their production or grow trees to that.	All construction sites	Throughout construction phase	Monthly	Included in the contracts document	PIC/EO	ES/contractor
Construct drainage system of rainwater,	Deposit mud sand; reduce suspended solids in surface	48. Provide drainage system of rainwater, water pumped from the foundation pits when constructing to prevent standing water and	All construction sites.	Design and construction phases	Monthly	Included in the contracts document	PIC/EO	ES/contractor

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
water pumped from the foundation pits	rainwater and water pumped from the foundation pits; prevent rainwater and water pumped from the foundation pits from overflowing on the ground	local flooding; deposit mud sand; reduce suspended solids in surface rainwater and water pumped from the foundation pits before pumping into environment. 49. Install temporary storm drains or ditches for construction sites 50. Ensure connections among surface waters (ponds) are maintained or enhanced to sustain existing storm water storage capacity. 51. Protect surface waters from silt and eroded soil. 52. Arrange construction sewage collection holes for depositing SS before running into surface sources.						
Construction activities and transport vehicles	Noise, dust and exhausts impact on ambient air environment quality	53. Transportation means, machines and equipment in list of means, machines and equipment to be obliged to register technique and environment safety must have effective certificate of environmental standards achievement issued by the register department. 54. Frequently water the construction sites and construction material transportation roads. 55. Means transporting construction materials	All construction sites	Beginning of construction (for license of equipment, machines and means) and throughout construction phase	Monthly	Included in the contracts document	PIC/EO	ES/Contractor

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
		in and out of the project site must be covered by canvas. 56. Cover canvas or water materials storage yards/stockpiles such sand, cement, filling soil etc. 57. Reduce excavation and filling duration, and excavated soil should be used to fill right after complete work. 58. Implement appropriately equipment, machines and vehicles maintenance. 59. Replace equipment, machines and vehicles causing large noise.						
Construction materials transportation, and storage	Traffic accidents, increase in traffic activities, damage to roads, traffic disruption	*For road and traffic activities:* 60. Prepare implementation alternative for the TL at every inter-cross location. 61. Contact with management unit of the roads for coordination to ensure construction safety and uninterrupted traffic activities. 62. Arrange reasonable work to avoid traffic obstacle. 63. At the locations crossing over the roads, it needs to set up scaffolding during wire scatter and pull process. 64. Set up signal light when constructing at	All construction sites.	Throughout construction phase	Monthly	Included in the contracts document	PIC/EO	ES/contractor

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
		night. 65. Put up warning boards at dangerous road sections. 66. Speed limits should be posted and adhered to by transportation means. 67. Limit transportation of materials in rush-hours. 68. Transport materials with the allowable load. Not expand trucks' body. 69. For oversize and/or overweight materials and equipment, it must have special purpose transport means. 70. Conduct road upgrading or repair if collapse occurrence due to the subproject construction. 71. For the underground cable section under the roads, it should use HDD excavation method if necessary. It should set up warning boards at the distance of 200m at the heads of the construction site. Set up warning boards and/or fence around the open cable ditch and tower excavation pits to avoid risk of accidents. 72. Clear soil and construction materials on road surface; level, compact, recover and return the initial status of the roads just after						

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
		completing the construction.						
Wire pull and scatter, and cut power to connect the national power grid	Discontinue utilities and services such as power supply, traffic disruption etc.	*For other TLs:* 73. Coordinate with management unit of the TLs to cut off power to ensure safety during wire pull and scatter process at the inter-cross locations if any. 74. Inform to people for their life and production arrangement before cut-off power. 75. Put up scaffolding during wire scatter and pull process. Put up warning boards. Have protection measures to prevent impact on other TLs. Ensure safety distance to those TLs. *For other underground works* 76. Collect information/data about existing underground works within the underground cable section site. 77. Contractor establishes emergency risk/failure response plan such as pipe break, underground cable ditch or cable break of other TLs, information cable break,...(if any). 78. Ensure safe distance to existing underground works (if any) when conducting the underground cable section construction. Prepare underground cable construction alternative at the locations where the	All construction sites.	Throughout construction phase	Monthly	Included in the contracts document	PIC/EO and Utility company	ES/contractor

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
		underground cable section crosses over the existing underground works to ensure safety for these works. 79. For construction of the underground cable section at locations where the underground cable section crosses over local existing drainage box culvert, mitigation impact measures are as follows: (i) Excavate cable ditch at inter-cross location by manual method in compliance with design drawing. (ii) Consolidate banks of cable ditch section crossing over drainage culvert by Larsen piles to avoid landslide. (iii) Consolidate temporarily the existing drainage box culvert. (iv) If the underground cable ditch crosses over the existing underground drainage box culvert at its junction, it need consolidate that junction location. (v) After the underground cable ditch, it must be recovered the initial status immediately to avoid landslide for drainage box culvert. (vi) During construction of the underground cable section at locations where the underground cable section crosses over local existing drainage box culvert, if any						

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
		extraordinary, the contractor must be stopped construction and inform to the relevant units (the PO, Consultant,…) to check and treat.						
Occupational health and safety of workers	Worker injury and health	80. Health and safety plan (HSP) will be prepared and implemented by the contractor. 81. All workers must be examined health, especially people working at height, and equipped sufficiently labor protection tools. This must be strictly imposed. 82. All construction equipment, tools should be carefully examined for quality and quantity before used. For people working at height, it should carefully check the suspending cables before climbing on the tower; not permitted to work at height when it is going in night; it has fogs; it has strong wind with above class V. Workers who climbed on towers must have Safety Certificate of Class 3 or above, and sufficient conditions for working at height. Safety belts should be attained use standard of the nearest inspection, not exceed over 6 months. During movement and working at height, workers must wear safety belts and the safety leather belts must be tightly tied with the tower. Carefully check boom guy, cable clip before load heavy objects.	All construction sites.	Throughout construction phase (fulltime)	Monthly	Included in the contracts document	PIC/EO	ES/contractor

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
		83. For tower foundation excavation (i) Strictly implement safety measures while excavating tower foundation pits. (ii) There are measures to consolidate the slope of tower foundation pits in dangerous positions during construction; 84. Use suitable means of transport. Check the load of the vehicles before use, fasten and comply with safety regulations on transportation. 85. Strictly comply with safety norms for installation of electrical equipment and relative regulations. 86. Workers conducting transport and installation of electrical equipment must understand regulations on installation and transport safety of electrical equipment. 87. Use specialized tools and devices to anchor, fasten electrical equipment during movement and installation process. Not use steel wires, cables, chains to tie the insulation parts, the connectors of the base holes. 88. Before switching on power to test the power grid and electrical equipment, it must stop relative all works and people without						

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
		relative task must go out of the danger area. 89. Fuse of the electrical networks connected to electrical equipment which will be installed must be disconnected during connection time. Fuse is only closed to adjust the equipment after everyone is in a safe location. 90. All towers, steel structures and equipment must have earthing system. 91. Contractors have to prepare emergency measures in time. When accident occurs, conduct in-site first aid, then quickly drive the wounded to hospital for treatment. It must keep a phone number of the nearest hospital to call ambulance. Besides, it must be equipped medicine cabinet for aid. 92. As existing commune health services are unable to accommodate additional patients from the construction workforce, the contractor will be required to provide first-aid facilities for the workers. At least one trained first-aid worker should be available at each construction camp. 93. PMB will be responsible for including these requirements in the contract documents.						

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
Community health and safety	Local people injury and health	94. Civil contractor will be required to develop a community health and safety plan. 95. Set up warning boards on all high voltage towers to warn people not to be in contact with them. 96. Installation of lightning protection systems in all towers as stipulated. Paint color (as defined) on tower with the height of 50m and above. 97. When fire occurs due to electricity, first notice immediately to authorized unit to cut off power, then comply with the procedures of fire fighting. 98. Check periodically trees outside the ROW which may potentially affect to the safety of the tower. 99. Coordinate with the local government of district and commune to propaganda and disseminate knowledge about safety of the ROW to communities living near areas where the TL crosses over. 100. PMB will be responsible for including these requirements in the contract documents.	All construction sites.	Throughout construction phase (fulltime)	Monthly	Included in the contracts document	PIC/EO	ES/contractor
Detect cultural and	Avoid damage to cultural and	101. Chances of detection of valuable relics and cultural values should be anticipated	All construction	At the begging, and throughout	Monthly	Included in the contracts		

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
historical properties or values	historical properties or values	by contractors. Site supervisors should be on the watch for finds. 102. When detection of valuable relics and cultural values, stop immediately all work, untouched to anything of them. And EA/IA informs the authorized agency (DoCST) to determine their value and treat appropriately. 103. Work at the found site will be stopped until DoCST allows to be continued working.	sites	construction phase		document	PIC/EO	ES/contractor
Repair, restore, return the ground after construction completion	Mitigate impacts on environment after construction	104. Repair, recover, and return the road sections, culverts, drainage system and public infrastructures damaged by subproject construction. 105. Clear, level and restore the ground after construction completion. 106. Grow trees in temporarily acquired areas.	All construction sites.	throughout construction phase until the project is put into operation.	Monthly	Included in the contracts document	PIC/EO	ES/contractor
Subproject Operation phase								
Cut trees and branches violating the ROW		107. Cut down only trees and branches which will get risk of the safety of the transmission line as specified. 108. Comply with regulations for growing plants inside and outside the ROW. 109. It will be not allowed to cut down or	ROW	Fulltime	Biannual	Included O and M cost	The high voltage grid management of Ho Chi Minh City	

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
		trim trees and branches of trees which locate outside the ROW without affecting to the safety of the TL during operation. 110. Use manual method to clear plants. Not use herbicide for plant clearance. 111. Trees and branches of trees which are cut down will be collected by local people for firewood or the operation agency will contact to local authorities to collect, transport and handle them as stipulated. 112. Recommend local people to grow trees whose height meets the requirements of height as stipulated. 113. Propagandize, train operation workers on prevention measures from forest fire; Strictly control fire use of operation workers during the TL maintenance and repair process to avoid forest fire occurrence. 114. Apply adequately fire fighting and protection requirements during installation and construction to avoid forest fire. Set up rules, fire forbidding signs in places where fire is forbidden. 115. Operation unit is responsible for establishing rules on fire fighting and prevention. Arrange necessary tools and means for firefighting as stipulated.						

