

# Initial Environmental Examination – Subproject 3

January 2014

## **Viet Nam: Ha Noi and Ho Chi Minh City Power Grid Development Sector Project**

(EVN HCMC: District 8 220 kV Substation and Upgraded Transmission Line)

## **CURRENCY EQUIVALENTS**

(as of 11 December 2013)

Currency Unit	–	Dong D
D1.00	=	\$0.000047
\$1.00	=	D20,948

## **ABBREVIATIONS**

ADB:	Asian Development Bank
AH:	Affected Household
AP:	Affected people
BOD:	Biochemical Oxygen Demand
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 Sport and Tourism
DoLISA:	Department of Labour Invalids and Social Assistance
EA:	Executing Agency
EIA:	Environment Impact Assessment
EMP:	Environment Management Plan
EO:	Environmental Officer
ESU:	Environmental and Social Unit
EVN:	Electricity of Viet Nam
EVN HANOI:	Ha Noi Power Corporation
EVNHCMC:	Ho Chi Minh Power Corporation
GHG:	Greenhouse gas
GRM:	Grievance Redress Mechanism
HN:	Ha Noi
IA:	Implementation Agency
IEE:	Initial Environmental Examination
MoLISA:	Ministry of Labour Invalids and Social Assistance
MoNRE:	Ministry of Natural Resources and Environment
NPA:	National Protected Area
OHL:	Overhead lines
PCB:	Polychlorinated biphenyls

PCR:	Physical Cultural Resources
PIC:	Project Implementation Consultant
PPC:	Provincial Peoples Committee
REA:	Rapid Environment Assessment
ROW:	Right-of-way
PPMB:	Power Project Management Board
TSS:	Total Suspended Solids
UGC:	Underground lines
UXO:	Unexploded Ordnance

#### WEIGHTS AND MEASURES

km:	kilometre
kg:	kilogram
kV:	kilovolt
ha:	hectare
mm:	millimetre
MV:	medium voltage

#### NOTE

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

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## 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 Hanoi Power Corporation (EVN HANOI) and Ho Chi Minh City Power Corporation (EVNHCMC), which are responsible for the power supply in their respective areas. Additionally, the project includes a smart grid component financed by the Clean Technology Fund (CTF).

2. The Initial Environmental Examination (IEE) presented herein addresses the 220 kV District 8 Substation and Transmission Line projects in HCMC which represents two of the eight core subprojects identified by Electricity of Viet Nam (EVN) for Ha Noi and Ho Chi Minh City. The eight core subprojects were assigned Category B for environment. The consolidated subproject consists of construction of a new 220 kV substation and a combined upgraded above (OHL) 110 kV to 220 kV, and a new underground line (UGC) 220 kV 6.5 km transmission line in southern HCMC. The IEEs of the other five core subprojects have been prepared separately.

### A. Subproject Summary

3. The primary objective for constructing the new substation is to ensure the sustainability of the N-1 condition for 220 and 110 kV grid network, and provision of overload relief of nearby substations in District 8. This entails supplying power for the 110 kV Phu Dinh, Chanh Hung, Hung Vuong and Tan Hung substations; reinforcing electrical supply capability for District 8 and other neighbouring areas; preventing overload of the 220 kV Nha Be, Tao Dan Substation and 110 kV Nam Sai Gon – Phu Dinh T/L; and linking 220 kV-110 kV power grid in the southern region and ensuring national energy security. The new substation is situated in 1027 Pham The Hien Road, Ward 5, District 8, HCMC. The main features of the substation are summarized as follows:

- Substation will occupy 3,915 m<sup>2</sup>
- 2x250 MVA, 220/110/22 kV substation;
- 220 kV side: double busbar diagram with bus-tie;
- 220 kV bays: two transformer bays, two T/L outgoing bays (Nam Sai Gon 1, Nam Sai Gon 2), one bus coupling bay;
- All 220 kV equipment to be indoor GIS type;
- 110 kV side: double busbar diagram with bus-tie;
- 110 kV bays: two 250 MVA transformer bay, two 63 MVA transformer bay, one bus coupling bay, six T/L line outgoing bays (Phu Dinh 1, Phu Dinh 2, Hung Vuong, Ben Thanh, Chanh Hung, Tan Hung);
- All 110 kV equipment are indoor GIS type;
- Control and protection equipment;
- Communication and SCADA system.

4. The new 6.5 km 220 kV overhead (OHL) and underground (UGC) transmission line is needed to connect the new District 8 substation to Binh Chanh substation (Nam Sai Gon). The need for a combination of OHL and UGC responds to the extent of urban development that has occurred under the existing line which dictates the UGC section in order to reduce cost.

## **B. Potential Impacts and Mitigation**

5. The IEE of the 220 kV District 8 Substation and upgraded 220 kV transmission 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 boat traffic 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). There are no rare or endangered wildlife, critical habitat, or protected areas in the subproject site which is located in high density urban, and peri-urban areas.

6. Some residential and commercial land will be permanently and temporarily lost due to the subproject. The lost land and compensation is addressed in detail in the Resettlement Plan (RP) prepared under separate cover.

7. The upgrading of the above ground (OHL) portion of the 110 kV transmission line from Binh Chanh Substation to 220 kV will occur on the existing RoW which means that the impact footprint of the RoW already exists. The construction-related disturbances to the environment and community concern the short-term disturbances caused by the civil works that will occur to upgrade the footings and replace the towers at the existing tower bases.

8. The underground (UGC) section of the 220 kV line will diverge from the 110 kV OHL and will be trenched along urban streets and under a canal to the new 220 kV substation site. The construction-related impacts and disturbances associated with the placement of the UGC section will be minimized with all work on the trenched line being conducted between 23:00 and 06:00, including restoration of roadway sections for normal daily use.

9. There are no perceived negative induced, or cumulative environmental impacts of the subproject. The objective of providing needed additional electrical power to southern HCMC supports the overall goal of urban and socioeconomic development in the city.

10. The Environmental Management Plan (EMP) prepared for the subproject provides a 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/ESU in environmental management and assessment as focused on the implementation of the EMP.

## **C. Conclusions**

11. The IEE concludes that the feasibility 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) of the subproject is not required.

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## II. INTRODUCTION

### A. Background to IEE

12. The 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 associated substations to supply their medium voltage (MV) distribution system. The Project also aims to strengthen the institutional capacities of Ha Noi Power Corporation (EVN HANOI) and Ho Chi Minh City Power Corporation (EVNHCMC) that are responsible for the supply of power in their respective areas. Additionally, the project includes a smart grid component financed by the Clean Technology Fund (CTF).

13. The Project in Ho Chi Minh City and Ha Noi consists of eight core subprojects (Table 1) that were originally defined by Electricity of Viet Nam (EVN).

**Table 1. Core Subprojects Forming the Project in Ho Chi Minh and Ha Noi<sup>1</sup>**

<b>Ho Chi Minh City</b>
<b>EVNHCMC</b>
<ul style="list-style-type: none"><li>• New 220 kV District 8 Substation</li></ul>
<ul style="list-style-type: none"><li>• Upgrading of existing 110kV to 220 kV transmission line from Nam Sai Gon (Binh Chanh) substation to the new District 8 Substation</li></ul>
<ul style="list-style-type: none"><li>• New 110 kV Tham Luong Substation</li></ul>
<ul style="list-style-type: none"><li>• New 110 kV underground transmission line to Tham Luong Substation</li></ul>
<b>Ha Noi</b>
<b>EVN HANOI</b>
<ul style="list-style-type: none"><li>• New Noi Bai Airport 110 kV Substation and associated 110 kV transmission line from existing Van Tri 220/110 kV Substation</li></ul>
<ul style="list-style-type: none"><li>• Upgrading of Phuong Liet 110 kV Substation</li></ul>
<ul style="list-style-type: none"><li>• Renovation of Son Tay 110 kV Substation</li></ul>
<ul style="list-style-type: none"><li>• Improving and upgrading of Tran Hung Dao 110 kV Substation</li></ul>

<sup>1</sup> Adapted from Project Inception Report 10/13

## **B. Consolidation of IEEs**

14. During the Project inception mission the eight core subprojects sites were visited, subproject documentation was reviewed, and meetings were held with EVN HANOI and EVNHCMC. The inception phase identified the need to consolidate the core subprojects in order to maximize the coherence and overall usefulness of the Initial Environmental Examinations (IEE) of the core subprojects. The original eight core subprojects were consolidated into the following four IEEs:

### **EVNHCMC:**

- 1) New District 8 220 kV Substation and upgraded 220kV transmission line
- 2) New Tham Luong 110 kV Substation and underground transmission line

### **EVN HANOI:**

- 1) New Noi Bai 220 kV Substation and over- and underground transmission line
- 2) Rehabilitation/upgrade of Tay Son, Phuong Liet, and Tran Hung Dao 110 kV Substations

15. The IEE presented herein addresses the new District 8 220 kV Substation and upgraded 220kV transmission line in HCMC. The IEEs for the other 3 consolidated core subprojects are found under separate cover.

## **C. Assessment Context**

16. The Project was assigned Environmental Category B pursuant to the ADB's Safeguard Policy<sup>2</sup> and recent good practice sourcebook guidance<sup>3</sup>. A category B project will have potential adverse impacts that are less adverse than the impacts of category A project, are site-specific, largely reversible, and can be mitigated with an environmental management plan<sup>4</sup>. The IEE was prepared for the consolidated District 8 220 kV Substation and Transmission Line core subprojects in the feasibility design stage using available data and information on sensitive ecological and cultural receptors that exist for the subproject site.

17. The detailed designs for the District 8 220 kV Substation and Transmission Line subproject will follow subproject approval. The Environmental Management Plan (EMP) that has been prepared for the subproject (Section X) will need to be updated where necessary to meet the final detailed designs of the subproject.

## **III. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK**

18. The District 8 220 kV Substation and Transmission Line subproject will be implemented according to the directives set down for use of Official Development Assistance (ODA) by GoV

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<sup>2</sup> ADB, 2009. Safeguard Policy Statement, ADB Policy Paper.

<sup>3</sup> ADB, 2012, Environmental Safeguards, A Good Practice Sourcebook, Draft.

<sup>4</sup> Footnote 2, pg 19.

Decree No. 131/2006/ND-CP which was promulgated November 9, 2006, and in accordance with the provisions of the parent Sector Project.

#### **A. Viet Nam Regulatory Framework for Environmental Assessment**

19. The Viet Nam Law on Environmental Protection (LEP 2005) prescribes the requirements for environmental assessment (EA) for development and domestic project interventions that affect the natural and social environments. Government Decree 29/2011/ND-CP on strategic environmental assessment (SEA), environmental impact assessment (EIA), and environmental protection commitment (EPC) in conjunction with Circular 26/2011/TT-BTNMT on stipulation of specific articles of Decree 29 both elaborate the EA requirements specified by the LEP (2005). Decree 29 and Circular 26 are implemented in conjunction with Decree 80/2006/ND-CP, and Decree 21/2008/ND-CP (see below).

20. The updated screening criteria of Decree 29 distinguish projects that require an Environmental Impact Assessment (EIA) from projects requiring the simpler Environmental Protection Commitment (EPC). The difference between the two processes reflects the level of assessment, and final review and appraisal that is required. At the time of writing Decree 29 requires that an EIA be prepared for the District 8 220 KV Substation and Transmission Line subproject.

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

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

- Law on Environmental Protection No. 52/2005/QH11, in effect on June 12, 2005;
- Law on Water Resources No 08/1998/QH10.
- Biodiversity Law 20/2008/QH12 dated 13th November 2008
- Cultural Heritage Law 28/2001/QH10 dated 29th June 2001
- Land law No.13/2003/QH11 dated 26<sup>th</sup> November 2003
- Decree No. 29/2011/ND-CP, dated April 18, 2011, on Regulating Strategic Environmental Assessment, Environmental Impact Assessment and Environmental Protection Commitment.
- Circular No. 26/2011/TT-BTNMT dated on 08/12/2011 by the Ministry of Natural Resources and Environment on Guidance for Strategic Environmental Assessment, Environmental Impact Assessment, and Environmental Protection Commitment.
- Decree No.12/2009/ND-CP which replaces Decree No. 16/2005/ND-CP and Decree No. 112/2006/ND-CP on Investment Management on Construction Projects.
- Decree No.21/2008/NĐ-CP dated on 28/02/2008 about Amendment and Addition of Some Articles in Decree No.80/2006/NĐ-CP dated on 09/8/2006 by the Government.

- Decree No.59/2007/NĐ-CP dated on 09/4/2007 by the Government about Solid Waste Management.
- Decree No. 117/2009/ND-CP Regulation on sanctioning administrative violations in environmental protection, issued: 31/12/2009
- Decree No. 04/2009/ND-CP, Incentives and support for environment protection activities, issued: 14/01/2009.
- Decree 110/2002/ND-CP, supplementing some Articles of Decree 06/1995 on Labour Code of Occupational Safety and Health
- Decree 06/1995, Elaborating Provisions of Labour Code on Occupational Safety and Health.
- Decree No.140/2006/NĐ-CP dated on 22/11/2006 by the Government which regulates Environmental Protection, Designing, Approval and Implementation of Development Strategies, Plans, Programs and Projects.
- Decree No.80/2006/NĐ-CP dated on 09/8/2006 about Guiding for the Implementation of Some Articles in the Law on Environmental Protection (2005).
- Decree No.149/2004/NĐ-CP dated on 27/7/2004 about Issuing Permits for Water Resource Exploration, Exploitation and Utilization and Permits for Discharge to Water Bodies.
- Decision No.16/2008/QĐ-BTNMT dated on 31/12/2008 by the Ministry of Natural Resources and Environment about Promulgation of the National Technical Regulations for the Environment.
- Decision No.18/2007/QĐ-BTNMT dated on 05/11/2007 about Promulgation of Statistic Indicator System for the Field of Natural Resources and Environment.
- Decision No.23/2006/QĐ-BTNMT dated on 26/12/2006 about Promulgation of the List of Hazardous Waste.
- Decision No.27/2004/QĐ - BXD dated on 09-11-2004 by the Minister of Ministry of Construction on the promulgation of TCXDVN 320:2004 "Landfill for hazardous waste – Design standards"
- Decision No.22/2006/QĐ-BTNMT dated on 18/12/2006 about Obligations to Apply Vietnamese Standards for the Environment.
- Decision No.233/2006/QĐ-TTg dated on 18/10/2006 about approving the National Program on Labor Protection, Safety and Sanitation up to 2010.
- Decision No.1222/QĐ-BTNMT dated on 20/09/2006 about Organization of Reception and Progressing Recommendations from Individuals, Organizations and Enterprises on Aspects which are managed by Ministry of Natural Resources and Environment.
- Decision No.35/2002/QĐ-BKHCHNMT dated on 25/6/2002 about Promulgation of Series of Vietnamese Standards for the Environment.
- Decision No.60/2002/QĐ-BKHCHNMT dated on 07/8/2002 about Promulgation of the Guidance for Disposal of Hazardous Wastes.

- Decision No.3733/2002/QĐ-BYT issued by Ministry of Healthcare dated on 10/10/2002 About the Application of 21 Labour Health and Safety Standards
- Decision No.155/1999/QĐ-TTg dated on 16/7/1999 by the Government on Promulgation of the Management Mechanism for Hazardous Waste.
- Decision No.505 BYT/QĐ, dated on 13/4/1992 by the Ministry of Healthcare on the Regulation for Allowed Concentrations.
- Circular No. 16/2009/BTNMT and No. 25/2009/BTNMT on Promulgation of Vietnamese National Standards.
- Circular No.10/2007/TT-BTNMT dated on 22/10/2007 about Guidance for Assurance and Control of the Quality of Environmental Monitoring.
- Circular No.12/2006/TT-BTNMT dated on 26/12/2006 by the Ministry of Natural Resources and Environment on Guidance for Practice Conditions, Procedures for Application, Registration, Endorsement and Issuing the Code for Hazardous Waste Management.

## **Environmental Standards and Regulations**

### **Water quality:**

- QCVN 01:2008/BYT – National technical regulations on quality of drinking water
- QCVN 08:2008/BTNMT – National technical regulations on quality of surface water
- QCVN 09:2008/BTNMT – National technical regulations on quality of groundwater
- QCVN 10:2008/BTNMT – National technical regulations on quality of about coastal water
- QCVN 14:2008/BTNMT – National technical regulations on quality of domestic wastewater
- QCVN 24:2008/BTNMT– Industrial wastewater discharge standards
- QCVN 02:2009/BYT - National standard of domestic water supply
- TCVN 5502:2003 – Supplied water – Requirements for quality
- TCVN 6773:2000 – Water quality – Water quality for irrigational purposes
- TCVN 6774:2000 – Water quality – Water quality for aquaculture protection
- TCVN 7222:2002 – Water quality for concentrated domestic WWTP
- TCVN / QCVN - Standard methods for analyzing environmental quality

### **Air Quality:**

- QCVN 05:2008 – Standards for ambient air quality
- QCVN 06:2008 – Maximum allowable concentration of hazardous substances in the ambient air
- TCVN 6438:2001 – Maximum permitted emission limits of exhausted gases from vehicles

### **Solid Waste Management:**

- TCVN 6696:2009 – Solid waste – Sanitary landfill. General requirements for environmental protection.
- QCVN 07:2009– National technical regulations for classification of hazardous wastes
- QCVN 25:2009 – National technical regulations for wastewater of solid waste sites
- QCVN 15:2008/BTNMT: - National regulation on allowable pesticide residues in soil
- QCVN 03:2008/BTNMT: - National regulation heavy metals concentrations in soil

### **Vibration and Noise:**

- QCVN 26:2010/BTNMT: national technical standard for noise

- TCVN 6962: 2001 Allowable vibration level for public and residential areas
- TCVN 6962:2001: - Allowable vibration and shock from construction activities

#### **International Guidelines**

- World Bank Group, 2007. Environmental Health and Safety Guidelines, Wash. DC.
- AWWA Standard Methods for Measurement and Analysis Environmental Quality

#### **Specific regulations for resettlement and compensation**

- Decree No. 197/2004/ND-CP dated 03/12/2004, on compensation support, and resettlement
- Circular 14/2009/TT-BTNMT dated 01/10/2009, on detailed regulations on compensation, support and resettlement.

#### **Directives of Electrical Power Industry in Viet Nam and Ho Chi Minh City**

- Electricity Law, No. 28/2004/QH11, Issued: 03/12/2004
- Government Decree, No. 81/2009/NĐ-CP, on the safety protection of high-voltage power grids, Issued 17/08/2005
- MIT Circular, No. 03/2010/TT-BCT, on safety protection of high-voltage power grid works, Date issued: 22/01/2010
- Decision No. 6493/QĐ-BCT dated 09/12/2010, Approved electricity development plan in Ho Chi Minh City period up to 2015 and 2020.

#### **International Environmental Management Conventions**

22. Viet Nam is signatory to the following relevant international conventions:
- 2009, Stockholm Convention on Protection of Human Health and the Environment from Persistent Organic Chemicals [including PCBs]
  - 1971, Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar)
  - 1982, Protocol to Amend the Convention on Wetlands of International Importance Especially as Waterfowl Habitat, Paris
  - 1972 Convention Concerning the Protection of the World Cultural and Natural Heritage October 1987]
  - 1973, Convention on International Trade in Endangered Species Wild Fauna and Flora
  - 1985 FAO International Code of Conduct on the Distribution and Use of Pesticides
  - 1985 Vienna Convention for the Protection of the Ozone Layer
  - 1987 Montreal Protocol on Substances that Deplete the Ozone Layer

- 1992, Copenhagen Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, Copenhagen
- 1989, Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal
- 1992, United Nations Framework Convention on Climate Change
- 1992, Convention on Biological Diversity

### **C. ADB Safeguard Policy**

23. The ADB Safeguard Policy Statement (ADB SPS, 2009) along with the recent good safeguard practice sourcebook clarify the rationale, scope and content of an EA 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).

24. 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. Appendix A presents the Rapid Environmental Assessment (REA) of the District 8 substation and transmission line.

## **IV. DESCRIPTION OF SUBPROJECT**

25. The District 8 substation and transmission line subproject consists of the two major components defined by: 1) new the 220 kV Substation; 2) new 220 kV OHL and UGC transmission line. The description of the subproject which is adapted from the Project Draft Final Report is provided below and shown in Figure 1.

### **A. 220 kV District 8 Substation**

26. The main objective for constructing the new substation<sup>5</sup> is to ensure the sustainability of the N-1 condition for 220 and 110 kV grid network, and provision of overload relief of nearby substations in District 8. This entails: supplying power for the 110 kV Phu Dinh, Chanh Hung, Hung Vuong and Tan Hung substations; reinforcing electrical supply capability for District 8 and other neighbour areas; preventing overload of the 220 kV Nha Be, Tao Dan Substation and 110

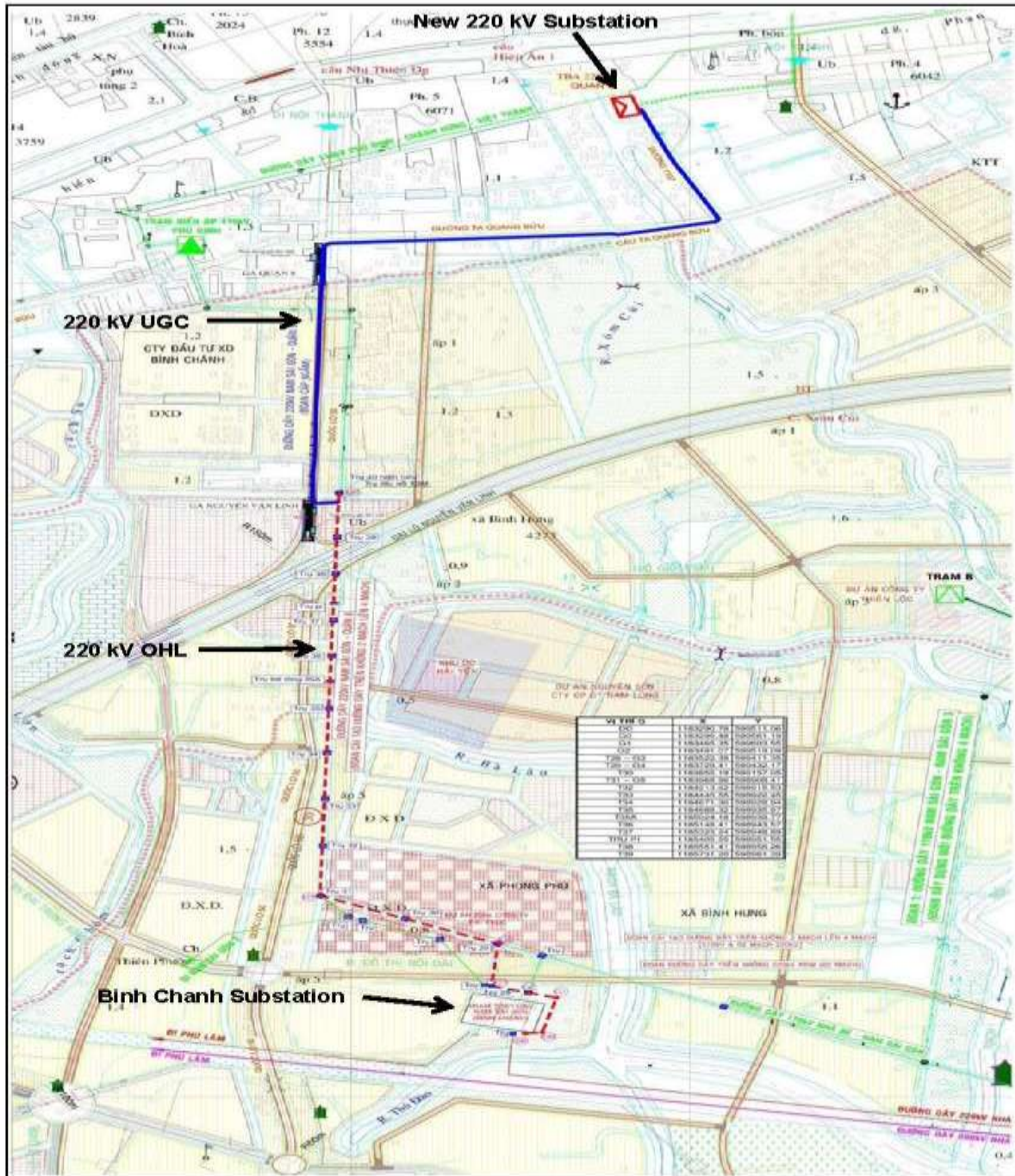
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<sup>5</sup> Adapted from Draft Final Report



kV Nam Sai Gon – Phu Dinh T/L; and linking 220 kV-110 kV power grid in the southern region and ensuring national energy security.

Figure 1. Location of 220 kV Transmission Line and Substation in District 8 in HCMC



27. The new substation is situated in 1027 Pham The Hien Road, Ward 5, District 8, HCMC. The main features of the substation are summarized as follows:

- Substation will occupy 3,915 m<sup>2</sup>;
- 2x250 MVA, 220/110/22 kV substation;
- 220 kV side: double busbar diagram with bus-tie;
- 220 kV bays: two transformer bays, two T/L outgoing bays (Nam Sai Gon 1, Nam Sai Gon 2), one bus coupling bay;
- All 220 kV equipment to be indoor GIS type;
- 110 kV side: double busbar diagram with bus-tie;
- 110 kV bays: two 250 MVA transformer bay, two 63 MVA transformer bay, one bus coupling bay, six T/L line outgoing bays (Phu Dinh 1, Phu Dinh 2, Hung Vuong, Ben Thanh, Chanh Hung, Tan Hung);
- All 110 kV equipment are indoor GIS type;
- Control and protection equipment; and
- Communication and SCADA system.

**B. 220 kV Transmission Line and Underground Cable**

28. The new 220 kV overhead (OHL) and underground (UGC) transmission line<sup>6</sup> is needed to connect the new District 8 substation to Binh Chanh substation (Nam Sai Gon). The need for a combination of OHL and UGC responds to the extent of urban development that has occurred under the existing line which dictates the UGC section in order to reduce cost. For example, at some sections of the line corridor there is no access to the existing 110 kV tower to upgrade to 220 kV tower, and as a result an UGC along the road is only option. Key details of the OHL and UGC are summarized in Table 2.

**Table 2. Key Features of 220 kV Transmission Line**

Length	6.5 km.
Open trench width for UGC	0.75 m
Voltage level	220 kV, 110 kV.
Number of circuits:	+ Independent circuits: 02 circuits of 220 kV
Beginning point	220 kV busbar - 220 kV Binh Chanh substation
Ending point	220 kV busbar - 220 kV District 8 substation
Conductor	ACSR- ≥400 XLPE-
Form design	Underground cable: inserted in HDPE Φ25 and buried beneath the road.

<sup>6</sup> Footnote 5

	Overhead line: using geometric steel pole and single steel pole, using pile foundation and reinforced concrete foundations. Ensure the safety distance as required by the current rules of equipping electricity and the Decree of the Government N° 106 and 81.
	Location: follows the existing corridor of 110 kV Binh Chanh – Phu Dinh line (with expanding the existing corridor) and underground along national road 50, Ta Quang Buu and road 1107.

## V. DESCRIPTION OF AFFECTED ENVIRONMENT

29. The environmental baseline was obtained primarily from HCMC Statistical Yearbooks, state of the environment reports (SoER) prepared by HCMC DoNRE, reports from PECC3, and supplemented from the literature including other EAs conducted for the same area. The description of affected environments focuses on natural features and land use.

### A. Physical Environment

#### 1. Climate

30. The subproject area is situated in the Southern Climate Zone which is typified by a tropical monsoon climate characterised by high temperatures with very little seasonal variation. Annual average temperature for lowland areas are constant within a narrow range of 27.2 - 27.7°C. The highest temperature is 40°C (April) and the lowest temperature is 13.8°C (January). Average sunshine is 2,400 hr/yr to 2,700 hr/yr. The subproject area belongs to wet and hot monsoon tropical climate region with characteristic of the South climate as summarized below. Temperature regime at Tan Son Nhat Meteorological station is summarized in Table 3.

**Table 3. 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	T <sub>max</sub> °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
(long-term average)	T <sub>min</sub> °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 <sub>average</sub> °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 (2011)	T <sub>average</sub> °C	26.9	27.6	28.3	29.11	29.5	28.5	27.9	28.4	28.1	28.1	28.1	27.2	28.1

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 2011 of HCMC)

31. According to the report of the Working Group on Climate Change and Development, (2007), in the Mekong region (Ho Chi Minh City) average temperatures over the last century, have risen between 0.3 to 0.8°C. Further temperature increases are expected along 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.

**a. Sunlight hours**

32. Average sunlight in Ho Chi Minh City is high as compared with other areas in Viet Nam. Number of sunlight hours in a year is of 1800 - 2500 hours or more. Table 4 shows the average sunlight at Tan Son Hoa and Tan Son Nhat meteorological station.

**Table 4. Average Sunlight (Hr) at Tan Son Nhat & Hoa**

Station	Months (hr)												
	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	2489
Tan Son Hoa (2011)	120.1	188.9	157.8	187.0	165.0	163.6	162.6	198.1	144.8	154.3	141.0	109.7	1892.2

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 2011 of HCMC)

**b. Humidity and Rainfall**

33. The subproject area is humid with little difference in rainfall between the monsoon seasons. Annual average humidity is about 78% - 82 %. The rainfall regime is separated into two seasons: rainy season from May to October; and dry season from November to April. Maximum rainfall in the region is 200 mm per day. Total annual average rainfall in the region is from 1800 mm to 2000 mm (Table 5).

**Table 5. Monthly and Annual Average Rainfall and Humidity at Tan Son Nhat Station**

	Months (mm)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
<b>Rainfall</b>	12	4	13	51	207	294	307	281	305	291	135	28	1926
<b>Humidity (%)</b>	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
<b>Humidity (%)</b>	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; data of Tan Son Hoa station %, statistic yearbook 2011 of HCMC

### c. Wind velocity

34. 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 with 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 6).

**Table 6. Wind Velocity and Number of Thunderstorm-days at Tan Son Nhat Station**

Parameters	Months, year												Year
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
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

35. Air quality in HCMC is monitored frequently and focused on pollutants from traffic activity. 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 7.

**Table 7. Air Pollutants at 6 locations in 2012/2013**

		Hang Xanh	DTH-DBP	Phu Lam	An Suong <sup>7</sup>	Go Vap	HTP-NVL
CO (mg/m <sup>3</sup> )	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 <sup>3</sup> )	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%

<sup>7</sup> An Suong station is nearest to project site located 1.5 km north at An Suong intersection, District 12.

		Hang Xanh	DTH-DBP	Phu Lam	An Suong <sup>7</sup>	Go Vap	HTP-NVL
Lead (mg/m <sup>3</sup> )	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 <sub>2</sub> (mg/m <sup>3</sup> )	Average 2012	0.17	0.21	0.18	0.21	0.18	0.17
	Average first half 2013	0.15	0.19	0.17	0.2	0.17	0.17
Noise (mg/m <sup>3</sup> )	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)

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

37. The second pollutant is dust which is also a serious concern. In 2012, dust levels at the 6 stations were from 0.44 – 0.65 mg/m<sup>3</sup>, with 96% of them over the permitted standard of 0.30mg/m<sup>3</sup>. 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<sup>3</sup>, with 95% over the standard.

38. NO<sub>2</sub> content was 0.17 – 0.21 mg/m<sup>3</sup> in 2012, and 0.15-0.20 mg/m<sup>3</sup> in the first 6 months of 2013. Overall, this content has 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. Air quality at 2 locations of the subproject area is summarized in the Table 8.

**Table 8. Air Quality at Subproject Area**

Position	Noise (dBA)	The concentration of pollutants (mg/m <sup>3</sup> )			
		Total dust	CO	SO <sub>2</sub>	NO <sub>2</sub>
KK1	58.1	0.215	4.26	0.086	0.057
KK2	55.2	0.243	4.51	0.076	0.065
<b>QCVN 05:2009/BTNMT</b>		<b>0.3</b>	<b>30</b>	<b>0.35</b>	<b>0.2</b>
<b>QCVN 26:2010/BTNMT</b>	<b>≤70</b>				

(Source: Result of integrated air quality division, 2013)

KK1 = Tower No.38, Nha Be-Phu Dinh 110kV T/L, 10°43'9.44"N; 106°39'23.28"E

KK2 = The area of the 220 kV substation, District 8, 10°44'26.51"N; 106°39'52.05"E

39. Table 8 indicates that the air quality in the subproject area is very good. All air quality parameters at the measurement points meet the standard of QCVN 05:2009/BTNMT and QCVN 26:2010/BTNMT.

### **3. Topography, Geology and Soils**

40. 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.

- a) 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 at 32 meters.
- b) 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.
- c) 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.

41. Geology of Ho Chi Minh City consists of exposed Pleistocene and Holocene sediment. Pleistocene sediment occupies most of the region in the north, northwest and northeast of the city. Under the influence of natural factors and human activities, ancient alluvial deposits formed a type of distinctive soil: gray soil. With more than 45 thousand hectares, or about 23.4 % of the city area, gray soil in Ho Chi Minh City has three categories: high gray soil, gray soil with patchy layer of red and yellow and grey gray soil pretty rare. Holocene sediment in Ho Chi Minh City was formed by many sources: the sea, bays, rivers, alluvial ground, etc. which formed many different types of soil: marine alluvial soils with 15,100 hectares, alkaline soil with 40,800 hectares and salty alkaline soil with 45,500 ha. In addition, there are about 400 hectares of "sand bar" near the sea and brown yellow feralite eroded and exposed stones on the hills.

42. The terrain of subproject area is mostly flat with many rivers/canals in this area. The infrastructure of area is well developed. The main roads to access the subproject include: Highway 50, Ta Quang Buu St., Road 1107 and some rural routes.

#### **a. Soil**

43. The soil of Ho Chi Minh City was formed upon two sediment classes: Pleistocene and Holocene, in which Hoc Mon district and district 12 belonging to the Pleistocene sediment - ancient alluvial sediment. Main characteristics of the sediment class are hilly terrain, with a depth range of 3 to 25 meters, and oscillation in the southeastern direction. Due to the combined effects of natural factors, including creatures, climate, time and human activities, and erosion and decomposition, the sediment class has developed into grey soil.

### **i. Alluvial soil**

44. Alluvial soil formed in the highlands terrain, which is as deep as 1.5-2 meters, include the areas of Hoc Mon district. The alluvial soil is classified into three types: alluvial soil with speckled layers, grey alluvial soil, and sweet alluvial soil. The main mechanical constituent of the alluvial soil is clay with a medium to high amount. Surface layers have a pH of 4.2 to 4.5. The pH degree of deeper layers is up to 5.6 or 6.0 but the acidity is higher. The soil has medium humus content and fairly high nutrient content. In general, the alluvial soil is fertile and suitable for growing high-yielding paddy.

45. According to the results of field survey and analysis in the laboratory, soil in the subproject area is divided into the following layers:

Layer 1: covered soil: fine sand, clay loam, clay loam with rounded material. The average thickness from 0.5 to 1.0m.

Layer 2: clay loam with colors such as green grey, gold grey, red brown, damp soil, soft–hard plastic state. This layer only appeared at bored hole No.1 of the survey for underground cable. This layer has 1.3 m in thickness.

Layer 3: clay with colors such as brown grey, gold grey, red brown, damp soil, medium hard – hard state. This layer appeared at all the bored holes of the survey items for both underground cable and substation. This layer has from 5.8 to over 15m in thickness (this layer still appeared even at the deepest point (40m) of the bore hole No.1.

Layer 4: clay sand with colors such as green grey, gold grey, red brown, damp soil, plastic state. The layer only appeared in the two bored hole. The layer has 1.9-5m in thickness.

Layer 5: salty sand with grey, gold grey colors, water-saturated soil, loosed state. This layer only appeared at the bore hole No.1 of the survey for underground cable. This layer has 5.0 m in thickness.

Layer 5a: medium - crushed sand with black grey, green grey, gold, water – saturated soil, and compact state. The layer only appeared in the two bore hole. The layer has 5.0 – 7.5m thickness.

### **4. Surface water / groundwater resources**

46. Ho Chi Minh City has a diverse river system. Dong Nai River has mean flow about 20–500 m<sup>3</sup>/s, supplying 15 billion m<sup>3</sup> 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<sup>3</sup>/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, and Nhieu Loc-Thi Nghe.



47. The rivers and canals in Ho Chi Minh City are influenced by the semi-diurnal tidal fluctuations of the East Sea which penetrates deep into the canals in the city. The highest average water level of tide is 1.10 m. The highest water level often occurs in October or November, the lowest water level can occur in June or July. In the dry season, discharge collected from the upstream rivers is small, salinity of 4‰ can penetrate in the Saigon River. In the rainy season, discharge from the upstream rivers is high, so salinity is pushed back farther and decrease significantly.

48. Near the subproject area, there are many canals such as the Hiep An River, Doi channel, Bo De canal, Xom Cui ditch, etc. These rivers and canals are influenced by semi-diurnal tides, the tide rises and falls twice every day.

49. The groundwater of the southern part of the city (including the subproject area) usually acquired alum or salt due to Holocene sediment, 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

50. 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, from which, three stations are near to the subproject site (Phu Cuong, canal N46, and Rach Tra), and 10 stations monitoring water surface of canals inner the city, including 1 station monitoring Tham Luong – Vam Thuat canal, which is near to the subproject site.

51. Overall, the quality of supply water is clean in terms of biochemical and chemical oxygen demand as well as coliform contents while the quality of water in canals inner the city is seriously contaminated. Tables 9 and 10 show some parameters measured in the stations close to the subproject sites in 2012 and 2013, respectively.

**Table 9. Surface Water Quality Near Subproject Area, 2012**

No	Station	pH	DO (mg/l)	COD (mg/l)	BOD <sub>5</sub> (mg/l)	Oil (mg/l)	Coliform (MPN/100 ml)
<i>I</i>	<b><i>Monitoring results of surface water quality for other purposes</i></b>						
	Binh Dien	6.9	1.9	10	6.4	0.031	9,186
	QCVN 08:2008/BTNM T column B1	<b>5.5-9</b>	<b>≥4</b>	<b>&lt;30</b>	<b>&lt;15</b>	<b>0.1</b>	<b>7,500</b>
<i>II</i>	<b><i>Monitoring results of the water quality from canals</i></b>						

No	Station	pH	DO (mg/l)	COD (mg/l)	BOD <sub>5</sub> (mg/l)	Oil (mg/l)	Coliform (MPN/100 ml)
	Doi - Te (high tide)	6.9		43.2	14.2		2.1 X10 <sup>5</sup>
	Doi - Te (low tide)	6.9		20.7	11.9		7.0X10 <sup>4</sup>
	QCVN 08:2008/BTNMT column B2	5.5-9		<25	<50		<10,000

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

QCVN 08:2008/BTNMT: national technical regulation on surface water quality. Specifically, Column A1 means good use for drinking water and others, B1 – use for irrigation or relevant purposes, B2 – use for waterway traffic

TCXD 33:2006: water supply distribution system and facilities – design standard. Binh Dien station is about 5km west of subproject site. Doi – Te system station is about 2.5 km northwest of subproject site

**Table 10. Surface Water Quality Near Subproject Area, 2013**

No.	Station	pH	DO (mg/l)	COD (mg/l)	BOD <sub>5</sub> (mg/l)	Oil (mg/l)	Coliform (MPN/100 ml)
<b>I</b>	<b>Monitoring results of surface water quality for other purposes</b>						
	Binh Dien	6.8	1.6	10.5	5.5	0.028	1,550
	QCVN 08:2008/ BTNMT column B1	<b>5.5-9</b>	<b>≥4</b>	<b>&lt;30</b>	<b>&lt;15</b>	<b>0.1</b>	<b>7,500</b>
<b>II</b>	<b>Monitoring results of the water quality from canals</b>						
	Doi - Te (high tide)	7.0		25	10.5		216,921
	Doi - Te	6.9		24.0	4.70		458,594

No.	Station	pH	DO (mg/l)	COD (mg/l)	BOD <sub>5</sub> (mg/l)	Oil (mg/l)	Coliform (MPN/100ml)
	(low tide)						
	QCVN 08:2008/ BTNMT column B2	5.5-9		<25	<50		<10,000

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

52. Tables 8 and 9 show that “other purpose water” has coliform and DO that exceed the standard level. Between 2012 and the first half of 2013, the parameters such as pH, BOD<sub>5</sub>, COD decreased both in the water-body for other purpose and the canals. It indicates that the environmental management of the surface water quality is better in the first half 2013 than that in 2012.

53. PECC3 conducted an analysis of water quality in the subproject area in April 2013. The values of analyzed parameters were compared with that from the B1 column of QCVN 08:2008/ BTNMT, that are applied for surface water used for irrigation purposes and for other similar purposes (Table 11).

**Table 11. Surface Water Quality Near Subproject Area**

Parameter		pH	TSS	BOD <sub>5</sub>	COD	Total of Nitrogen	Total of Phosphorous	Coliform
Unit		-	mg/L	mg/L	mg/L	mg/L	mg/L	MPN/100mL
NM1		6.57	54	16	30	5.48	0.43	31x10 <sup>2</sup>
NM2		6.71	110	15	27	5.12	0.37	23x10 <sup>2</sup>
<b>QCVN 08:2008 /BTNMT</b>	<b>B1</b>	<b>5.5-9</b>	<b>50</b>	<b>15</b>	<b>30</b>	<b>10</b>	<b>0.3</b>	<b>7,500</b>
	<b>B2</b>	<b>5.5-9</b>	<b>100</b>	<b>25</b>	<b>50</b>	<b>15</b>	<b>0.5</b>	<b>10,000</b>

NM1 = Rach Ngang Bridge, Phong Phu, Binh Chanh, 10°43'14.31"N; 106°39'28.05"E

NM2 = Ta Quang Buu Bridge, Ward 5, Dist. 8, 10°44'5.42"N; 106°39'56.63"E

54. According to the standard of TSS, COD and BOD<sub>5</sub> of column B1 given in Table 11, the river water is slightly contaminated especially at location NM1. The reason is due to the stagnant water amount of the canals, ditches and these sampling locations are near the place where public garbage is collected. The concentration of TSS at location NM2 is high. It exceeds the B2 criteria because the sampling location is the place where the river has greatly changed in the vertical as well as horizontal direction. There is no water surface source directly impacted by the subproject's construction and operation.

**a. Groundwater quality**

55. Groundwater in HCMC is polluted by microorganisms, especially at Pleistocene layer. Binh Chanh district is one of locations where layer are contaminated by alum. Water quality of upper and under Pliocene layers at Binh Chanh district and District 8 is relatively good (Table 12).

**Table 12. Groundwater Quality at Binh Hung Station Near Binh Chanh Dist. and Dist. 8**

Binh Hung Stations	pH	TDS	hardness	NO <sub>3</sub> -	Fe	Total Coliform	Fecal Coliform
		mg/l	mgCaCO <sub>3</sub> /l	mg/l	mg/l		
<b>Pleistocene layer</b>							
2012	6	5926	1176	6.33	4.22	1688	153
First 6 month 2013	7.8	3375	958.78	3.9	3.06	581	45
<b>Under Pliocene layer</b>							
2012	5.93	5620	1228.37	5.16	4.08	3068	800
First 6 month 2013	4.26	136	45.55	22.69	0.53	580	0
<b>QCVN 09:2008/BTNMT</b>	<b>5.5-8.5</b>	<b>1500</b>	<b>500</b>	<b>15</b>	<b>5</b>	<b>3</b>	<b>0</b>

*(Source: Reports on monitoring results of environmental quality in HCMC in 2012, from Environmental Monitoring and Analysis Centre – DONRE of HCMC)*

56. The groundwater quality of Pleistocene Layer at Binh Hung station in 2012 and 2013 when compared with QCVN 09:2008/BTNMT shows high TDS, hardness, total coliform and fecal coliform that exceed the permitted values. Only NO<sub>3</sub><sup>-</sup> and Fe meet the QCVN standard. The groundwater quality of upper Pliocene Layer at Binh Hung station in 2012 was high in TDS, hardness, total coliform and faecal coliform values which exceeded the permitted values. Only NO<sub>3</sub> and Fe parameters met standard. However in 2013, TDS and hardness rapidly decreased to several times lower than the standards and NO<sub>3</sub><sup>-</sup> value is higher than the standard. It may be caused by the filling of ground water level with rain water.

## B. Biological Environment

### 1. Vegetation and Land Use

57. Binh Chanh District has a natural area of 25,255.29 ha with land types (agricultural and non-agricultural land) as follows: agricultural land of 17,172.64 ha, non-agricultural land of 7,963.99 ha and unused land of 118,67 ha. In agricultural land, there are forest land of 1047.85 hectares with 755.26 ha production forest, mainly pineapples, eucalyptus, etc. being exploited, particularly at Pham Van Hai commune, Le Minh Xuan commune; protection forest land of 262.67ha and special used forest of 29.92ha mainly acacia auriculiformis distributed in Le Minh Xuan commune. Overall, the district forest takes very small proportion, mainly natural secondary forest and planted forest. Plantation area of Binh Chanh District is both improving the ecological environment landscape and contributing to the supply of wood for construction (Melaleuca pile, etc.).

58. District 8 has an area of 1899.89 hectares with land-use rate still low. District 8 has 75 main roads, regional roads and internal roads with total length of 111.626m, , most of the roads concentrate in the old urban areas (Cui Hamlet, Hung Phu, Rach Ong, etc.). There are also 47 bridges, including 24 bridges for pedestrians. In recent years, in District 8, traffic density has been increasing, due to narrow roadways so traffic jam often occurs. About waterways, District 8 has 23 large and small canals, but they are rarely dredged and encroached by many houses along canals so water transportation is very difficult, and transportation of goods and passengers is reduced. In addition, as planned, District 8 has many industrial parks such as Binh Dang, Phu Dinh, Phu Loi 7, Ben Luc, etc. Vegetation cover of District 8 includes the Ward 4 park with area of 35.83 ha, Hiep An green tree park with area of 29ha, Xang Thoi park with area of 3 hectares, Da Nam park - Chu Y bridge and the landscapes along the canals have been cleared (at the Ben Binh Dong cleared area and houses along the canals).

59. Vegetation and land use systems occurring within the RoW is mostly residential area, which occupy 1.3 km of the RoW and pond area, which occupy 1.69km while the next most common feature is road which occupy 3.51km of the RoW. There is no undisturbed natural forest remaining anywhere within the RoW.

60. Vegetation and land use systems occurring within the substation is shown in Table 13 which shows that majority of the subproject land is substation area, which occupy 3,995 m<sup>2</sup> while pond area occupy 144 m<sup>2</sup>.

**Table 13. Vegetation and Land Use Within Subproject Area**

No	Section	Length (m)	Area* (m <sup>2</sup> )				
			Pond	Road	Residential area	Commercial area	Total
	Transmission line						
	Wire line						
1.	G1-G5	1,016	3,302				3,302

No	Section	Length (m)	Area* (m <sup>2</sup> )				
			Pond	Road	Residential area	Commercial area	Total
2.	G5-G6	1,980	2,210		4,225		6,435
	Underground line	3,510		14,040			14,040
<b>Total</b>			<b>5,512</b>	<b>14,040</b>	<b>4,225</b>	<b>0</b>	<b>23,777</b>
	Substation					3,995	3,995
<b>Total</b>			<b>144</b>	<b>0</b>	<b>0</b>	<b>3,995</b>	<b>4,139</b>
<b>TOTAL</b>			<b>5,656</b>	<b>14,040</b>	<b>4,225</b>	<b>3,995</b>	<b>33,916</b>

\* Area is calculated by Distance x safety zone along the line for 110kV and 220 kV

## 2. Wildlife

61. The area has been extensively changed and no original habitats remain in the area. No significant wildlife occurs any longer within the area. There are no climbing animals that could interfere with the transmission line. A check of websites e.g. Birdlife International does not identify any bird migration routes through Vietnam. The Asian Flyway does not pass through Vietnam and instead heads south through the Philippines.

## 3. Conservation Areas

62. There are no conservation areas within the proximity of the transmission line or site for substation.

## C. Socioeconomic condition

### 1. Population

63. The transmission line and substation is situated within Ho Chi Minh City and includes 2 districts with 2 communes and 1 ward<sup>8</sup>. The population within the immediate subproject area (as defined by communes through which the transmission line passes) is 133,558 persons with 74% of the population being rural-based and the remaining 26% as being urban-based. Population statistics for the subproject is located as shown in Table 14.

**Table 14. Population Distribution in Subproject Area**

<sup>8</sup> Wards are the urban equivalent of communes which are defined as being rural based communities.

District/	Commune/ Ward	Population (no)	Female	Male	Ethnic minority
Binh Chanh	Phong Phu (Rural)	61,298	31,323	29,975	Khmer and Chinese 40 households
	Binh Hung (Rural)	67,240	34,023	33,287	Chinese 17 households
District 8	Ward 5 (Urban)	34,401	18,113	16,288	No
<b>TOTAL</b>		16,2939	83,459	79,550	
<b>%</b>		<b>100%</b>	<b>51%</b>	<b>49%</b>	

Source: Commune statistics, 2013

## 2. Local Economy

64. 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 2012 decreased to 9,2% (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.

## 3. Social Infrastructure

### a. Public Health and Sanitation.

65. The location of the underground cable close to Ho Chi Minh City means that all communities have good access to medical services. Local medical facilities include healthcare stations at the commune level which includes first aid and medical assistance for minor illnesses and maternal services. Medical emergencies are referred to district hospitals while more complex surgery is carried out in the main hospitals in Ho Chi Minh City. Services and trained medical staff are increasing.

66. The incidence of HIV/AIDS in Ho Chi Minh is the highest in Vietnam. According to the "Analysis and Advocacy" subproject of USAID, the total number of people living with HIV in Ho Chi Minh City is expected to rise from 72,400 in 2006 to 89,900 in 2010 and 105,800 in 2020. In 2006, there were about 4,800 new AIDS cases in Ho Chi Minh City, in 2012 this figure was 1099 new cases which held 18.5% of total new cases in the whole country (According to report No. 755/BC-BYT of Health Ministry dated September 4<sup>th</sup> 2012). The number of people with HIV is 49,429 people based on the statistics in the first of 2012. Clients of sex workers have become the largest single group of new HIV infections. By 2005, almost 4,000 clients a year contracted

HIV. These and previous infections among men have led to an estimated 2,000 women per year being infected by their husbands by 2005. In 2006, there were about 4,800 new AIDS cases in Ho Chi Minh City. This will climb to an estimated 7,700 new cases in 2010. All three communes have sewer drainage system and wastewater treatment facilities that are operating well.

**b. Education**

67. Literacy is high in the area due to good access to primary and secondary schools, while technical and tertiary education is available in numerous colleges within Ho Chi Minh City. In 1995, the city achieved the standard to eliminate the illiterate situation and universalized primary education; 100 % of communes had primary schools and 80 % of them had junior high school. Education standard of citizens is being enhanced.

68. In 2002, Ho Chi Minh City Department of Education and Training received a souvenir flag and decision certifying to complete secondary education popularization awarded by Ministry of Education and Training and became the first locality in the country to achieve this standard. Since 2005, the education and training sector has continued to consolidate the popularization results of primary and secondary education, the city has added 3 districts obtaining the standard of secondary education popularization (District 1, District 3 and Binh Thanh District), so it has got 5 districts with universalized secondary education. Graduation exams at all levels are held safely and achieve good results (in which the percentage of students graduating from junior high school was 99.3 % and from high school was 90.3 %). The number of schools in the subproject area is presented in Table 16.

**Table 15. Number of Schools in Subproject Area**

Commune/ward	Kindergarten	Elementary school	Middle school	High school
Phong Phu	2 public and many private	2	2	0
Binh Hung	n.a	n.a	n.a	n.a
Ward 5	4	2	1	1

**c. Communications**

69. Infrastructure for transport, communications and electricity are being constantly improved so that people’s standard of living and access to services has improved appreciably. All households in the subproject area have TV and telephones. All communes/ward have their own mass communication facilities. The post office locations are a short distance for all people.

**d. Water and electricity**

70. In Phong Phu commune, 40% of households who live along road No. 50 have tap water, 60% of households use water from drilled/shallow wells. In Binh Hung commune and Ward 5, 100% of households have tap water. District 8 and Binh Chanh district are supplied with electricity from the national electricity grid network.



#### **e. Infrastructure for transport**

71. Infrastructure for transport 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. A network of provincial, district, commune and village roads also serve the area. Traffic in the subproject area is convenient with many important roads such as Nguyen Van Linh road, highway No. 50, and thickness of district-road system. Most of the roads in the subproject area are concreted and asphalted which is convenient to traffic movement of cars, buses, and tipper trucks.

#### **4. Cultural and Heritage Sites**

72. Cultural characteristics of former Saigon and Ho Chi Minh City today is quite a unique expression of the cultural character of the people of Vietnam in historical context - the space of the southern region. Saigon - Ho Chi Minh City is a convergence place of many different cultural currents in the historical process of formation and development. Its culture has been influenced by Vietnamese, Chinese, Cham, Khmer, Indian, etc., since Saigon became one of the centers of the country which received the French and American cultural influence over the rise and fall period of the country. The cultural structures are the Nha Rong wharf, Saigon Central Post Office, the Municipal Theatre (Saigon Opera House), National Ancestor Temple, City People's Committee office, Thong Nhat Palace, Ben Thanh market, etc.; the ancient temple system such as Giac Lam Pagoda, Ba Thien Hau Temple, Giac Vien Ancestor temple, etc.; ancient churches such as Saigon Notre Dame Cathedral, Huyen Sy, Thong Tay Hoi, Thu Duc, etc. This city has the diversity of religious beliefs with dozens of annual cultural festival and creates unity in cultural diversity of the southern region.

73. The PECC3 has compiled a list of cultural and heritage sites within the RoW and substation which are shown in Table 17. While there are several temples and other public infrastructure within the vicinity of the transmission line corridor, the RoW has been sited to avoid these structures. There are no distance criteria to justify the acceptability of the location of the RoW with regard to the transmission line. However, based on the subproject scale and activities, it can be confirmed that the subproject activities will not have an impact on those cultural heritage sites. PECC3 confirms that the separation distances are acceptable and as such none of these structures will be affected by the subproject.

#### **5. UXO Clearance**

4.3 After decades of war, UXO remains a significant issue in Vietnam. The presence of UXO along the RoW of transmission line was confirmed by the military headquarters. While most of UXO has been cleared from agricultural areas, the HCM Military HQ directs that particular attention should still be given to the RoW. It is a legal requirement that the safety of construction workers is ensured by having specialized army units clear UXO before construction commences<sup>9</sup>. It is a requirement that surveys be made to identify and clear UXO before construction commences.

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<sup>9</sup> Details of landmine clearance are presented in the Circular 146/2007/TT-BQP by Ministry of Defence dated September 11 2007 guiding UXO clearance for project construction

**Table 16. Historic Buildings and Infrastructure Within 500m of RoW and Substation**

No	Distance from centre line (m)		Name of infrastructure	Location
	Left	Right		
1	270		Phu Lac village hall	National road 50 - Phong Phu commune - Binh Chanh - HCM city
2	130		Thien Phuoc pagoda	National road 50 - Phong Phu commune - Binh Chanh - HCM city
3	80		An Hoa pagoda	National road 50 - Phong Phu commune - Binh Chanh - HCM city
4	80		Thien Tri pagoda	National road 50 - Phong Phu commune - Binh Chanh - HCM city
5		5	Ta Quang Buu high school	Ta Quang Buu road - Binh Hung commune - Binh Chanh - HCM city

Source: PECC3, 2013

## 6. Subproject Affected People

74. A few communities will be affected by loss of land and loss of assets within the RoW. All households that are affected by permanent or temporary losses will be compensated according to the Resettlement Plan (RP). Loss of land includes both permanent and temporary loss of land as defined below.

75. The Inventory of Loss (IOL) carried out in Nov. 2012 and Oct. 2013, had identified a total of 46 households (189 persons) and 2 affected institutions belonging to 3 communes/ward that may be affected by the implementation of the subproject. Loss of land includes both permanent and temporary loss of land.

### a. Permanent loss

76. The total estimated permanently affected land is 5,301 m<sup>2</sup>, of which 4,139 m<sup>2</sup> (78.08%) belongs to 1 Anh Tu Company (garage for repair and keeping cars), and 1,162 m<sup>2</sup> (21.92%) belonging to 5 AHs. Twenty five jobs for the company will be lost. Each of the 5 AHs may lose residential land or agricultural land. Total estimated affected land in ROW is 4,272m<sup>2</sup> with 46 households, including residential land area of 1,752 m<sup>2</sup> (41.01%) and agricultural land area of 2,525 m<sup>2</sup> (58.99%).

### b. Temporary loss

77. This includes the loss of land along the RoW which will be cleared of vegetation that exceeds the safety criteria i.e. they must not be higher than 2.0m for 110kv and 3.0m for 220kV systems. Landholders will be compensated for loss of access to crop areas during conductor stringing when vehicle access will be required along the RoW which will destroy crops and interfere with crop practices. During operation, farmers will be able to grow and cultivate crops under the RoW provided these do not exceed the established conductor safety limits. In total 1.05 ha of land will be temporarily affected. The summary of impact is presented in Table 17.

**Table 17. Summary of Impacts**

No.	Items		Unit	Total	Affected households or institutions
<b>I</b>	<b>AFFECTED ASSET</b>				
<b>1</b>	<b>Land</b>				
<b>1.1</b>	<b>Permanent land acquisition</b>				
	AHs	Residential land	m <sup>2</sup>	285	3
		Agricultural land	m <sup>2</sup>	877	2
	Affected institutions	Specialized land	m <sup>2</sup>	4,139.06	1
<b>1.2</b>	<b>Affected land in ROW</b>				
	AHs	Residential land	m <sup>2</sup>	1,752	43
		Agricultural land	m <sup>2</sup>	2,520	2
	Affected institutions	Specialized land	m <sup>2</sup>	-	-

Source: PECC3, Nov. 2013

#### D. Additional Features of Substation and Transmission Line Sites

78. Supplementing Figure 1 are views of the upgraded transmission line and new substation site in Figure 2. Figure 2 shows the northeast corner of the Binh Chanh substation (Fig 2a) beside which the first new 220 kV tower will be built on previously private land, an example 110 kV tower that will be upgraded to carry the 220 kV line (Fig 2b), the location of the start of the new underground section of the 220 kV line through Binh Chanh and District 8 (Fig 2c), and the site of the new 220 kV substation on the VINA Port Authority property (Fig 2d and e).

**Figure 2. Binh Chanh Substation, 110 kV Tower, and Site of New 220 kV Substation**



Fig 2a:  
 Northeast corner of Binh Chanh substation from which new 220 kV transmission line will start. Existing 110 kV transmission line in background.



Fig 2b:  
 Example 110 kV transmission tower that will be replaced with 220 kV tower, and underlying lowland flood area.



Fig 2c:  
 Location of start of underground section of transmission line along curb of roadway



Fig 2d:  
Section of underground cable route beside new substation site



Fig 2e:  
Location of VINA Port Authority site where substation will be built

## VI. INFORMATION DISLCOSURE AND PUBLIC CONSULTATION

### A. Information disclosure

79. Formal disclosure of information on the District 8 220 kV Substation and Transmission Line subproject that occurred to affected persons and stakeholders during the IEE is meant to form the beginning of continued information disclosure and stakeholder involvement with the subproject 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.

80. 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 EA/IA 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 EA/IA after implementation begins.

## **B. Public Consultation**

81. The stakeholder consultation strategy was developed to meet the requirements of meaningful consultation as stipulated by the ADB 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**

82. 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) PPC, (ii) DPC; (iii) Project EA, (iv) PECC4, and (v) commune leaders;
- Mass organizations such as Womens Union, and Farmers Union which provided information for the design of the various subproject interventions, and which might participate in implementation of measures and interventions;
- Affected households and businesses living along the transmission line and near the substation site who may be directly and/or adversely affected, and who have an interest in the identification and implementation of measures to avoid or minimize negative impacts; and
- Other institutions or individuals with a vested interest in the outcomes and/or impacts of the subproject.

### **2. Public consultation meeting**

83. Formal community consultation meetings were held to discuss the location and potential environmental and social impacts of the transmission line and substation. Public consultations were held in (i) Phong, Phu commune, Binh Chanh District and Ward 5 – District 8 on 30<sup>th</sup> of October, and in (ii) Binh Hung Communes - Binh Chanh District on 1<sup>st</sup> of November 2013.

84. The public meeting consisted of the following three component procedures:

- (i) 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;
- (ii) 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
- (iii) 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.

85. During the meeting, people raised their questions and comments on the environmental issues. The participants of the meetings included Commune leaders, representatives of mass organization such as Women Union, Farmer union and affected people. A total of 55 people were consulted on the views and concerns of the subproject (Appendix B).

### **3. Results of Public Consultations**

#### **a. Comments from communal authorities**

86. The summary of comments/questions from local authorities/people and answers of subproject owners and consultants company PECC4 are summarized in Table 18. The main concerns of subproject are:

- i. Potential impacts and required mitigation measures of construction activities (dust, noise, smoke emissions, and traffic obstruction) on daily living condition of local people. Construction work is required to finish at the same night.
- ii. Damage to the existing roadways due to the subproject activities, and requirement for complete rehabilitation of damaged roads after construction is finished.
- iii. The effects of electromagnetic field (EMF) on the internet, wireless devices, cellular phones;
- iv. The safety corridor (ROW) for the transmission line. The local people need to be informed of any safety and health issues with the underground cable.
- v. The construction techniques for the underground cable across Highway 50 and the appropriate construction schedule to avoid diurnal high tides inundating Highway 50 at 4:00PM and 5:00AM.





**Table 18. Summary of Public Questions and Comments and Response by PECC4.**

Location and time	Comments/questions from local authorities <sup>10</sup>	Answers of Project owners and consultant company PECC4	Project response <sup>11</sup>
Phong Phu Commune- Binh Chanh District HCM city 31 October 2013	How wide is a safety corridor for transmission line?	The distance from the ROW to the outermost line is 6m.	Compliance with standard RoW will be underscored in EMP.
	The mitigation measures are suitable but will they be implemented during construction stage?	There will be a monitoring agency to inspect the environmental compliance of constructor.	The Mitigation Plan of the EMP consists of a set of sub-mitigation plans focused specifically on construction phase activities.
	Contractor must not work at night when local people are resting.	A hotline will be established for the complaint cases.	EMP specifies that construction activity to occur between 07:00 – 18:00. Need for a Hotline with number posted at all construction sites identified in EMP.
	If the roads are damaged due to the subproject construction, the contractor must restore the roads.	These measures are stipulated in the bidding document.	These measures are also specified in EMP.
Ward 5 District 8 31 October 2013	How about the impact level of noise and smoke emissions, and the effects on the Internet and wireless devices?	Smoke emissions and waste water is insignificant. - Hazardous waste is also insignificant. - Noise <70 db	Mitigation Plan of EMP prescribes sub-plans for noise and dust. EMP also states notes that scientific evidence of negative health effects of EMF from transmission lines not proven.
	How about the piling solutions during construction?	This is the preparation stage for investment, but in the construction stage, pile driving will be used so this will not make noise.	Required pile driving for footings will be executed following accepted construction practice as indicated in EMP.
	Impact on wave for the cellular phone?	There are many stations in this city but they have not caused any impact yet.	n/a

<sup>10</sup> Environmental issues raised in public meetings recorded in table as received.