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
		116. PO legal responsible for the occurrence of forest fire during the maintenance and repair process. 117. In case forest fire occurrence, stop all works to focus workforce, tools and means on fire fighting. Inform immediately to firefighting police, local authority and people for coordinating firefighting. The PO will be responsible for all cost of firefighting and forest recovery.						
Occupational health and safety of the workers operating the substation and maintaining TL		118. Restricting access to electrical equipment, except workers who are trained and certified to work on electrical equipment. Properly limit time for contacting with EMF for trained workers. (ii) Adherence to electrical safety standards. (iii) Proper grounding transmission line. (iv) Provision of PPE for workers, safety measures, personal safety devices, and other precautions during maintenance work or if working in close proximity to the TL. 119. Follow safety measures when working at height during maintenance and repair the TL, particularly: (i) All workers must be examined health for working at height, equip sufficiently labor	Substation, and ROW	Fulltime	Biannual	Included O and M cost	The high voltage grid management of Ho Chi Minh City	

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
		protection tools and cloths. (ii) Workers who climbed on towers must have Safety Certificate of Class 3 or above and sufficient conditions for working at height. Safety belts should be attained used standard of the nearest inspection, not exceed over 6 months. During movement and working at height, workers must wear safety belts and the safety leather belts must be tightly tied with the tower. (iii) All equipment, tools and means should be carefully examined for quality and quantity before used. It should carefully check the suspending cables before climbing on the tower. (iv) Not permitted to work at height when it is going in night; it has fogs; it has strong wind with above class V. 120. Occupational EMF exposure should be minimized through the implementation of an EMF safety program that includes: (i) Identification of potential exposure levels in the working area including survey of exposure levels and establishment of safety zones (ii) Properly limit time for contacting with EMF for trained workers as stipulated and						

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
		those equipped with appropriate PPE when entering safety zones. (iii) Utilization of personal monitors during work activities. (iv) Post safety signs and warning signs. 121. In addition, in the operation phase, conduct training for workers in order that they can respond to risks/failures and meet the operation procedures. An emergency and safety guideline needs to be prepared and disseminated to the workers for handling risks/failures occurring in the operation process. Coordinate with the local authorities at commune, district levels to propagandize, disseminate knowledge of safety of the ROW to communities and residents living near the T/L. Equipment maintenance areas must be located away from the residential areas.						
Community Health and Safety		122. To prevent electrocution risk, HCMC high voltage Company will implement the following: (i) Conduct earthing for the TL, especially all towers. (ii) To ensure absolute safety, operators must comply with operation procedures and safety requirements;	Around the subproject area	Fulltime	Biannual	Included O and M cost	The high voltage grid management of Ho Chi Minh City	

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
		(iii) Provision of warning signs and anti-climbing devices on all towers. (iv) Periodically check the distance from wire to the ground and/or other objects as stipulated. Monitor minimum approach distances for excavations, tools, vehicles, pruning, and other activities when working around the TL. (v) Check earthing system of buildings under the ROW as stipulated. Ensure that any new buildings within the 72 m-wide earthing zone are earthed. (vi) Observe/Test EMF at resident's buildings for treating appropriately if any complaint. 123. To prevent impacts of EMF: the community should be warned about the safety distances from the transmission system and power lines through warning signs and the restrictions on erecting any houses or buildings within the ROW and earth zone are to be enforced by operation unit.						
hazardous waste from substation operation	Transformation oil and clouts stuck oil which can cause pollute soil and water environment	124. In case of transformer failure or oil change, the emergency oil and waste oil will be collected and stored in the emergency oil tank, then the operation unit (HCMC high voltage grid company)	Transformer and around substation	Fulltime	Biannual	Included O and M cost	The high voltage grid management of Ho Chi Minh City	

Activities of Subproject	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[1] (USD)	Responsibility	
							Supervision	Implementation
		will contract with competent unit who has license for hazardous waste treatment, and the competent unit will pumped the oil into tankers then transport to factories for treat under regulation for hazardous waste. 125. In the annual test for transformer oil, if the oil sample is analyzed to not meet technical specification for operation, the oil will be filtered under the regulated procedure and conducted by the specialized and licensed unit						

A. Institutional Arrangements and Responsibilities

140. At the feasibility, stage in the primary management framework is responsible for the implementation of the environmental management plan (EMP) for the subproject is summarized as follows: The EVNHCMC is the executing agency (EA/PO). The PO is overall responsible for implementing the EMP with executive support from the Ho Chi Minh City Power Projects Management Board (PPMB) directly under the EVNHCMC being the implementing agency (IA) of the subproject. The PPMB under the direction of the PO implements the subproject and the EMP.

141. The PPMB is supported by the Project Implementation Consultant (PIC). The PIC assists in completion of the detailed subproject design, updates the EMP to address the detailed subproject design, and assist the implementation of the EMP. The PIC also provides required capacity development and training to the PPMB. The PPMB monitors and assists the work of the construction contractor who implements the EMP of the contractors (SEMP).

142. External support of the ES for the implementation of the EMP is provided by the international and national environmental specialists of the PIC, and an environmental monitoring consultant (EMC) it is necessary to conduct the field sampling and laboratory analyses of the environmental monitoring plan (e.g, water quality, air quality) of the EMP that cannot be performed by the contractor or the IA/EO. A summary of responsibilities for the implementation of the EMP is provided below.

143. Responsibilities of the EA/PO with support from the EVN include:

- Overall responsibility for the implementation of the EMP;
- Provide and coordinate to monitor environmental and social safeguards for the IA/EO;
- Maintain the communication with the EVN and the ADB on the implementation of the EMP; and;
- Coordinate with the IA/EO to resolve the issues arising from the implementation of the EMP;
- Submit every semi-annual monitoring reports to the ADB

144. Responsibilities of the EO directly under the IA include:

- Assist the PIC in updating the EMP to meet detailed subproject design;
- Notify the DoNRE to verify whether the subproject met the approvals of the GOV;
- Assist the PIC with inclusion of CEMP requirements in bidding documents for the contractors based on the updated EMP;
- Implement daily management of the EMP activities;
- Work with the EMC to prepare monitoring plan for the EMP;
- Ensure compliance with loan agreement and assurance in respect of the entire subproject, including the EMP (as well as PAPs, resettlement plan);
- Monitor the meetings with all affected stakeholders;
- Prepare and submit quarterly reports on the EMP implementation to the IA/EA;
- Monitor the implementation of the CEMP;

- Coordinate with the international and national environmental specialists of the PIC for the EMP implementation;
- Implement frequently construction site inspection to ensure that the contractor implements the CEMP properly; and
- Ensure the environment staff of the contractor submits monthly report on mitigation measures and construction monitoring.

145. Responsibilities of the national environmental specialist of the PIC include:

- Provide technical direction and assist the EO/IA with the implementation of the EMP;
- Monitor design and implement capacity development and enhancement training for the EO/IA and environmental staff of the contractor(s);
- Provide advice and support to the EMC with their monitoring activities;
- Support to prepare and review all reports prepared by the EO/IA and the EMC for the EA and the ADB; and
- Review locations where may be contaminated near the subproject site.

146. Responsibilities of the Environmental Staff (ES) of the Contractor include:

- Supervise/monitor the implementation the SEMP of constructor and all mitigation measures mentioned in part VI and table 15 for the construction phase of the subproject; and
- Prepare and submit monthly reports on any environmental issue mitigation and monitoring activities related to environmental included in work contacts with PO, including the SEMP at the construction site.

147. Responsibilities of external Environmental Monitoring Consultant (EMC) include:

- Implement environmental sampling required for monitoring plan of the EMP that cannot be conducted by the contractor and the EO/IA/ES.
- Perform laboratory analyses (if necessary) for detailed monitoring program in the EMP; and;
- Prepare and submit quarterly reports or semi-annual environmental monitoring report on monitoring activities to the IA/EO.

148. Department of Natural Resources and Environment (DoNRE) is the provincial agency which monitors environmental management in the city. DoNRE along with the district staff will provide direction and support for environmental protection-relating issues including application of the Law on Environmental Protection, EIA, and environmental standards.

149. ADB provides guidance to the EA/IA with any issues related to the EMP, and reviews every 6-month reports on the EMP activities compiled and submitted by the EA.

B. Environmental Monitoring Plan

150. The environmental monitoring plan for the EMP is provided in Table 16. The monitoring plan focuses on all three phases (pre-construction, construction, post-construction operation) of the subproject and consists of environmental indicators, the sampling locations and frequency, method of data collection, responsible parties, and estimated costs. The purpose of the monitoring plan is to determine the effectiveness of

the impact mitigations, and to document any unexpected positive or negative environmental impacts of the subproject.

151. The external environmental monitoring consultant (EMC) identified above will implement the environmental monitoring program. The EMC will be responsible for the sampling of environmental parameters that must be analyzed in a laboratory. The ES and EO will coordinate with the EMC. The PIC/IU will provide logistical support to the EMC where necessary for the implementation of environmental monitoring plan.

152. The standards for ambient environmental quality (e.g., water and air quality) for Viet Nam listed in section III will be the foundation for preparing the monitoring program. The environmental standards provided by the Environmental, Health and Safety Guidelines of the IFC/World Bank (2007) should be based to supplement standards that are not provided by the GoV.

153. After construction is completed the potential impacts of the operation of the subproject will be monitored by EVNHCMC. Monitoring of the success of the minor resettlement in the affected areas will be undertaken as part of the separate RP prepared for the subproject.

C. Performance Monitoring

154. Performance monitoring is required to assess the overall performance of the EMP. A performance monitoring system is normally developed by the EA for the subproject. Select indicators of major components of the environment that will be affected primarily by the construction phase are drawn from the mitigation and monitoring plans and summarized in Table 17.

D. Reporting

155. Regular reporting on the implementation of mitigation measures and on monitoring activities during construction phase of the subproject is required. Reporting is the responsibility of IA/EO and should be conducted in conjunction with regular meetings with stakeholders as part of the continuation of stakeholder communications. The mitigation and monitoring plans (Tables 15 and 16) summarize proposed timing of reporting.

156. A report on environmental monitoring and implementation of EMP will be prepared quarterly for the EA by the IA/EO. The IA report will compile monthly reports provided by the ES of contractor, the reports of the EMC on monitoring, and input from the international and national environmental specialists of the PIC. The IA/EO report will also be sent to the DoNRE and ADB. The reports will table all indicators measured with the monitoring plan of EMP including performance monitoring indicators (Table 17), and will include relevant environmental quality standards as regulation.

Table 16. Environmental Monitoring Plan

Environmental Indicators	Location	Means of Monitoring	Frequency	Reporting	Responsibility		Estimated Cost (USD
					Supervision	Implementation	
Pre-construction Phase							
Update where necessary baseline on sensitive receptors (e.g., cultural property and values, new schools or hospitals, rare/endangered species, critical habitat along TL corridor and substation area	A. ROW B. Substation	Original field work, community consultations	Once	Once	PIC/PPMB	PPMB (Monitoring Consultant)	$ 1,000.
a) Air quality: dust, CO, NO_2, SO_2, noise b) Affected surface water quality: pH, TSS, oil and grease, COD, BOD_5, NO^-_3, PO_4^{3-}, Coliform	A: 03 positions; one in substation and the others along the TL. B: 03 position at Bau Cua, Ong Cay and Ong Ky canals	Using field and analytical methods approved by DoNRE.	Once	Assessment of physical environment included in the IEE	PIC/PPMB	Consultant who preparing the IEE and the subproject	A&B: including in consultancy cost ($500)
Construction Phase							
a) Air quality: dust, CO, NO_2, SO_2, noise b) Affected surface water quality: pH, TSS, oil and grease, COD, BOD_5, NO^-_3, PO_4^{3-}, Coliform c) Domestic (worker) and construction solid waste inside and outside construction sites including worker camps. D)Public comments and complaints E) Incidence of worker or public accident or injury	a) 03 positions; one in substation and the others along the TL, near to the intersection with Long Thanh Dau Giay HW, and 01 at G1-G2 . b) 03 position at Bau Cua, Ong Cay and Ong Ky canals c) All construction sites and worker camps d) Using hotline number placed at construction areas e) At all construction areas	a-b) Using field and analytical methods in accordance with current regulations. Include visual observations of dust and noise from contractor and public reports. c) Visual observation d) Information transferred by telephone hotline number posted at all construction sites. E) regular reporting by contractors/PPMB	(A - C) Once per 3 month D) Continuous E) Continuous	monthly	(A - C):		
					PPMB	PPMB (Monitoring Consultant)	A & B: $ 1,500 C: $700
					(D & E) observation		
					PPMB	Contractor	D&E: $200
Operation phase							
Incidence of worker accidents,	The substation and TL	Regular documentation	Continuous		EVNHCM		O&M cost

Environmental Indicators	Location	Means of Monitoring	Frequency	Reporting	Responsibility		Estimated Cost (USD
					Supervision	Implementation	
or maintenance of the ROW		and reporting					
Electromagnetic field monitoring	In the Substation and along the connection line	Equipment for measuring electromagnetic field	Biannual	Biannual	EVNHCM		

Table 17. Performance Monitoring Indicators for Subproject

Activities of subproject	Mitigation activities	Key Indicator	Performance Objective	Data Source
Pre-construction Phase				
Detailed designs, bidding document establishment, the project approval and submission	Mentioned in Table 15	Design documents Local GOV's letters for agreement of TL alternative Requirements of EMP (SEMP)	All mitigation measures are considered during detailed designs All stakeholders contacted during IEE re-contacted for follow-up consultation EMP appended to bidding documents with clear instructions to bidders for SEMP	Design documents EMP Bid documents
Land acquisition and compensation	Mentioned in Table 15	Mentioned in RP	Mentioned in RP	Resettlement Due Diligence Document
UXO clearance	Mentioned in Table 15	UXO disarmament	No risk of life safety of workers and people	Monitoring by PIC/PMB
Training of PMB/EO		Training course(s) and schedule	By end of pre-construction phase, required course(s) that will be delivered are designed and scheduled	Course(s) outline, participants, and schedule
Construction site arrangement	Mentioned in Table 15	- License of disposal - Transportation plan - location of temporary area for stock pile and material gathering - License for safety and environment ensure of vehicles/machines	By end of pre-construction phase, meeting with contractors to check licenses and observation in the construction site for checking the arrangement	Monitoring by PIC/PMB
Construction Phase				
Tree cutting and site clearance	Mentioned in Table 15	- Important habitat, rare or endangered species if presenting during tree cutting and site clearance - Fire protection at section crossing forest - Implementation of reforestation	All *present* critical habitat and rare and endangered species if unchanged, and unharmed - Prevent forest fire - Forest coverage	Monitoring by EMC

Activities of subproject	Mitigation activities	Key Indicator	Performance Objective	Data Source
Concentration of workers and domestic wastes generated	Mentioned in Table 15	Hygiene situation, availability of toilet and waste basket Residential register of workers Rainwater drainage system in worker camps Food safety regulations Educating and training about health and hygiene for workers	Rigorous program of procedures to manage worker's camp	EMC and contractor monitoring reports
Refused rock and soil, debrides, other hazardous wastes generated by rock and soil filling and excavation for tower foundation pits, cable trenches, tower installation, and equipment, devices, machines and transportation means	Mentioned in Table 15	Solid waste and liquid waste treatment system Hazardous waste: Oil, gasoline, grease collection and treatment license	- Rigorous program of procedures to manage and store all waste from construction camps and sites practiced, and manage earthworks. - Rigorous program of procedures to manage and store all waste from construction camps and sites practiced.	EMC and contractor monitoring reports,
Noise, dust and exhausts due to construction activities and transportation of materials	Mentioned in Table 15	dust, CO, NO_2, SO_2, noise levels meet Vietnamese standards	The content must not exceed the level at pre-subproject. Complying with mitigation measures for water quality mentioned in table 15	EMC and monitoring report of contractors
Earthwork and leveling work causing soil erosion	Mentioned in Table 15	Earth dyke, Embankment were built; vegetation are grown on bare land	Land quality and minimize land slide or erosion	EMC and monitoring report of contractors
Construct drainage system of rainwater, water pumped from the foundation pits	Mentioned in Table 15	pH, TSS, oil and grease, COD, BOD_5, NO^-_3, PO_4^{3-}, Coliform levels meet Vietnamese standards	GoV environmental standards and criteria met Complying with mitigation measures for water quality mentioned in table 15	Monitoring by EMC
Construction materials transportation, and storage	Mentioned in Table 15	Frequency of disruptions and blocked roadways is reduced Maintenance and operation method of equipment, machines, and vehicles	Disruptions, stoppages, or detours are managed to absolute minimum.	Public input, contractor reports, EMC reports
Power supply and other utilities due to	Mentioned	Timing of power cut	Minimized time of power cut, effect on	EMC and monitoring

Activities of subproject	Mitigation activities	Key Indicator	Performance Objective	Data Source
wire pull and scatter, and the TL connection to the national grid system	in Table 15	Methods of pulling wire at section crossing over existing TLs Methods of constructing underground cable	existing Tls and underground works.	report of contractors
Community and worker safety	Mentioned in Table 15	Frequency of injuries are reduced	Adherence to GoV occupational health and Safety regulations	Contractor reports
Detect cultural and historical properties or values	Mentioned in Table 15	cultural and historical properties are conserved	No valued cultural property, or unearthed valuable relic is harmed in any way	Public input, contractor reports, public input, EMC reports
Repair, restore, return the ground after construction completion	Mentioned in Table 15	Remain construction material at the site are collected Construction solid waste; un-clearance of worker camp etc. are cleaned.	Recovery of construction site; remove construction solid waste; clean worker camp etc.	Site observation; Contractor and EMC monitoring reports
Operation phase of transmission line				
Worker and community Safety	Mentioned in Table 15	Frequency of accidents, and spills is reduced Electromagnetic field monitoring	No increase in pre-construction frequency	EVNHCMC
Hazardous waste from substation operation	Mentioned in Table 15	Frequently surveillance transformer oil and its operation Procedure of waste oil treatment	No happen or minimize transformer failure In case of transformer failure or oil change (after 15years of operation), the procedure or waste oil treatment must obey current regulations on hazardous waste treatment	EVNHCMC

IX. ESTIMATED COST OF EMP

157. The costs for implementing the EMP are primarily for environmental monitoring because the costs for implementing impact mitigation measures are included with the construction costs in contractor bid documents. From Table 14 the preliminary cost for the implementation of the EMP for the subproject including an estimated environmental training budget for EVNHCMC/PPBM is approximately USD $4,200.00 which is summarized in Table 18.

Table 18. Estimated costs for Environmental Monitoring Plan of EMP

Activity Type	Estimated Cost (USD)
Pre-construction Phase	
Cultural receptors	$ 1,000.00
Inspecting environmental quality and site clearance	including in consultancy cost ($500.00)
Construction Phase	
Inspecting environmental quality	$ 1,500.00
inspecting environmental compliance	$ 700.00
Operation Phase	
Inspecting environmental quality (electromagnetic measurement)	O&M cost (average $1,000.00 per year)
Training and capacity development of EVNHCM / PPBM	$ 1,000.00
Total	**$ 4200.00**

158. The environmental costs in Table 18 are for field sampling and laboratory analyses which include professional per diems of technicians.

159. An estimated budget of USD $1,000.00 is required for training of the PO/PPMB on environmental assessment and management, and the implementation of the EMP. The estimated costs of the EMP and training will need to be updated by the PIC in conjunction with the PPMB during the pre-construction phase.

X. INFORMATION DISCLOSURE AND PUBLIC CONSULTATION

A. Public Consultation

160. A stakeholder consultation strategy was developed to meet the requirements of meaningful consultation as stipulated by the SPS (2009). The strategy embodied the principles of meaningful engagement, transparency, participation, and inclusiveness to ensure that affected and marginalized groups such as women, and the poor, were given equal opportunities to participate in the design of the subproject.

1. Identification of Stakeholders

161. Stakeholders were identified and engaged in a participatory manner. Stakeholder communication focused on institutional stakeholders, affected communities, and persons directly affected by proposed subproject interventions. The stakeholders of the subproject include:

- Institutional stakeholders such as: (i) People's committee of the city, (ii) People's committee of the precinct/district; (iii) Project management agency, (iv) PECC4, and (v) commune leaders;
- Organizations/unions/associations such as Women Union and Farmers Union which provided various information for the design of the subproject, and which might participate in implementation of measures and interventions;
- Households and enterprises living along the transmission line can be people who will be directly affected or be adversely impacted or can be people who will be received benefits from the determination and implementation of mitigation measures against adverse impacts, and
- Organizations, individuals affected by the subproject

162. After identifying stakeholders of the subproject, the Consultant contact and cooperate with the commune/ward people's committee to send invitation for the relevant parties.

2. Public consultation meeting

163. Formal community consultation meetings were held to discuss the location and impact of the transmission line and substation for both environmental and social aspects Public consultations were held in Phuoc Long B ward dated October 14, 2014 (04 people: 03 male, 01 female) and Phu Huu ward dated October 16, 2014 (05 people: 04 male, 01 female), District 9, HCMC.

- The public meeting consisted of the following three component procedures:
- The engineering consultant introduced the subproject including the substation location, the route of underground cable, and the length of the cable that will traverse communes and wards;
- The environmental consultant presented ADB's environmental policy, safety regulations in the Vietnam power sector, anticipated environmental impacts and respective mitigation measures (to be developed in IEE), the grievance redress mechanism for environmental and resettlement problems; and
- The social/resettlement consultants presented: ADB's resettlement plan; impacts due to the acquisition land and properties; policies of GOV and local authorities, the Project's policies in compensation for loss as the state acquired land and properties on land; and Potential impacts due to land acquisition/resettlement.

164. During the meeting, people presented their questions and comments on environmental issues. PECC4's consultants answered and explained all questions of the participants

165. The participants of the public consultation meeting included Commune leaders, cadastral officer affected persons. The list of participants is stated in Appendix B.