<sup>11</sup> Issues to be addressed by EMP

Location and time	Comments/questions from local authorities <sup>10</sup>	Answers of Project owners and consultant company PECC4	Project response <sup>11</sup>
Binh Hung Commune Binh Chanh District 1 <sup>st</sup> of November 2013	<p>How height of the transmission line is compared with the ground surface?</p> <p>Due to water level increasing, the elevation of a house foundation is raised so the transmission line needs to be also raised.</p> <p>The specific criteria need to be informed to the local people to know the safety distance.</p>	<p>The line section crossing the resident area is over 8m in height.</p> <p>The difference between the lowest point of the transmission line and the highest point of the ground surface is 4m</p>	<p>Height of line set according to international standards. The footings of the transmission towers and the foundation of new substation will be flood and climate change resilient.</p>
	<p>Is there any construction solution when implementation crosses Highway 50?</p>	<p>When building crosses Highway 50, the constructor must be have a permission before that.</p>	<p>Explicit in the EMP is that contractors obtain, and follow current regulations and guidelines for conducting civil works in urban areas including roadway intersections with pipelines</p>
	<p>When implementing construction work at night time, the team work must ensure that living and production of the local people will not be affected.</p> <p>Construction work is required to finish at the same night.</p>	<p>Implementing construction work will be conducted according to the short sections and the ground will be restored the same as the first situation only for one day.</p>	<p>Also indicted in EMP</p>
	<p>Highway 50 is usually inundated at 4:00PM and 5:00 AM so this problem must be considered carefully when establishing the construction schedule.</p>	<p>Will consider this factor when establishing the construction schedule.</p>	<p>Explicit in EMP is requirement to manage construction activities and vehicle traffic to avoid heavy urban traffic periods if possible, and to minimize disruption of urban traffic at all times.</p>
<p>How about construction activities?</p> <p>How to reduce the noise</p>	<p>Cutting and digging roads.</p> <p>Digging roads may be implemented in daytime to reduce noise at night time.</p>	<p>A specific directive in Mitigation Plan of EMP is for construction activities when/where possible to be conducted between 07:00 and 18:00.</p>	

<b>Location and time</b>	<b>Comments/questions from local authorities<sup>10</sup></b>	<b>Answers of Project owners and consultant company PECC4</b>	<b>Project response<sup>11</sup></b>
	The local people need to be informed on the safety level of the underground cable which can affect the local people 's health.	The safety requirements are approved by DONRE. Thus the underground cable does not affect the local people 's health.	The only risk of injury from UGC line is from unauthorized digging along line. The community will be educated on not digging anywhere near UGC until clearance obtained from EVNHCMC.
	Will the land area in the ROW be used?	The land area in the ROW will only be used for temporary purposes, solid building is not permitted.	n/a
<b>Conclusion</b>	Phong Phu, Binh Hung Commune People's Committees, and Ward 5 People's Committee and affected households agree and will support the construction of 220kV South Sai Gon substation and the transmission line South Sai Gon-District 8		Follow-up consultations will occur to monitor community views of subproject

## **VII. POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATIONS**

87. The assessment of potential impacts of the subproject is structured by the three development phases of the subproject defined by: *pre-construction*, *construction*, and *post-construction operational phase*. The two major components of the subproject (Substation and Transmission line) are addressed within this assessment.

88. In this way potential impacts of common activities of the two components can be addressed together thereby minimizing redundant assessments. Potential impacts specific to the substation or transmission line are addressed separately. This structure is carried forward to the EMP that will be prepared for the subproject (Section X).

### **A. Subproject Benefits**

89. The single comprehensive benefit of the subproject is the provision of needed electrical power to southern 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. Pre-construction Phase**

90. Negative impacts associated with the pre-construction phase of the subproject concern land acquisition and compensation. As indicated in Table 15 at the feasibility design stage, 5 households and 1 business will permanently lose some agricultural or household land, while 43 households and 2 businesses will temporarily lose access to part of their land during the construction phase of the upgrading of the transmission line. The details of the land losses and compensation are found in the Resettlement Plan (RP) which is under separate cover.

#### **a. Updating Environmental Management Plans**

91. The subproject EMP will need to be updated during the pre-construction – detailed design phase to ensure that the EMP fully addresses the potential impacts of the final detailed designs of the District 8 220 kV Substation and Transmission Line. This will involve finalization of the Mitigation and Monitoring Plans of the EMP that will manage and measure potential impact areas such as erosion, noise, dust and air quality, construction waste and spoil disposal, construction traffic, and worker and public safety at the subproject sites. The updated EMP will be used by the contractors to prepare their contractor environmental management plans (CEMP).

92. The key impact management measures to be implemented during the pre-construction phase are:

- 1) Initiation of the RP and land compensation for affected households and businesses;
- 2) Completion of detailed designs of the subproject; and
- 3) Updating and initiation of the subproject EMPs.

## **C. Construction Phase**

93. The potential environmental impacts of the subproject are associated primarily with the construction phase of the two subproject components. The substation and entire transmission line is not located in a national protected area, and there are no documented rare or endangered wildlife in the area.

### **1. Potential impacts of the Substation and Transmission Line**

94. Short-term construction-related impacts common to the construction of the District 8, 220 kV Substation and Transmission Line are, for example, reduced and/or blocked public access, disrupted agriculture, noise, dust and air pollution from NO<sub>x</sub>, SO<sub>x</sub>, and CO caused by construction truck traffic and heavy equipment use, soil and surface water pollution caused by equipment operation and maintenance, public and worker accidents, increased traffic and traffic accidents, erosion and sedimentation, drainage and flooding problems, solid waste and domestic pollution from worker camps, social disease and community problems caused by migrant workers.

95. The magnitude of these short-term construction-related impacts will be different at the substation site versus along the corridor for the new transmission line. For example, traffic disruption and overall construction disturbance along the road under which the UGC portion of the transmission line is buried will likely be greater than traffic and other construction-related disturbances associated with the construction of the substation.

#### **a. Mitigation measures**

96. Construction management measures to mitigate the potential construction-related impacts and disturbances common to the District 8 220 kV Substation and Transmission Line are exemplified below. The mitigation measures are detailed further in the EMP.

- 1) As indicated above the corridor for the transmission line and substation area must be reviewed, and surveyed for unexploded ordnance (UXO) by the military of Viet Nam prior to construction. If such ordnance is detected, clearing work will need to be commissioned prior to undertaking civil works.
- 2) Open excavations should be fenced, and trenches covered where public walkways or vehicles must cross.
- 3) A cultural chance find management sub-plan must be in place in the EMP for cultural artifacts and property.
- 4) Regular use of wetting agents should be employed at construction sites and along construction roads to minimize dust.
- 5) All construction vehicles and gas powered equipment should be maintained in proper working order to minimize emissions, and not operated at night if possible to minimize noise.
- 6) Speed limits should be posted and adhered to by construction vehicles.
- 7) Where possible construction vehicles should use different roads or dedicated lanes of roads shared by the public.

- 8) Trees and other vegetation at all construction sites and along road corridors should be protected with minimal removal.
- 9) Present and past land use should be reviewed to assess whether excavated soils are contaminated spoil. Contaminated spoil should be disposed at a landfill or a location approved by DoNRE.
- 10) Berms and/or silt curtains should be constructed around all excavation/trench sites and along all rice paddy and surface waters to prevent soil erosion and sedimentation.
- 11) Local workers should be used as much as possible to prevent or minimize influx of migrant workers, and incidence of social disease and community unrest.
- 12) Worker camps must have adequate domestic waste collection facilities and sufficient pit latrines that are located away from public areas and surface waters.
- 13) Dedicated fuel storage areas must be established away from public areas and marked clearly.
- 14) To minimize the risk of public and worker injury appropriate GoV regulations on Occupational, Safety, and Community Health must be applied<sup>12</sup>, or the IFC/World Bank Environment, Health, and Safety Guidelines (2007) that govern the safe and orderly operation of civil works should be followed.
- 15) Aggregates (e.g., sand, gravel, rock) that are transported by truck should be covered.
- 16) Prolonged use of temporary storage piles of fill should be avoided, or covered, or wetted regularly to prevent dust and erosion.
- 17) Sand extraction from any rivers for construction fill should be done at licensed areas only.
- 18) Storage of bulk fuel should be on covered concrete pads away from the public and worker camp. Fuel storage areas and tanks must be clearly marked, protected and lighted. Contractors should be required to have an emergency plan to handle fuel and oil spillage.

## **2. Component-specific potential construction impacts, and mitigations**

97. The short-term construction-related impacts and required mitigations summarized above will vary between the substation site and transmission line. Listed below are highlighted potential construction-related impacts specific to both subproject components.

### **a. Substation**

98. In addition to permanent loss of some land of AHs (Table 15), potential construction-related impacts of the substation are traffic congestion, blocked access, and increased risk of accidents along the access urban street to the current Vina Port Authority Site. Other potential impacts are worker injury, solid and liquid waste on construction site, and social issues arising from the worker camp that will be established on onsite.

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<sup>12</sup> e.g. Decree 110/2002/ND-CP, supplementing some Articles of Decree 06/1995 on Labour Code of Occupational Safety and Health, MoLISA.

## **b. Transmission line**

99. In addition to the temporary loss of land of AHs (Table 15), the installation of the OHL 220 kV towers along the existing transmission RoW from the Binh Chanh substation will disrupt land use and access underneath the existing line which is primarily small-scale agriculture. The placement of the new tower footings and construction vehicle activity will disturb the low lying land causing local erosion and sedimentation. The UGC section of the transmission line will disrupt access and road-side business activity along the road sections in which the trench for the cable is excavated. Traffic along the sections being trenched will be disrupted with the additional construction traffic and the movement of construction materials in/out of the area.

100. The key mitigation of for the construction-related disturbances associated with the OHL and UGC segments of the transmission line are to schedule the work at night. For example, during the inception phase EVNHCMC indicated that approximately 50 m sections of the UGC would be buried and the road restored between midnight and 06:00 section in order to minimize disruption to local businesses and community.

101. Construction of the OHL section line must minimize the number of access points to the transmission line in order to minimize lateral expansion of the RoW impact. Access to the RoW corridor should occur along the corridor from road crossings as much as possible.

## **D. Operation Phase**

### **1. Substation**

102. The potential impact of the completed 220 kV substation on Vina Port Authority land is restricted to worker safety, the potential risk for children of the community gaining access to the property, and spills of hazardous waste such as transformer oils. An increase in local traffic caused by substation employee traffic is not expected because the current bus and truck traffic that use the site for parking will be decreased after the site is constructed.

### **2. Transmission Line**

103. Potential impacts associated with the operation of the OHL and UGC portions of the transmission line are restricted to worker and public safety during routine maintenance activities, and unauthorized public access to the towers, respectively. The risk of negative health effects of electromagnetic radiation (EMF) from the transmission line are not an issue because negative health effects of EMF have not been established by the international medical community.

104. The collective mitigation for potential operation effects is to prevent public access to the substation property and at the transmission towers. This management action would be implemented with effective fencing, and clear signage indicating the dangers of the different facilities.

## **E. Climate Change**

105. Regional Global Circulation Modeling subproject greenhouse-climate change induced changes to the frequency and severity of rainfall events in the subproject area. The design of the substation site includes sufficient filling to a grade that will be resilient to flooding associated from a 100-year storm. Similarly, the underground section of the transmission line will be designed to withstand periods of street flooding.

## **VIII. ANALYSIS OF ALTERNATIVES**

106. Assessment of alternatives to the subproject design focused primarily on cost issues associated with the transmission line with the current placement of the new UGC section along the road way being optimal. The subproject alternative of doing nothing and not building the new District 8 220 kV substation and transmission line would result in the continued situation of power shortages in the area.

## **IX. GRIEVANCE REDRESS MECHANISM**

107. A well-defined grievance redress and resolution mechanism will be established to address affected persons (AP) grievances and complaints regarding environmental issues, land acquisition, compensation and resettlement in a timely and satisfactory manner. 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 APs.

108. APs are entitled to lodge complaints regarding any aspect of affected environments, land acquisition and resettlement requirements such as, noise, pollution, entitlements, rates and payment and procedures for resettlement and income restoration programs. 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.

109. A Grievance Committee with appointed environmental and social issues experience will be organized in local communes comprising of local leaders designated for such tasks. The designated commune officials shall exercise all efforts to settle APs issues at the commune level through appropriate community consultation. 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 EA/IA<sup>13</sup>, and ADB upon request.

110. The procedures for grievance redress are below and summarized in Figure 3. The procedure described below should apply easily to both social and environmental issues and be consistent with the legal process for resolution of disputes in Viet Nam.

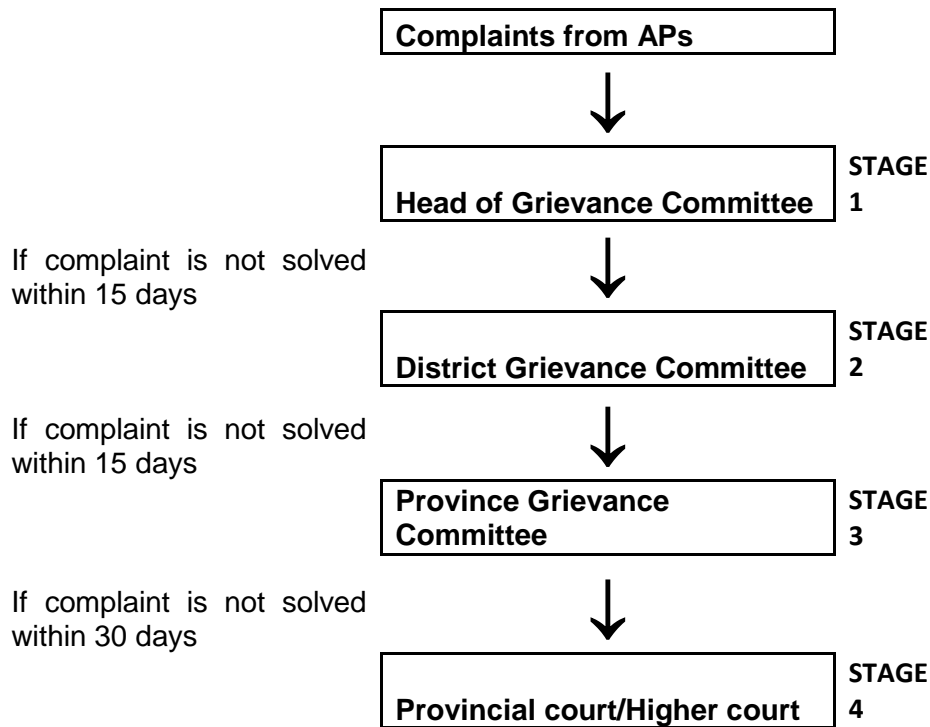
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<sup>13</sup> See Section XB below for institutional responsibilities for EMP



- i) Stage 1: Complaints from APs for the first time shall be lodged verbally or in written form with the village head or commune leader. The complaints shall be discussed with the APs and the designated Head of Grievance Committee or members of the committee. Because initial environmental issues will most likely be construction-related, the EO/contractor and then the ESU/IA need to be notified immediately. It will be the responsibility of the Head of Grievance Committee to resolve the issue within 15 days from the date the complaint is received. All meetings shall be recorded and copies of the minutes of meetings will be provided to APs.
- ii) Stage 2: If no understanding or amicable solution can be reached or if no response is received from the grievance committee within 15 days from filing the complaint, the APs can elevate the case to the District Grievance Committee. The District Grievance Committee is expected to respond within 15 days upon receiving the APs appeal.
- iii) Stage 3: If the AP is not satisfied with the decision of the District Office, or in the absence of any response, the APs can appeal to the Provincial Grievance Committee (PGC). The PGC will review and issue a decision on the appeal within 30 days from the day the complaint is received.
- iv) Stage 4: If the AP is still not satisfied with the decision of the PGC 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 court. The court will address the appeal by written decision and submit copies to the respective entities which include the EA, DGC/PGC 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 3. Summary of Grievance Redress Process**



111. 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.

112. 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.

113. 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).

## **X. ENVIRONMENTAL MANAGEMENT PLAN**

### **A. Overview**

114. An EMP has been developed for the implementation of the District 8 220 kV Substation and Transmission 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.

115. The EMP, *inter alia*, 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.

### **B. Institutional Arrangements and Responsibilities**

116. At the feasibility stage the primary management framework<sup>14</sup> responsible for the implementation of the EMP for the new District 8, 220 kV Substation and upgrading of the 110/200 kV Transmission Line subproject is summarized as follows. The EVNHCMC is the executing agency (EA). The EA takes overall responsibility for implementing the EMP with executive support from the Power Project Management Board (PPMB); a subsidiary of EVN HCMC and the implementing agency (IA) of the subproject. The IA under the direction of the EA implements the subproject and EMP with an assigned environmental and social unit (ESU) whose sole responsibility is to implement the EMP.

117. The IA/ESU is supported by the [international] Project Implementation Consultant<sup>15</sup> (PIC). The PIC assists with completion of the detailed subproject designs, updates the EMP to address the detailed subproject designs, and assist with the implementation of the EMP. The PIC also delivers required capacity development and training to the IA/ESU. The ESU oversees and assists the work of the environmental officer (EO) of the construction contractor who implements the contractors EMP (CEMP)<sup>16</sup>.

118. External support of the ESU for the implementation of the EMP is provided by the international and national environment specialists (ES) of the PIC, and an Environmental Monitoring Consultant (EMC) which is required 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 that cannot be performed by the contractor or IA/ESU. A summary of indicative responsibilities for implementation of the EMP is provided below.

119. The responsibilities of the EA with support from EVN include:

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<sup>14</sup> Adapted from kick-off meeting presentation slides, December 10-13 in Ho Chi Minh City

<sup>15</sup> PIC to be defined

<sup>16</sup> Contractor Environmental Management Plan prepared by contractor as part of bid documents based on EMP

1. Overall responsibility for implementation of EMP;
2. Provide coordination and supervision for environmental and social safeguards and monitoring for IA/ESU;
3. Liaise with EVN and ADB on the implementation of the EMP; and
4. Coordinate resolution with IA/ESU with issues arising from the implementation of EMP.

120. The responsibilities of the ESU of IA include:

5. Assist PIC with updating the EMP to meet final detailed Subproject design;
6. Notify DoNRE to verify GoV approvals of subproject are met;
7. Assist PIC with inclusion of CEMP requirements in contractor bid documents including bid evaluations based on updated EMP;
8. Undertake day to day management of EMP implementation activities;
9. Work with EMC on implementation of monitoring plan of EMP;
10. Ensuring compliance with loan covenants and assurances in respect of entire Subproject, including EMP (as well as IPPs, GAPS, resettlement plans);
11. Lead follow-up meetings with all affected stakeholders;
12. Prepare and submit quarterly reports on EMP implementation to IA/EA;
13. Oversee implementation of CEMP by contractor;
14. Coordinate with ES of PIC for EMP implementation;
15. Undertake regular construction site inspections to ensure contractor implements CEMP properly; and
16. Ensure EO of contractor submits monthly reports on construction mitigations and monitoring.

The responsibilities of the ES (International and National) of the PIC are:

17. Updating the EMP to meet final detailed design of subproject;
18. Provide technical direction and support to ESU/IA for implementation of EMP;
19. Oversee design and delivery of capacity development and training of ESU/IA and EO of contractor(s);
20. Provide advice and support to EMC with their monitoring activities;
21. Review all reports prepared ESU/IA and EMC for EA and ADB; and
22. Review location of any possible contaminated sites near subproject.

The responsibilities of Environmental Officer (EO) of Contractor include:

23. Implement CEMP for construction phase of subproject; and

24. Prepare and submit monthly reports on mitigation and monitoring activities of CEMP any environmental issues at construction sites.

The responsibilities of external Environmental Monitoring Consultant (EMC) include:

25. Implement the environmental sampling required for monitoring plan of EMP that cannot be conducted by the contractor and ESU/IA/EO.
26. Perform required laboratory analyses for monitoring program detailed in EMP; and;
27. Prepare and submit quarterly reports to IA/ESU on monitoring activities.

121. The Department of Natural Resources and Environment (DoNRE) is the provincial agency which oversees environmental management of Ha Noi. The DoNRE with District staff provides direction and support for environmental protection-related matters including application of the Law on Environmental Protection No. 02/99/NA (1999), EIA, and environmental standards.

122. The ADB provides guidance to EA/IA with any issues related to EMP, and reviews biannual reports on EMP activities compiled and submitted by EA.

### C. Summary of Potential Impacts of Subproject

The potential impacts of the subproject are summarized in Table 19.

**Table 19. Summary of Potential Impacts of Subproject**

<b>Pre-construction Phase</b>
<ul style="list-style-type: none"> <li>• Permanent loss of some residential and agricultural land</li> </ul>
<b>Construction Phase</b>
<ul style="list-style-type: none"> <li>• Temporary loss of residential and agriculture land along RoW of TL</li> <li>• Common construction-related civil works disturbances such as dust, noise, reduced and/or blocked public access, disrupted business and recreation, noise, dust and air pollution from NO<sub>x</sub>, SO<sub>x</sub>, and CO caused by increased truck traffic and heavy equipment use, soil and surface water pollution caused by equipment operation and maintenance, public and worker accidents, disruption of traffic, increased traffic accidents, damage to existing roads, land erosion and surface water sedimentation, drainage and flooding problems, solid and domestic waste from worker camps, social issues and community problems caused by migrant workers.</li> </ul>
<b>Operational Phase</b>

- |                                                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Risk of worker and public safety at facilities</li><li>• Spills of hazardous materials such as transformer oil</li></ul> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## **D. Mitigation Plan**

123. The impact mitigation measures of the EMP are presented in a comprehensive mitigation plan for the subproject in Table 20. Similar to IEE the mitigation plan is structured by the three development phases of the subproject defined by the pre-construction; construction; and post construction operational phase. The mitigation plan addresses the environmental issues and concerns raised at the stakeholder meetings.

124. The mitigation plan combines construction phase impacts common to all subproject components for which single mitigation measures are prescribed. In this way redundant mitigation measures are not re-stated numerous times. However, impacts and required mitigations specific to subproject component are also identified or common mitigations that are particularly important for a subproject component are underscored. The mitigation plan identifies potential impacts, required mitigations, responsible parties, location, timing, and indicative costs.

### **1. Mitigation subplans**

125. The mitigation plan is comprehensive by design because it will need to be updated to meet the final detailed designs of the subproject. 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 CEMPs as part of their bid documents, and ultimately will allow the ESU/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.

**Table 20. Environmental Impact Mitigation Plan**

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
<b><i>Pre-Construction, Detailed Design Phase</i></b>								
Confirmation of required resettlement, relocations, and compensation	No negative environmental impacts	1. Affected persons well informed well ahead of Subproject implementation.	All affected persons in subproject areas	Before subproject implemented	See resettlement plans	See resettlement plan	EA/IA/ESU	Resettlement committees
Disclosure, and engagement of community	No negative impacts	2. Initiate Information Disclosure and Grievance process of IEE	For all construction sites.	Beginning of subproject	Quarterly	No marginal cost <sup>18</sup>	IA/ESU	IA/ESU
GoV approvals	No negative impact	3. Notify DoNRE of Subproject initiation to complete EA requirements, and obtain required subproject permits and certificates.	Entire subproject	Before construction	As required	No marginal cost	EA/DoNRE	DoNRE

<sup>17</sup> Costs will need to be updated during detailed design phase.

<sup>18</sup> No marginal cost indicates that costs to implement mitigation are to be built into cost estimates of bids of contractors

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
Detailed designs of Subproject,	Minimize negative environmental impacts	<p>4. Work with PIC<sup>19</sup> to complete detailed designs of the upgraded access roads and cave tourist facilities. Ensure the following measures are included:</p> <p>a) identification of spill management prevention plans, and emergency response plans for all construction sites;</p> <p>b) no disturbance or damage to culture property and values;</p> <p>c) minimal acquisition of agriculture and forested lands</p> <p>d) locate aggregate borrow pits and rock supply areas away from human settlements with fencing and access barriers;</p> <p>e) none or minimal disruption to village water supplies along access roads, utilities, and electricity with contingency plans for unavoidable disruptions;</p> <p>f) none or minimal disruption to normal pedestrian and vehicle traffic along all road segments with contingency alternate routes;</p> <p>g) for built-up areas include specific plan to notify and provide residents and merchants of construction activities and schedule to minimize disruption to normal commercial and residential activities.</p>	Final siting	Before construction initiated	Once with detailed designs documents	No marginal cost	PIC	EA/IA

<sup>19</sup> PIC is Project Implementation Consultant at detailed design phase to be determined



Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
Update EMP	Positive environmental impacts	5. Review finalized RoW of TL to confirm absence of valued ecological or cultural resources. 6. Re-clarify with DoNRE that no known rare or endangered species inhabit the Subproject areas 7. Identify any new potential impacts of subproject and include in EMP with special attention to residential areas. 8. Update mitigation measures and monitoring requirements of EMP where necessary to meet detailed designs, and to protect affected environments. 9. Submit updated EMP with new potential impacts to ADB to review. 10. Develop individual management subplans 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.	All sites	Before construction initiated	Once with detailed designs documents		PIC	IA/ESU
Update EMP	Positive environmental impacts	11. Update information where necessary on water quality and presence of valued aquatic biota in surface waters underneath OHL from Binh Chanh SS	OHL from SS to start of UGC	Before construction initiated	Once with updated EMP	See Monitoring Plan below	PIC	PIC/ESU
Confirm approved construction waste disposal sites	No negative impact	12. Notify DoNRE to confirm locations of sites for borrow pits and disposal areas for construction and hazardous waste for Subprojects, and obtain required permits.	Entire Subproject	Before construction	As required	No marginal cost	IA/DoNRE	ESU

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
UXO survey, and removal	Injured worker or public	13. Ensure GoV military is consulted and clears UXO areas where necessary	All construction sites.	Beginning of Subproject	Once	See Monitoring Plan below	EA/IA	ESU/GoV
Develop bid documents	No negative environmental impact	14. Ensure updated EMP is included in contractor tender documents, and that tender documents specify requirements of EMP must be budgeted. 15. Specify in bid documents that contractor must have experience with implementing EMPs, or provide staff with the experience.	All Subproject areas	Before construction begins	Once for all tenders	No marginal cost	PIC	IA/ESU
Create awareness of physical cultural resources in area	No negative environmental impact	16. EA to review potential locations of physical resources, and explain possible PCR to contractors and PIC	All Subproject areas	Before construction begins	Once	No marginal cost	EA/IA	IA/ESU
Obtain and activate permits and licenses	Prevent or minimize impacts	17. Contractors to comply with all statutory requirements set out by GoV for use of construction equipment, and operation construction plants such as concrete batching.	For all construction sites	Beginning of construction	Once	No marginal cost	EA/PIC	ESU and contractors
Capacity development	No negative environmental impact	18. Develop and schedule training plan for IA/ESU/EO to be able to fully implement EMP, and to manage implementation of mitigation measures by contractors. 19. Create awareness and training plan for contractors whom will implement mitigation measures.	All Subproject areas	Before construction begins	Initially, refresher later if needed	No marginal cost	PIC	PIC
Recruitment of workers	Spread of sexually transmitted disease	20. Use local workers as much as possible thereby reducing number of migrant worker	All work forces.	Throughout construction phase	Worker hiring stages	No marginal cost	EA/IA	Contractor's bid documents

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
<b>Construction Phase of 220 kV Substation and Transmission Line</b>								
Initiate EMP and sub-plans,	Prevent or minimize impacts	21. Initiate updated EMP and CEMP including individual management sub-plans for different potential impact areas that are completed in pre-construction phase (see sub-plan guidance below).	For all construction sites	Beginning of construction	Once	No marginal cost	IA/PIC	ESU and contractors
Worker camps	Pollution and social problems	22. Locate worker camps away from human settlements. 23. Ensure adequate housing and waste disposal facilities including pit latrines and garbage cans. 24. A solid waste collection program must be established and implemented that maintains a clean worker camps 25. Locate separate pit latrines for male and female workers away from worker living and eating areas. 26. A clean-out or infill schedule for pit latrines must be established and implemented to ensure working latrines are available at all times. 27. Worker camps must have adequate drainage. 28. Local food should be provided to worker camps. Guns and weapons not allowed in camps. 29. Transient workers should not be allowed to interact with the local community. HIV/AIDS education should be given to workers. 30. Camp areas must be restored to original condition after construction completed.	All worker camps	Throughout construction phase	Monthly	No marginal cost	PIC/ESU	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
Training and capacity	Prevent of impacts through education	31. Implement training and awareness plan for IA/ESU/EO and contractors.	ESU office, construction sites	Beginning of construction	After each event	No marginal cost	PIC	PIC/ESU

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
Implement Construction materials acquisition, transport, and storage sub-plan	Pollution, injury, increased traffic, disrupted access	<p>32. All borrow pits and quarries should be approved by DoNRE.</p> <p>33. Select pits and quarries in areas with low gradient and as close as possible to construction sites.</p> <p>34. Required aggregate volumes must be carefully calculated prior to extraction to prevent wastage.</p> <p>35. Pits and quarries should not be located near surface waters, forested areas, critical habitat for wildlife, or cultural property or values.</p> <p>36. If aggregate mining from fluvial environments is required small streams and rivers should not be used, and dry alluvial plains preferred.</p> <p>37. All topsoil and overburden removed should be stockpiled for later restoration.</p> <p>38. All borrow pits and quarries should have a fence perimeter with signage to keep public away.</p> <p>39. After use pits and quarries should be dewatered and permanent fences installed with signage to keep public out, and restored as much as possible using original overburden and topsoil.</p> <p>40. Unstable slope conditions in/adjacent to the quarry or pit caused by the extractions should be rectified with tree planting.</p> <p>41. Define and schedule how materials are extracted from borrow pits and rock quarries, transported, and handled and stored at sites.</p> <p>42. Define and schedule how fabricated materials such as steel, wood structures, and scaffolding will be transported and handled.</p> <p>43. All aggregate loads on trucks should be covered.</p>	For all construction areas.	Throughout construction phase	Monthly	No marginal cost	PIC/ESU	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
DBST (low grade asphalt) production, and application to repair roads	Air pollution, land and water contamination, and traffic and access problems,	<p>44. Piles of aggregates at sites should be used/or removed promptly, or covered and placed in non- traffic areas</p> <p>45. Stored paving materials e.g., DBST or asphalt, well away from all human activity and settlements, and cultural (e.g., schools, hospitals), and ecological receptors. Bitumen production and handling areas should be isolated.</p> <p>46. Contractors must be well trained and experienced with the production, handling, and application of bitumen.</p> <p>47. All spills should be cleaned immediately and handled as per hazardous waste management plan, and according to GoV regulations.</p> <p>48. Bitumen should only be spread on top of cable trench not near or in any surface waters, or near any human activities.</p> <p>49. Bitumen should not be used as a fuel.</p>	For all construction areas.	Throughout construction phase	Monthly	No marginal cost	PIC/ESU	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
Implement Spoil management subplan	Contamination of land and surface waters from excavated spoil, and construction waste	<p>50. Uncontaminated spoil to be disposed of in GoV-designated sites, which must never be in or adjacent surface waters. Designated sites must be clearly marked and identified.</p> <p>51. Spoil must not be disposed of on sloped land, near cultural property or values, ecologically important areas, or on/near any other culturally or ecologically sensitive feature.</p> <p>52. Where possible spoil should be used at other construction sites, or disposed in spent quarries or borrow pits.</p> <p>53. A record of type, estimated volume, and source of disposed spoil must be recorded.</p> <p>54. Contaminated spoil disposal must follow GoV regulations including handling, transport, treatment (if necessary), and disposal.</p> <p>55. Suspected contaminated soil must be tested, and disposed of in designated sites identified as per GoV regulations.</p> <p>56. Before treatment or disposal contaminated spoil must be covered with plastic and isolated from all human activity.</p>	All excavation areas	Throughout construction phase	Monthly	See Monitoring Plan for contaminated soil analyses	PIC/ESU and DoNRE	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
Implement Solid and liquid construction waste sub-plan	Contamination of land and surface waters from construction waste	<p>57. Management of general solid and liquid waste of construction will follow GoV regulations, and will cover, collection, handling, transport, recycling, and disposal of waste created from construction activities and worker force.</p> <p>58. Areas of disposal of solid and liquid waste to be determined by GoV.</p> <p>59. Disposed of waste should be catalogued for type, estimated weigh, and source.</p> <p>60. Construction sites should have large garbage bins.</p> <p>61. A schedule of solid and liquid waste pickup and disposal must be established and followed that ensures construction sites are as clean as possible.</p> <p>62. Solid waste should be separated and recyclables sold to buyers in community.</p> <p><u>Hazardous Waste</u></p> <p>63. Collection, storage, transport, and disposal of hazardous waste such as used oils, gasoline, paint, and other toxics must follow GoV regulations.</p> <p>64. Wastes should be separated (e.g., hydrocarbons, batteries, paints, organic solvents)</p> <p>65. Wastes must be stored above ground in closed, well labeled, ventilated plastic bins in good condition well away from construction activity areas, all surface water, water supplies, and cultural and ecological sensitive receptors.</p> <p>66. All spills must be cleaned up completely with all contaminated soil removed and handled with by contaminated spoil sub-plan.</p>	All construction sites and worker camps	Throughout construction phase	Monthly	No marginal cost	PIC/ESU and DoNRE	contractor



Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
Implement Noise and dust sub-plan	Dust Noise	<p>67. Regularly apply wetting agents to exposed soil and construction roads.</p> <p>68. Cover or keep moist all stockpiles of construction aggregates, and all truck loads of aggregates.</p> <p>69. Minimize time that excavations and exposed soil are left open/exposed. Backfill immediately after work completed.</p> <p>70. As much as possible restrict working time at substation site between 07:00 and 17:00. For UGC of TL place 50 m sections between 23:00 and 06:00 hrs</p> <p>71. Maintain equipment in proper working order</p> <p>72. Replace unnecessarily noisy vehicles and machinery.</p> <p>73. Vehicles and machinery to be turned off when not in use.</p> <p>74. Construct temporary noise barriers around excessively noisy activity areas where possible.</p>	All construction sites.	Fulltime	Monthly	No marginal cost	PIC/ESU	contractor
Implement Utility and power disruption sub-plan	Loss or disruption of utilities and services such as water supply and electricity	<p>75. Develop carefully a plan of days and locations where outages in utilities and services will occur, or are expected.</p> <p>76. Contact local utilities and services with schedule, and identify possible contingency back-up plans for outages.</p> <p>77. Contact affected community to inform them of planned outages.</p> <p>78. Try to schedule all outages during low use time such between 24:00 and 06:00.</p>	All construction sites.	Fulltime	Monthly	No marginal cost	PIC/ESU and Utility company	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
Implement Tree and vegetation removal, and site restoration sub-plan	Damage or loss of trees, vegetation, and landscape	<p>79. Contact DoT/DARD for advice on how to minimize damage to trees and vegetation along transmission line</p> <p>80. Restrict tree and vegetation removal to within RoWs.</p> <p>81. Within RoWs minimize removals, and install protective physical barriers around trees that do not need to be removed.</p> <p>82. Where possible all RoWs to be re-vegetated and landscaped after construction completed. Consult DoT/DARD to determine the most successful restoration strategy and techniques. Aim to replant three trees for each tree removed.</p> <p>83. Restore sections of roads, culverts, irrigation canals, and other public infrastructures damaged by the construction of the transmission line and other facilities.</p>	All construction sites.	Beginning and end of Subproject	Monthly	No marginal cost	PIC/ESU	contractor
Implement Erosion control sub-plan	Land erosion	<p>84. Berms, and plastic sheet fencing should be placed around all excavations and earthwork areas.</p> <p>85. Earthworks should be conducted during dry periods.</p> <p>86. Maintain a stockpile of topsoil for immediate site restoration following backfilling.</p> <p>87. Protect exposed or cut slopes with planted vegetation, and have a slope stabilization protocol ready.</p> <p>88. Re-vegetate all soil exposure areas immediately after work is completed.</p>	All construction sites	Throughout construction phase	Monthly	No marginal cost	PIC/ESU	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
Implement worker and public safety sub-plan	Public and worker injury, and health	<p>89. Proper fencing, protective barriers, and buffer zones should be provided around all construction sites.</p> <p>90. Sufficient signage and information disclosure, and site supervisors and night guards should be placed at all sites.</p> <p>91. Worker and public safety guidelines of MoLISA should be followed.</p> <p>92. Population near possible blast areas should be notified 24 hrs ahead, and evacuated well before operation. Accepted GoV blast procedures and safety measures implemented.</p> <p>93. Speed limits suitable for the size and type of construction vehicles, and current traffic patterns should be developed, posted, and enforced on all roads used by construction vehicles.</p> <p>94. Standing water suitable for disease vector breeding should be filled in.</p> <p>95. Worker education and awareness seminars for construction hazards should be given at beginning of construction phase, and at ideal frequency of monthly. A construction site safety program should be developed and distributed to workers.</p> <p>96. Appropriate safety clothing and footwear should be mandatory for all construction workers.</p> <p>97. Adequate medical services must be on site or nearby all construction sites.</p> <p>98. Drinking water must be provided at all construction sites.</p> <p>99. Sufficient lighting be used during necessary night work.</p> <p>100. All construction sites should be examined daily to ensure unsafe conditions are removed.</p>	All construction sites.	Fulltime	Monthly	No marginal cost	PIC/ESU	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
Civil works	Degradation of water quality and aquatic resources	<p>101. Protective coffer dams, berms, plastic sheet fencing, or silt curtains should be placed between all earthworks and surface waters.</p> <p>102. Erosion channels must be built around aggregate stockpile areas to contain rain-induced erosion.</p> <p>103. Earthworks should be conducted during dry periods.</p> <p>104. All construction fluids such as oils, and fuels should be stored and handled well away from surface waters.</p> <p>105. No waste of any kind is to be thrown in surface waters.</p> <p>106. No washing or repair of machinery near surface waters.</p> <p>107. Pit latrines to be located well away from surface waters.</p> <p>108. No unnecessary earthworks in or adjacent to water courses.</p> <p>109. No aggregate mining from rivers or lakes.</p> <p>110. All irrigation canals and channels to be protected the same way as rivers, streams, and lakes</p>	All construction sites	Throughout construction phase	Monthly	No marginal cost	PIC/ESU	contractor
Civil works	Degradation of terrestrial resources	<p>111. All construction sites should be located away forested or all plantation areas as much as possible.</p> <p>112. No unnecessary cutting of trees along RoW.</p> <p>113. All construction fluids such as oils, and fuels should be stored and handled well away from forested and plantation areas.</p> <p>114. No waste of any kind is to be discarded on land or in forests/plantations.</p>	All construction sites	Throughout construction phase	Monthly	No marginal cost	PIC/ESU	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
Implement Construction and urban traffic sub-plan	Traffic disruption, accidents, public injury	<p>115. Schedule construction vehicle activity during light traffic periods. Create adequate traffic detours, and sufficient signage and warning lights.</p> <p>116. Post speed limits, and create dedicated construction vehicle roads or lanes.</p> <p>117. Inform community of location of construction traffic areas, and provide them with directions on how to best co-exist with construction vehicles on their roads.</p> <p>118. Demarcate additional locations where pedestrians can develop road crossings away from construction areas.</p> <p>119. Increase road and walkway lighting.</p>	All construction sites	Fulltime	Monthly	No marginal cost	PIC/ESU	contractor
Implement Construction Drainage sub-plan	Loss of drainage and flood storage	<p>120. Provide adequate short-term drainage away from construction sites to prevent ponding and flooding.</p> <p>121. Manage to not allow borrow pits and quarries to fill with water. Pump periodically to land infiltration or nearby water courses.</p> <p>122. Install temporary storm drains or ditches for construction sites</p> <p>123. Ensure connections among surface waters (ponds) are maintained or enhanced to sustain existing stormwater storage capacity.</p> <p>124. Protect surface waters from silt and eroded soil.</p>	All areas with surface waters	Design and construction phases	Monthly	No marginal cost	PIC/ESU	contractor
Civil works and Chance finds sub-plan	Damage to cultural property or values, and chance finds	<p>125. As per detailed designs all civil works should be located away from all physical cultural property and values.</p> <p>126. Chance finds of valued relics and cultural values should be anticipated by contractors. Site supervisors</p>	All construction sites	At the start , and throughout construction phase	Monthly	No marginal cost	PIC/ESU	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
		<p>should be on the watch for finds.</p> <p>127. Upon a chance find all work stops immediately, find left untouched, and EA/IA notified to determine if find is valuable. Culture section of DCST notified by telephone if valuable.</p> <p>128. Work at find site will remain stopped until DCST allows work to continue.</p>						
<b><i>Post-construction Operation of 220 kV Substation</i></b>								
Operation of new substation	Increased risk of worker or public injury	129. Occupational health and safety regulations and guidelines of MoLISA should be applied to operations of substation.	At substation	Fulltime	Biannual	OandM	EVNHCMC / PPMB	
		130. Ensure substation property is adequately fenced with clearly visible danger warning signs to keep public out.						
		131. Store and handle transformer fluids and other hazardous materials according to international procedures and standards.						
<b><i>Post-construction Operation of 220 kV Transmission Line</i></b>								
Operation of new transmission line		<p>132. Occupational safety and health regulations and guidelines of MoLISA should be applied to operations and maintenance of TL</p> <p>133. Ensure TL towers are marked with clearly visible danger warning signs to keep public out.</p>	At all TL towers	Fulltime	Biannual	O and M	EVNHCMC / PPMB	

## **F. Monitoring Plan**

126. The environmental monitoring plan for the EMP is provided in Table 21. 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.

127. The independent 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 ESU 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.

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

129. After construction is completed the potential impacts of the operation of the new District 8, 220 kV substation and transmission line 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.

## **G. Performance Monitoring**

130. Performance monitoring is required to assess the overall performance of the EMP. A performance monitoring system is normally developed by the EA for the entire Project. 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 5.

## **H. Reporting**

131. 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/ESU 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 20 and 21) summarize proposed timing of reporting.

132. A report on environmental monitoring and implementation of EMP will be prepared quarterly for the EA by the IA/ESU. The IA report will compile monthly reports provided by the EO of contractor, the reports of the EMC on monitoring, and input from the ES of the PIC. The IA/ESU 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 22), and will include relevant GoV environmental quality standards. A semi-annual report on the environment monitoring of the subproject must be prepared and submitted to the ADB by the EA

**Table 21. Environmental Monitoring Plan**

ENVIRONMENTAL EFFECTS MONITORING							
Environmental Indicators	Location	Means of Monitoring	Frequency	Reporting	Responsibility Supervision / Implementation		Estimated Cost (USD)
					Supervision	Implementation	
<b><i>Pre-construction Phase – Update Baseline Conditions</i></b>							
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.	A) RoW for transmission line (TL) B) Substation (SS) location	Original field work, community consultations	Once	Once	PIC/ESU	Environmental Monitoring Consultant	\$2,000.
A) Air quality: dust, CO, NOx, SOx, noise B) Affected water quality of canal: TSS, oil and grease, BOD <sub>5</sub> , , TDS, TP, TN	A): Along TL and at SS site B): At SS site	Using field and analytical methods approved by DoNRE.	A) One day and one night measurement b) One measurement	One baseline supplement report before construction phase starts	PIC/ESU	Environmental Monitoring Consultant	A) \$1,500 B) \$2,500
Inventory of present and past land uses that could cause contaminated soil.	Possible contaminated lands at all excavation sites	Using field and analytical methods approved by DoNRE.	Once	Once	PIC/ESU	Environmental Monitoring Consultant	\$500.
<b>Construction Phase of 220 kV Substation and Transmission Line</b>							
Analysis of soil quality (heavy metals (As, Cd, Pb, oil and	Possible contaminated lands at all excavation sites	Using field and analytical methods approved by DoNRE.	Once if	Once	ESU	Environmental Monitoring	\$2,500.



grease, hydrocarbons).			<b>needed</b>			Consultant	
A) Air quality: dust, CO, NOx, SOx, noise  B) ) Affected surface water quality: TSS, oil and grease, BOD <sub>5</sub> , , TDS, TP, TN  C) Analysis of contaminated soil quality (heavy metals (As, Cd, Pb, Hg, Mn), hydrocarbons.  D) Domestic (worker) and construction solid waste inside and outside construction sites including worker camps.  E) Public comments and complaints  F) Incidence of worker or public accident or injury	A and B): Baseline sites of pre-construction phase.  C) At sites where contaminated soil is suspected.  D) All construction sites and worker camps  E) Using hotline number placed at construction areas  F) At all construction areas	A – C : Using field and analytical methods approved by DoNRE.  Include visual observations of dust and noise from contractor and public reports .  D) Visual observation  E) Information transferred by telephone hotline number posted at all construction sites.  F) regular reporting by contractors/ESU	(A – B): Quarterly during construction periods  Daily visual records  C) Once at start of excavations  D) Monthly  E) Continuous public input  F) Continuous	Monthly	(A - D):	ESU  Monitoring Consultant	A and B: \$5,000./yr  C: \$2,000./yr  D: no marginal cost
<b>Operation of 220 kV Substation and Transmission Line</b>							
Incidence of worker accidents, or spills on hazardous materials	At substation and along UGC transmission line	Regular documentation and reporting	Continuous			EVNHCMC /PPMB	O and M
					(E and F) and daily observations:	EA/ESU  contractor	E: \$1,000./yr  F: no marginal cost

**Table 22. Performance Monitoring Indicators for Subproject**

Major Environmental Component	Key Indicator	Performance Objective	Data Source
<b>Pre-construction Phase</b>			
Public Consultation and Disclosure	Affected public and stakeholders	Meetings with public stakeholders contacted during IEE and new stakeholders convened for follow-up consultation and to introduce grievance mechanism	Minutes of meeting, and participants list
EMP	Updated EMP	All stakeholders contacted during IEE re-contacted for follow-up consultation	EMP
Bid Documents	Requirements of EMP (CEMP <sup>20</sup> )	EMP appended to bidding documents with clear instructions to bidders for CEMP	Bid documents
Training of IA/ESU	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
<b>Construction Phase</b>			
All Subproject areas	Critical habitat, rare or endangered species <b><i>if present</i></b>	All <i>present</i> critical habitat and R and E species if unchanged, and unharmed	Monitoring by EMC <sup>21</sup>
Affected water quality	TSS, oil and grease, BOD <sub>5</sub> , , TDS, TP, TN,	GoV environmental standards and criteria met	Monitoring by EMC
Air quality	dust, CO, NOx, SOx, noise	Levels never exceed pre-construction baseline levels	EMC and contractor monitoring reports,
Soil quality	Solid and liquid waste	Rigorous program of procedures and rules to collect and store all waste from construction camps and sites practiced.	Contractor and EMC monitoring reports
Hazardous materials and waste	Oil, gasoline, grease, PCBs	Rigorous program of procedures to manage and store all waste from construction camps and sites practiced.	Contractor and EMC monitoring reports
Public and worker safety	Frequency of injuries	Adherence to GoV occupational health and Safety regulations <sup>22</sup>	Contractor reports
Cultural property	Incidence of damage, or complaints	No valued cultural property, or unearthed valuable relic is harmed in any way	Public input, contractor reports, public input, EMC

<sup>20</sup> Contractor Environmental Management Plan developed from EMP in contractor bidding document

<sup>21</sup> Environmental Monitoring Consultant hired to assist implementation of Environmental Monitoring Plan

<sup>22</sup> OSH Guidelines provided by MoLISA, or IFC World Bank EHS (2007)

Major Environmental Component	Key Indicator	Performance Objective	Data Source
			reports
Traffic	Frequency of disruptions and blocked roadways	Disruptions, stoppages, or detours are managed to absolute minimum.	Public input, contractor reports, EMC reports
<b><i>Operation Phase of Substation and Transmission Line</i></b>			
Worker and Public Safety	Frequency of accidents and spills	No increase in pre-construction frequency	EA

## XI. ESTIMATED COST OF EMP

133. The marginal 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 21 the preliminary cost for the implementation of the EMP for the subproject including an estimated environmental training budget for EVNHCMC / PPBM is approximately USD \$35,500.00 which is summarized in Table 23.

**Table 23. Estimated costs for Environmental Monitoring Plan of EMP**

Activity Type	Estimated Cost (USD)
<i>Pre-construction Phase</i>	
Updating Environmental Baseline	
cultural receptors	\$2,000.00
environmental quality	\$6,500.00
<i>Construction Phase</i>	
environmental quality	\$19,000.00
public consultation	\$2,000.00
<i>Operation Phase</i>	
environmental quality	no cost
public input	no cost
Training and capacity development of EVNHCM / PPBM / ESU	\$6,000.00
<b>Total</b>	<b>\$35,500.00</b>

The environmental costs in Table 23 are for field sampling and laboratory analyses which include professional per diems of technicians.

134. An estimated budget of USD \$6,000.00 is required for training of the EA/IA/ESU 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 IA/ESU during the pre-construction phase.

## **XII. EMERGENCY RESPONSE PLAN**

135. The Contractor must develop emergency or incident response procedures during construction and operation phases of the new District 8 220 kV Substation and Transmission 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 D.

## **XIII. INSTITUTIONAL CAPACITY REVIEW AND NEEDS**

136. 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 ESU/IA of the subproject will develop and deliver training courses to the IA staff including the EO of the contractor. The purpose of the course(s) is to strengthen the ability of the subproject owner including the ESU to oversee implementation of the EMP by construction contractors, and EMC. Costs for training should be included with costs for implementation of the EMP.

137. 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.

## **XIV. CONCLUSIONS AND RECOMMENDATION**

138. The initial examination of the District 8 220 kV Substation and Transmission Line subproject in HCMC indicates that potential environmental impacts are largely construction-related impacts and disturbances that can be mitigated and managed.

139. 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).

140. 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.

## **XV. REFERENCES CITED**

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## **APPENDICES**

- A. Rapid Environmental Assessment (REA) Checklist**
- B. Minutes of Public Consultation Meetings**
  - B.1 Ward 5 – District 8
  - B.2 Phong Phu Commune – Binh Chanh District
  - B.3 Binh Hung Commune – Binh Chanh District
- C. Emergency Response Plan**

## **CURRENCY EQUIVALENTS**

(as of 11 December 2013)

Currency Unit	–	Dong D
D1.00	=	\$0.000047
\$1.00	=	D20,948

## **ABBREVIATIONS**

ADB:	Asian Development Bank
AH:	Affected Household
AP:	Affected people
BOD:	Biochemical Oxygen Demand
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 Sport and Tourism
DoLISA:	Department of Labour Invalids and Social Assistance
EA:	Executing Agency
EIA:	Environment Impact Assessment
EMP:	Environment Management Plan
EO:	Environmental Officer
ESU:	Environmental and Social Unit
EVN:	Electricity of Viet Nam
EVN HANOI:	Ha Noi Power Corporation
EVNHCMC:	Ho Chi Minh Power Corporation
GHG:	Greenhouse gas
GRM:	Grievance Redress Mechanism
HN:	Ha Noi
IA:	Implementation Agency
IEE:	Initial Environmental Examination
MoLISA:	Ministry of Labour Invalids and Social Assistance
MoNRE:	Ministry of Natural Resources and Environment
NPA:	National Protected Area
OHL:	Overhead lines
PCB:	Polychlorinated biphenyls



PCR:	Physical Cultural Resources
PIC:	Project Implementation Consultant
PPC:	Provincial Peoples Committee
REA:	Rapid Environment Assessment
ROW:	Right-of-way
PPMB:	Power Project Management Board
TSS:	Total Suspended Solids
UGC:	Underground lines
UXO:	Unexploded Ordnance

#### WEIGHTS AND MEASURES

km:	kilometre
kg:	kilogram
kV:	kilovolt
ha:	hectare
mm:	millimetre
MV:	medium voltage

#### NOTE

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

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## 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 Hanoi Power Corporation (EVN HANOI) and Ho Chi Minh City Power Corporation (EVNHCMC), which are responsible for the power supply in their respective areas. Additionally, the project includes a smart grid component financed by the Clean Technology Fund (CTF).

2. The Initial Environmental Examination (IEE) presented herein addresses the 220 kV District 8 Substation and Transmission Line projects in HCMC which represents two of the eight core subprojects identified by Electricity of Viet Nam (EVN) for Ha Noi and Ho Chi Minh City. The eight core subprojects were assigned Category B for environment. The consolidated subproject consists of construction of a new 220 kV substation and a combined upgraded above (OHL) 110 kV to 220 kV, and a new underground line (UGC) 220 kV 6.5 km transmission line in southern HCMC. The IEEs of the other five core subprojects have been prepared separately.

### A. Subproject Summary

3. The primary objective for constructing the new substation is to ensure the sustainability of the N-1 condition for 220 and 110 kV grid network, and provision of overload relief of nearby substations in District 8. This entails supplying power for the 110 kV Phu Dinh, Chanh Hung, Hung Vuong and Tan Hung substations; reinforcing electrical supply capability for District 8 and other neighbouring areas; preventing overload of the 220 kV Nha Be, Tao Dan Substation and 110 kV Nam Sai Gon – Phu Dinh T/L; and linking 220 kV-110 kV power grid in the southern region and ensuring national energy security. The new substation is situated in 1027 Pham The Hien Road, Ward 5, District 8, HCMC. The main features of the substation are summarized as follows:

- Substation will occupy 3,915 m<sup>2</sup>
- 2x250 MVA, 220/110/22 kV substation;
- 220 kV side: double busbar diagram with bus-tie;
- 220 kV bays: two transformer bays, two T/L outgoing bays (Nam Sai Gon 1, Nam Sai Gon 2), one bus coupling bay;
- All 220 kV equipment to be indoor GIS type;
- 110 kV side: double busbar diagram with bus-tie;
- 110 kV bays: two 250 MVA transformer bay, two 63 MVA transformer bay, one bus coupling bay, six T/L line outgoing bays (Phu Dinh 1, Phu Dinh 2, Hung Vuong, Ben Thanh, Chanh Hung, Tan Hung);
- All 110 kV equipment are indoor GIS type;
- Control and protection equipment;
- Communication and SCADA system.

4. The new 6.5 km 220 kV overhead (OHL) and underground (UGC) transmission line is needed to connect the new District 8 substation to Binh Chanh substation (Nam Sai Gon). The need for a combination of OHL and UGC responds to the extent of urban development that has occurred under the existing line which dictates the UGC section in order to reduce cost.

## **B. Potential Impacts and Mitigation**

5. The IEE of the 220 kV District 8 Substation and upgraded 220 kV transmission 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 boat traffic 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). There are no rare or endangered wildlife, critical habitat, or protected areas in the subproject site which is located in high density urban, and peri-urban areas.

6. Some residential and commercial land will be permanently and temporarily lost due to the subproject. The lost land and compensation is addressed in detail in the Resettlement Plan (RP) prepared under separate cover.

7. The upgrading of the above ground (OHL) portion of the 110 kV transmission line from Binh Chanh Substation to 220 kV will occur on the existing RoW which means that the impact footprint of the RoW already exists. The construction-related disturbances to the environment and community concern the short-term disturbances caused by the civil works that will occur to upgrade the footings and replace the towers at the existing tower bases.

8. The underground (UGC) section of the 220 kV line will diverge from the 110 kV OHL and will be trenched along urban streets and under a canal to the new 220 kV substation site. The construction-related impacts and disturbances associated with the placement of the UGC section will be minimized with all work on the trenched line being conducted between 23:00 and 06:00, including restoration of roadway sections for normal daily use.

9. There are no perceived negative induced, or cumulative environmental impacts of the subproject. The objective of providing needed additional electrical power to southern HCMC supports the overall goal of urban and socioeconomic development in the city.

10. The Environmental Management Plan (EMP) prepared for the subproject provides a 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/ESU in environmental management and assessment as focused on the implementation of the EMP.

## **C. Conclusions**

11. The IEE concludes that the feasibility 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) of the subproject is not required.

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## II. INTRODUCTION

### A. Background to IEE

12. The 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 associated substations to supply their medium voltage (MV) distribution system. The Project also aims to strengthen the institutional capacities of Ha Noi Power Corporation (EVN HANOI) and Ho Chi Minh City Power Corporation (EVNHCMC) that are responsible for the supply of power in their respective areas. Additionally, the project includes a smart grid component financed by the Clean Technology Fund (CTF).

13. The Project in Ho Chi Minh City and Ha Noi consists of eight core subprojects (Table 1) that were originally defined by Electricity of Viet Nam (EVN).

**Table 1. Core Subprojects Forming the Project in Ho Chi Minh and Ha Noi<sup>1</sup>**

<b>Ho Chi Minh City</b>
<b>EVNHCMC</b>
<ul style="list-style-type: none"> <li>• New 220 kV District 8 Substation</li> </ul>
<ul style="list-style-type: none"> <li>• Upgrading of existing 110kV to 220 kV transmission line from Nam Sai Gon (Binh Chanh) substation to the new District 8 Substation</li> </ul>
<ul style="list-style-type: none"> <li>• New 110 kV Tham Luong Substation</li> </ul>
<ul style="list-style-type: none"> <li>• New 110 kV underground transmission line to Tham Luong Substation</li> </ul>
<b>Ha Noi</b>
<b>EVN HANOI</b>
<ul style="list-style-type: none"> <li>• New Noi Bai Airport 110 kV Substation and associated 110 kV transmission line from existing Van Tri 220/110 kV Substation</li> </ul>
<ul style="list-style-type: none"> <li>• Upgrading of Phuong Liet 110 kV Substation</li> </ul>
<ul style="list-style-type: none"> <li>• Renovation of Son Tay 110 kV Substation</li> </ul>
<ul style="list-style-type: none"> <li>• Improving and upgrading of Tran Hung Dao 110 kV Substation</li> </ul>

<sup>1</sup> Adapted from Project Inception Report 10/13



## **B. Consolidation of IEEs**

14. During the Project inception mission the eight core subprojects sites were visited, subproject documentation was reviewed, and meetings were held with EVN HANOI and EVNHCMC. The inception phase identified the need to consolidate the core subprojects in order to maximize the coherence and overall usefulness of the Initial Environmental Examinations (IEE) of the core subprojects. The original eight core subprojects were consolidated into the following four IEEs:

### **EVNHCMC:**

- 1) New District 8 220 kV Substation and upgraded 220kV transmission line
- 2) New Tham Luong 110 kV Substation and underground transmission line

### **EVN HANOI:**

- 1) New Noi Bai 220 kV Substation and over- and underground transmission line
- 2) Rehabilitation/upgrade of Tay Son, Phuong Liet, and Tran Hung Dao 110 kV Substations

15. The IEE presented herein addresses the new District 8 220 kV Substation and upgraded 220kV transmission line in HCMC. The IEEs for the other 3 consolidated core subprojects are found under separate cover.

## **C. Assessment Context**

16. The Project was assigned Environmental Category B pursuant to the ADB's Safeguard Policy<sup>2</sup> and recent good practice sourcebook guidance<sup>3</sup>. A category B project will have potential adverse impacts that are less adverse than the impacts of category A project, are site-specific, largely reversible, and can be mitigated with an environmental management plan<sup>4</sup>. The IEE was prepared for the consolidated District 8 220 kV Substation and Transmission Line core subprojects in the feasibility design stage using available data and information on sensitive ecological and cultural receptors that exist for the subproject site.

17. The detailed designs for the District 8 220 kV Substation and Transmission Line subproject will follow subproject approval. The Environmental Management Plan (EMP) that has been prepared for the subproject (Section X) will need to be updated where necessary to meet the final detailed designs of the subproject.

## **III. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK**

18. The District 8 220 kV Substation and Transmission Line subproject will be implemented according to the directives set down for use of Official Development Assistance (ODA) by GoV

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<sup>2</sup> ADB, 2009. Safeguard Policy Statement, ADB Policy Paper.

<sup>3</sup> ADB, 2012, Environmental Safeguards, A Good Practice Sourcebook, Draft.

<sup>4</sup> Footnote 2, pg 19.

Decree No. 131/2006/ND-CP which was promulgated November 9, 2006, and in accordance with the provisions of the parent Sector Project.

#### **A. Viet Nam Regulatory Framework for Environmental Assessment**

19. The Viet Nam Law on Environmental Protection (LEP 2005) prescribes the requirements for environmental assessment (EA) for development and domestic project interventions that affect the natural and social environments. Government Decree 29/2011/ND-CP on strategic environmental assessment (SEA), environmental impact assessment (EIA), and environmental protection commitment (EPC) in conjunction with Circular 26/2011/TT-BTNMT on stipulation of specific articles of Decree 29 both elaborate the EA requirements specified by the LEP (2005). Decree 29 and Circular 26 are implemented in conjunction with Decree 80/2006/ND-CP, and Decree 21/2008/ND-CP (see below).

20. The updated screening criteria of Decree 29 distinguish projects that require an Environmental Impact Assessment (EIA) from projects requiring the simpler Environmental Protection Commitment (EPC). The difference between the two processes reflects the level of assessment, and final review and appraisal that is required. At the time of writing Decree 29 requires that an EIA be prepared for the District 8 220 KV Substation and Transmission Line subproject.

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

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

- Law on Environmental Protection No. 52/2005/QH11, in effect on June 12, 2005;
- Law on Water Resources No 08/1998/QH10.
- Biodiversity Law 20/2008/QH12 dated 13th November 2008
- Cultural Heritage Law 28/2001/QH10 dated 29th June 2001
- Land law No.13/2003/QH11 dated 26<sup>th</sup> November 2003
- Decree No. 29/2011/ND-CP, dated April 18, 2011, on Regulating Strategic Environmental Assessment, Environmental Impact Assessment and Environmental Protection Commitment.
- Circular No. 26/2011/TT-BTNMT dated on 08/12/2011 by the Ministry of Natural Resources and Environment on Guidance for Strategic Environmental Assessment, Environmental Impact Assessment, and Environmental Protection Commitment.
- Decree No.12/2009/ND-CP which replaces Decree No. 16/2005/ND-CP and Decree No. 112/2006/ND-CP on Investment Management on Construction Projects.
- Decree No.21/2008/NĐ-CP dated on 28/02/2008 about Amendment and Addition of Some Articles in Decree No.80/2006/NĐ-CP dated on 09/8/2006 by the Government.

- Decree No.59/2007/NĐ-CP dated on 09/4/2007 by the Government about Solid Waste Management.
- Decree No. 117/2009/ND-CP Regulation on sanctioning administrative violations in environmental protection, issued: 31/12/2009
- Decree No. 04/2009/ND-CP, Incentives and support for environment protection activities, issued: 14/01/2009.
- Decree 110/2002/ND-CP, supplementing some Articles of Decree 06/1995 on Labour Code of Occupational Safety and Health
- Decree 06/1995, Elaborating Provisions of Labour Code on Occupational Safety and Health.
- Decree No.140/2006/NĐ-CP dated on 22/11/2006 by the Government which regulates Environmental Protection, Designing, Approval and Implementation of Development Strategies, Plans, Programs and Projects.
- Decree No.80/2006/NĐ-CP dated on 09/8/2006 about Guiding for the Implementation of Some Articles in the Law on Environmental Protection (2005).
- Decree No.149/2004/NĐ-CP dated on 27/7/2004 about Issuing Permits for Water Resource Exploration, Exploitation and Utilization and Permits for Discharge to Water Bodies.
- Decision No.16/2008/QĐ-BTNMT dated on 31/12/2008 by the Ministry of Natural Resources and Environment about Promulgation of the National Technical Regulations for the Environment.
- Decision No.18/2007/QĐ-BTNMT dated on 05/11/2007 about Promulgation of Statistic Indicator System for the Field of Natural Resources and Environment.
- Decision No.23/2006/QĐ-BTNMT dated on 26/12/2006 about Promulgation of the List of Hazardous Waste.
- Decision No.27/2004/QĐ - BXD dated on 09-11-2004 by the Minister of Ministry of Construction on the promulgation of TCXDVN 320:2004 "Landfill for hazardous waste – Design standards"
- Decision No.22/2006/QĐ-BTNMT dated on 18/12/2006 about Obligations to Apply Vietnamese Standards for the Environment.
- Decision No.233/2006/QĐ-TTg dated on 18/10/2006 about approving the National Program on Labor Protection, Safety and Sanitation up to 2010.
- Decision No.1222/QĐ-BTNMT dated on 20/09/2006 about Organization of Reception and Progressing Recommendations from Individuals, Organizations and Enterprises on Aspects which are managed by Ministry of Natural Resources and Environment.
- Decision No.35/2002/QĐ-BKHCHNMT dated on 25/6/2002 about Promulgation of Series of Vietnamese Standards for the Environment.
- Decision No.60/2002/QĐ-BKHCHNMT dated on 07/8/2002 about Promulgation of the Guidance for Disposal of Hazardous Wastes.

- Decision No.3733/2002/QĐ-BYT issued by Ministry of Healthcare dated on 10/10/2002 About the Application of 21 Labour Health and Safety Standards
- Decision No.155/1999/QĐ-TTg dated on 16/7/1999 by the Government on Promulgation of the Management Mechanism for Hazardous Waste.
- Decision No.505 BYT/QĐ, dated on 13/4/1992 by the Ministry of Healthcare on the Regulation for Allowed Concentrations.
- Circular No. 16/2009/BTNMT and No. 25/2009/BTNMT on Promulgation of Vietnamese National Standards.
- Circular No.10/2007/TT-BTNMT dated on 22/10/2007 about Guidance for Assurance and Control of the Quality of Environmental Monitoring.
- Circular No.12/2006/TT-BTNMT dated on 26/12/2006 by the Ministry of Natural Resources and Environment on Guidance for Practice Conditions, Procedures for Application, Registration, Endorsement and Issuing the Code for Hazardous Waste Management.

## **Environmental Standards and Regulations**

### **Water quality:**

- QCVN 01:2008/BYT – National technical regulations on quality of drinking water
- QCVN 08:2008/BTNMT – National technical regulations on quality of surface water
- QCVN 09:2008/BTNMT – National technical regulations on quality of groundwater
- QCVN 10:2008/BTNMT – National technical regulations on quality of about coastal water
- QCVN 14:2008/BTNMT – National technical regulations on quality of domestic wastewater
- QCVN 24:2008/BTNMT– Industrial wastewater discharge standards
- QCVN 02:2009/BYT - National standard of domestic water supply
- TCVN 5502:2003 – Supplied water – Requirements for quality
- TCVN 6773:2000 – Water quality – Water quality for irrigational purposes
- TCVN 6774:2000 – Water quality – Water quality for aquaculture protection
- TCVN 7222:2002 – Water quality for concentrated domestic WWTP
- TCVN / QCVN - Standard methods for analyzing environmental quality

### **Air Quality:**

- QCVN 05:2008 – Standards for ambient air quality
- QCVN 06:2008 – Maximum allowable concentration of hazardous substances in the ambient air
- TCVN 6438:2001 – Maximum permitted emission limits of exhausted gases from vehicles

### **Solid Waste Management:**

- TCVN 6696:2009 – Solid waste – Sanitary landfill. General requirements for environmental protection.
- QCVN 07:2009– National technical regulations for classification of hazardous wastes
- QCVN 25:2009 – National technical regulations for wastewater of solid waste sites
- QCVN 15:2008/BTNMT: - National regulation on allowable pesticide residues in soil
- QCVN 03:2008/BTNMT: - National regulation heavy metals concentrations in soil

### **Vibration and Noise:**

- QCVN 26:2010/BTNMT: national technical standard for noise

- TCVN 6962: 2001 Allowable vibration level for public and residential areas
- TCVN 6962:2001: - Allowable vibration and shock from construction activities

#### **International Guidelines**

- World Bank Group, 2007. Environmental Health and Safety Guidelines, Wash. DC.
- AWWA Standard Methods for Measurement and Analysis Environmental Quality

#### **Specific regulations for resettlement and compensation**

- Decree No. 197/2004/ND-CP dated 03/12/2004, on compensation support, and resettlement
- Circular 14/2009/TT-BTNMT dated 01/10/2009, on detailed regulations on compensation, support and resettlement.

#### **Directives of Electrical Power Industry in Viet Nam and Ho Chi Minh City**

- Electricity Law, No. 28/2004/QH11, Issued: 03/12/2004
- Government Decree, No. 81/2009/NĐ-CP, on the safety protection of high-voltage power grids, Issued 17/08/2005
- MIT Circular, No. 03/2010/TT-BCT, on safety protection of high-voltage power grid works, Date issued: 22/01/2010
- Decision No. 6493/QĐ-BCT dated 09/12/2010, Approved electricity development plan in Ho Chi Minh City period up to 2015 and 2020.

#### **International Environmental Management Conventions**

22. Viet Nam is signatory to the following relevant international conventions:
- 2009, Stockholm Convention on Protection of Human Health and the Environment from Persistent Organic Chemicals [including PCBs]
  - 1971, Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar)
  - 1982, Protocol to Amend the Convention on Wetlands of International Importance Especially as Waterfowl Habitat, Paris
  - 1972 Convention Concerning the Protection of the World Cultural and Natural Heritage October 1987]
  - 1973, Convention on International Trade in Endangered Species Wild Fauna and Flora
  - 1985 FAO International Code of Conduct on the Distribution and Use of Pesticides
  - 1985 Vienna Convention for the Protection of the Ozone Layer
  - 1987 Montreal Protocol on Substances that Deplete the Ozone Layer

- 1992, Copenhagen Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, Copenhagen
- 1989, Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal
- 1992, United Nations Framework Convention on Climate Change
- 1992, Convention on Biological Diversity

### **C. ADB Safeguard Policy**

23. The ADB Safeguard Policy Statement (ADB SPS, 2009) along with the recent good safeguard practice sourcebook clarify the rationale, scope and content of an EA 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).

24. 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. Appendix A presents the Rapid Environmental Assessment (REA) of the District 8 substation and transmission line.

## **IV. DESCRIPTION OF SUBPROJECT**

25. The District 8 substation and transmission line subproject consists of the two major components defined by: 1) new the 220 kV Substation; 2) new 220 kV OHL and UGC transmission line. The description of the subproject which is adapted from the Project Draft Final Report is provided below and shown in Figure 1.

### **A. 220 kV District 8 Substation**

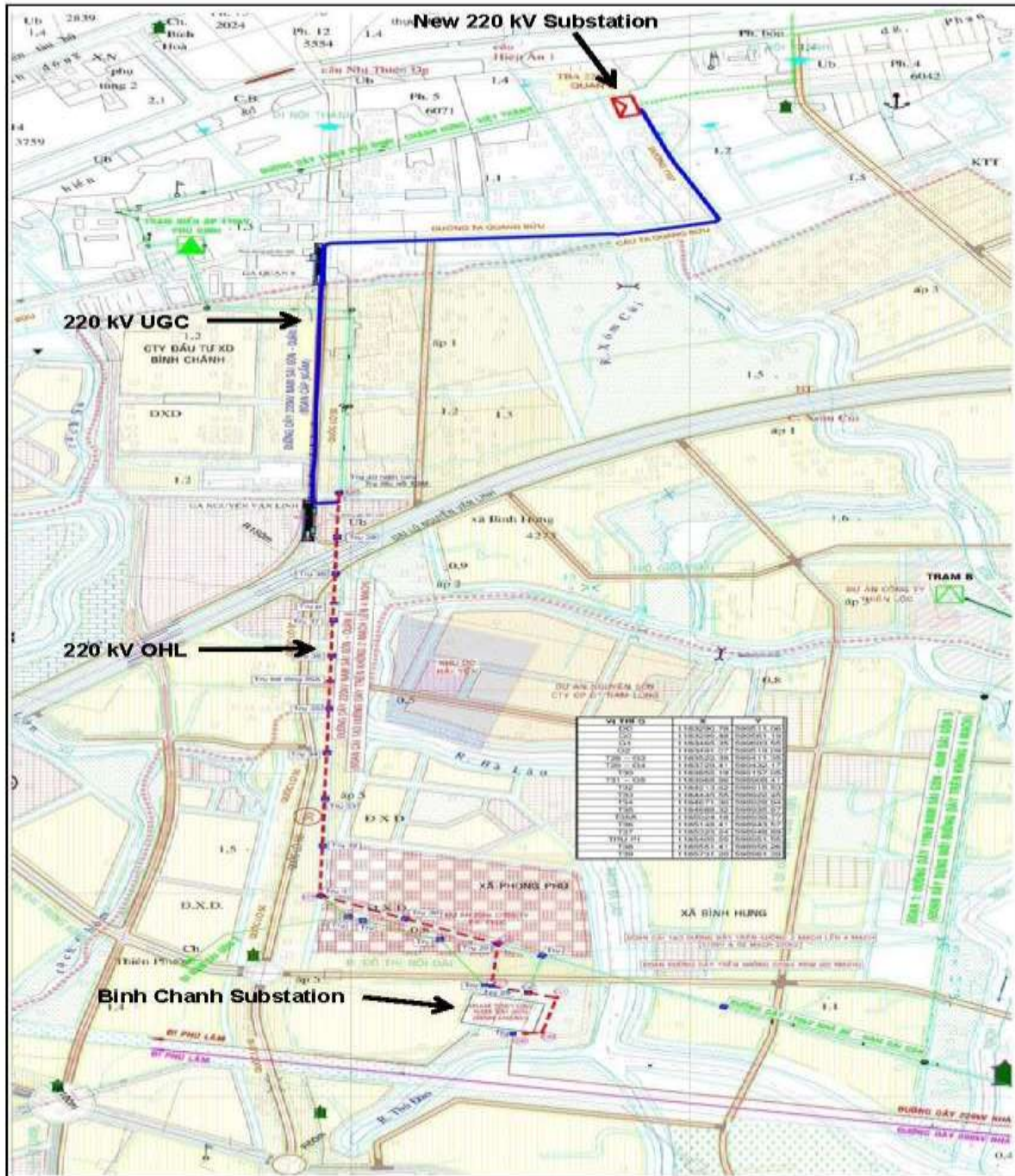
26. The main objective for constructing the new substation<sup>5</sup> is to ensure the sustainability of the N-1 condition for 220 and 110 kV grid network, and provision of overload relief of nearby substations in District 8. This entails: supplying power for the 110 kV Phu Dinh, Chanh Hung, Hung Vuong and Tan Hung substations; reinforcing electrical supply capability for District 8 and other neighbour areas; preventing overload of the 220 kV Nha Be, Tao Dan Substation and 110

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<sup>5</sup> Adapted from Draft Final Report

kV Nam Sai Gon – Phu Dinh T/L; and linking 220 kV-110 kV power grid in the southern region and ensuring national energy security.

Figure 1. Location of 220 kV Transmission Line and Substation in District 8 in HCMC



27. The new substation is situated in 1027 Pham The Hien Road, Ward 5, District 8, HCMC. The main features of the substation are summarized as follows:

- Substation will occupy 3,915 m<sup>2</sup>;
- 2x250 MVA, 220/110/22 kV substation;
- 220 kV side: double busbar diagram with bus-tie;
- 220 kV bays: two transformer bays, two T/L outgoing bays (Nam Sai Gon 1, Nam Sai Gon 2), one bus coupling bay;
- All 220 kV equipment to be indoor GIS type;
- 110 kV side: double busbar diagram with bus-tie;
- 110 kV bays: two 250 MVA transformer bay, two 63 MVA transformer bay, one bus coupling bay, six T/L line outgoing bays (Phu Dinh 1, Phu Dinh 2, Hung Vuong, Ben Thanh, Chanh Hung, Tan Hung);
- All 110 kV equipment are indoor GIS type;
- Control and protection equipment; and
- Communication and SCADA system.

**B. 220 kV Transmission Line and Underground Cable**

28. The new 220 kV overhead (OHL) and underground (UGC) transmission line<sup>6</sup> is needed to connect the new District 8 substation to Binh Chanh substation (Nam Sai Gon). The need for a combination of OHL and UGC responds to the extent of urban development that has occurred under the existing line which dictates the UGC section in order to reduce cost. For example, at some sections of the line corridor there is no access to the existing 110 kV tower to upgrade to 220 kV tower, and as a result an UGC along the road is only option. Key details of the OHL and UGC are summarized in Table 2.

**Table 2. Key Features of 220 kV Transmission Line**

Length	6.5 km.
Open trench width for UGC	0.75 m
Voltage level	220 kV, 110 kV.
Number of circuits:	+ Independent circuits: 02 circuits of 220 kV
Beginning point	220 kV busbar - 220 kV Binh Chanh substation
Ending point	220 kV busbar - 220 kV District 8 substation
Conductor	ACSR- $\geq$ 400 XLPE-
Form design	Underground cable: inserted in HDPE $\Phi$ 25 and buried beneath the road.

<sup>6</sup> Footnote 5



	Overhead line: using geometric steel pole and single steel pole, using pile foundation and reinforced concrete foundations. Ensure the safety distance as required by the current rules of equipping electricity and the Decree of the Government N° 106 and 81.
	Location: follows the existing corridor of 110 kV Binh Chanh – Phu Dinh line (with expanding the existing corridor) and underground along national road 50, Ta Quang Buu and road 1107.

## V. DESCRIPTION OF AFFECTED ENVIRONMENT

29. The environmental baseline was obtained primarily from HCMC Statistical Yearbooks, state of the environment reports (SoER) prepared by HCMC DoNRE, reports from PECC3, and supplemented from the literature including other EAs conducted for the same area. The description of affected environments focuses on natural features and land use.

### A. Physical Environment

#### 1. Climate

30. The subproject area is situated in the Southern Climate Zone which is typified by a tropical monsoon climate characterised by high temperatures with very little seasonal variation. Annual average temperature for lowland areas are constant within a narrow range of 27.2 - 27.7°C. The highest temperature is 40°C (April) and the lowest temperature is 13.8°C (January). Average sunshine is 2,400 hr/yr to 2,700 hr/yr. The subproject area belongs to wet and hot monsoon tropical climate region with characteristic of the South climate as summarized below. Temperature regime at Tan Son Nhat Meteorological station is summarized in Table 3.

**Table 3. 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	T <sub>max</sub> °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
(long-term average)	T <sub>min</sub> °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 <sub>average</sub> °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 (2011)	T <sub>average</sub> °C	26.9	27.6	28.3	29.11	29.5	28.5	27.9	28.4	28.1	28.1	28.1	27.2	28.1

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 2011 of HCMC)

31. According to the report of the Working Group on Climate Change and Development, (2007), in the Mekong region (Ho Chi Minh City) average temperatures over the last century, have risen between 0.3 to 0.8°C. Further temperature increases are expected along 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.

**a. Sunlight hours**

32. Average sunlight in Ho Chi Minh City is high as compared with other areas in Viet Nam. Number of sunlight hours in a year is of 1800 - 2500 hours or more. Table 4 shows the average sunlight at Tan Son Hoa and Tan Son Nhat meteorological station.

**Table 4. Average Sunlight (Hr) at Tan Son Nhat & Hoa**

Station	Months (hr)												
	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	2489
Tan Son Hoa (2011)	120.1	188.9	157.8	187.0	165.0	163.6	162.6	198.1	144.8	154.3	141.0	109.7	1892.2

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 2011 of HCMC)

**b. Humidity and Rainfall**

33. The subproject area is humid with little difference in rainfall between the monsoon seasons. Annual average humidity is about 78% - 82 %. The rainfall regime is separated into two seasons: rainy season from May to October; and dry season from November to April. Maximum rainfall in the region is 200 mm per day. Total annual average rainfall in the region is from 1800 mm to 2000 mm (Table 5).

**Table 5. Monthly and Annual Average Rainfall and Humidity at Tan Son Nhat Station**

	Months (mm)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
<b>Rainfall</b>	12	4	13	51	207	294	307	281	305	291	135	28	1926
<b>Humidity (%)</b>	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
<b>Humidity (%)</b>	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; data of Tan Son Hoa station %, statistic yearbook 2011 of HCMC

### c. Wind velocity

34. 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 with 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 6).

**Table 6. Wind Velocity and Number of Thunderstorm-days at Tan Son Nhat Station**

Parameters	Months, year												Year
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
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

35. Air quality in HCMC is monitored frequently and focused on pollutants from traffic activity. 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 7.

**Table 7. Air Pollutants at 6 locations in 2012/2013**

		Hang Xanh	DTH-DBP	Phu Lam	An Suong <sup>7</sup>	Go Vap	HTP-NVL
CO (mg/m <sup>3</sup> )	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 <sup>3</sup> )	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%

<sup>7</sup> An Suong station is nearest to project site located 1.5 km north at An Suong intersection, District 12.

		Hang Xanh	DTH-DBP	Phu Lam	An Suong <sup>7</sup>	Go Vap	HTP-NVL
Lead (mg/m <sup>3</sup> )	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 <sub>2</sub> (mg/m <sup>3</sup> )	Average 2012	0.17	0.21	0.18	0.21	0.18	0.17
	Average first half 2013	0.15	0.19	0.17	0.2	0.17	0.17
Noise (mg/m <sup>3</sup> )	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)

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

37. The second pollutant is dust which is also a serious concern. In 2012, dust levels at the 6 stations were from 0.44 – 0.65 mg/m<sup>3</sup>, with 96% of them over the permitted standard of 0.30mg/m<sup>3</sup>. 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<sup>3</sup>, with 95% over the standard.

38. NO<sub>2</sub> content was 0.17 – 0.21 mg/m<sup>3</sup> in 2012, and 0.15-0.20 mg/m<sup>3</sup> in the first 6 months of 2013. Overall, this content has 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. Air quality at 2 locations of the subproject area is summarized in the Table 8.

**Table 8. Air Quality at Subproject Area**

Position	Noise (dBA)	The concentration of pollutants (mg/m <sup>3</sup> )			
		Total dust	CO	SO <sub>2</sub>	NO <sub>2</sub>
KK1	58.1	0.215	4.26	0.086	0.057
KK2	55.2	0.243	4.51	0.076	0.065
<b>QCVN 05:2009/BTNMT</b>		<b>0.3</b>	<b>30</b>	<b>0.35</b>	<b>0.2</b>
<b>QCVN 26:2010/BTNMT</b>	<b>≤70</b>				

(Source: Result of integrated air quality division, 2013)

KK1 = Tower No.38, Nha Be-Phu Dinh 110kV T/L, 10°43'9.44"N; 106°39'23.28"E

KK2 = The area of the 220 kV substation, District 8, 10°44'26.51"N; 106°39'52.05"E

39. Table 8 indicates that the air quality in the subproject area is very good. All air quality parameters at the measurement points meet the standard of QCVN 05:2009/BTNMT and QCVN 26:2010/BTNMT.

### **3. Topography, Geology and Soils**

40. 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.

- a) 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 at 32 meters.
- b) 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.
- c) 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.

41. Geology of Ho Chi Minh City consists of exposed Pleistocene and Holocene sediment. Pleistocene sediment occupies most of the region in the north, northwest and northeast of the city. Under the influence of natural factors and human activities, ancient alluvial deposits formed a type of distinctive soil: gray soil. With more than 45 thousand hectares, or about 23.4 % of the city area, gray soil in Ho Chi Minh City has three categories: high gray soil, gray soil with patchy layer of red and yellow and grey gray soil pretty rare. Holocene sediment in Ho Chi Minh City was formed by many sources: the sea, bays, rivers, alluvial ground, etc. which formed many different types of soil: marine alluvial soils with 15,100 hectares, alkaline soil with 40,800 hectares and salty alkaline soil with 45,500 ha. In addition, there are about 400 hectares of "sand bar" near the sea and brown yellow feralite eroded and exposed stones on the hills.

42. The terrain of subproject area is mostly flat with many rivers/canals in this area. The infrastructure of area is well developed. The main roads to access the subproject include: Highway 50, Ta Quang Buu St., Road 1107 and some rural routes.

#### **a. Soil**

43. The soil of Ho Chi Minh City was formed upon two sediment classes: Pleistocene and Holocene, in which Hoc Mon district and district 12 belonging to the Pleistocene sediment - ancient alluvial sediment. Main characteristics of the sediment class are hilly terrain, with a depth range of 3 to 25 meters, and oscillation in the southeastern direction. Due to the combined effects of natural factors, including creatures, climate, time and human activities, and erosion and decomposition, the sediment class has developed into grey soil.

### **i. Alluvial soil**

44. Alluvial soil formed in the highlands terrain, which is as deep as 1.5-2 meters, include the areas of Hoc Mon district. The alluvial soil is classified into three types: alluvial soil with speckled layers, grey alluvial soil, and sweet alluvial soil. The main mechanical constituent of the alluvial soil is clay with a medium to high amount. Surface layers have a pH of 4.2 to 4.5. The pH degree of deeper layers is up to 5.6 or 6.0 but the acidity is higher. The soil has medium humus content and fairly high nutrient content. In general, the alluvial soil is fertile and suitable for growing high-yielding paddy.

45. According to the results of field survey and analysis in the laboratory, soil in the subproject area is divided into the following layers:

Layer 1: covered soil: fine sand, clay loam, clay loam with rounded material. The average thickness from 0.5 to 1.0m.

Layer 2: clay loam with colors such as green grey, gold grey, red brown, damp soil, soft–hard plastic state. This layer only appeared at bored hole No.1 of the survey for underground cable. This layer has 1.3 m in thickness.

Layer 3: clay with colors such as brown grey, gold grey, red brown, damp soil, medium hard – hard state. This layer appeared at all the bored holes of the survey items for both underground cable and substation. This layer has from 5.8 to over 15m in thickness (this layer still appeared even at the deepest point (40m) of the bore hole No.1.

Layer 4: clay sand with colors such as green grey, gold grey, red brown, damp soil, plastic state. The layer only appeared in the two bored hole. The layer has 1.9-5m in thickness.

Layer 5: salty sand with grey, gold grey colors, water-saturated soil, loosed state. This layer only appeared at the bore hole No.1 of the survey for underground cable. This layer has 5.0 m in thickness.

Layer 5a: medium - crushed sand with black grey, green grey, gold, water – saturated soil, and compact state. The layer only appeared in the two bore hole. The layer has 5.0 – 7.5m thickness.

### **4. Surface water / groundwater resources**

46. Ho Chi Minh City has a diverse river system. Dong Nai River has mean flow about 20–500 m<sup>3</sup>/s, supplying 15 billion m<sup>3</sup> 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<sup>3</sup>/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, and Nhieu Loc-Thi Nghe.

47. The rivers and canals in Ho Chi Minh City are influenced by the semi-diurnal tidal fluctuations of the East Sea which penetrates deep into the canals in the city. The highest average water level of tide is 1.10 m. The highest water level often occurs in October or November, the lowest water level can occur in June or July. In the dry season, discharge collected from the upstream rivers is small, salinity of 4‰ can penetrate in the Saigon River. In the rainy season, discharge from the upstream rivers is high, so salinity is pushed back farther and decrease significantly.

48. Near the subproject area, there are many canals such as the Hiep An River, Doi channel, Bo De canal, Xom Cui ditch, etc. These rivers and canals are influenced by semi-diurnal tides, the tide rises and falls twice every day.

49. The groundwater of the southern part of the city (including the subproject area) usually acquired alum or salt due to Holocene sediment, 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

50. 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, from which, three stations are near to the subproject site (Phu Cuong, canal N46, and Rach Tra), and 10 stations monitoring water surface of canals inner the city, including 1 station monitoring Tham Luong – Vam Thuat canal, which is near to the subproject site.

51. Overall, the quality of supply water is clean in terms of biochemical and chemical oxygen demand as well as coliform contents while the quality of water in canals inner the city is seriously contaminated. Tables 9 and 10 show some parameters measured in the stations close to the subproject sites in 2012 and 2013, respectively.

**Table 9. Surface Water Quality Near Subproject Area, 2012**

No	Station	pH	DO (mg/l)	COD (mg/l)	BOD <sub>5</sub> (mg/l)	Oil (mg/l)	Coliform (MPN/100 ml)
<i>I</i>	<b><i>Monitoring results of surface water quality for other purposes</i></b>						
	Binh Dien	6.9	1.9	10	6.4	0.031	9,186
	QCVN 08:2008/BTNM T column B1	<b>5.5-9</b>	<b>≥4</b>	<b>&lt;30</b>	<b>&lt;15</b>	<b>0.1</b>	<b>7,500</b>
<i>II</i>	<b><i>Monitoring results of the water quality from canals</i></b>						

No	Station	pH	DO (mg/l)	COD (mg/l)	BOD <sub>5</sub> (mg/l)	Oil (mg/l)	Coliform (MPN/100 ml)
	Doi - Te (high tide)	6.9		43.2	14.2		2.1 X10 <sup>5</sup>
	Doi - Te (low tide)	6.9		20.7	11.9		7.0X10 <sup>4</sup>
	QCVN 08:2008/BTNMT column B2	5.5-9		<25	<50		<10,000

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

QCVN 08:2008/BTNMT: national technical regulation on surface water quality. Specifically, Column A1 means good use for drinking water and others, B1 – use for irrigation or relevant purposes, B2 – use for waterway traffic

TCXD 33:2006: water supply distribution system and facilities – design standard. Binh Dien station is about 5km west of subproject site. Doi – Te system station is about 2.5 km northwest of subproject site

**Table 10. Surface Water Quality Near Subproject Area, 2013**

No.	Station	pH	DO (mg/l)	COD (mg/l)	BOD <sub>5</sub> (mg/l)	Oil (mg/l)	Coliform (MPN/100 ml)
<b>I</b>	<b>Monitoring results of surface water quality for other purposes</b>						
	Binh Dien	6.8	1.6	10.5	5.5	0.028	1,550
	QCVN 08:2008/ BTNMT column B1	<b>5.5-9</b>	<b>≥4</b>	<b>&lt;30</b>	<b>&lt;15</b>	<b>0.1</b>	<b>7,500</b>
<b>II</b>	<b>Monitoring results of the water quality from canals</b>						
	Doi - Te (high tide)	7.0		25	10.5		216,921
	Doi - Te	6.9		24.0	4.70		458,594



No.	Station	pH	DO (mg/l)	COD (mg/l)	BOD <sub>5</sub> (mg/l)	Oil (mg/l)	Coliform (MPN/100ml)
	(low tide)						
	QCVN 08:2008/ BTNMT column B2	5.5-9		<25	<50		<10,000

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

52. Tables 8 and 9 show that “other purpose water” has coliform and DO that exceed the standard level. Between 2012 and the first half of 2013, the parameters such as pH, BOD<sub>5</sub>, COD decreased both in the water-body for other purpose and the canals. It indicates that the environmental management of the surface water quality is better in the first half 2013 than that in 2012.

53. PECC3 conducted an analysis of water quality in the subproject area in April 2013. The values of analyzed parameters were compared with that from the B1 column of QCVN 08:2008/BTNMT, that are applied for surface water used for irrigation purposes and for other similar purposes (Table 11).

**Table 11. Surface Water Quality Near Subproject Area**

Parameter		pH	TSS	BOD <sub>5</sub>	COD	Total of Nitrogen	Total of Phosphorous	Coliform
Unit		-	mg/L	mg/L	mg/L	mg/L	mg/L	MPN/100mL
NM1		6.57	54	16	30	5.48	0.43	31x10 <sup>2</sup>
NM2		6.71	110	15	27	5.12	0.37	23x10 <sup>2</sup>
<b>QCVN 08:2008 /BTNMT</b>	<b>B1</b>	<b>5.5-9</b>	<b>50</b>	<b>15</b>	<b>30</b>	<b>10</b>	<b>0.3</b>	<b>7,500</b>
	<b>B2</b>	<b>5.5-9</b>	<b>100</b>	<b>25</b>	<b>50</b>	<b>15</b>	<b>0.5</b>	<b>10,000</b>

NM1 = Rach Ngang Bridge, Phong Phu, Binh Chanh, 10°43'14.31"N; 106°39'28.05"E

NM2 = Ta Quang Buu Bridge, Ward 5, Dist. 8, 10°44'5.42"N; 106°39'56.63"E

54. According to the standard of TSS, COD and BOD<sub>5</sub> of column B1 given in Table 11, the river water is slightly contaminated especially at location NM1. The reason is due to the stagnant water amount of the canals, ditches and these sampling locations are near the place where public garbage is collected. The concentration of TSS at location NM2 is high. It exceeds the B2 criteria because the sampling location is the place where the river has greatly changed in the vertical as well as horizontal direction. There is no water surface source directly impacted by the subproject's construction and operation.

**a. Groundwater quality**

55. Groundwater in HCMC is polluted by microorganisms, especially at Pleistocene layer. Binh Chanh district is one of locations where layer are contaminated by alum. Water quality of upper and under Pliocene layers at Binh Chanh district and District 8 is relatively good (Table 12).

**Table 12. Groundwater Quality at Binh Hung Station Near Binh Chanh Dist. and Dist. 8**

Binh Hung Stations	pH	TDS	hardness	NO <sub>3</sub> -	Fe	Total Coliform	Fecal Coliform
		mg/l	mgCaCO <sub>3</sub> /l	mg/l	mg/l		
<b>Pleistocene layer</b>							
2012	6	5926	1176	6.33	4.22	1688	153
First 6 month 2013	7.8	3375	958.78	3.9	3.06	581	45
<b>Under Pliocene layer</b>							
2012	5.93	5620	1228.37	5.16	4.08	3068	800
First 6 month 2013	4.26	136	45.55	22.69	0.53	580	0
<b>QCVN 09:2008/BTNMT</b>	<b>5.5-8.5</b>	<b>1500</b>	<b>500</b>	<b>15</b>	<b>5</b>	<b>3</b>	<b>0</b>

*(Source: Reports on monitoring results of environmental quality in HCMC in 2012, from Environmental Monitoring and Analysis Centre – DONRE of HCMC)*

56. The groundwater quality of Pleistocene Layer at Binh Hung station in 2012 and 2013 when compared with QCVN 09:2008/BTNMT shows high TDS, hardness, total coliform and fecal coliform that exceed the permitted values. Only NO<sub>3</sub><sup>-</sup> and Fe meet the QCVN standard. The groundwater quality of upper Pliocene Layer at Binh Hung station in 2012 was high in TDS, hardness, total coliform and faecal coliform values which exceeded the permitted values. Only NO<sub>3</sub> and Fe parameters met standard. However in 2013, TDS and hardness rapidly decreased to several times lower than the standards and NO<sub>3</sub><sup>-</sup> value is higher than the standard. It may be caused by the filling of ground water level with rain water.

## B. Biological Environment

### 1. Vegetation and Land Use

57. Binh Chanh District has a natural area of 25,255.29 ha with land types (agricultural and non-agricultural land) as follows: agricultural land of 17,172.64 ha, non-agricultural land of 7,963.99 ha and unused land of 118,67 ha. In agricultural land, there are forest land of 1047.85 hectares with 755.26 ha production forest, mainly pineapples, eucalyptus, etc. being exploited, particularly at Pham Van Hai commune, Le Minh Xuan commune; protection forest land of 262.67ha and special used forest of 29.92ha mainly acacia auriculiformis distributed in Le Minh Xuan commune. Overall, the district forest takes very small proportion, mainly natural secondary forest and planted forest. Plantation area of Binh Chanh District is both improving the ecological environment landscape and contributing to the supply of wood for construction (Melaleuca pile, etc.).

58. District 8 has an area of 1899.89 hectares with land-use rate still low. District 8 has 75 main roads, regional roads and internal roads with total length of 111.626m, , most of the roads concentrate in the old urban areas (Cui Hamlet, Hung Phu, Rach Ong, etc.). There are also 47 bridges, including 24 bridges for pedestrians. In recent years, in District 8, traffic density has been increasing, due to narrow roadways so traffic jam often occurs. About waterways, District 8 has 23 large and small canals, but they are rarely dredged and encroached by many houses along canals so water transportation is very difficult, and transportation of goods and passengers is reduced. In addition, as planned, District 8 has many industrial parks such as Binh Dang, Phu Dinh, Phu Loi 7, Ben Luc, etc. Vegetation cover of District 8 includes the Ward 4 park with area of 35.83 ha, Hiep An green tree park with area of 29ha, Xang Thoi park with area of 3 hectares, Da Nam park - Chu Y bridge and the landscapes along the canals have been cleared (at the Ben Binh Dong cleared area and houses along the canals).

59. Vegetation and land use systems occurring within the RoW is mostly residential area, which occupy 1.3 km of the RoW and pond area, which occupy 1.69km while the next most common feature is road which occupy 3.51km of the RoW. There is no undisturbed natural forest remaining anywhere within the RoW.

60. Vegetation and land use systems occurring within the substation is shown in Table 13 which shows that majority of the subproject land is substation area, which occupy 3,995 m<sup>2</sup> while pond area occupy 144 m<sup>2</sup>.

**Table 13. Vegetation and Land Use Within Subproject Area**

No	Section	Length (m)	Area* (m <sup>2</sup> )				
			Pond	Road	Residential area	Commercial area	Total
	Transmission line						
	Wire line						
1.	G1-G5	1,016	3,302				3,302

No	Section	Length (m)	Area* (m <sup>2</sup> )				
			Pond	Road	Residential area	Commercial area	Total
2.	G5-G6	1,980	2,210		4,225		6,435
	Underground line	3,510		14,040			14,040
<b>Total</b>			<b>5,512</b>	<b>14,040</b>	<b>4,225</b>	<b>0</b>	<b>23,777</b>
	Substation					3,995	3,995
<b>Total</b>			<b>144</b>	<b>0</b>	<b>0</b>	<b>3,995</b>	<b>4,139</b>
<b>TOTAL</b>			<b>5,656</b>	<b>14,040</b>	<b>4,225</b>	<b>3,995</b>	<b>33,916</b>

\* Area is calculated by Distance x safety zone along the line for 110kV and 220 kV

## 2. Wildlife

61. The area has been extensively changed and no original habitats remain in the area. No significant wildlife occurs any longer within the area. There are no climbing animals that could interfere with the transmission line. A check of websites e.g. Birdlife International does not identify any bird migration routes through Vietnam. The Asian Flyway does not pass through Vietnam and instead heads south through the Philippines.

## 3. Conservation Areas

62. There are no conservation areas within the proximity of the transmission line or site for substation.

## C. Socioeconomic condition

### 1. Population

63. The transmission line and substation is situated within Ho Chi Minh City and includes 2 districts with 2 communes and 1 ward<sup>8</sup>. The population within the immediate subproject area (as defined by communes through which the transmission line passes) is 133,558 persons with 74% of the population being rural-based and the remaining 26% as being urban-based. Population statistics for the subproject is located as shown in Table 14.