3. Results of Public consultations

a. Comments from communal authorities

166. The comments/questions of local authorities/people were given as in the Table 19:

Table 19. The comments/questions of local authorities/people during public consultation meetings

Location and time	Comments/questions from local authorities	Answers of Project owner and consultants company PECC4	Project Response (stated in EMP)
Phu Huu ward -District 9 - HCMC dated October 14, 2014	For the trees, crop affected during the construction, it is requested the subproject owner to have significant compensation policy for the APs according to the market price.	Agreed. The project owner will compensate adequately based on the market price at the time of the compensation.	The RDD of the subproject already provided compensation policy for affected people
	For the loss inventory, it should have cooperation between the local authorities, subproject owner and APs for ensuring fair and avoiding any mistakes.	The inspection of the damage will be coordinated between local, investors and people affected	This is stated in the RP of the subproject
	The payment for the compensation should be implemented prior to the construction.	The project will only be deployed when the compensation is completed	This is stated in the RP of the subproject
	For the section that will be crossed with the traffic roads with high participants density, the Contractor should cooperate with the Traffic road management agencies to control traffic routes for avoiding traffic congestions and accidents.	This issue will be implemented	Regulations have been included in the EMP to ensure safety during construction
	Following the local provisions in declaring and registering temporary resident.	This issue will be implemented	EMP stated that all workers must be registered with the local government.
	For the solid waste generated from construction and daily activities, it should be collected and transported to the designated local public disposals.	This issue will be implemented	EMP stated that all construction waste and domestic wastes are transported to the local landfill
Conclusions	Phu Huu People's Committee agrees the plan to construct the subproject and requires the participants to implement following the meeting content.		Follow-up consultations of community views of subproject will occur.
Phuoc Long B ward - District 9 - HCMC dated October 16, 2014	It is proposed the HCMC Power Grid Management Board to contact with the relevant authorities to attain agreement on compensation, support for land, structures of Phu Nhuan Houses Trading and Construction One Member Limited Company following the current regulations.	This issue will be implemented	EMP stated that the project owner will work with the Phu Nhuan medical company on compensation, assistance for land and assets
	It is proposed the subproject owner	Compensation will be	

	to tightly cooperate with the local agencies in the works of compensation and support.	coordinated between local authorities, investors and people affected	This is stated in the RP
	It should cooperate with the local agencies in resolving complaints happened in the territory.	This issue will be implemented	EMP stated that the investors will closely coordinate with local authorities to resolve the complaints in area
	It is proposed the HCMC Power Grid Management Board and Contractor follow the provisions on residential management and regulations on environmental protection when implementing the subproject.	This issue will be implemented	EMP stated that the investor will fully comply with the regulations on management of residential area and regulations on environmental protection when implementing the project
	For the route section crossed with traffic roads, it is proposed the Contractor to have plan notification to the locality, avoiding un-expected accidents.	This issue will be implemented	Regulations have been included in the EMP to ensure safety during construction
	It should be ensured to clean the surface tidily after completing the subproject construction.	The project owner should return the project site to the the state after completing the construction.	EMP already provided mitigation measures for these impacts at Table 15.
Conclusions	Phuoc Long B People's Committee agrees with the plan to construct the subproject and requires the PO and contractors to implement the proposed mitigation measures.		Follow-up consultations of community views of subproject will occur.

B. Information disclosure

167. Formal disclosure to affected persons and stakeholders of information on the Phuoc Long 110 kV substation and connection line that occurred during the IEE is meant to form the beginning of continued information disclosure and stakeholder involvement as the subproject is implemented. As part of the stakeholder communication strategy regular information exchange meetings with stakeholders are strongly encouraged throughout implementation of the subproject.

168. The IEE must be easily available to the stakeholders contacted during examination in written and verbal forms in local language of Vietnamese. At a minimum the Executive Summary of the IEE should be translated to local language and distributed to all APs. The IEE should be available on the EVNHCMC website, at the EVNHCMC office in Ho Chi Minh, and at the subproject sites. Similarly, all subproject reporting with specific

reference to stakeholder consultation minutes, environmental monitoring, and reports on EMP implementation released by the EVNHCMC/PPMB should be available at the same offices and websites. The IEE will be available on the ADB website as well as EMP reporting that is prepared by the EVNHCMC/PPMB after implementation begins.

169. The people's committees of Phu Huu and Phuoc Long B wards, and affected people were received the draft IEE in Vietnamese version during the public consultation process. The final IEE (after receiving the letter of No objection from ADB) will be translated into Vietnamese language, then send to each ward people's committees for disclosure. By doing this, local people and local authorities can easily refer the final IEE.

XI. EMERGENCY RESPONSE PLAN

170. The Contractor must develop emergency or incident response procedures during construction and operation phases of the new Phuoc Long 110 kV Substation and connection line to protect workers and the public. The emergency response plan (ERP) outlines the roles and responsibilities of persons from first identification of an incident or emergency to the final steps of safe and complete closure of the situation. The detailed requirements for the ERP are described in Appendix C.

XII. INSTITUTIONAL CAPACITY REVIEW AND NEEDS

171. Currently there is insufficient experience and capacity for environmental assessment and management in EVNHCMC for the implementation of the EMP, and to develop future safeguards for the non-core subprojects. The PIC with assistance from the PPMB of the subproject will develop and deliver training courses to the IA staff including the contractor. The purpose of the course(s) is to strengthen the ability of the subproject owner including the PPMB to oversee implementation of the EMP by construction contractors, and EMC. Costs for training should be included with costs for implementation of the EMP.

172. Training on the implementation of an EMP should address two thematic areas. The first area should be principles environmental assessment and management focused on the potential impacts of subproject activities on the natural and social environments. The second area should be environmental safeguard requirements of the ADB and GoV with specific reference to the EMP.

XIII. CONCLUSIONS AND RECOMMENDATION

173. The initial examination of the Phuoc Long 110 kV Substation and connection line subproject in HCMC indicates that potential environmental impacts are largely construction-related impacts and disturbances that can be mitigated and managed.

174. The public consultation meetings underscored the need for effective management of construction impacts such as noise, dust, traffic disruptions, and public safety. Follow-up meetings with the consulted stakeholders to address any construction-related issues are required. The civil construction impacts of elevated dust, noise, traffic disruptions, erosion and sedimentation, and public and worker safety can be managed effectively with standard construction practices (e.g., IFC/World Bank 2007).

175. The IEE concludes that the description of the feasibility design of the subproject combined with available information on the affected environment is sufficient to identify the scope of potential environmental impacts of the subproject. Providing that significant changes do not occur to the design of one or more of the subproject components, and that new sensitive environmental or PCR components are not identified in pre-construction phase, further detailed environmental impact assessment (EIA) of the subproject is not required.

XIV. REFERENCES CITED

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APPENDICES

A. Rapid Environmental Assessment (REA) Checklist
B. Minutes of Public Consultation Meetings
C. Emergency response plan
D. Vietnamese EIA certificate
E. Letter on UXO situation in the subproject issued by Commander Military Zone No.7

Appendix A. Rapid Environmental Assessment (REA) Checklist

Instructions:

(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to Environment and Safeguards Division (RSES) for endorsement by Director, RSES and for approval by the Chief Compliance Officer.

(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.

(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:	Preparing the Ha Noi and Ho Chi Minh City Power Grid Development Sector Project TA 8205-VIE
Sector Division:	Phuoc Long 110kV substation and connection line

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Cultural heritage site		X	
▪ Protected Area		X	
▪ Wetland		X	
▪ Mangrove		X	
▪ Estuarine		X	
▪ Buffer zone of protected area		X	
▪ Special area for protecting biodiversity		X	
B. Potential Environmental Impacts Will the Project cause…			
▪ Encroachment on historical/cultural areas, disfiguration of landscape and increased waste generation?		x	The subproject will not be near any temple and cemetery.
▪ Encroachment on precious ecosystem (e.g. sensitive or protected areas)		x	
▪ Alteration of surface water hydrology of waterways crossed by roads and resulting in increased sediment in streams affected by increased soil erosion at the construction site?		x	There is no river, stream flowing through the project area
▪ Damage to sensitive coastal/marine habitats by construction of submarine cables?		x	There are no submarine cables to be installed by the project.

Screening Questions	Yes	No	Remarks
▪ Deterioration of surface water quality due to silt runoff, sanitary wastes from worker-based camps and chemicals used in construction?		x	Construction water will settled down in grid chamber before flow into the city's drainage, and treated concentrative before discharging outside.
▪ Increased local air pollution due to rock crushing, cutting and filling?		x	There is no rock crushing, cutting in the subproject. However, rock is used to mix concrete and filled into dug channel. The mitigation measures will be implemented to reduce air pollution
▪ Risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?	x		To minimize potential risks, an Occupational Health and Safety Plan (OHSP) will be developed and implemented.
▪ Chemical pollution resulting from chemical clearing of vegetation for construction site?		x	Not using herbicide for site clearance
▪ Noise and vibration due to blasting and other civil works?		x	Minor impact level due to noise and vibration occurred during road cutting and movement of construction vehicles along access road in construction phase
▪ Dislocation or involuntary resettlement of people?		x	The subproject affects only agricultural land without houses/accommodations
▪ Dis-proportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		x	No possibility to happen. The assessment of impacts to social is implemented separately.
▪ Social conflicts relating to inconveniences in living conditions where construction interferes with pre-existing roads?	x		Small impacts. Due to increase of vehicle density on roads. No cause obstacles of traffic because of no construction on road.
▪ Hazardous driving conditions where construction interferes with pre-existing roads?	x		Small impacts. The works of stretching wires will have risks caused traffic accidents. However, the mitigation measures will be strictly implemented such as installing scaffolds, fences, signal panels, traffic control.
▪ Creation of temporary breeding habitats for vectors of disease such as mosquitoes and rodents?		x	
▪ Dislocation and compulsory resettlement of people living in right-of-way of the power transmission lines?		x	The subproject will only suspend wires on the 220kV Cat Lai – Thu Duc T/L, not affecting to houses.
▪ Environmental disturbances associated		x	Small impact. Only chopping trees

Screening Questions	Yes	No	Remarks
with the maintenance of lines (e.g. routine control of vegetative height under the lines)?			and branches which have height higher than permitted level provided in Decree No.14/2014/ND-CP.
▪ Facilitation of access to protected areas in case corridors traverse protected areas?		x	There is not protected area in the subproject area.
▪ Disturbances (e.g. noise and chemical pollutants) if herbicides are used to control vegetative height?		x	The subproject will not use herbicide.
▪ Large population influx during project construction and operation that cause increased burden on social infrastructure and services (such as water supply and sanitation systems)?		x	The expected number workers will be 30 persons, who will rent local people's house for their accommodation, therefore, no need to build sanitation and water supply systems.
▪ Social conflicts if workers from other regions or countries are hired?	x		Hiring workers to the project construction site will cause some impacts on local communities. For minimizing this, the Contractor will priory to hide the local workers.
▪ Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?	x		Small impact. Since the number of workers is small, no worker camps are built but hired local houses. Work sites are also small areas, thus solid waste generated is small. The transmission of communicable diseases from workers to local populations is not likely However, the Contractor shall implement measures to ensure the hygiene and health of workers and local people, such as hiring hygiene sufficient accommodation, and hiring specialized units to collect waste daily.
▪ Risks to community safety associated with maintenance of lines and related facilities?		x	The connection line locates within in the substation rounding by fence. So maintenance will not cause risk to communities.
▪ Community health hazards due to electromagnetic fields?	x		Small impact - The transmission line is designed according to the electromagnetic current standards should not impact public health. It will be periodically measured electromagnetic field with 6 months/time and installed warning panels.
▪ Risks to community health and safety due		x	The subproject will not transport,

Screening Questions	Yes	No	Remarks
to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?			use, store, dispose explosive and other hazardous agents. Fuel for vehicles, equipment will be purchased at the regional petrol stations, not storage or transport.
▪ Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project (e.g., high voltage wires, and transmission towers and lines) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	x		Low risk level. In the design process, the geological base was survey drilled and measures for constructing foundation was implemented following current sector regulations. Therefore, this risk is small. Also, in the process of maintenance, the operate unit will conduct regular inspection for timely detection and treatment.