**Table 14. Population Distribution in Subproject Area**

<sup>8</sup> Wards are the urban equivalent of communes which are defined as being rural based communities.

District/	Commune/ Ward	Population (no)	Female	Male	Ethnic minority
Binh Chanh	Phong Phu (Rural)	61,298	31,323	29,975	Khmer and Chinese 40 households
	Binh Hung (Rural)	67,240	34,023	33,287	Chinese 17 households
District 8	Ward 5 (Urban)	34,401	18,113	16,288	No
<b>TOTAL</b>		16,2939	83,459	79,550	
<b>%</b>		<b>100%</b>	<b>51%</b>	<b>49%</b>	

Source: Commune statistics, 2013

## 2. Local Economy

64. 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 2012 decreased to 9,2% (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.

## 3. Social Infrastructure

### a. Public Health and Sanitation.

65. The location of the underground cable close to Ho Chi Minh City means that all communities have good access to medical services. Local medical facilities include healthcare stations at the commune level which includes first aid and medical assistance for minor illnesses and maternal services. Medical emergencies are referred to district hospitals while more complex surgery is carried out in the main hospitals in Ho Chi Minh City. Services and trained medical staff are increasing.

66. The incidence of HIV/AIDS in Ho Chi Minh is the highest in Vietnam. According to the "Analysis and Advocacy" subproject of USAID, the total number of people living with HIV in Ho Chi Minh City is expected to rise from 72,400 in 2006 to 89,900 in 2010 and 105,800 in 2020. In 2006, there were about 4,800 new AIDS cases in Ho Chi Minh City, in 2012 this figure was 1099 new cases which held 18.5% of total new cases in the whole country (According to report No. 755/BC-BYT of Health Ministry dated September 4<sup>th</sup> 2012). The number of people with HIV is 49,429 people based on the statistics in the first of 2012. Clients of sex workers have become the largest single group of new HIV infections. By 2005, almost 4,000 clients a year contracted

HIV. These and previous infections among men have led to an estimated 2,000 women per year being infected by their husbands by 2005. In 2006, there were about 4,800 new AIDS cases in Ho Chi Minh City. This will climb to an estimated 7,700 new cases in 2010. All three communes have sewer drainage system and wastewater treatment facilities that are operating well.

**b. Education**

67. Literacy is high in the area due to good access to primary and secondary schools, while technical and tertiary education is available in numerous colleges within Ho Chi Minh City. In 1995, the city achieved the standard to eliminate the illiterate situation and universalized primary education; 100 % of communes had primary schools and 80 % of them had junior high school. Education standard of citizens is being enhanced.

68. In 2002, Ho Chi Minh City Department of Education and Training received a souvenir flag and decision certifying to complete secondary education popularization awarded by Ministry of Education and Training and became the first locality in the country to achieve this standard. Since 2005, the education and training sector has continued to consolidate the popularization results of primary and secondary education, the city has added 3 districts obtaining the standard of secondary education popularization (District 1, District 3 and Binh Thanh District), so it has got 5 districts with universalized secondary education. Graduation exams at all levels are held safely and achieve good results (in which the percentage of students graduating from junior high school was 99.3 % and from high school was 90.3 %). The number of schools in the subproject area is presented in Table 16.

**Table 15. Number of Schools in Subproject Area**

Commune/ward	Kindergarten	Elementary school	Middle school	High school
Phong Phu	2 public and many private	2	2	0
Binh Hung	n.a	n.a	n.a	n.a
Ward 5	4	2	1	1

**c. Communications**

69. Infrastructure for transport, communications and electricity are being constantly improved so that people’s standard of living and access to services has improved appreciably. All households in the subproject area have TV and telephones. All communes/ward have their own mass communication facilities. The post office locations are a short distance for all people.

**d. Water and electricity**

70. In Phong Phu commune, 40% of households who live along road No. 50 have tap water, 60% of households use water from drilled/shallow wells. In Binh Hung commune and Ward 5, 100% of households have tap water. District 8 and Binh Chanh district are supplied with electricity from the national electricity grid network.

#### **e. Infrastructure for transport**

71. Infrastructure for transport 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. A network of provincial, district, commune and village roads also serve the area. Traffic in the subproject area is convenient with many important roads such as Nguyen Van Linh road, highway No. 50, and thickness of district-road system. Most of the roads in the subproject area are concreted and asphalted which is convenient to traffic movement of cars, buses, and tipper trucks.

#### **4. Cultural and Heritage Sites**

72. Cultural characteristics of former Saigon and Ho Chi Minh City today is quite a unique expression of the cultural character of the people of Vietnam in historical context - the space of the southern region. Saigon - Ho Chi Minh City is a convergence place of many different cultural currents in the historical process of formation and development. Its culture has been influenced by Vietnamese, Chinese, Cham, Khmer, Indian, etc., since Saigon became one of the centers of the country which received the French and American cultural influence over the rise and fall period of the country. The cultural structures are the Nha Rong wharf, Saigon Central Post Office, the Municipal Theatre (Saigon Opera House), National Ancestor Temple, City People's Committee office, Thong Nhat Palace, Ben Thanh market, etc.; the ancient temple system such as Giac Lam Pagoda, Ba Thien Hau Temple, Giac Vien Ancestor temple, etc.; ancient churches such as Saigon Notre Dame Cathedral, Huyen Sy, Thong Tay Hoi, Thu Duc, etc. This city has the diversity of religious beliefs with dozens of annual cultural festival and creates unity in cultural diversity of the southern region.

73. The PECC3 has compiled a list of cultural and heritage sites within the RoW and substation which are shown in Table 17. While there are several temples and other public infrastructure within the vicinity of the transmission line corridor, the RoW has been sited to avoid these structures. There are no distance criteria to justify the acceptability of the location of the RoW with regard to the transmission line. However, based on the subproject scale and activities, it can be confirmed that the subproject activities will not have an impact on those cultural heritage sites. PECC3 confirms that the separation distances are acceptable and as such none of these structures will be affected by the subproject.

#### **5. UXO Clearance**

4.3 After decades of war, UXO remains a significant issue in Vietnam. The presence of UXO along the RoW of transmission line was confirmed by the military headquarters. While most of UXO has been cleared from agricultural areas, the HCM Military HQ directs that particular attention should still be given to the RoW. It is a legal requirement that the safety of construction workers is ensured by having specialized army units clear UXO before construction commences<sup>9</sup>. It is a requirement that surveys be made to identify and clear UXO before construction commences.

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<sup>9</sup> Details of landmine clearance are presented in the Circular 146/2007/TT-BQP by Ministry of Defence dated September 11 2007 guiding UXO clearance for project construction

**Table 16. Historic Buildings and Infrastructure Within 500m of RoW and Substation**

No	Distance from centre line (m)		Name of infrastructure	Location
	Left	Right		
1	270		Phu Lac village hall	National road 50 - Phong Phu commune - Binh Chanh - HCM city
2	130		Thien Phuoc pagoda	National road 50 - Phong Phu commune - Binh Chanh - HCM city
3	80		An Hoa pagoda	National road 50 - Phong Phu commune - Binh Chanh - HCM city
4	80		Thien Tri pagoda	National road 50 - Phong Phu commune - Binh Chanh - HCM city
5		5	Ta Quang Buu high school	Ta Quang Buu road - Binh Hung commune - Binh Chanh - HCM city

Source: PECC3, 2013

## 6. Subproject Affected People

74. A few communities will be affected by loss of land and loss of assets within the RoW. All households that are affected by permanent or temporary losses will be compensated according to the Resettlement Plan (RP). Loss of land includes both permanent and temporary loss of land as defined below.

75. The Inventory of Loss (IOL) carried out in Nov. 2012 and Oct. 2013, had identified a total of 46 households (189 persons) and 2 affected institutions belonging to 3 communes/ward that may be affected by the implementation of the subproject. Loss of land includes both permanent and temporary loss of land.

### a. Permanent loss

76. The total estimated permanently affected land is 5,301 m<sup>2</sup>, of which 4,139 m<sup>2</sup> (78.08%) belongs to 1 Anh Tu Company (garage for repair and keeping cars), and 1,162 m<sup>2</sup> (21.92%) belonging to 5 AHs. Twenty five jobs for the company will be lost. Each of the 5 AHs may lose residential land or agricultural land. Total estimated affected land in ROW is 4,272m<sup>2</sup> with 46 households, including residential land area of 1,752 m<sup>2</sup> (41.01%) and agricultural land area of 2,525 m<sup>2</sup> (58.99%).

### b. Temporary loss

77. This includes the loss of land along the RoW which will be cleared of vegetation that exceeds the safety criteria i.e. they must not be higher than 2.0m for 110kv and 3.0m for 220kV systems. Landholders will be compensated for loss of access to crop areas during conductor stringing when vehicle access will be required along the RoW which will destroy crops and interfere with crop practices. During operation, farmers will be able to grow and cultivate crops under the RoW provided these do not exceed the established conductor safety limits. In total 1.05 ha of land will be temporarily affected. The summary of impact is presented in Table 17.

**Table 17. Summary of Impacts**



No.	Items		Unit	Total	Affected households or institutions
<b>I</b>	<b>AFFECTED ASSET</b>				
<b>1</b>	<b>Land</b>				
<b>1.1</b>	<b>Permanent land acquisition</b>				
	AHs	Residential land	m <sup>2</sup>	285	3
		Agricultural land	m <sup>2</sup>	877	2
	Affected institutions	Specialized land	m <sup>2</sup>	4,139.06	1
<b>1.2</b>	<b>Affected land in ROW</b>				
	AHs	Residential land	m <sup>2</sup>	1,752	43
		Agricultural land	m <sup>2</sup>	2,520	2
	Affected institutions	Specialized land	m <sup>2</sup>	-	-

Source: PECC3, Nov. 2013

#### D. Additional Features of Substation and Transmission Line Sites

78. Supplementing Figure 1 are views of the upgraded transmission line and new substation site in Figure 2. Figure 2 shows the northeast corner of the Binh Chanh substation (Fig 2a) beside which the first new 220 kV tower will be built on previously private land, an example 110 kV tower that will be upgraded to carry the 220 kV line (Fig 2b), the location of the start of the new underground section of the 220 kV line through Binh Chanh and District 8 (Fig 2c), and the site of the new 220 kV substation on the VINA Port Authority property (Fig 2d and e).

**Figure 2. Binh Chanh Substation, 110 kV Tower, and Site of New 220 kV Substation**



Fig 2a:  
 Northeast corner of Binh Chanh substation from which new 220 kV transmission line will start. Existing 110 kV transmission line in background.



Fig 2b:  
 Example 110 kV transmission tower that will be replaced with 220 kV tower, and underlying lowland flood area.



Fig 2c:  
 Location of start of underground section of transmission line along curb of roadway



Fig 2d:  
Section of underground cable route beside new substation site



Fig 2e:  
Location of VINA Port Authority site where substation will be built

## VI. INFORMATION DISLCOSURE AND PUBLIC CONSULTATION

### A. Information disclosure

79. Formal disclosure of information on the District 8 220 kV Substation and Transmission Line subproject that occurred to affected persons and stakeholders during the IEE is meant to form the beginning of continued information disclosure and stakeholder involvement with the subproject 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.

80. 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 EA/IA 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 EA/IA after implementation begins.

## **B. Public Consultation**

81. The stakeholder consultation strategy was developed to meet the requirements of meaningful consultation as stipulated by the ADB 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**

82. 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) PPC, (ii) DPC; (iii) Project EA, (iv) PECC4, and (v) commune leaders;
- Mass organizations such as Womens Union, and Farmers Union which provided information for the design of the various subproject interventions, and which might participate in implementation of measures and interventions;
- Affected households and businesses living along the transmission line and near the substation site who may be directly and/or adversely affected, and who have an interest in the identification and implementation of measures to avoid or minimize negative impacts; and
- Other institutions or individuals with a vested interest in the outcomes and/or impacts of the subproject.

### **2. Public consultation meeting**

83. Formal community consultation meetings were held to discuss the location and potential environmental and social impacts of the transmission line and substation. Public consultations were held in (i) Phong, Phu commune, Binh Chanh District and Ward 5 – District 8 on 30<sup>th</sup> of October, and in (ii) Binh Hung Communes - Binh Chanh District on 1<sup>st</sup> of November 2013.

84. The public meeting consisted of the following three component procedures:

- (i) 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;
- (ii) 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
- (iii) 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.

85. During the meeting, people raised their questions and comments on the environmental issues. The participants of the meetings included Commune leaders, representatives of mass organization such as Women Union, Farmer union and affected people. A total of 55 people were consulted on the views and concerns of the subproject (Appendix B).

### **3. Results of Public Consultations**

#### **a. Comments from communal authorities**

86. The summary of comments/questions from local authorities/people and answers of subproject owners and consultants company PECC4 are summarized in Table 18. The main concerns of subproject are:

- i. Potential impacts and required mitigation measures of construction activities (dust, noise, smoke emissions, and traffic obstruction) on daily living condition of local people. Construction work is required to finish at the same night.
- ii. Damage to the existing roadways due to the subproject activities, and requirement for complete rehabilitation of damaged roads after construction is finished.
- iii. The effects of electromagnetic field (EMF) on the internet, wireless devices, cellular phones;
- iv. The safety corridor (ROW) for the transmission line. The local people need to be informed of any safety and health issues with the underground cable.
- v. The construction techniques for the underground cable across Highway 50 and the appropriate construction schedule to avoid diurnal high tides inundating Highway 50 at 4:00PM and 5:00AM.



**Table 18. Summary of Public Questions and Comments and Response by PECC4.**

Location and time	Comments/questions from local authorities <sup>10</sup>	Answers of Project owners and consultant company PECC4	Project response <sup>11</sup>
Phong Phu Commune- Binh Chanh District HCM city 31 October 2013	How wide is a safety corridor for transmission line?	The distance from the ROW to the outermost line is 6m.	Compliance with standard RoW will be underscored in EMP.
	The mitigation measures are suitable but will they be implemented during construction stage?	There will be a monitoring agency to inspect the environmental compliance of constructor.	The Mitigation Plan of the EMP consists of a set of sub-mitigation plans focused specifically on construction phase activities.
	Contractor must not work at night when local people are resting.	A hotline will be established for the complaint cases.	EMP specifies that construction activity to occur between 07:00 – 18:00. Need for a Hotline with number posted at all construction sites identified in EMP.
	If the roads are damaged due to the subproject construction, the contractor must restore the roads.	These measures are stipulated in the bidding document.	These measures are also specified in EMP.
Ward 5 District 8 31 October 2013	How about the impact level of noise and smoke emissions, and the effects on the Internet and wireless devices?	Smoke emissions and waste water is insignificant. - Hazardous waste is also insignificant. - Noise <70 db	Mitigation Plan of EMP prescribes sub-plans for noise and dust. EMP also states notes that scientific evidence of negative health effects of EMF from transmission lines not proven.
	How about the piling solutions during construction?	This is the preparation stage for investment, but in the construction stage, pile driving will be used so this will not make noise.	Required pile driving for footings will be executed following accepted construction practice as indicated in EMP.
	Impact on wave for the cellular phone?	There are many stations in this city but they have not caused any impact yet.	n/a

<sup>10</sup> Environmental issues raised in public meetings recorded in table as received.

<sup>11</sup> Issues to be addressed by EMP

Location and time	Comments/questions from local authorities <sup>10</sup>	Answers of Project owners and consultant company PECC4	Project response <sup>11</sup>
Binh Hung Commune Binh Chanh District 1 <sup>st</sup> of November 2013	<p>How height of the transmission line is compared with the ground surface?</p> <p>Due to water level increasing, the elevation of a house foundation is raised so the transmission line needs to be also raised.</p> <p>The specific criteria need to be informed to the local people to know the safety distance.</p>	<p>The line section crossing the resident area is over 8m in height.</p> <p>The difference between the lowest point of the transmission line and the highest point of the ground surface is 4m</p>	<p>Height of line set according to international standards. The footings of the transmission towers and the foundation of new substation will be flood and climate change resilient.</p>
	<p>Is there any construction solution when implementation crosses Highway 50?</p>	<p>When building crosses Highway 50, the constructor must be have a permission before that.</p>	<p>Explicit in the EMP is that contractors obtain, and follow current regulations and guidelines for conducting civil works in urban areas including roadway intersections with pipelines</p>
	<p>When implementing construction work at night time, the team work must ensure that living and production of the local people will not be affected.</p> <p>Construction work is required to finish at the same night.</p>	<p>Implementing construction work will be conducted according to the short sections and the ground will be restored the same as the first situation only for one day.</p>	<p>Also indicted in EMP</p>
	<p>Highway 50 is usually inundated at 4:00PM and 5:00 AM so this problem must be considered carefully when establishing the construction schedule.</p>	<p>Will consider this factor when establishing the construction schedule.</p>	<p>Explicit in EMP is requirement to manage construction activities and vehicle traffic to avoid heavy urban traffic periods if possible, and to minimize disruption of urban traffic at all times.</p>
<p>How about construction activities?</p> <p>How to reduce the noise</p>	<p>Cutting and digging roads.</p> <p>Digging roads may be implemented in daytime to reduce noise at night time.</p>	<p>A specific directive in Mitigation Plan of EMP is for construction activities when/where possible to be conducted between 07:00 and 18:00.</p>	



<b>Location and time</b>	<b>Comments/questions from local authorities<sup>10</sup></b>	<b>Answers of Project owners and consultant company PECC4</b>	<b>Project response<sup>11</sup></b>
	The local people need to be informed on the safety level of the underground cable which can affect the local people 's health.	The safety requirements are approved by DONRE. Thus the underground cable does not affect the local people 's health.	The only risk of injury from UGC line is from unauthorized digging along line. The community will be educated on not digging anywhere near UGC until clearance obtained from EVNHCMC.
	Will the land area in the ROW be used?	The land area in the ROW will only be used for temporary purposes, solid building is not permitted.	n/a
<b>Conclusion</b>	Phong Phu, Binh Hung Commune People's Committees, and Ward 5 People's Committee and affected households agree and will support the construction of 220kV South Sai Gon substation and the transmission line South Sai Gon-District 8		Follow-up consultations will occur to monitor community views of subproject

## **VII. POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATIONS**

87. The assessment of potential impacts of the subproject is structured by the three development phases of the subproject defined by: *pre-construction*, *construction*, and *post-construction operational phase*. The two major components of the subproject (Substation and Transmission line) are addressed within this assessment.

88. In this way potential impacts of common activities of the two components can be addressed together thereby minimizing redundant assessments. Potential impacts specific to the substation or transmission line are addressed separately. This structure is carried forward to the EMP that will be prepared for the subproject (Section X).

### **A. Subproject Benefits**

89. The single comprehensive benefit of the subproject is the provision of needed electrical power to southern 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. Pre-construction Phase**

90. Negative impacts associated with the pre-construction phase of the subproject concern land acquisition and compensation. As indicated in Table 15 at the feasibility design stage, 5 households and 1 business will permanently lose some agricultural or household land, while 43 households and 2 businesses will temporarily lose access to part of their land during the construction phase of the upgrading of the transmission line. The details of the land losses and compensation are found in the Resettlement Plan (RP) which is under separate cover.

#### **a. Updating Environmental Management Plans**

91. The subproject EMP will need to be updated during the pre-construction – detailed design phase to ensure that the EMP fully addresses the potential impacts of the final detailed designs of the District 8 220 kV Substation and Transmission Line. This will involve finalization of the Mitigation and Monitoring Plans of the EMP that will manage and measure potential impact areas such as erosion, noise, dust and air quality, construction waste and spoil disposal, construction traffic, and worker and public safety at the subproject sites. The updated EMP will be used by the contractors to prepare their contractor environmental management plans (CEMP).

92. The key impact management measures to be implemented during the pre-construction phase are:

- 1) Initiation of the RP and land compensation for affected households and businesses;
- 2) Completion of detailed designs of the subproject; and
- 3) Updating and initiation of the subproject EMPs.

## **C. Construction Phase**

93. The potential environmental impacts of the subproject are associated primarily with the construction phase of the two subproject components. The substation and entire transmission line is not located in a national protected area, and there are no documented rare or endangered wildlife in the area.

### **1. Potential impacts of the Substation and Transmission Line**

94. Short-term construction-related impacts common to the construction of the District 8, 220 kV Substation and Transmission Line are, for example, reduced and/or blocked public access, disrupted agriculture, noise, dust and air pollution from NO<sub>x</sub>, SO<sub>x</sub>, and CO caused by construction truck traffic and heavy equipment use, soil and surface water pollution caused by equipment operation and maintenance, public and worker accidents, increased traffic and traffic accidents, erosion and sedimentation, drainage and flooding problems, solid waste and domestic pollution from worker camps, social disease and community problems caused by migrant workers.

95. The magnitude of these short-term construction-related impacts will be different at the substation site versus along the corridor for the new transmission line. For example, traffic disruption and overall construction disturbance along the road under which the UGC portion of the transmission line is buried will likely be greater than traffic and other construction-related disturbances associated with the construction of the substation.

#### **a. Mitigation measures**

96. Construction management measures to mitigate the potential construction-related impacts and disturbances common to the District 8 220 kV Substation and Transmission Line are exemplified below. The mitigation measures are detailed further in the EMP.

- 1) As indicated above the corridor for the transmission line and substation area must be reviewed, and surveyed for unexploded ordnance (UXO) by the military of Viet Nam prior to construction. If such ordnance is detected, clearing work will need to be commissioned prior to undertaking civil works.
- 2) Open excavations should be fenced, and trenches covered where public walkways or vehicles must cross.
- 3) A cultural chance find management sub-plan must be in place in the EMP for cultural artifacts and property.
- 4) Regular use of wetting agents should be employed at construction sites and along construction roads to minimize dust.
- 5) All construction vehicles and gas powered equipment should be maintained in proper working order to minimize emissions, and not operated at night if possible to minimize noise.
- 6) Speed limits should be posted and adhered to by construction vehicles.
- 7) Where possible construction vehicles should use different roads or dedicated lanes of roads shared by the public.

- 8) Trees and other vegetation at all construction sites and along road corridors should be protected with minimal removal.
- 9) Present and past land use should be reviewed to assess whether excavated soils are contaminated spoil. Contaminated spoil should be disposed at a landfill or a location approved by DoNRE.
- 10) Berms and/or silt curtains should be constructed around all excavation/trench sites and along all rice paddy and surface waters to prevent soil erosion and sedimentation.
- 11) Local workers should be used as much as possible to prevent or minimize influx of migrant workers, and incidence of social disease and community unrest.
- 12) Worker camps must have adequate domestic waste collection facilities and sufficient pit latrines that are located away from public areas and surface waters.
- 13) Dedicated fuel storage areas must be established away from public areas and marked clearly.
- 14) To minimize the risk of public and worker injury appropriate GoV regulations on Occupational, Safety, and Community Health must be applied<sup>12</sup>, or the IFC/World Bank Environment, Health, and Safety Guidelines (2007) that govern the safe and orderly operation of civil works should be followed.
- 15) Aggregates (e.g., sand, gravel, rock) that are transported by truck should be covered.
- 16) Prolonged use of temporary storage piles of fill should be avoided, or covered, or wetted regularly to prevent dust and erosion.
- 17) Sand extraction from any rivers for construction fill should be done at licensed areas only.
- 18) Storage of bulk fuel should be on covered concrete pads away from the public and worker camp. Fuel storage areas and tanks must be clearly marked, protected and lighted. Contractors should be required to have an emergency plan to handle fuel and oil spillage.

## **2. Component-specific potential construction impacts, and mitigations**

97. The short-term construction-related impacts and required mitigations summarized above will vary between the substation site and transmission line. Listed below are highlighted potential construction-related impacts specific to both subproject components.

### **a. Substation**

98. In addition to permanent loss of some land of AHs (Table 15), potential construction-related impacts of the substation are traffic congestion, blocked access, and increased risk of accidents along the access urban street to the current Vina Port Authority Site. Other potential impacts are worker injury, solid and liquid waste on construction site, and social issues arising from the worker camp that will be established on onsite.

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<sup>12</sup> e.g. Decree 110/2002/ND-CP, supplementing some Articles of Decree 06/1995 on Labour Code of Occupational Safety and Health, MoLISA.

## **b. Transmission line**

99. In addition to the temporary loss of land of AHs (Table 15), the installation of the OHL 220 kV towers along the existing transmission RoW from the Binh Chanh substation will disrupt land use and access underneath the existing line which is primarily small-scale agriculture. The placement of the new tower footings and construction vehicle activity will disturb the low lying land causing local erosion and sedimentation. The UGC section of the transmission line will disrupt access and road-side business activity along the road sections in which the trench for the cable is excavated. Traffic along the sections being trenched will be disrupted with the additional construction traffic and the movement of construction materials in/out of the area.

100. The key mitigation of for the construction-related disturbances associated with the OHL and UGC segments of the transmission line are to schedule the work at night. For example, during the inception phase EVNHCMC indicated that approximately 50 m sections of the UGC would be buried and the road restored between midnight and 06:00 section in order to minimize disruption to local businesses and community.

101. Construction of the OHL section line must minimize the number of access points to the transmission line in order to minimize lateral expansion of the RoW impact. Access to the RoW corridor should occur along the corridor from road crossings as much as possible.

## **D. Operation Phase**

### **1. Substation**

102. The potential impact of the completed 220 kV substation on Vina Port Authority land is restricted to worker safety, the potential risk for children of the community gaining access to the property, and spills of hazardous waste such as transformer oils. An increase in local traffic caused by substation employee traffic is not expected because the current bus and truck traffic that use the site for parking will be decreased after the site is constructed.

### **2. Transmission Line**

103. Potential impacts associated with the operation of the OHL and UGC portions of the transmission line are restricted to worker and public safety during routine maintenance activities, and unauthorized public access to the towers, respectively. The risk of negative health effects of electromagnetic radiation (EMF) from the transmission line are not an issue because negative health effects of EMF have not been established by the international medical community.

104. The collective mitigation for potential operation effects is to prevent public access to the substation property and at the transmission towers. This management action would be implemented with effective fencing, and clear signage indicating the dangers of the different facilities.

## **E. Climate Change**

105. Regional Global Circulation Modeling subproject greenhouse-climate change induced changes to the frequency and severity of rainfall events in the subproject area. The design of the substation site includes sufficient filling to a grade that will be resilient to flooding associated from a 100-year storm. Similarly, the underground section of the transmission line will be designed to withstand periods of street flooding.

## **VIII. ANALYSIS OF ALTERNATIVES**

106. Assessment of alternatives to the subproject design focused primarily on cost issues associated with the transmission line with the current placement of the new UGC section along the road way being optimal. The subproject alternative of doing nothing and not building the new District 8 220 kV substation and transmission line would result in the continued situation of power shortages in the area.

## **IX. GRIEVANCE REDRESS MECHANISM**

107. A well-defined grievance redress and resolution mechanism will be established to address affected persons (AP) grievances and complaints regarding environmental issues, land acquisition, compensation and resettlement in a timely and satisfactory manner. 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 APs.

108. APs are entitled to lodge complaints regarding any aspect of affected environments, land acquisition and resettlement requirements such as, noise, pollution, entitlements, rates and payment and procedures for resettlement and income restoration programs. 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.

109. A Grievance Committee with appointed environmental and social issues experience will be organized in local communes comprising of local leaders designated for such tasks. The designated commune officials shall exercise all efforts to settle APs issues at the commune level through appropriate community consultation. 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 EA/IA<sup>13</sup>, and ADB upon request.

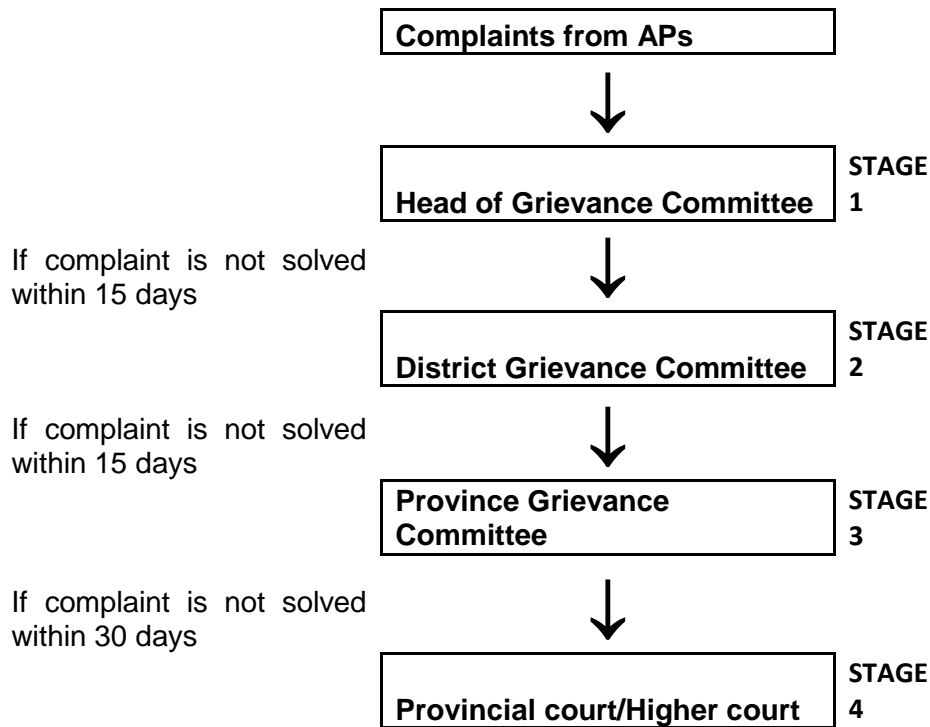
110. The procedures for grievance redress are below and summarized in Figure 3. The procedure described below should apply easily to both social and environmental issues and be consistent with the legal process for resolution of disputes in Viet Nam.

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<sup>13</sup> See Section XB below for institutional responsibilities for EMP

- i) Stage 1: Complaints from APs for the first time shall be lodged verbally or in written form with the village head or commune leader. The complaints shall be discussed with the APs and the designated Head of Grievance Committee or members of the committee. Because initial environmental issues will most likely be construction-related, the EO/contractor and then the ESU/IA need to be notified immediately. It will be the responsibility of the Head of Grievance Committee to resolve the issue within 15 days from the date the complaint is received. All meetings shall be recorded and copies of the minutes of meetings will be provided to APs.
- ii) Stage 2: If no understanding or amicable solution can be reached or if no response is received from the grievance committee within 15 days from filing the complaint, the APs can elevate the case to the District Grievance Committee. The District Grievance Committee is expected to respond within 15 days upon receiving the APs appeal.
- iii) Stage 3: If the AP is not satisfied with the decision of the District Office, or in the absence of any response, the APs can appeal to the Provincial Grievance Committee (PGC). The PGC will review and issue a decision on the appeal within 30 days from the day the complaint is received.
- iv) Stage 4: If the AP is still not satisfied with the decision of the PGC 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 court. The court will address the appeal by written decision and submit copies to the respective entities which include the EA, DGC/PGC 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 3. Summary of Grievance Redress Process**



111. 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.

112. 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.

113. 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).



## X. ENVIRONMENTAL MANAGEMENT PLAN

### A. Overview

114. An EMP has been developed for the implementation of the District 8 220 kV Substation and Transmission 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.

115. The EMP, *inter alia*, 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.

### B. Institutional Arrangements and Responsibilities

116. At the feasibility stage the primary management framework<sup>14</sup> responsible for the implementation of the EMP for the new District 8, 220 kV Substation and upgrading of the 110/200 kV Transmission Line subproject is summarized as follows. The EVNHCMC is the executing agency (EA). The EA takes overall responsibility for implementing the EMP with executive support from the Power Project Management Board (PPMB); a subsidiary of EVN HCMC and the implementing agency (IA) of the subproject. The IA under the direction of the EA implements the subproject and EMP with an assigned environmental and social unit (ESU) whose sole responsibility is to implement the EMP.

117. The IA/ESU is supported by the [international] Project Implementation Consultant<sup>15</sup> (PIC). The PIC assists with completion of the detailed subproject designs, updates the EMP to address the detailed subproject designs, and assist with the implementation of the EMP. The PIC also delivers required capacity development and training to the IA/ESU. The ESU oversees and assists the work of the environmental officer (EO) of the construction contractor who implements the contractors EMP (CEMP)<sup>16</sup>.