Climate Change and Disaster Risk Questions The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks	**Yes**	**No**	**Remark**
▪ Is the Project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes (see Appendix I)?	x		The project area has been suffered by local flood due to rain (flooded level about 10-20 cm). This is because of the effects of the urbanization process in the region. Also, the area has low elevation about which can be affected by tides and sea water level rises due to climate change.
▪ Could changes in precipitation, temperature, salinity, or extreme events over the Project lifespan affect its sustainability or cost?		X	
▪ Are there any demographic or socio-economic aspects of the Project area that are already vulnerable (e.g. high incidence of marginalized populations, rural-urban migrants, illegal settlements, ethnic minorities, women or children)?		X	
▪ Could the Project potentially increase the climate or disaster vulnerability of the surrounding area (e.g., increasing traffic or housing in areas that will be more prone to flooding, by encouraging settlement in earthquake zones)?		x	

Appendix B. Minutes of public consultation

i) Minute of meeting
B.1 Minutes of public consultation at Phuoc Long B ward.
B.2 Minutes of public consultation at Phu Huu ward.
ii) List of participants
iii) Photos of Public Consultation

i) Minute of meeting

B1. Minutes of public consultation at Phuoc Long B ward

THE SOCIALIST REPUBLIC OF VIETNAM

Independence – Freedom – Happiness

Phuoc Long B ward, 16 October 2014

MINUTES OF PUBLIC CONSULTATION

Re: meeting on initial environmental examination, and resettlement plan

Subproject: Phuoc Long 110kV substation and connection line

Location: meeting room of Phuoc Long B People's Committee

Time & Date: 10h00 on 16 October 2014

I. Participants

1. Representatives of people's committee: Phước Long B ward – 9 distirct

- Mr/Ms. Tran Thanh Giau Job title: vice chairman of the ward PC
- Mr/Ms Hu Van Thang Job title: Cadastral official
- Mr/Ms Nguyen Thi Danh Job title: official

2. Representatives of PECC4

- Mr/Ms. Nguyen Van Thanh Job title: engineer

3. Representatives of APs/ Organization

- Nguyen Van Thuan Job title: Project Management Department

II. Contents of the meeting

1. Representatives of PECC4 presented that the reasons of the meetings is public consultation of resettlement plan (RP) and environmental management plan (EMP)

2. Representatives of PECC4 presented the following contents:

a. The project's information

b. The project description (in construction and operation phase)

c. The project's impacts on environment, socio-economy

d. Compensation, resettlement and policies of Asian Development Bank and GOV

e. Compensation, resettlement plan

f. Relevant complaints and grievance

g. mitigation measures and monitors for the project's impacts on environment

3. Feedbacks and comments of participants

3.1. Comments on the resettlement plan

- Suggesting that the PO to contact with the relevant authorities to attain agreement on compensation, support for land, structures of Phu Nhuan Houses Trading and Construction One Member Limited Company following the current regulations.

- Suggesting that the PO tightly cooperates with the locality in compensation and site clearance.

- Suggesting that the PO tightly cooperate with the local agencies in resolving complaints happened in the territory.

3.2. Comments on environmental management plan

- The PO and civil work contractors have to comply regulations on environmental protection during the project implementation.

- For the route section crossed with traffic roads, it is proposed the Contractor to have plan notification to the locality, avoiding un-expected accidents.

- Returning the site as same as the pre-project after finishing the construction.

4. Conclusion

- Agreeing with the subproject construction.

- Suggesting the relevant parties have to right implement provisions mentioned in the meeting.

5. The meetings ended

Writer	**Representative of affected household/institution**
Signed	Signed
Nguyen Van Thanh	Nguyen Van Thuan
Representative of PECC4	**Representative of Linh Trung ward people's committee**
Signed	Signed
Nguyen Van Thanh	Tran Thanh Giau

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc
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BIÊN BẢN THAM VẤN CỘNG ĐỒNG

"Tham vấn ý kiến cộng đồng về các vấn đề kế hoạch tái định cư (RP), kế hoạch quản lý môi trường (EMP)"

Tên dự án: Trạm biến áp 110kV Phước Long và đường dây đấu nối

Địa điểm: UBND Phường Phước Long B

Ngày họp: 16/01/2014

Thời gian: 10h

I. THÀNH PHẦN THAM DỰ

1. Đại diện UBND phường Phước Long B

Ông: Trần Thanh Giàu. Chức vụ: PCT UBND

Ông: Hứa Văn Thắng Chức vụ: Cán bộ địa chính

Ông: Nguyễn Thị Danh Chức vụ: Cán bộ văn phòng

Ông:..... Chức vụ:.....

Ông:..... Chức vụ:.....

2. Đại diện Công ty cổ phần tư vấn xây dựng Điện 4

Ông: Nguyễn Văn Thanh Chức vụ: Cán bộ

Ông:..... Chức vụ:.....

Ông:..... Chức vụ:.....

3. Đại diện hộ bị ảnh hưởng/Tổ chức

Ông: Nguyễn Văn Thuận Chức vụ: Phòng QLDA

Ông:..... Chức vụ:.....

Ông:..... Chức vụ:.....

II. NỘI DUNG CUỘC HỌP

1. Đại diện UBND Phường Phước Long B tuyên bố cuộc họp tham vấn ý kiến cộng đồng về các vấn đề kế hoạch tái định cư (RP), kế hoạch quản lý môi trường (EMP)

.....

2. Đại diện công ty cổ phần tư vấn xây dựng điện 4 báo cáo các nội dung sau:

a. Thông tin về dự án

b. Mô tả dự án (giai đoạn xây dựng, vận hành)

c. Các ảnh hưởng của dự án đến môi trường, kinh tế xã hội

d. Phương án bồi thường, tái định cư và chính sách của Ngân hàng Phát triển Châu Á (ADB) và chính phủ Việt Nam.

e. Kế hoạch bồi thường, tái định cư

f. Những khiếu nại

g. Biện pháp giảm thiểu và giám sát những tác động của dự án đến môi trường.

3. Ý kiến đóng góp của các đại biểu

3.1. Các vấn đề phục vụ báo cáo RP

- Đề nghị Ban quản lý dự án Lưới điện thành phố Hồ Chí Minh liên hệ các cơ quan chức năng để có phương án thỏa thuận về việc bồi thường, hỗ trợ về đất, vật kiến trúc cho Công ty Khu Nhuận theo quy định hiện hành.

- Đề nghị chủ dự án phối hợp chặt chẽ với địa phương trong công tác đền bù, bồi thường.

- Phối hợp với địa phương giải quyết các thắc mắc xảy ra trên địa bàn.

3.2. Các vấn đề phục vụ báo cáo EMP

- Đề nghị Ban QLDA lưới điện thành phố Hồ Chí Minh và đơn vị thi công tuân thủ quy chế quản lý lưu dân cư và các quy định về bảo vệ môi trường khi thực hiện dự án.

- Đối với những đoạn tuyến cắt đường giao thông đề nghị đơn vị thi công có kế hoạch thông báo cho địa phương, tránh xảy ra các tai nạn không mong muốn xảy ra.

- Đảm bảo việc thu dọn sạch sẽ sau khi hoàn thành công trình.

4. Kết luận

- Hoàn toàn đồng ý dự án đi trên địa bàn.....
.....
- Đề nghị các đơn vị liên quan thực hiện tốt nhất trình thân.....
Cuộc họp.....
.....
.....
.....
.....
.....
5. Cuộc họp kết thúc vào.....

Người viết biên bản

Nguyễn văn thanh

Đại diện hộ bị ảnh hưởng /tổ chức

Nguyễn Văn Thuận

Đại diện Công ty cổ phần Tư vấn Xây dựng Điện 4

Nguyễn văn thanh

Đại diện UBND Phường Phước Long B

KT. CHỦ TỊCH
PHÓ CHỦ TỊCH

Trần Thanh Giàu

B.2 Minutes of public consultation at Phu Huu ward

THE SOCIALIST REPUBLIC OF VIETNAM

Independence – Freedom – Happiness

Phu Huu ward, 14 October 2014

MINUTES OF PUBLIC CONSULTATION

Re: meeting on initial environmental examination, and resettlement plan

Subproject: Phuoc Long 110kV substation and connection line

Location: meeting room of Phu Huu People's Committee

Time & Date: 9h00 on 14 October 2014

III. Participants

1. Representatives of people's committee: Phu Huu ward – 9 distirct

- Mr/Ms. Dang Thanh Ngoc Job title: vice chairman of the ward PC
- Mr/Ms Nguyen Tran Mai Ngoc Job title: Cadastral official

2. Representatives of PECC4

- Mr/Ms. Nguyen Van Thanh Job title: engineer

3. Representatives of APs

- Nguyen Minh Thang Job title: AHH

IV. Contents of the meeting

1. Representatives of Phu Huu ward PC presented that the reasons of the meetings is public consultation of resettlement plan (RP) and environmental management plan (EMP)

2. Representatives of PECC4 presented the following contents:

a. The project's information

b. The project description (in construction and operation phase)

c. The project's impacts on environment, socio-economy

d. Compensation, resettlement and policies of Asian Development Bank and GOV

e. Compensation, resettlement plan

f. Relevant complaints and grievance

g. mitigation measures and monitors for the project's impacts on environment

3. Feedbacks and comments of participants

3.1. Comments on the resettlement plan

- For the trees, crop affected during the construction, it is requested the PO to have significant compensation policy for the APs according to the market price.

- For the loss inventory, it should have cooperation between the local authorities, subproject owner and APs for ensuring fair and avoiding any mistakes.

- The payment for the compensation should be implemented prior to the construction.

3.2. Comments on environmental management plan

- For the section that will be crossed with the traffic roads with high participants density, the Contractor should cooperate with the Traffic road management agencies to control traffic routes for avoiding traffic congestions and accidents.

- Following the local provisions in declaring and registering temporary resident.

- For the solid waste generated from construction and daily activities, it should be collected and transported to the designated local public disposals.

4. Conclusion

- Agreeing with the subproject construction.

- The IA should notify the plans of construction and operation to the locality for information and management.

5. The meetings ended

Writer	**Representative of affected household/institution**
Signed	Signed
Nguyen Van Thanh	Nguyen Minh Thang

Representative of PECC4	**Representative of Linh Trung ward people's committee**
Signed	Signed
Nguyen Van Thanh	Dang Thanh Phong

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc
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BIÊN BẢN THAM VẤN CỘNG ĐỒNG

"Tham vấn ý kiến cộng đồng về các vấn đề kế hoạch tái định cư (RP), kế hoạch quản lý môi trường (EMP)"

Tên dự án: Trạm biến áp 110kV Phước Long và đường dây đấu nối

Địa điểm:....UBND...Phường...Phú Hữu.....