118. External support of the ESU for the implementation of the EMP is provided by the international and national environment specialists (ES) of the PIC, and an Environmental Monitoring Consultant (EMC) which is required 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 that cannot be performed by the contractor or IA/ESU. A summary of indicative responsibilities for implementation of the EMP is provided below.

119. The responsibilities of the EA with support from EVN include:

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<sup>14</sup> Adapted from kick-off meeting presentation slides, December 10-13 in Ho Chi Minh City

<sup>15</sup> PIC to be defined

<sup>16</sup> Contractor Environmental Management Plan prepared by contractor as part of bid documents based on EMP

1. Overall responsibility for implementation of EMP;
2. Provide coordination and supervision for environmental and social safeguards and monitoring for IA/ESU;
3. Liaise with EVN and ADB on the implementation of the EMP; and
4. Coordinate resolution with IA/ESU with issues arising from the implementation of EMP.

120. The responsibilities of the ESU of IA include:

5. Assist PIC with updating the EMP to meet final detailed Subproject design;
6. Notify DoNRE to verify GoV approvals of subproject are met;
7. Assist PIC with inclusion of CEMP requirements in contractor bid documents including bid evaluations based on updated EMP;
8. Undertake day to day management of EMP implementation activities;
9. Work with EMC on implementation of monitoring plan of EMP;
10. Ensuring compliance with loan covenants and assurances in respect of entire Subproject, including EMP (as well as IPPs, GAPS, resettlement plans);
11. Lead follow-up meetings with all affected stakeholders;
12. Prepare and submit quarterly reports on EMP implementation to IA/EA;
13. Oversee implementation of CEMP by contractor;
14. Coordinate with ES of PIC for EMP implementation;
15. Undertake regular construction site inspections to ensure contractor implements CEMP properly; and
16. Ensure EO of contractor submits monthly reports on construction mitigations and monitoring.

The responsibilities of the ES (International and National) of the PIC are:

17. Updating the EMP to meet final detailed design of subproject;
18. Provide technical direction and support to ESU/IA for implementation of EMP;
19. Oversee design and delivery of capacity development and training of ESU/IA and EO of contractor(s);
20. Provide advice and support to EMC with their monitoring activities;
21. Review all reports prepared ESU/IA and EMC for EA and ADB; and
22. Review location of any possible contaminated sites near subproject.

The responsibilities of Environmental Officer (EO) of Contractor include:

23. Implement CEMP for construction phase of subproject; and

24. Prepare and submit monthly reports on mitigation and monitoring activities of CEMP any environmental issues at construction sites.

The responsibilities of external Environmental Monitoring Consultant (EMC) include:

25. Implement the environmental sampling required for monitoring plan of EMP that cannot be conducted by the contractor and ESU/IA/EO.
26. Perform required laboratory analyses for monitoring program detailed in EMP; and;
27. Prepare and submit quarterly reports to IA/ESU on monitoring activities.

121. The Department of Natural Resources and Environment (DoNRE) is the provincial agency which oversees environmental management of Ha Noi. The DoNRE with District staff provides direction and support for environmental protection-related matters including application of the Law on Environmental Protection No. 02/99/NA (1999), EIA, and environmental standards.

122. The ADB provides guidance to EA/IA with any issues related to EMP, and reviews biannual reports on EMP activities compiled and submitted by EA.

### C. Summary of Potential Impacts of Subproject

The potential impacts of the subproject are summarized in Table 19.

**Table 19. Summary of Potential Impacts of Subproject**

<b>Pre-construction Phase</b>
<ul style="list-style-type: none"> <li>• Permanent loss of some residential and agricultural land</li> </ul>
<b>Construction Phase</b>
<ul style="list-style-type: none"> <li>• Temporary loss of residential and agriculture land along RoW of TL</li> <li>• Common construction-related civil works disturbances such as dust, noise, reduced and/or blocked public access, disrupted business and recreation, noise, dust and air pollution from NO<sub>x</sub>, SO<sub>x</sub>, and CO caused by increased truck traffic and heavy equipment use, soil and surface water pollution caused by equipment operation and maintenance, public and worker accidents, disruption of traffic, increased traffic accidents, damage to existing roads, land erosion and surface water sedimentation, drainage and flooding problems, solid and domestic waste from worker camps, social issues and community problems caused by migrant workers.</li> </ul>
<b>Operational Phase</b>

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| <ul style="list-style-type: none"><li>• Risk of worker and public safety at facilities</li><li>• Spills of hazardous materials such as transformer oil</li></ul> |
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## **D. Mitigation Plan**

123. The impact mitigation measures of the EMP are presented in a comprehensive mitigation plan for the subproject in Table 20. Similar to IEE the mitigation plan is structured by the three development phases of the subproject defined by the pre-construction; construction; and post construction operational phase. The mitigation plan addresses the environmental issues and concerns raised at the stakeholder meetings.

124. The mitigation plan combines construction phase impacts common to all subproject components for which single mitigation measures are prescribed. In this way redundant mitigation measures are not re-stated numerous times. However, impacts and required mitigations specific to subproject component are also identified or common mitigations that are particularly important for a subproject component are underscored. The mitigation plan identifies potential impacts, required mitigations, responsible parties, location, timing, and indicative costs.

### **1. Mitigation subplans**

125. The mitigation plan is comprehensive by design because it will need to be updated to meet the final detailed designs of the subproject. 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 CEMPs as part of their bid documents, and ultimately will allow the ESU/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.

**Table 20. Environmental Impact Mitigation Plan**

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
<b><i>Pre-Construction, Detailed Design Phase</i></b>								
Confirmation of required resettlement, relocations, and compensation	No negative environmental impacts	1. Affected persons well informed well ahead of Subproject implementation.	All affected persons in subproject areas	Before subproject implemented	See resettlement plans	See resettlement plan	EA/IA/ESU	Resettlement committees
Disclosure, and engagement of community	No negative impacts	2. Initiate Information Disclosure and Grievance process of IEE	For all construction sites.	Beginning of subproject	Quarterly	No marginal cost <sup>18</sup>	IA/ESU	IA/ESU
GoV approvals	No negative impact	3. Notify DoNRE of Subproject initiation to complete EA requirements, and obtain required subproject permits and certificates.	Entire subproject	Before construction	As required	No marginal cost	EA/DoNRE	DoNRE

<sup>17</sup> Costs will need to be updated during detailed design phase.

<sup>18</sup> No marginal cost indicates that costs to implement mitigation are to be built into cost estimates of bids of contractors

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
Detailed designs of Subproject,	Minimize negative environmental impacts	<p>4. Work with PIC<sup>19</sup> to complete detailed designs of the upgraded access roads and cave tourist facilities. Ensure the following measures are included:</p> <p>a) identification of spill management prevention plans, and emergency response plans for all construction sites;</p> <p>b) no disturbance or damage to culture property and values;</p> <p>c) minimal acquisition of agriculture and forested lands</p> <p>d) locate aggregate borrow pits and rock supply areas away from human settlements with fencing and access barriers;</p> <p>e) none or minimal disruption to village water supplies along access roads, utilities, and electricity with contingency plans for unavoidable disruptions;</p> <p>f) none or minimal disruption to normal pedestrian and vehicle traffic along all road segments with contingency alternate routes;</p> <p>g) for built-up areas include specific plan to notify and provide residents and merchants of construction activities and schedule to minimize disruption to normal commercial and residential activities.</p>	Final siting	Before construction initiated	Once with detailed designs documents	No marginal cost	PIC	EA/IA

<sup>19</sup> PIC is Project Implementation Consultant at detailed design phase to be determined

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
Update EMP	Positive environmental impacts	5. Review finalized RoW of TL to confirm absence of valued ecological or cultural resources. 6. Re-clarify with DoNRE that no known rare or endangered species inhabit the Subproject areas 7. Identify any new potential impacts of subproject and include in EMP with special attention to residential areas. 8. Update mitigation measures and monitoring requirements of EMP where necessary to meet detailed designs, and to protect affected environments. 9. Submit updated EMP with new potential impacts to ADB to review. 10. Develop individual management subplans 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.	All sites	Before construction initiated	Once with detailed designs documents		PIC	IA/ESU
Update EMP	Positive environmental impacts	11. Update information where necessary on water quality and presence of valued aquatic biota in surface waters underneath OHL from Binh Chanh SS	OHL from SS to start of UGC	Before construction initiated	Once with updated EMP	See Monitoring Plan below	PIC	PIC/ESU
Confirm approved construction waste disposal sites	No negative impact	12. Notify DoNRE to confirm locations of sites for borrow pits and disposal areas for construction and hazardous waste for Subprojects, and obtain required permits.	Entire Subproject	Before construction	As required	No marginal cost	IA/DoNRE	ESU

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
UXO survey, and removal	Injured worker or public	13. Ensure GoV military is consulted and clears UXO areas where necessary	All construction sites.	Beginning of Subproject	Once	See Monitoring Plan below	EA/IA	ESU/GoV
Develop bid documents	No negative environmental impact	14. Ensure updated EMP is included in contractor tender documents, and that tender documents specify requirements of EMP must be budgeted. 15. Specify in bid documents that contractor must have experience with implementing EMPs, or provide staff with the experience.	All Subproject areas	Before construction begins	Once for all tenders	No marginal cost	PIC	IA/ESU
Create awareness of physical cultural resources in area	No negative environmental impact	16. EA to review potential locations of physical resources, and explain possible PCR to contractors and PIC	All Subproject areas	Before construction begins	Once	No marginal cost	EA/IA	IA/ESU
Obtain and activate permits and licenses	Prevent or minimize impacts	17. Contractors to comply with all statutory requirements set out by GoV for use of construction equipment, and operation construction plants such as concrete batching.	For all construction sites	Beginning of construction	Once	No marginal cost	EA/PIC	ESU and contractors
Capacity development	No negative environmental impact	18. Develop and schedule training plan for IA/ESU/EO to be able to fully implement EMP, and to manage implementation of mitigation measures by contractors. 19. Create awareness and training plan for contractors whom will implement mitigation measures.	All Subproject areas	Before construction begins	Initially, refresher later if needed	No marginal cost	PIC	PIC
Recruitment of workers	Spread of sexually transmitted disease	20. Use local workers as much as possible thereby reducing number of migrant worker	All work forces.	Throughout construction phase	Worker hiring stages	No marginal cost	EA/IA	Contractor's bid documents



Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
<b>Construction Phase of 220 kV Substation and Transmission Line</b>								
Initiate EMP and sub-plans,	Prevent or minimize impacts	21. Initiate updated EMP and CEMP including individual management sub-plans for different potential impact areas that are completed in pre-construction phase (see sub-plan guidance below).	For all construction sites	Beginning of construction	Once	No marginal cost	IA/PIC	ESU and contractors
Worker camps	Pollution and social problems	22. Locate worker camps away from human settlements. 23. Ensure adequate housing and waste disposal facilities including pit latrines and garbage cans. 24. A solid waste collection program must be established and implemented that maintains a clean worker camps 25. Locate separate pit latrines for male and female workers away from worker living and eating areas. 26. A clean-out or infill schedule for pit latrines must be established and implemented to ensure working latrines are available at all times. 27. Worker camps must have adequate drainage. 28. Local food should be provided to worker camps. Guns and weapons not allowed in camps. 29. Transient workers should not be allowed to interact with the local community. HIV/AIDS education should be given to workers. 30. Camp areas must be restored to original condition after construction completed.	All worker camps	Throughout construction phase	Monthly	No marginal cost	PIC/ESU	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
Training and capacity	Prevent of impacts through education	31. Implement training and awareness plan for IA/ESU/EO and contractors.	ESU office, construction sites	Beginning of construction	After each event	No marginal cost	PIC	PIC/ESU

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
Implement Construction materials acquisition, transport, and storage sub-plan	Pollution, injury, increased traffic, disrupted access	<p>32. All borrow pits and quarries should be approved by DoNRE.</p> <p>33. Select pits and quarries in areas with low gradient and as close as possible to construction sites.</p> <p>34. Required aggregate volumes must be carefully calculated prior to extraction to prevent wastage.</p> <p>35. Pits and quarries should not be located near surface waters, forested areas, critical habitat for wildlife, or cultural property or values.</p> <p>36. If aggregate mining from fluvial environments is required small streams and rivers should not be used, and dry alluvial plains preferred.</p> <p>37. All topsoil and overburden removed should be stockpiled for later restoration.</p> <p>38. All borrow pits and quarries should have a fence perimeter with signage to keep public away.</p> <p>39. After use pits and quarries should be dewatered and permanent fences installed with signage to keep public out, and restored as much as possible using original overburden and topsoil.</p> <p>40. Unstable slope conditions in/adjacent to the quarry or pit caused by the extractions should be rectified with tree planting.</p> <p>41. Define and schedule how materials are extracted from borrow pits and rock quarries, transported, and handled and stored at sites.</p> <p>42. Define and schedule how fabricated materials such as steel, wood structures, and scaffolding will be transported and handled.</p> <p>43. All aggregate loads on trucks should be covered.</p>	For all construction areas.	Throughout construction phase	Monthly	No marginal cost	PIC/ESU	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
DBST (low grade asphalt) production, and application to repair roads	Air pollution, land and water contamination, and traffic and access problems,	<p>44. Piles of aggregates at sites should be used/or removed promptly, or covered and placed in non- traffic areas</p> <p>45. Stored paving materials e.g., DBST or asphalt, well away from all human activity and settlements, and cultural (e.g., schools, hospitals), and ecological receptors. Bitumen production and handling areas should be isolated.</p> <p>46. Contractors must be well trained and experienced with the production, handling, and application of bitumen.</p> <p>47. All spills should be cleaned immediately and handled as per hazardous waste management plan, and according to GoV regulations.</p> <p>48. Bitumen should only be spread on top of cable trench not near or in any surface waters, or near any human activities.</p> <p>49. Bitumen should not be used as a fuel.</p>	For all construction areas.	Throughout construction phase	Monthly	No marginal cost	PIC/ESU	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
Implement Spoil management subplan	Contamination of land and surface waters from excavated spoil, and construction waste	<p>50. Uncontaminated spoil to be disposed of in GoV-designated sites, which must never be in or adjacent surface waters. Designated sites must be clearly marked and identified.</p> <p>51. Spoil must not be disposed of on sloped land, near cultural property or values, ecologically important areas, or on/near any other culturally or ecologically sensitive feature.</p> <p>52. Where possible spoil should be used at other construction sites, or disposed in spent quarries or borrow pits.</p> <p>53. A record of type, estimated volume, and source of disposed spoil must be recorded.</p> <p>54. Contaminated spoil disposal must follow GoV regulations including handling, transport, treatment (if necessary), and disposal.</p> <p>55. Suspected contaminated soil must be tested, and disposed of in designated sites identified as per GoV regulations.</p> <p>56. Before treatment or disposal contaminated spoil must be covered with plastic and isolated from all human activity.</p>	All excavation areas	Throughout construction phase	Monthly	See Monitoring Plan for contaminated soil analyses	PIC/ESU and DoNRE	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
Implement Solid and liquid construction waste sub-plan	Contamination of land and surface waters from construction waste	<p>57. Management of general solid and liquid waste of construction will follow GoV regulations, and will cover, collection, handling, transport, recycling, and disposal of waste created from construction activities and worker force.</p> <p>58. Areas of disposal of solid and liquid waste to be determined by GoV.</p> <p>59. Disposed of waste should be catalogued for type, estimated weigh, and source.</p> <p>60. Construction sites should have large garbage bins.</p> <p>61. A schedule of solid and liquid waste pickup and disposal must be established and followed that ensures construction sites are as clean as possible.</p> <p>62. Solid waste should be separated and recyclables sold to buyers in community.</p> <p><u>Hazardous Waste</u></p> <p>63. Collection, storage, transport, and disposal of hazardous waste such as used oils, gasoline, paint, and other toxics must follow GoV regulations.</p> <p>64. Wastes should be separated (e.g., hydrocarbons, batteries, paints, organic solvents)</p> <p>65. Wastes must be stored above ground in closed, well labeled, ventilated plastic bins in good condition well away from construction activity areas, all surface water, water supplies, and cultural and ecological sensitive receptors.</p> <p>66. All spills must be cleaned up completely with all contaminated soil removed and handled with by contaminated spoil sub-plan.</p>	All construction sites and worker camps	Throughout construction phase	Monthly	No marginal cost	PIC/ESU and DoNRE	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
Implement Noise and dust sub-plan	Dust Noise	<p>67. Regularly apply wetting agents to exposed soil and construction roads.</p> <p>68. Cover or keep moist all stockpiles of construction aggregates, and all truck loads of aggregates.</p> <p>69. Minimize time that excavations and exposed soil are left open/exposed. Backfill immediately after work completed.</p> <p>70. As much as possible restrict working time at substation site between 07:00 and 17:00. For UGC of TL place 50 m sections between 23:00 and 06:00 hrs</p> <p>71. Maintain equipment in proper working order</p> <p>72. Replace unnecessarily noisy vehicles and machinery.</p> <p>73. Vehicles and machinery to be turned off when not in use.</p> <p>74. Construct temporary noise barriers around excessively noisy activity areas where possible.</p>	All construction sites.	Fulltime	Monthly	No marginal cost	PIC/ESU	contractor
Implement Utility and power disruption sub-plan	Loss or disruption of utilities and services such as water supply and electricity	<p>75. Develop carefully a plan of days and locations where outages in utilities and services will occur, or are expected.</p> <p>76. Contact local utilities and services with schedule, and identify possible contingency back-up plans for outages.</p> <p>77. Contact affected community to inform them of planned outages.</p> <p>78. Try to schedule all outages during low use time such between 24:00 and 06:00.</p>	All construction sites.	Fulltime	Monthly	No marginal cost	PIC/ESU and Utility company	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
Implement Tree and vegetation removal, and site restoration sub-plan	Damage or loss of trees, vegetation, and landscape	<p>79. Contact DoT/DARD for advice on how to minimize damage to trees and vegetation along transmission line</p> <p>80. Restrict tree and vegetation removal to within RoWs.</p> <p>81. Within RoWs minimize removals, and install protective physical barriers around trees that do not need to be removed.</p> <p>82. Where possible all RoWs to be re-vegetated and landscaped after construction completed. Consult DoT/DARD to determine the most successful restoration strategy and techniques. Aim to replant three trees for each tree removed.</p> <p>83. Restore sections of roads, culverts, irrigation canals, and other public infrastructures damaged by the construction of the transmission line and other facilities.</p>	All construction sites.	Beginning and end of Subproject	Monthly	No marginal cost	PIC/ESU	contractor
Implement Erosion control sub-plan	Land erosion	<p>84. Berms, and plastic sheet fencing should be placed around all excavations and earthwork areas.</p> <p>85. Earthworks should be conducted during dry periods.</p> <p>86. Maintain a stockpile of topsoil for immediate site restoration following backfilling.</p> <p>87. Protect exposed or cut slopes with planted vegetation, and have a slope stabilization protocol ready.</p> <p>88. Re-vegetate all soil exposure areas immediately after work is completed.</p>	All construction sites	Throughout construction phase	Monthly	No marginal cost	PIC/ESU	contractor



Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
Implement worker and public safety sub-plan	Public and worker injury, and health	<p>89. Proper fencing, protective barriers, and buffer zones should be provided around all construction sites.</p> <p>90. Sufficient signage and information disclosure, and site supervisors and night guards should be placed at all sites.</p> <p>91. Worker and public safety guidelines of MoLISA should be followed.</p> <p>92. Population near possible blast areas should be notified 24 hrs ahead, and evacuated well before operation. Accepted GoV blast procedures and safety measures implemented.</p> <p>93. Speed limits suitable for the size and type of construction vehicles, and current traffic patterns should be developed, posted, and enforced on all roads used by construction vehicles.</p> <p>94. Standing water suitable for disease vector breeding should be filled in.</p> <p>95. Worker education and awareness seminars for construction hazards should be given at beginning of construction phase, and at ideal frequency of monthly. A construction site safety program should be developed and distributed to workers.</p> <p>96. Appropriate safety clothing and footwear should be mandatory for all construction workers.</p> <p>97. Adequate medical services must be on site or nearby all construction sites.</p> <p>98. Drinking water must be provided at all construction sites.</p> <p>99. Sufficient lighting be used during necessary night work.</p> <p>100. All construction sites should be examined daily to ensure unsafe conditions are removed.</p>	All construction sites.	Fulltime	Monthly	No marginal cost	PIC/ESU	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
Civil works	Degradation of water quality and aquatic resources	<p>101. Protective coffer dams, berms, plastic sheet fencing, or silt curtains should be placed between all earthworks and surface waters.</p> <p>102. Erosion channels must be built around aggregate stockpile areas to contain rain-induced erosion.</p> <p>103. Earthworks should be conducted during dry periods.</p> <p>104. All construction fluids such as oils, and fuels should be stored and handled well away from surface waters.</p> <p>105. No waste of any kind is to be thrown in surface waters.</p> <p>106. No washing or repair of machinery near surface waters.</p> <p>107. Pit latrines to be located well away from surface waters.</p> <p>108. No unnecessary earthworks in or adjacent to water courses.</p> <p>109. No aggregate mining from rivers or lakes.</p> <p>110. All irrigation canals and channels to be protected the same way as rivers, streams, and lakes</p>	All construction sites	Throughout construction phase	Monthly	No marginal cost	PIC/ESU	contractor
Civil works	Degradation of terrestrial resources	<p>111. All construction sites should be located away forested or all plantation areas as much as possible.</p> <p>112. No unnecessary cutting of trees along RoW.</p> <p>113. All construction fluids such as oils, and fuels should be stored and handled well away from forested and plantation areas.</p> <p>114. No waste of any kind is to be discarded on land or in forests/plantations.</p>	All construction sites	Throughout construction phase	Monthly	No marginal cost	PIC/ESU	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
Implement Construction and urban traffic sub-plan	Traffic disruption, accidents, public injury	<p>115. Schedule construction vehicle activity during light traffic periods. Create adequate traffic detours, and sufficient signage and warning lights.</p> <p>116. Post speed limits, and create dedicated construction vehicle roads or lanes.</p> <p>117. Inform community of location of construction traffic areas, and provide them with directions on how to best co-exist with construction vehicles on their roads.</p> <p>118. Demarcate additional locations where pedestrians can develop road crossings away from construction areas.</p> <p>119. Increase road and walkway lighting.</p>	All construction sites	Fulltime	Monthly	No marginal cost	PIC/ESU	contractor
Implement Construction Drainage sub-plan	Loss of drainage and flood storage	<p>120. Provide adequate short-term drainage away from construction sites to prevent ponding and flooding.</p> <p>121. Manage to not allow borrow pits and quarries to fill with water. Pump periodically to land infiltration or nearby water courses.</p> <p>122. Install temporary storm drains or ditches for construction sites</p> <p>123. Ensure connections among surface waters (ponds) are maintained or enhanced to sustain existing stormwater storage capacity.</p> <p>124. Protect surface waters from silt and eroded soil.</p>	All areas with surface waters	Design and construction phases	Monthly	No marginal cost	PIC/ESU	contractor
Civil works and Chance finds sub-plan	Damage to cultural property or values, and chance finds	<p>125. As per detailed designs all civil works should be located away from all physical cultural property and values.</p> <p>126. Chance finds of valued relics and cultural values should be anticipated by contractors. Site supervisors</p>	All construction sites	At the start , and throughout construction phase	Monthly	No marginal cost	PIC/ESU	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost <sup>17</sup> (USD)	Responsibility	
							Supervision	Implementation
		<p>should be on the watch for finds.</p> <p>127. Upon a chance find all work stops immediately, find left untouched, and EA/IA notified to determine if find is valuable. Culture section of DCST notified by telephone if valuable.</p> <p>128. Work at find site will remain stopped until DCST allows work to continue.</p>						
<b><i>Post-construction Operation of 220 kV Substation</i></b>								
Operation of new substation	Increased risk of worker or public injury	129. Occupational health and safety regulations and guidelines of MoLISA should be applied to operations of substation.	At substation	Fulltime	Biannual	OandM	EVNHCMC / PPMB	
		130. Ensure substation property is adequately fenced with clearly visible danger warning signs to keep public out.						
		131. Store and handle transformer fluids and other hazardous materials according to international procedures and standards.						
<b><i>Post-construction Operation of 220 kV Transmission Line</i></b>								
Operation of new transmission line		<p>132. Occupational safety and health regulations and guidelines of MoLISA should be applied to operations and maintenance of TL</p> <p>133. Ensure TL towers are marked with clearly visible danger warning signs to keep public out.</p>	At all TL towers	Fulltime	Biannual	O and M	EVNHCMC / PPMB	

## **F. Monitoring Plan**

126. The environmental monitoring plan for the EMP is provided in Table 21. 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.

127. The independent 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 ESU 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.

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

129. After construction is completed the potential impacts of the operation of the new District 8, 220 kV substation and transmission line 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.

## **G. Performance Monitoring**

130. Performance monitoring is required to assess the overall performance of the EMP. A performance monitoring system is normally developed by the EA for the entire Project. 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 5.

## **H. Reporting**

131. 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/ESU 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 20 and 21) summarize proposed timing of reporting.

132. A report on environmental monitoring and implementation of EMP will be prepared quarterly for the EA by the IA/ESU. The IA report will compile monthly reports provided by the EO of contractor, the reports of the EMC on monitoring, and input from the ES of the PIC. The IA/ESU 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 22), and will include relevant GoV environmental quality standards. A semi-annual report on the environment monitoring of the subproject must be prepared and submitted to the ADB by the EA

**Table 21. Environmental Monitoring Plan**

ENVIRONMENTAL EFFECTS MONITORING							
Environmental Indicators	Location	Means of Monitoring	Frequency	Reporting	Responsibility Supervision / Implementation		Estimated Cost (USD)
					Supervision	Implementation	
<b><i>Pre-construction Phase – Update Baseline Conditions</i></b>							
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.	A) RoW for transmission line (TL) B) Substation (SS) location	Original field work, community consultations	Once	Once	PIC/ESU	Environmental Monitoring Consultant	\$2,000.
A) Air quality: dust, CO, NOx, SOx, noise B) Affected water quality of canal: TSS, oil and grease, BOD <sub>5</sub> , , TDS, TP, TN	A): Along TL and at SS site B): At SS site	Using field and analytical methods approved by DoNRE.	A) One day and one night measurement b) One measurement	One baseline supplement report before construction phase starts	PIC/ESU	Environmental Monitoring Consultant	A) \$1,500 B) \$2,500
Inventory of present and past land uses that could cause contaminated soil.	Possible contaminated lands at all excavation sites	Using field and analytical methods approved by DoNRE.	Once	Once	PIC/ESU	Environmental Monitoring Consultant	\$500.
<b>Construction Phase of 220 kV Substation and Transmission Line</b>							
Analysis of soil quality (heavy metals (As, Cd, Pb, oil and	Possible contaminated lands at all excavation sites	Using field and analytical methods approved by DoNRE.	Once if	Once	ESU	Environmental Monitoring	\$2,500.

grease, hydrocarbons).			<b>needed</b>			Consultant	
A) Air quality: dust, CO, NOx, SOx, noise	A and B): Baseline sites of pre-construction phase.	A – C : Using field and analytical methods approved by DoNRE.	(A – B): Quarterly during construction periods	Monthly	(A - D):		
B) ) Affected surface water quality: TSS, oil and grease, BOD <sub>5</sub> , , TDS, TP, TN	C) At sites where contaminated soil is suspected.	Include visual observations of dust and noise from contractor and public reports .	Daily visual records		ESU	Monitoring Consultant	A and B: \$5,000./yr C: \$2,000./yr D: no marginal cost
C) Analysis of contaminated soil quality (heavy metals (As, Cd, Pb, Hg, Mn), hydrocarbons.	D) All construction sites and worker camps	D) Visual observation	C) Once at start of excavations		(E and F) and daily observations:		
D) Domestic (worker) and construction solid waste inside and outside construction sites including worker camps.	E) Using hotline number placed at construction areas	E) Information transferred by telephone hotline number posted at all construction sites.	D) Monthly		EA/ESU	contractor	E: \$1,000./yr F: no marginal cost
E) Public comments and complaints	F) At all construction areas	F) regular reporting by contractors/ESU	E) Continuous public input				
F) Incidence of worker or public accident or injury			F) Continuous				
<b>Operation of 220 kV Substation and Transmission Line</b>							
Incidence of worker accidents, or spills on hazardous materials	At substation and along UGC transmission line	Regular documentation and reporting	Continuous			EVNHCMC /PPMB	O and M

**Table 22. Performance Monitoring Indicators for Subproject**

Major Environmental Component	Key Indicator	Performance Objective	Data Source
<b>Pre-construction Phase</b>			
Public Consultation and Disclosure	Affected public and stakeholders	Meetings with public stakeholders contacted during IEE and new stakeholders convened for follow-up consultation and to introduce grievance mechanism	Minutes of meeting, and participants list
EMP	Updated EMP	All stakeholders contacted during IEE re-contacted for follow-up consultation	EMP
Bid Documents	Requirements of EMP (CEMP <sup>20</sup> )	EMP appended to bidding documents with clear instructions to bidders for CEMP	Bid documents
Training of IA/ESU	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
<b>Construction Phase</b>			
All Subproject areas	Critical habitat, rare or endangered species <b><i>if present</i></b>	All <i>present</i> critical habitat and R and E species if unchanged, and unharmed	Monitoring by EMC <sup>21</sup>
Affected water quality	TSS, oil and grease, BOD <sub>5</sub> , , TDS, TP, TN,	GoV environmental standards and criteria met	Monitoring by EMC
Air quality	dust, CO, NOx, SOx, noise	Levels never exceed pre-construction baseline levels	EMC and contractor monitoring reports,
Soil quality	Solid and liquid waste	Rigorous program of procedures and rules to collect and store all waste from construction camps and sites practiced.	Contractor and EMC monitoring reports
Hazardous materials and waste	Oil, gasoline, grease, PCBs	Rigorous program of procedures to manage and store all waste from construction camps and sites practiced.	Contractor and EMC monitoring reports
Public and worker safety	Frequency of injuries	Adherence to GoV occupational health and Safety regulations <sup>22</sup>	Contractor reports
Cultural property	Incidence of damage, or complaints	No valued cultural property, or unearthed valuable relic is harmed in any way	Public input, contractor reports, public input, EMC

<sup>20</sup> Contractor Environmental Management Plan developed from EMP in contractor bidding document

<sup>21</sup> Environmental Monitoring Consultant hired to assist implementation of Environmental Monitoring Plan

<sup>22</sup> OSH Guidelines provided by MoLISA, or IFC World Bank EHS (2007)



Major Environmental Component	Key Indicator	Performance Objective	Data Source
			reports
Traffic	Frequency of disruptions and blocked roadways	Disruptions, stoppages, or detours are managed to absolute minimum.	Public input, contractor reports, EMC reports
<b><i>Operation Phase of Substation and Transmission Line</i></b>			
Worker and Public Safety	Frequency of accidents and spills	No increase in pre-construction frequency	EA

## XI. ESTIMATED COST OF EMP

133. The marginal 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 21 the preliminary cost for the implementation of the EMP for the subproject including an estimated environmental training budget for EVNHCMC / PPBM is approximately USD \$35,500.00 which is summarized in Table 23.

**Table 23. Estimated costs for Environmental Monitoring Plan of EMP**

Activity Type	Estimated Cost (USD)
<i>Pre-construction Phase</i>	
Updating Environmental Baseline	
cultural receptors	\$2,000.00
environmental quality	\$6,500.00
<i>Construction Phase</i>	
environmental quality	\$19,000.00
public consultation	\$2,000.00
<i>Operation Phase</i>	
environmental quality	no cost
public input	no cost
Training and capacity development of EVNHCM / PPBM / ESU	\$6,000.00
<b>Total</b>	<b>\$35,500.00</b>

The environmental costs in Table 23 are for field sampling and laboratory analyses which include professional per diems of technicians.

134. An estimated budget of USD \$6,000.00 is required for training of the EA/IA/ESU 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 IA/ESU during the pre-construction phase.

## **XII. EMERGENCY RESPONSE PLAN**

135. The Contractor must develop emergency or incident response procedures during construction and operation phases of the new District 8 220 kV Substation and Transmission 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 D.

## **XIII. INSTITUTIONAL CAPACITY REVIEW AND NEEDS**

136. 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 ESU/IA of the subproject will develop and deliver training courses to the IA staff including the EO of the contractor. The purpose of the course(s) is to strengthen the ability of the subproject owner including the ESU to oversee implementation of the EMP by construction contractors, and EMC. Costs for training should be included with costs for implementation of the EMP.