Ngày họp:....14.10.2014.....

Thời gian:.....9h.....

I. THÀNH PHẦN THAM DỰ

1. Đại diện UBND phường Phú Hữu

Ông:..Đặng..Thanh..Ngọc Chức vụ:..CT..UBND.....

Ông:Nguyễn..Trần..Mai..Ngọc Chức vụ:..Cán..bộ..địa..chính

Ông:..... Chức vụ:.....

Ông:..... Chức vụ:.....

Ông:..... Chức vụ:.....

2. Đại diện Công ty cổ phần tư vấn xây dựng Điện 4

Ông:Nguyễn..văn..Thanh Chức vụ:..Cán...bộ.....

Ông:..... Chức vụ:.....

Ông:..... Chức vụ:.....

3. Đại diện hộ bị ảnh hưởng

Ông:Nguyễn..Minh..Thắng Chức vụ:..hộ..ảnh..hưởng....

Ông:..... Chức vụ:.....

Ông:..... Chức vụ:.....

II. NỘI DUNG CUỘC HỌP

1. Đại diện..UBND..Phường..Phú..Hữu.....tuyên bố cuộc họp
tham...vấn..ý..kiến...cộng...đồng...về...các...vấn...đề...kế...hoạch...tái....
.định..cư..(RP),..kế...hoạch..quản..lý..môi..trường...(EMP).....
.....

2. Đại diện công ty cổ phần tư vấn xây dựng điện 4 báo cáo các nội dung sau:

a. Thông tin về dự án

b. Mô tả dự án (giai đoạn xây dựng, vận hành)

c. Các ảnh hưởng của dự án đến môi trường, kinh tế xã hội

d. Phương án bồi thường, tái định cư và chính sách của Ngân hàng Phát triển Châu Á (ADB) và chính phủ Việt Nam.

e. Kế hoạch bồi thường, tái định cư

f. Những khiếu nại

g. Biện pháp giảm thiểu và giám sát những tác động của dự án đến môi trường.

3. Ý kiến đóng góp của các đại biểu

3.1. Các vấn đề phục vụ báo cáo RP

.....

- Đối với cây cối, hoa màu bị ảnh hưởng trong quá trình thi công, đề nghị chủ dự án có chính sách bồi thường thỏa đáng cho người dân, theo giá thị trường.

.....

- Việc kiểm tra thiệt hại, cần có sự phối hợp giữa địa phương, chủ đầu tư và người dân để đảm bảo công bằng và tránh sai sót.

.....

- Công tác chi trả tiền bồi thường phải được thực hiện trước khi thi công dự án.

.....

3.2. Các vấn đề phục vụ báo cáo EMP

.....

- Đối với những đoạn cắt qua đường giao thông có lưu lượng lớn, đề nghị đơn vị thi công phối hợp các đơn vị quản lý các tuyến giao thông để phân luồng hợp lý tránh ùn tắc giao thông và tai nạn có thể xảy ra.

.....

- Tuân thủ những quy định của địa phương trong công tác thải bỏ tạm thu, tạm vận.

.....

- Đối với chất thải rắn phát sinh từ xây dựng và sinh hoạt, phải được thu gom và vận chuyển đến các bãi rác công cộng của địa phương.

.....

.....

4. Kết luận

- Hoàn toàn đồng ý chủ trương của dự án

- Chủ đầu tư phải khai báo kế hoạch hoạch xây dựng vận hành để địa phương nắm và có phương án quản lý.

5. Cuộc họp kết thúc vào.....

Người viết biên bản

Nguyễn văn Thanh

Đại diện hộ bị ảnh hưởng

Nguyễn Minh Thống

Đại diện Công ty cổ phần Tư vấn Xây dựng Điện 4

Nguyễn văn Thanh

Đại diện UBND Phường Phú Hữu

KT.CHỦ TỊCH
P.CHỦ TỊCH

Đặng Thanh Phong

***ii) List of participants at Phu Huu* ward**

LIST OF PARTICIPANTS OF PUBIC CONSULTATION

RESETTLEMENT PLAN (RP) AND ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Date : 14th October 2014

Location: the office of Phu Huu ward

No.	Name	Address	Position	Remark
1	Dang Thanh Ngoc	Phu Huu ward	Vice chairman	
2	Nguyen Tran Mai Ngoc	Phu Huu ward	Cadastral official	
3	Nguyen Minh Thang	Phu Huu ward	AP	
4	Tran Van Danh	Phu Huu ward	AP	
5	Nguyen Van Ngoc	Phu Huu ward	AP	

DANH SÁCH THAM GIA THAM VẤN CỘNG ĐỒNG

"Tham vấn ý kiến cộng đồng về các vấn đề kế hoạch tái định cư (RP), kế hoạch quản lý môi trường (EMP)"

Ngày.14..Tháng.10..Năm..2014..; Tại:..UBND..P..Phú..Hữu.....

STT	Họ và tên	Địa chỉ	Chức vụ, Nghề nghiệp	Ghi chú
1	Đặng Thanh Ngọc	Phú Hữu	2 CT. UBND	
2	Nguyễn Trần Mai Ngọc	- nt -	Địa chính	
3	Nguyễn Minh Thắng	- nt -	Người dân	
4	Trần Văn Danh	- nt -	- nt -	
5	Nguyễn Văn Ngọc	- nt -	- nt -	
6				
7				
8				

iii) Photos of Public Consultation

Figure PL1: Photos of Public Consultation at Phu Huu ward

Figure PL2: Photos of Public Consultation at Phuoc Long B ward

Appendix C: EMERGENCY RESPONSE PLAN

1. The Contractor must develop emergency or incident response procedures (ERP) during construction. In the operational phase the operator/civil authorities will have responsibility for any emergencies or serious incidents. The construction phase should ensure:

i) Emergency Response Team (ERT) of the Contractor as initial responder;

ii) The District fire and police departments, emergency medical service, the Department of Public Health (DPH), collectively referred to as the External Emergency Response Team (EERT), as ultimate responders

2. The Contractor will provide and sustain the required technical, human and financial resources for quick response during construction

Table 1. Roles and Responsibilities in Emergency Incident Response

Entity	Responsibilities
Contractor Team (ERT)	- Communicates /alerts the EERT. - Prepares the emergency site to facilitate the response action of the EERT, e.g., vacating, clearing, restricting site. - When necessary and requested by the EERT lends support /provides assistance during EERT's response operations.
External Emergency Response Team (EERT)	Solves the emergency/incident
Contractor Resources	- Provide and sustain the people, equipment, tools and funds necessary to ensure Subproject's quick response to emergency situations. - Maintain good communication lines with the EERT to ensure prompt help response and adequate protection, by keeping them informed of Subproject progress.

3. The ERT will be led by the senior Contractor engineer (designated ERTL) on site with a suitably trained foreman or junior engineer as deputy. Trained first-aiders and security crew will be the core members of the ERT.

4. The Contractor will ensure that ERT members are physically, technically and psychologically fit for their emergency response roles and responsibilities.

5. Prior to the mobilization of civil works, the Contractor, through its Construction Manager, ERTL, in coordination with the PO/PPMB, will meet with the ultimate response institutions to discuss the overall construction process, including, but not limited to:

i) Subproject sites;

ii) construction time frame and phasing;

iii) any special construction techniques and equipment that will be used; i

iv) any hazardous materials that will be brought to and stored in the construction premise and details on their applications and handling/management system;

v) the Contractor's Emergency Management Plan

vi) names and contact details of the ERT members

6. The objective of this meeting is to provide the ultimate response institutions the context for:

i) their comments on the adequacy of the respective Emergency Management Plans

ii) their own assessment of what types, likely magnitude and likely incidence rate of potential hazards are anticipated

iii) the arrangements for coordination and collaboration.

7. To ensure effective emergency response, prior to mobilization of civil works, the Contractor will:

i) set up the ERT;

ii) set up all support equipment and facilities in working condition

iii) made arrangements with the EERT;

iv) conducted proper training of ERT members, and encouraged and trained volunteers from the work force;

v) conducted orientation to all construction workers on the emergency response procedures and facilities, particularly evacuation procedures, evacuation routes, evacuation assembly points, and self-first response, among others; and

vi) conducted drills for different possible situations.

8. To sustain effective emergency response throughout Subproject implementation an adequate budget shall be provided to sustain the capabilities and efficiency of the emergency response mechanism, the emergency response equipment, tools, facilities and supplies. Drills and reminders will take place regularly, the former at least every two months and the latter at least every month.

Alert Procedures

9. Means of communicating, reporting and alerting an emergency situation may be any combination of the following: i) audible alarm (siren, bell or gong); ii) visual alarm (blinking/rotating red light or orange safety flag); iii) telephone (landline); iv) mobile phone; v) two-way radio; and vi) public address system/loud speakers. Some rules relative to communicating/alerting will be:

(i) Whoever detects an emergency situation first shall immediately :

- call the attention of other people in the emergency site,
- sound the nearest alarm, and/or
- report/communicate the emergency situation to the ERT.

(ii) Only the ERTL and, if ERTL is not available, the Deputy ERTL are authorized to communicate with the EERT. Exceptional cases to this rule may be necessary and should be defined in the Emergency Management Plans.

(iii) When communicating/alerting an emergency to the EERT, it is important to provide them with at least: i) the type of emergency situation; ii) correct location of the emergency; ii) estimated magnitude of the situation; iii) estimated persons harmed; iv) time it happened; v) in case of a spill, which hazardous substance spilled; and vi) in case of fire and explosion, what caused it. Such details would allow the EERT to prepare

for the appropriate response actions. For an effective reporting/alerting of an emergency situation:

(i) The names and contact details of the relevant persons and institutions should be readily available in, or near to, all forms of communication equipment, and strategically posted (at legible size) in all Subproject sites and vehicles:

- Most relevant construction/operations staffs namely, the ERTL, Deputy ERTL, first-aiders, supervising engineers, foremen
- EERT institutions/organizations
- Concerned village authority/ies
- IA Office, SS

(ii) All Subproject sites should have good access to any combination of audible and visual alarms, landline phones, mobile phones and two-way radio communication at all times.

(iii) Contractor's construction vehicles should also be equipped with the appropriate communication facilities.

Emergency Response Situations

The following tables suggest general procedures that will be refined in the final EMP during detailed design, and described in more detail in the Emergency Management Plans of the Contractor.

Table 2. Evacuation Procedure

Procedure	Remarks
Move out as quickly as possible as a group, but avoid panic	All workers/staff, sub-contractors, site visitors to move out, guided by the ERT
Evacuate through the directed evacuation route	The safe evacuation shall have been determined fast by the ERTL/Deputy ERTL and immediately communicated to ERT members
Keep moving until everyone is safely away from the emergency site and its influence area	A restricted area must be established outside the emergency site, all to stay beyond the restricted area
Once outside, conduct head counts	Foremen to do head counts of their sub-groups; ERTL/Deputy ERTL of the ERT.
Once outside, conduct head counts	Foremen to do head counts of their sub-groups; ERTL/Deputy ERTL of the ERT
Report missing persons to EERT immediately	ERTL/Deputy ERTL to communicate with the EERT
Assist the injured in evacuation and hand them over to the ERT first-aiders or EERT medical group	ERT to manage injured persons to ensure proper handling.
If injury warrants special care, DO NOT MOVE them, unless necessary and	ERTL/Deputy ERTL communicates with EERT to get instructions/directions in handling the injured.

instructed/directed by the EERT	

Table 3. Response Procedure During Medical Emergency

Procedure	Remarks
Administer First Aid regardless of severity immediately.	Fundamentals when giving First Aid: - Safety first of both the rescuer and the victim. - Do not move an injured person unless: - victim is exposed to more danger when left where they are, e.g., during fire, chemical spill - it would be impossible for EERT to aid victims in their locations, e.g., under a collapsed structure - instructed or directed by the EERT First AID to be conducted only by a person who has been properly trained in giving First Aid.
Call the EERT emergency medical services and/or nearest hospital.	ERTL/Deputy ERTL or authorized on-site emergency communicator
Facilitate leading the EERT to the emergency site	ERTL/Deputy ERTL to instruct: - An ERT member on- site to meet EERT in access road/strategic location. He/she shall hold orange safety flag to get their attention and lead them to site. - Other ERT members to clear access road for smooth passage of the EERT
If applicable, vacate site and influence area at once, restrict site, suspend work until further notice.	Follow evacuation procedure

Table 4. Response Procedure in Case of Fire

Procedure	Remarks
Alert a fire situation	Whoever detects the fire shall immediately: - Call the attention of other people in the site, - Sound the nearest alarm, and/or - Foreman or any ERT member among the construction sub-group contacts the fire department (in this case it should be agreed on that it is alright for any ERT member in the sub-group to alert the fire department) - Report/communicate the emergency situation to the ERTL/Deputy ERTL.
Stop all activities/operations and evacuate	All (non-ERT) workers/staff sub-contractors, site visitors and concerned public to move out to safe grounds following the evacuation procedure
Activate ERT to contain fire/control fire from spreading	Guided by the training they undertook, ERT members assigned to mitigate the fire shall assess their own safety situation first before attempting

	to control fire spread
Call the nearest fire and police stations and, if applicable, emergency medical services	When alerting the EERT, ERTL will give the location, cause of fire, estimated fire alarm rating, any injuries.
Facilitate leading the EERT to the emergency site	ERTL/Deputy ERTL to instruct: - An ERT member to meet the EERT in the access road or strategic location and lead them to the site. He/she shall hold the orange safety flag to get their attention and lead them to the site. - Some ERT members to stop traffic in, and clear, the access road to facilitate passage of the EERT
ERT to vacate the site as soon as their safety is assessed as in danger.	Follow appropriate evacuation procedure

D. Vietnamese EIA certificate

HO CHI MINH CITY PEOPLE'S COMMITTEE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT
Ref.No.: 1006/QD-TNMT-CCBVMT

SOCIALIST REPUBLIC OF VIET NAM
Independence – Freedom – Happiness
Ho Chi Minh City, 28 July 2015

DECISION
Regarding approval on environmental impact assessment report of "110kV Phuoc Long substation and connection line" of Ho Chi Minh City gird power projects management board

DIRECTOR OF DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT – HO CHI MINH CITY

Pursuant to Law on environmental protection dated June 23th, 2014;

Pursuant to Decree No. 18/2015/ND-CP dated February, 14th 2015 by the Government (GOV) on strategic environment assessment, environmental impact assessment and environment protection plan;

Pursuant to Circular No. 27/2015/TT-BTNMT dated 19 May 2015 by MONRE on Environmental Strategy Assessment, Environmental Impact assessment, and environmental protection plan;

Pursuant to Decision No. 121/2003/QDD-UB dated July 18th 2003 by Ho Chi Minh people's committee on Department of Natural resources and environment;

Pursuant to Decision No. 04/2012/QD-UBND dated 31 January 2012 by Ho Chi Minh people's committee on change of organization regime of Environmental Protection Branch of Department of Natural resources and environment;

According to the suggestion of Evaluation Committee of environmental impact assessment report of "110kV Phuoc Long substation and connection line" project at Phu Huu and Phuoc Long B wards, district 9, Ho Chi Minh City of Ho Chi Minh City Grid Power projects management board, which was met in April 8th, 2015 at Department of natural resources and environment;

Consider the revised and supplemented report on environmental impact assessment of "110kV Phuoc Long substation and connection line" at Phu Huu and Phuoc Long B wards, district 9, Ho Chi Minh City, attached letter No. 2423/ALD-CBDT dated June 19th, 2015 by Ho Chi Minh City Grid Power projects management board;

According to the suggestion of Chairman of of Environmental Protection Brach.

DECISION:

Article 1. Approve the contents of the environmental impact assessment report of "110kV Phuoc Long substation and connection line" at Phu Huu and Phuoc Long B wards, district 9, Ho Chi Minh City which is established by Ho Chi Minh City Grid Power projects management board (after here called Project Owner) with the following main contents:

1. Scope and scale of the project:

1.1. Scope: the project is proposed to implement at Phu Huu and Phuoc Long B wards, district 9, Ho Chi Minh City

1.2. Scale:

- Newly construct a substation at the planned area for part ò Phuoc Long B residential area, in Phuoc Long ward, district 9. Total capacity of 02x63 MVA and voltage level of 110/22/15kV, total area of 1,624m2.
- The connection line:
  - 110kV double circuit overhead transmission line with 1,987m in length will be started from tower No. 7 of the existing 220kV Cat

Lai – Thu Duc substation to end at the new tower for new underground cable

- 110kV double circuit underground cable with 25m in length and 1200mm2 XLPE cable will be newly constructed from the new tower to the GIS feeder bay of Phuoc Long 110kV SS.

2. Requirements of environmental protection for the project:
   2.1. Implement mitigation measures, population treatment during construction phase for dust, noise, vibration, emission, sewage and solid waste, which complies to national technical regulations on environment such as QCVN 05:2013/BTNMT; QCVN 06:2009/BTNMT; QCVN 26:2010/BTNMT; QCVN 27/2010/BTNMT; QCVN 14:2008/BTNMT; apply mitigation measures for impacts on traffic activity in the project area and communication wire, other power lines during construction phase of the project;
   2.2. Drainage system have to be separately divided for rainwater and wastewater; the project have to construct collection and treatment measures of domestic wastewater for operation phase, which have to comply with national technical regulation on domestic wastewater No. 14/2008/BTNMT (column B, K=1.2) and legally connect to regional drainage, construct pits after treatment facilitating checking and monitoring.
   2.3. Classification, storing and contracting with a specialized agency to collect, transport, treat normal waste, and hazardous waste under the current regulations.
   2.4. Implement mitigation measures for impacts on electromagnetic field, safety in grounding wire for houses under the ROW;
   2.5. Implement labour safety measures, responding and preventing plans for risk of fire and electric shock; ensure safety of management, operation, repairing, and maintenance for power works;
   2.6. Implement environmental management plan during the project's construction and operation phase. Implement environmental monitoring plan, report to Department of Natural resource and Environment (Environmental Protection Brach) and authority agencies on periodic environmental monitoring results.

Article 2. Ho Chi Minh City grid power projects management board has the following responsibilities:

1. Prepare, approve, and public post environmental management plan of the project before commencing the project.
2. Seriously implement requirements on environmental protection regulated in item 2, article 1 of this decision and other responsibilities under regulations of Vietnamese law.

Article 3. During the implementation process, if the project has changes different to item 1 and 2 of Article 1 of this decision, the project owner has to report in writing and only to be allowed to implement these changes after receiving agreement letter of Department of Natural Resource and Environment.

Article 4. The approval decision on environmental impact assessment report of ""110kV Phuoc Long substation and connection line" at Phu Huu and Phuoc Long B wards, district 9, Ho Chi Minh City of Ho Chi Minh City Grid Power projects management board is the basis for approving the project investment; and the basis for the national authority agencies to check, inspect the environmental protection of the project.

Article 5. This decision is come into force from the signing date. The decision has 03 pages with stamped./.

Receipt:
- HCMC Grid Power projects MB;
- HCM city PC;
- DOIT;

PP.DIRECTOR
DEPUTY DIRECTOR

- DPCs/offices of NRE of district 5;
- DPCs/offices of NRE of district 8;
- Director of DONRE;
- Archival, Environmental protection brach (Vien 09)

(signed)

Nguyen Thi Thanh My

ỦY BAN NHÂN DÂN
THÀNH PHỐ HỒ CHÍ MINH
SỞ TÀI NGUYÊN VÀ MÔI TRƯỜNG

Số 1006 /QĐ –TNMT–CCBVMT

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

Tp. Hồ Chí Minh, ngày 28 tháng 7 năm 2015.

QUYẾT ĐỊNH

Về việc phê duyệt Báo cáo đánh giá tác động môi trường dự án "Trạm biến áp 110kV Phước Long và đường dây đấu nối" của Ban Quản lý dự án lưới điện Thành phố Hồ Chí Minh.

GIÁM ĐỐC SỞ TÀI NGUYÊN VÀ MÔI TRƯỜNG THÀNH PHỐ HỒ CHÍ MINH

Căn cứ Luật Bảo vệ môi trường ngày 23/6/2014;

Căn cứ Nghị định số 18/2015/NĐ-CP ngày 14/02/2015 của Chính phủ quy định về quy hoạch bảo vệ môi trường, đánh giá môi trường chiến lược, đánh giá tác động môi trường và kế hoạch bảo vệ môi trường;

Căn cứ Thông tư số 27/2015/TT-BTNMT ngày 29/5/2015 của Bộ Tài nguyên và môi trường trưởng về đánh giá môi trường chiến lược, đánh giá tác động môi trường và kế hoạch bảo vệ môi trường;

Căn cứ Quyết định số 121/2003/QĐ-UB ngày 18/7/2003 của Ủy ban nhân dân thành phố về việc thành lập Sở Tài nguyên và Môi trường;

Căn cứ Quyết định số 04/2012/QĐ-UBND ngày 31/01/2012 của Ủy ban nhân dân thành phố về việc chuyển đổi mô hình tổ chức Chi cục Bảo vệ môi trường thuộc Sở Tài nguyên và Môi trường;

Theo đề nghị của Hội đồng thẩm định Báo cáo đánh giá tác động môi trường dự án "Trạm biến áp 110kV Phước Long và đường dây đấu nối" tại phường Phú Hữu và phường Phước Long B, quận 9, Thành phố Hồ Chí Minh, họp ngày 08/4/2015 tại Sở Tài nguyên và Môi trường;

Xét nội dung Báo cáo đánh giá tác động môi trường dự án "Trạm biến áp 110kV Phước Long và đường dây đấu nối" tại phường Phú Hữu và phường Phước Long B, quận 9, Thành phố Hồ Chí Minh đã được chỉnh sửa, bổ sung kèm văn bản giải trình số 2423/ALĐ-CBĐT ngày 19/6/2015 của Ban Quản lý dự án lưới điện Thành phố Hồ Chí Minh;

Theo đề nghị của Chi cục trưởng Chi cục Bảo vệ Môi trường,

1

QUYẾT ĐỊNH:

Điều 1. Phê duyệt nội dung Báo cáo đánh giá tác động môi trường dự án "Trạm biến áp 110kV Phước Long và đường dây đấu nối" tại phường Phú Hữu và phường Phước Long B, quận 9, Thành phố Hồ Chí Minh được lập bởi Ban Quản lý dự án lưới điện Thành phố Hồ Chí Minh (sau đây gọi là Chủ dự án) với các nội dung chủ yếu sau đây:

1. Phạm vi, quy mô Dự án:

1.1. Phạm vi Dự án: Dự án được triển khai trên địa bàn phường Phú Hữu và phường Phước Long B, quận 9, Thành phố Hồ Chí Minh.

1.2. Quy mô Dự án:

– Xây dựng mới Trạm biến áp trong khu vực quy hoạch cây xanh của Khu dân cư Phước Long B, phường Phước Long B, quận 9. Tổng công suất của Trạm là 02 x 63 MVA, cấp điện áp 110/22kV, diện tích 1.624 m^2.

– Phần đường dây đấu nối:

+ Đoạn đường dây trên không 02 mạch, cấp điện áp 110 kV, chiều dài 1.987 m. Vị trí đấu nối từ trụ số 7 của đường dây 220 kV Cát Lái-Thủ Đức đến trụ đấu nối cáp ngầm xây dựng mới.

+ Đoạn cáp ngầm 02 mạch, cấp điện áp 110 kV, chiều dài khoảng 25m, sử dụng cáp XLPE 1200 mm^2. Vị trí đấu nối cáp ngầm xây dựng mới đến ngăn GIS đường dây của Trạm biến áp 110 kV Phước Long.

2. Yêu cầu về bảo vệ môi trường đối với Dự án:

2.1. Thực hiện các biện pháp giảm thiểu, xử lý ô nhiễm trong giai đoạn thi công xây dựng đối với bụi, tiếng ồn, rung, khí thải, nước thải và chất thải rắn đảm bảo đạt các Quy chuẩn kỹ thuật Quốc gia về môi trường theo QCVN 05:2013/BTNMT; QCVN 06:2009/BTNMT, QCVN 26:2010/BTNMT, QCVN 27:2010/BTNMT, QCVN 14:2008/BTNMT; có biện pháp giảm thiểu tác động tới hoạt động giao thông khu vực dự án trong suốt quá trình thi công xây dựng của Dự án;

2.2. Phân loại, lưu giữ và hợp đồng với các đơn vị có chức năng để thu gom, vận chuyển, xử lý chất thải rắn thông thường, chất thải nguy hại theo đúng quy định hiện hành;

2.3. Thực hiện các biện pháp giảm thiểu tác động do điện từ trường, an toàn nối đất cho các hộ dân trong hành lang an toàn lưới điện;

2.4. Thực hiện các biện pháp an toàn lao động, các phương án phòng chống và ứng phó sự cố cháy nổ, điện giật, đảm bảo an toàn trong công tác quản lý, vận hành, sửa chữa và bảo dưỡng các công trình điện;

2.5. Thực hiện chương trình quản lý môi trường trong suốt quá trình thi công xây dựng và hoạt động của Dự án. Thực hiện chương trình giám sát môi trường, báo cáo kết quả giám sát môi trường định kỳ cho Sở Tài nguyên và Môi trường (Chi cục Bảo vệ Môi trường) và các cơ quan chức năng.

2

Điều 2. Ban Quản lý dự án lưới điện Thành phố Hồ Chí Minh có các trách nhiệm sau đây:

1. Lập, phê duyệt và niêm yết công khai kế hoạch quản lý môi trường của Dự án trước khi triển khai Dự án.

2. Thực hiện nghiêm túc các yêu cầu về bảo vệ môi trường quy định tại khoản 2 Điều 1 Quyết định này và các trách nhiệm khác theo quy định của pháp luật về bảo vệ môi trường.

Điều 3. Trong quá trình thực hiện nếu Dự án "Trạm biến áp 110kV Phước Long và đường dây đấu nối" tại phường Phú Hữu và phường Phước Long B, quận 9, Thành phố Hồ Chí Minh có những thay đổi so với các khoản 1 và 2 Điều 1 của Quyết định này, Chủ dự án phải có văn bản báo cáo và chỉ được thực hiện những thay đổi sau khi có văn bản chấp thuận của Sở Tài nguyên và Môi trường.

Điều 4. Quyết định phê duyệt Báo cáo đánh giá tác động môi trường dự án "Trạm biến áp 110kV Phước Long và đường dây đấu nối" tại phường Phú Hữu và phường Phước Long B, quận 9, Thành phố Hồ Chí Minh của Ban Quản lý dự án lưới điện Thành phố Hồ Chí Minh là căn cứ để quyết định việc đầu tư Dự án; là cơ sở để các cơ quan quản lý nhà nước có thẩm quyền kiểm tra, thanh tra việc thực hiện công tác bảo vệ môi trường của Dự án.

Điều 5. Quyết định này có hiệu lực thi hành kể từ ngày ký. Quyết định gồm 03 trang, có đóng dấu giáp lai./.

Nơi nhận:
- Ban Quản lý dự án lưới điện Tp.HCM;
- UBND TP.HCM;
- Sở Công thương;
- UBND/Phòng TNMT quận 9;
- UBND phường Phú Hữu, quận 9;
- UBND phường Phước Long, quận 9;
- Giám đốc Sở;
- Lưu: VT, TĐMT, CCBVMT (Viên.10).

KT.GIÁM ĐỐC
PHÓ GIÁM ĐỐC

Nguyễn Thị Thanh Mỹ

3

E. Letter on UXO situation in the subproject

COMMANDER MILITARY ZONE NO.7

COUNSEL BUREAU

Ref.No.: 794/BTM-PCB

Re information of bombs, mines, UXO remained after the war of the project " Phuoc Long 110kV substation and connection line"

SOCIALIST REPUBLIC OF VIET NAM

Independence – Freedom – Happiness

Ho Chi Minh City, 5 February 2015

To: Ho Chi Minh City Power Grid projects management board (PMB)

Pursuant to letter No. 422/ALD-CBDT dated 02 February of PMB on providing information of bombs, mines, UXO remained after the war in the project site "Phuoc Long 110kV substation and connection line" on Phuoc Long B, district 9, HCMC

Pursuant to documents on mines pollution in HCMC and situation of district 9, HCMC, Commander military zone No. 7 has the following opinions:

HCMC (including district 9) is one of key areas in the violent wars with the use of much UXO in the past.

After the war, Engineers of Military zone No.7 have determined, collected and cleared UXO. However, this only is performed for the surface, the UXO deep under ground and under river/canal has still not cleared yet.

In order to ensure safety for the project construction and operation, suggest PMB cooperate with UXO clearance Company No. 319 under Ministry of National Defense (specialized unit in the sector) to survey, prepare technical plan to submit the authorities for approval and implement UXO clearance under technical regulations of Ministry of National Defense

PP. COUNSEL HEADERS

ENGINEERING DEPARMENT MANAGER

(signed and stamped)

Colonel

Quanh Dinh Bach

BỘ TƯ LỆNH QUÂN KHU 7
BỘ THAM MƯU

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

Số: 794 /BTM-PCB

Thành phốHồ Chí Minh, ngày 05 tháng 02 năm 2015

V/v thông báo tình hình bom mìn, vật nổ còn sót lại sau chiến tranh dự án "Trạm biến áp 110 kV Phước Long và đường dây đấu nối"

BAN QUẢN LÝ DỰ ÁN LƯỚI ĐIỆN THÀNH PHỐ HỒ CHÍ MINH
ĐẾN Số: 842
Ngày 13./.2./ 2015

Kính gửi: Ban QLDA Lưới điện Thành phố Hồ Chí Minh

Căn cứ Công văn số 422/ALD-CBĐT ngày 02/02/2015 của Ban QLDA Lưới điện Thành phố Hồ Chí Minh về việc cung cấp thông tin bom mìn, vật nổ trong khu vực diện tích xây dựng dự án "Trạm biến áp 110 kV Phước Long và đường dây đấu nối" trên địa bàn Phường Phước Long B, Quận 9, Thành phố Hồ Chí Minh;

Căn cứ hồ sơ lưu trữ về tình hình ô nhiễm bom mìn, vật nổ còn sót lại sau chiến tranh trên địa bàn Quân khu và tình hình thực tế tại địa bàn Quận 9, Thành phố Hồ Chí Minh, Bộ Tham mưu Quân khu 7 có ý kiến như sau:

Theo hồ sơ lưu trữ về tình hình bom mìn, vật nổ, trong thời gian chiến tranh chống Mỹ trước đây, các khu vực trên thuộc địa bàn thành phố Hồ Chí Minh (khu vực Quận 9) là một trong những trọng điểm đánh phá ác liệt của ta và địch, cả hai bên đã sử dụng rất nhiều các loại bom mìn, vật nổ, với mật độ dày đặc và nhiều chủng loại khác nhau.

Từ sau ngày giải phóng đến nay, lực lượng Công binh Quân khu 7 và LLVT thành phố đã tiến hành thu hồi bom mìn, vật nổ bảo đảm an toàn trên địa bàn, tuy nhiên chủ yếu mới giải phóng được lớp trên bề mặt, số lượng bom mìn, vật nổ còn sót lại nằm sâu dưới lòng đất, sông rạch chưa có điều kiện dò tìm, xử lý hết, nguy cơ xảy ra mất an toàn rất cao.

Để đảm bảo an toàn cho quá trình thi công dự án cũng như sử dụng công trình sau này, đề nghị Ban Quản lý dự án Lưới điện Thành phố Hồ Chí Minh phối hợp với Công ty TNHH MTV xử lý bom mìn, vật nổ 319/Tổng Công ty 319/Bộ Quốc phòng là đơn vị chuyên trách có chức năng và kinh nghiệm, có giấy phép rà phá bom mìn, vật nổ, tổ chức khảo sát, thu thập số liệu, lập phương án kỹ thuật thi công, trình cấp có thẩm quyền phê duyệt và thực hiện công tác rà phá bom mìn, vật nổ theo đúng quy trình kỹ thuật của Bộ Quốc phòng./.

Nơi nhận:
- Như Trên;
- Lưu: VT, PCB; Th 04.

TL. THAM MƯU TRƯỞNG
TRƯỞNG PHÒNG CÔNG BINH

BỘ TƯ LỆNH QUÂN KHU 7 * BỘ THAM MƯU *

Đại tá
Quách Đình Bách