137. 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.

## **XIV. CONCLUSIONS AND RECOMMENDATION**

138. The initial examination of the District 8 220 kV Substation and Transmission Line subproject in HCMC indicates that potential environmental impacts are largely construction-related impacts and disturbances that can be mitigated and managed.

139. 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).

140. 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.

## **XV. REFERENCES CITED**

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- MOC -Ministry of Construction, 2009. Vietnam building Code 02:2009/BXD
- PECC3, 2013. Survey of Historic Buildings and Infrastructure Within 500m of RoW and Substation
- PECC3, 2013. Resettlement Plan
- VEPA-Vietnam Environmental Protection Agency, 2012. National Environmental Analysis report.
- World Bank Group, 2007. Environmental, Health, and Safety Guidelines. Washington DC., 96 pgs.

## **APPENDICES**

- A. Rapid Environmental Assessment (REA) Checklist**
- B. Minutes of Public Consultation Meetings**
  - B.1 Ward 5 – District 8
  - B.2 Phong Phu Commune – Binh Chanh District
  - B.3 Binh Hung Commune – Binh Chanh District
- C. Emergency Response Plan**

## 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:**

The District 8 substation and The Sai Gon South – District 8 transmission line

Screening Questions	Ye s	No	Remarks
<b>A. Project Siting</b> Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Cultural heritage site		x	
▪ Protected Area		x	

Screening Questions	Yes	No	Remarks
▪ Wetland		x	
▪ Mangrove		x	
▪ Estuarine		x	
▪ Buffer zone of protected area		x	
▪ Special area for protecting biodiversity		x	
<b>B. Potential Environmental Impacts</b> Will the Project cause...			
▪ encroachment on historical/cultural areas, disfiguration of landscape and increased waste generation?		x	<b>Low level</b> The project will not cut through the pagodas and public infrastructures. The contractors will manage and ban their workers to encroach into these sites. The Project owner and contractors will strictly implement mitigation measures in the construction phase.
▪ 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.
▪ deterioration of surface water quality due to silt runoff, sanitary wastes from worker-based camps and chemicals used in construction?	x		Low level during construction phase. Construction water will runs into the city's drainage and release surface water. It is mainly to increase turbidity of water. Mitigation measures will be implemented.  Construction water will settled down in grid chamber before flow into the city's drainage. No domestic wastewater of worker-based camps. No chemicals used in construction Mitigation measures will be implemented.

Screening Questions	Ye s	No	Remarks
<ul style="list-style-type: none"> <li>▪ increased local air pollution due to rock crushing, cutting and filling?</li> </ul>		<b>x</b>	Low level. There is no rock crushing, cutting in the project. However, rock is used to mix concrete and filled into dug channel. The mitigation measures will be implemented to reduce air pollution
<ul style="list-style-type: none"> <li>▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?</li> </ul>		<b>x</b>	<p>Medium impact level due to noise and vibration during construction phase;</p> <p>Low impact level due to electromagnetic fields in the operation phase. To minimize potential risks, an Occupational Health and Safety Plan (OHSP) will be developed and implemented.</p>
<ul style="list-style-type: none"> <li>▪ chemical pollution resulting from chemical clearing of vegetation for construction site?</li> </ul>		<b>x</b>	
<ul style="list-style-type: none"> <li>▪ noise and vibration due to blasting and other civil works?</li> </ul>		<b>x</b>	
<ul style="list-style-type: none"> <li>▪ dislocation or involuntary resettlement of people?</li> </ul>	<b>x</b>		Low impact level. The total estimated permanently affected land is 5,301 m <sup>2</sup> , of which 4,139 m <sup>2</sup> (78.08%) belongs to 1 Anh Tu Company (garage for repair and keeping cars), and 1,162 m <sup>2</sup> (21.92%) belonging to 5 Ahs. However, no dislocation or involuntary resettlement of people
<ul style="list-style-type: none"> <li>▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?</li> </ul>		<b>x</b>	
<ul style="list-style-type: none"> <li>▪ social conflicts relating to inconveniences in living conditions where construction interferes with pre-existing roads?</li> </ul>	<b>x</b>		Small impacts. The construction of underground cable sections on roadways will obstruct traffic. Also, noise and dust from excavation and construction works will affect household who are living along the roads cable run through. However, the Project owner, contractors will implement the proposed mitigation measures which are highly feasible such as: constructing completely each section (50m/section) during one night, putting signs, barricades, clean the site daily to ensure temporary traffic back to normal, repair damaged road after the construction.



Screening Questions	Yes	No	Remarks
<ul style="list-style-type: none"> <li>hazardous driving conditions where construction interferes with pre-existing roads?</li> </ul>	x		Small impact. The digging cable ditches on roadways and increase of project heavy trucks can cause risk in traffic accident. However, mitigation measures, and ensuring safety will be taken strictly, as railings, set the speed control signs, traffic regulation etc.
<ul style="list-style-type: none"> <li>creation of temporary breeding habitats for vectors of disease such as mosquitoes and rodents?</li> </ul>		x	The project does not create the stagnant water. Construction area will be cleaned every day and recovered the surface of roads as the pre-project situation after finishing the construction of each underground cable section. Construction wastewater in the substation will be collected into the city drainage
<ul style="list-style-type: none"> <li>dislocation and compulsory resettlement of people living in right-of-way of the power transmission lines?</li> </ul>		x	45 AHs have temporary affected land in ROW . However, no dislocation or involuntary resettlement of people
<ul style="list-style-type: none"> <li>environmental disturbances associated with the maintenance of lines (e.g. routine control of vegetative height under the lines)?</li> </ul>		x	No tree with height higher than 6 m under transmission line
<ul style="list-style-type: none"> <li>facilitation of access to protected areas in case corridors traverse protected areas?</li> </ul>		x	No protected areas within 10 km of the project area
<ul style="list-style-type: none"> <li>disturbances (e.g. noise and chemical pollutants) if herbicides are used to control vegetative height?</li> </ul>		x	No herbicides will be used to control vegetative height
<ul style="list-style-type: none"> <li>large population influx during project construction and operation that cause increased burden on social infrastructure and services (such as water supply and sanitation systems)?</li> </ul>		x	The subproject scale is small, therefore the number of works is limited for about 10-20 people
<ul style="list-style-type: none"> <li>social conflicts if workers from other regions or countries are hired?</li> </ul>		x	No impact. All workers are Vietnamese. Workers from other regions or countries are not hired

Screening Questions	Ye s	No	Remarks
<ul style="list-style-type: none"> <li>▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?</li> </ul>	x		<p>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</p> <p>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.</p>
<ul style="list-style-type: none"> <li>▪ risks to community safety associated with maintenance of lines and related facilities?</li> </ul>	x		<p>Maintenance of cable acrosses National road 50 and Nguyen Van Linh Highway, can interfere with the movement of local people or even cause traffic accidents. An operation safety plan will be set up and implemented by the operating unit to reduce negative impacts.</p>
<ul style="list-style-type: none"> <li>▪ community health hazards due to electromagnetic fields, land subsidence, lowered groundwater table, and salinization?</li> </ul>	x		<p>Minor impact. No land subsidence, lowered groundwater table, and salinization would be happed. Electromagnetic fields occur in operation phase</p> <ul style="list-style-type: none"> <li>- Underground cable is designed according to the electromagnetic current standards should not impact public health. Risk of subsidence at cable cellar may occur if heavy trucks illegal run through the road, or by the construction of other infrastructure systems.</li> <li>- Electromagnetic field of the substation will not affected surrounding communities because the wall serves as a safety corridor.</li> </ul>
<ul style="list-style-type: none"> <li>▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?</li> </ul>	x		<p>There is minimal risk that accidents could happen but not expected to be significant. If so, measures will be in place to deal with them.</p>

Screening Questions	Yes	No	Remarks
<ul style="list-style-type: none"> <li>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?</li> </ul>	<b>x</b>		Low level risk. These risks maybe happened at tower locations and along underground cable ditch. The towers may be collapsed due to typhoons or tropical cyclones. The underground cable may cause risks of power shock, cable broken when it happen earthquake, but this hazard will rarely appear in this project area and the project was designed to probably stand the earthquake. Also, in the process of maintenance, the operate unit will conduct regular inspection for timely detection and treatment.

Climate Change and Disaster Risk Questions	Yes	No	Remarks
The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks.			
<ul style="list-style-type: none"> <li>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)?</li> </ul>		<b>x</b>	
<ul style="list-style-type: none"> <li>Could changes in precipitation, temperature, salinity, or extreme events over the Project lifespan affect its sustainability or cost?</li> </ul>		<b>x</b>	
<ul style="list-style-type: none"> <li>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)?</li> </ul>		<b>x</b>	Low level
<ul style="list-style-type: none"> <li>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)?</li> </ul>	<b>x</b>		Very low level

**Appendix I: Environments, Hazards and Climate Changes**

Environment	Natural Hazards and Climate Change
<b>Arid/Semi-arid and desert environments</b>	Low erratic rainfall of up to 500 mm rainfall per annum with periodic droughts and high rainfall variability. Low vegetative cover. Resilient ecosystems & complex pastoral and systems, but medium certainty that 10–20% of drylands degraded; 10-30% projected decrease in water availability in next 40 years; projected increase in drought duration and severity under climate change. Increased mobilization of sand dunes and other soils as vegetation cover declines; likely overall decrease in agricultural productivity, with rain-fed agriculture yield reduced by 30% or more by 2020. Earthquakes and other geophysical hazards may also occur in these environments.
<b>Humid and sub-humid plains, foothills and hill country</b>	More than 500 mm precipitation/yr. Resilient ecosystems & complex human pastoral and cropping systems. 10-30% projected decrease in water availability in next 40 years; projected increase in droughts, heatwaves and floods; increased erosion of loess-mantled landscapes by wind and water; increased gully erosion; landslides likely on steeper slopes. Likely overall decrease in agricultural productivity & compromised food production from variability, with rain-fed agriculture yield reduced by 30% or more by 2020. Increased incidence of forest and agriculture-based insect infestations. Earthquakes and other geophysical hazards may also occur in these environments.
<b>River valleys/deltas and estuaries and other low-lying coastal areas</b>	River basins, deltas and estuaries in low-lying areas are vulnerable to riverine floods, storm surges associated with tropical cyclones/typhoons and sea level rise; natural (and human-induced) subsidence resulting from sediment compaction and ground water extraction; liquefaction of soft sediments as result of earthquake ground shaking. Tsunami possible/likely on some coasts. Lowland agri-business and subsistence farming in these regions at significant risk.
<b>Small islands</b>	Small islands generally have land areas of less than 10,000km <sup>2</sup> in area, though Papua New Guinea and Timor with much larger land areas are commonly included in lists of small island developing states. Low-lying islands are especially vulnerable to storm surge, tsunami and sea-level rise and, frequently, coastal erosion, with coral reefs threatened by ocean warming in some areas. Sea level rise is likely to threaten the limited ground water resources. High islands often experience high rainfall intensities, frequent landslides and tectonic environments in which landslides and earthquakes are not uncommon with (occasional) volcanic eruptions. Small islands may have low adaptive capacity and high adaptation costs relative to GDP.
<b>Mountain ecosystems</b>	Accelerated glacial melting, rockfalls/landslides and glacial lake outburst floods, leading to increased debris flows, river bank erosion and floods and more extensive outwash plains and, possibly, more frequent wind erosion in intermontane valleys. Enhanced snow melt and fluctuating stream flows may produce seasonal floods and droughts. Melting of permafrost in some environments. Faunal and floral species migration. Earthquakes, landslides and other geophysical hazards may also occur in these environments.
<b>Volcanic environments</b>	Recently active volcanoes (erupted in last 10,000 years – see <a href="http://www.volcano.si.edu">www.volcano.si.edu</a> ). Often fertile soils with intensive agriculture and landslides on steep slopes. Subject to earthquakes and volcanic eruptions including pyroclastic flows and mudflows/lahars and/or gas emissions and occasionally widespread ashfall.



## APPENDIX B. PUBLIC CONSULTATIONS

No.	Name of subprojects	Location	Date	Participants*		
				Male	Female	Total
1	New District 8 220 kV Substation	<b>B1.</b> Ward 5 - District 8	31 October, 2013	6	4	10
2	Upgraded 110/220kV OHL and UGC District 8-South Saigon Transmission line	<b>B2.</b> Phong Phu, Commune- Binh Chanh District	31 October, 2013	14	6	20
		<b>B3.</b> Binh Hung Commune Binh Chanh District	1st of November 2013	18	7	25
		<b>TOTAL</b>		<b>38</b>	<b>17</b>	<b>55</b>

*\*This numbers is counted from the list of participants; some persons are repeatedly counted since they participated in all meetings.*

### APPENDIX B.1 PUBLIC CONSULTATION IN PHONG PHU COMMUNE- BINH CHANH DISTRICT, HCM CITY

**Date: October, 31<sup>st</sup>, 2013**

#### a. LIST OF PARTICIPANTS

No.	Name	Male	Female	Position	Organization/Addresses
1	Phạm Thị Dương			Household	E15/408, Hamlet 5
2	Đình Văn Đầu	x		Household	E12/342, Hamlet 5
3	Nguyễn Văn Nào	x		Household	Hamlet 4 (near the station)
4	Nguyễn Văn Hiếu	x		Household	Hamlet 4 (near the station)
5	Nguyễn Văn Lượm	x		Household	E12/356 Y , Hamlet 5
6	Lê Minh Tâm	x		Household	311, 320A, Hamlet5
7	Nguyễn Văn Lô	x		Household	324 , Hamlet 5

8	Nguyễn Văn Hoàng	x		Household	E10/292 C, Hamlet 5
9	Trần Minh xuân	x		Household	E11/304, Hamlet 5
10	Nguyễn Văn Vàng	x		Household	E12/356S, Hamlet 5
11	Chung Thị The		x	Household	E1192I, Hamlet 5
12	Đỗ Quang Lĩnh	x		Environment Expert	PECC3
13	Nguyễn Thị Thanh Tuyền		x	Chairwoman of commune Women's Union	Phong Phu commune
14	Lê Thị Ngọc Xuân		x	Social Expert	PECC3
15	Trịnh Minh Sơn	x		Expert of Investment Preparation Department	Network Grid Project Management Board
16	Nguyễn Hữu Nghiệp			President of commune PC	People's Committee of Phong Phu Commune
17	Đỗ Văn Thảo			President of Farmers' Union	Phong Phu Commune
18	Nguyễn Hoàng Dân			President of Veterans' society	Phong Phu Commune
19	Nguyễn Thị Loan		x	Consultant of ADB	
20	Khúc Thị Thanh Vân		x	Consultant of ADB	



PUBLIC CONSULTATION ON ENVIRONMENT AND SOCIAL/RESETLEMENT

THAM VẤN CỘNG ĐỒNG VỀ MÔI TRƯỜNG VÀ  
XÃ HỘI/TÁI ĐỊNH CƯ

LIST OF PARTICIPANTS  
DANH SÁCH NGƯỜI THAM DỰ

Date (Ngày tháng):

Location (Địa điểm): UBND Xã Phong Phú - H. Bình Chánh - Tp. HCM

No. TT	Họ và tên (Name)	Nam (M)	Nữ (F)	Chức vụ (Position)	Cơ quan/Địa chỉ (Organization/Address)	Chữ ký (Signature)
1	Phạm Thị Diệu Ngọc P.Đ.T.Đ		✓	Hộ gia đình	E1/408 Ấp 5	<i>[Signature]</i>
2	Đinh Văn Đức	✓		"	E1/342 Ấp 5 (gần chùa)	<i>[Signature]</i>
3	Nguyễn Văn Ngọc	✓		"	E1/342 Ấp 5 (gần chùa)	<i>[Signature]</i>
4	Nguyễn Văn Hiếu	✓		Hộ gia đình	" F	<i>[Signature]</i>
5	Nguyễn Văn Luận	✓		Hộ gia đình	E1/356 Ấp 5 K. P. Phú	<i>[Signature]</i>
6	Lê Minh Tâm	✓		Hộ gia đình	311, 320A Ấp 5	<i>[Signature]</i>
7	Ngô Văn Lễ	✓		Hộ gia đình	324 Ấp 5	<i>[Signature]</i>
8	Ngô Thanh Hoàng (Hàng N.T. Ngọc Trâm?)	✓		"	F10/292C Ấp 5	<i>[Signature]</i>
9	Trần Minh Xuân (Hàng P.T. Hoàng Xuân?)	✓		Hộ gia đình	E1/306 Ấp 5	<i>[Signature]</i>
10	Nguyễn Văn Văn	✓		"	E1/356 Ấp 5	<i>[Signature]</i>
11	Chung Thị Thu (C. Trâm Văn Thu?)	✓		"	E1/321 Ấp 5	<i>[Signature]</i>
12	Đỗ Công Lợi	✓		Hàng xóm (gần chùa)	(Khu vực E1/402?) P.Đ.Đ	<i>[Signature]</i>
13	Ngô Thị Thanh Tuyền		✓	CT. HĐND xã	Xã Phong Phú	<i>[Signature]</i>
14	Lê Thị Ngọc Xuân		✓	P. UBND xã	PECC3	<i>[Signature]</i>
15	Trần Minh An	✓		P. UBND	Ban QLDA Lũ lụt	<i>[Signature]</i>
16	Nguyễn Hải Nghiệp	✓		CT. UBND	xã Phong Phú	<i>[Signature]</i>
17	Đỗ Văn Thảo	✓		CT. HĐND	"	<i>[Signature]</i>
18	Nguyễn Văn Văn Dân			CT. HĐND	"	<i>[Signature]</i>
19	Nguyễn Thị Loan			Tư vấn ADB		<i>[Signature]</i>
20	Khúc Thị Thanh Vân			Tư vấn ADB		<i>[Signature]</i>
21						
22						
23						
24						
25						



b. MINUTES OF MEETING-PHONG PHU COMMUNE

<b>Comments/questions from local authorities</b>	<b>Answers of project owners and consultants company PECC4</b>
How wide is a safety corridor for transmission line?	The distance from the ROW to the outermost line is 6m
The mitigation measures are suitable but will they be implemented during construction stage?	There will be a monitoring agency to inspect the environmental compliance of constructor
Contractor must not work during time when local people are resting	A hotline will be established for the complaint cases
If the roads are damaged due to the project construction, the contractor must restore the roads as the first situation	These measures are stipulated in the bidding document.

Ha Noi and Ho Chi Minh City Power Transmission Development Sector Project  
DỰ ÁN NGÀNH PHÁT TRIỂN ĐƯỜNG DÂY TRUYỀN TẢI ĐIỆN THÀNH PHỐ HÀ NỘI  
VÀ HỒ CHÍ MINH

CỘNG HOÀ XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập - Tự Do - Hạnh phúc

\*\*\*

Phong Phú, Ngày 31 tháng 10 năm 2013

BIÊN BẢN HỌP THAM VẤN CỘNG ĐỒNG VỀ ĐÁNH GIÁ MÔI TRƯỜNG,  
TÁI ĐỊNH CƯ VÀ PHÁT TRIỂN DÂN TỘC THIỂU SỐ

Tiêu dự án: *Trạm biến áp 220kV Nam Sài Gòn quận 8 và đường dây*  
Phường/Xã: *P. Phong Phú* Quận/Huyện: *Bình Chánh* Thành phố HCM: *Nam SG quận 8*

I. Thành phần tham dự

- Ông/Bà: *Nguyễn Hữu Nghiệp* Chức vụ: *Chủ tịch UBND xã*
- Ông/Bà: *Nguyễn Thị Thanh Tuyết* Chức vụ: *Chủ tịch hội phụ nữ xã*
- Ông/Bà: *Đoàn Văn Thảo* Chức vụ: *Chủ tịch Ban nông dân*
- Ông/Bà: *Nguyễn Hoàng Dân* Chức vụ: *Chủ tịch câu lạc bộ bình*
- Ông/Bà: *Trần Minh Sơn* Chức vụ: *Ban quản lý DA lưới điện*
- Ông/Bà: ..... Chức vụ: .....
- Đại diện những người bị ảnh hưởng: ..... người (*chi tiết xem danh sách đính kèm*)

I. Nội dung tham vấn

- *Tư vấn thiết kế giới thiệu dự án:* Vị trí trạm, tuyến đường; vị trí và chiều dài tuyến đường dây trên địa bàn phường, xã.
- *Tư vấn môi trường trình bày về:* Chính sách môi trường của ADB; Các quy định về môi trường trong ngành điện của chính phủ Việt Nam; Các tác động về môi trường và các biện pháp giảm thiểu tương ứng (như trong IEE); Cơ chế khiếu nại khi có các vấn đề môi trường xảy ra
- *Tư vấn xã hội/tái định cư trình bày về:* Kế hoạch tái định cư của ADB; Những tác động khi thu hồi đất và các tài sản trên đất; Những chính sách của Chính phủ nước Cộng hòa xã hội chủ nghĩa Việt Nam và địa phương, chính sách của dự án trong vấn đề bồi thường thiệt hại khi Nhà nước thu hồi đất đai và các tài sản trên đất; Các tác động thu hồi đất/tái định cư dự kiến trên địa bàn; Các phương án bồi thường đề xuất (*theo Khung chính sách của dự án đã được phê duyệt*); Tổ chức thực hiện, kế hoạch thực hiện kế hoạch tái định cư.



Ha Noi and Ho Chi Minh City Power Transmission Development Sector Project  
DỰ ÁN NGÀNH PHÁT TRIỂN ĐƯỜNG DÂY TRUYỀN TẢI ĐIỆN THÀNH PHỐ HÀ NỘI  
VÀ HỒ CHÍ MINH

III. Ý kiến thảo luận

III.1 Về các tác động môi trường tiêu cực và biện pháp giảm thiểu

- Các biện pháp giảm thiểu đã xác định, nhưng trong thời gian thi công có thực hiện hay không?
- Không được thi công trong thời gian nghỉ của người dân
- Khi thi công làm hỏng đường của dân thì nhà thầu phải sửa chữa.
- Phải lập đường dây rọi để người dân có thể đi lại nơi về nơi trường.
- Cần cho phép xây dựng nhà dưới hành lang an toàn, nhưng đảm bảo độ cao an toàn

III.2 Về các vấn đề thu hồi đất và các tài sản trên đất và các chính sách

- Đất đai địa hình hay được đo đạc thì tại các dự án trước đây - thì bây giờ có được đo đạc không?
- Nhà địa hình hay tuyên được hồ sơ kê các dự án trước đây thì dự án này có được hồ sơ kê để đảm bảo an toàn không?
- Nhà ở địa hình hay có cho phép sửa chữa 10%.
- Sửa chữa thì cho đồ sửa chữa đảm bảo theo quy.

IV. Kết luận

UBND xã Phong phú và các hộ dân bị ảnh hưởng đồng ý với chủ trương xây dựng trạm biến áp 220kV và đường dây Nam Sơn - Quản B, và nhất trí với các biện pháp giảm thiểu về môi trường và tái định cư đã nêu.

Đại diện Chủ đầu tư

Đại diện cộng đồng

Đại diện tư vấn

Đại diện UBND xã

  
Phách Minh Sơn.

  
Đinh Văn Dân

  
Nguyễn Xuân

  
Nguyễn Hữu Nghiệp

C. PICTURES- PHONG PHU COMMUNE



**APPENDIX B.2 PUBLIC CONSULTATION IN WARD 5- DISTRICT 8, HCM CITY****Date: October, 31<sup>st</sup>, 2013****a. LIST OF PARTICIPANTS**

<b>No.</b>	<b>Name</b>	<b>Male</b>	<b>Female</b>	<b>Position</b>	<b>Organization/Address</b>
1	Nguyễn Mạnh Tường	x		Head of Project Management Board	SSIC (Saigon Shipbuilding Industry Corporation)
2	Từ Văn Thiệu	x		Investor of Thien Thach Company	1027, Pham The Hien St.
3	Huỳnh Ngọc Tú	x		Business	Anh Tu Company
4	Nguyễn Văn Cường	x		Vice president of PC	People's committee of Ward 5
5	Đỗ Quang Lĩnh	x		Environment Expert	PECC3
6	Lê Thị Ngọc Xuân		x	Social Expert	PECC3
7	Trịnh Minh Sơn	x		Expert of Investment Preparation Department	Network Grid Project Management Board
8	Nguyễn Thị Loan		x	Consultant of ADB	
9	Khúc Thị Thanh Vân		x	Consultant of ADB	
10	Đào Minh Tâm	x		Veteran	
11	Nguyễn Hồng Dịu		x	Fatherland Front Committee	



b. MINUTE OF MEETINGS-WARD 5 -DISTRICT 8

<p>How about the impact level of noise and smoke emissions, the effects on the Internet and wireless devices?</p>	<p>Smoke emissions and waste water is insignificant.</p> <ul style="list-style-type: none"><li>- Hazardous waste is also insignificant.</li><li>- Noise &lt;70 db</li></ul>
<p>How about the piling solutions during construction?</p>	<p>This is the preparation stage for investment, but in the construction stage, pile driving will be used so this will not make noise.</p>
<p>Impact on wave for the cellular phone?</p>	<p>There are many stations in this city but they have not caused any impact yet.</p>

Hanoi and Ho Chi Minh City Power Transmission Development Sector Project  
DỰ ÁN NGÀNH PHÁT TRIỂN ĐƯỜNG DÂY TRUYỀN TẢI ĐIỆN THÀNH PHỐ HÀ NỘI  
VÀ HỒ CHÍ MINH

CỘNG HOÀ XÃ HỘI CHỦ NGHĨA VIỆT NAM  
Độc lập - Tự Do - Hạnh phúc

Phước Mỹ, Ngày 31 tháng 10 năm 2013

BIÊN BẢN HỌP THAM VẤN CỘNG ĐỒNG VỀ ĐÁNH GIÁ MÔI TRƯỜNG,  
TÁI ĐỊNH CƯ VÀ PHÁT TRIỂN DÂN TỘC THIỂU SỐ

Tiêu dự án: Trạm biến áp 220 kV quận 8 và đường dây 220 kV Sài Gòn - Quận 8  
Phường/Xã: 5 Quận/Huyện: 8 Thành phố: Hồ Chí Minh

1. Thành phần tham dự

- Ông/Bà: Nguyễn Văn Cường.....Chức vụ: Phó chủ tịch UBND phường
- Ông/Bà: Trần Văn Minh.....Chức vụ: Tổng chủ đầu tư EVNH
- Ông/Bà: Lê Thị Ngọc Xuân.....Chức vụ: Trưởng Văn Xã Hội PECC
- Ông/Bà: Nguyễn Mạnh Tường.....Chức vụ: Tổng ban QLDA VINASIN
- Ông/Bà: Huỳnh Ngọc Tiến.....Chức vụ: Công ty Anh Tiến
- Ông/Bà:.....Chức vụ:.....
- Đại diện những người bị ảnh hưởng: .....người (chi tiết xem danh sách đính kèm)

I. Nội dung tham vấn

- **Tư vấn thiết kế giới thiệu dự án:** Vị trí trạm, tuyến đường; vị trí và chiều dài tuyến đường dây trên địa bàn phường, xã.
- **Tư vấn môi trường trình bày về:** Chính sách môi trường của ADB; Các quy định về môi trường trong ngành điện của chính phủ Việt Nam; Các tác động về môi trường và các biện pháp giảm thiểu tương ứng (như trong IEE); Cơ chế khiếu nại khi có các vấn đề môi trường xảy ra
- **Tư vấn xã hội/tái định cư trình bày về:** Kế hoạch tái định cư của ADB; Những tác động khi thu hồi đất và các tài sản trên đất; Những chính sách của Chính phủ nước Cộng hòa xã hội chủ nghĩa Việt Nam và địa phương, chính sách của dự án trong vấn đề bồi thường thiệt hại khi Nhà nước thu hồi đất đai và các tài sản trên đất; Các tác động thu hồi đất/tái định cư dự kiến trên địa bàn; Các phương án bồi thường đề xuất (theo Khung chính sách của dự án đã được phê duyệt); Tổ chức thực hiện, kế hoạch thực hiện kế hoạch tái định cư.



Hanoi and Ho Chi Minh City Power Transmission Development Sector Project  
DỰ ÁN NGÀNH PHÁT TRIỂN ĐƯỜNG DÂY TRUYỀN TẢI ĐIỆN THÀNH PHỐ HÀ NỘI  
VÀ HỒ CHÍ MINH

III. Ý kiến thảo luận

III.1 Về các tác động môi trường tiêu cực và biện pháp giảm thiểu

- Mức độ ảnh hưởng về tiếng ồn và khí thải như thế nào?
- Khi thi công đóng cọc có thể gây nhiễu tiếng ồn
- Trong quá trình vận hành có gây ảnh hưởng đến sống điện thoại hay không?



III.2 Về các vấn đề thu hồi đất và các tài sản trên đất và các chính sách

- Dự án lợi ích thế nào, còn có những khó khăn gì?
- Đất đai bị thu hồi - cần giải bài toán quỹ đất kinh doanh - giải quyết thế nào?
- Xí nghiệp đầu tư sẽ tập hợp các chủ thể đi lại thế nào?

IV. Kết luận

UBND phường 5 quận 8 nhất và các bên liên quan đồng ý với chủ trương xây dựng trạm biến áp 220kV quận 8 và đường dây 220kV Mầm Sỏi Gòn - quận 8, đồng thời nhất trí với các biện pháp giảm thiểu môi trường và tái định cư đã đề xuất nêu ra.

Đại diện Chủ đầu tư

Đại diện cộng đồng

Đại diện tư vấn

Đại diện UBND xã

Thủ lĩnh Sơn

Nguyễn Hoàng Tường

Nguyễn Thị Loan



Nguyễn Văn Cường

c. PICTURES-WARD 5 DISTRICT 8



**APPENDIX B.3 PUBLIC CONSULTATION IN BINH HUNG COMMUNE - BINH CHANH DISTRICT, HCM CITY**

**a. LIST OF PARTICIPANT-BINH HUNG COMMUNE**

<b>No.</b>	<b>Name</b>	<b>Male</b>	<b>Female</b>	<b>Position</b>	<b>Organization/Address</b>
1	Hà Phát	x		Household	Hamlet 3 - Binh Hung Commune
2	Trần Văn Mươi	x		Household	15/19 Highway 50, Hamlet 1
3	Phạm Long Hưng	x		Household	16/39 Highway 50, Hamlet 3
4	Trương Minh Nhật	x		Household	B15/14, Hamlet 3A
5	Nguyễn Tiến Quân	x		Household	B13/11, Hamlet 3A
6	Nguyễn Kiến Triết	x		Household	B13/10, Hamlet 3A
7	Lê Thị Nguyệt		x	Household	B13/10, Hamlet 3A
8	Lê Hồng Thúy		x	Household	B15/28, Hamlet 3
9	Võ Thị Trúc Liên		x	Household	B15/38R1, Hamlet 3
10	Đào Công Đồ	x		Household	B15/14, Hamlet 3A
11	Huỳnh Ngọc Chánh	x		Household	B15/36C1, Hamlet 3
12	Nguyễn Ngọc Tuấn	x		Household	B30/32, Hamlet 3
13	Hà Công	x		Household	B14/4F Quarter 143, Hamlet 3A,
14	Trần Văn Nho	x		Household	B14/4, Hamlet 3A
15	Nguyễn Thị Vân		x	Household	B14/5, Hamlet 3A
16	Nguyễn Văn Lành	x		Chairman of Fatherland Front Committee	Binh Hung Commune

17	Phan Thanh Nhã	x		Vice president of PC	Binh Hung Commune
18	Huỳnh Thanh Phong	x		Technical office of PC	Binh Hung Commune
19	Đỗ Quang Lĩnh	x		Environment Expert	PECC3
20	Lê Thị Ngọc Xuân		x	Social Expert	PECC3
21	Võ Hữu Thắng	x		Expert	Department of International Relation - HCM PC
22	Nguyễn Thị Loan		x	Consultant of ADB	
23	Khúc Thị Thanh Vân		x	Consultant of ADB	
24	Trịnh Minh Sơn	x		Expert of Investment Preparation Department	Network Grid Project Management Board

PUBLIC CONSULTATION ON ENVIRONMENT AND SOCIAL/RESETLEMENT



THAM VẤN CỘNG ĐỒNG VỀ MÔI TRƯỜNG VÀ  
XÃ HỘI/TÁI ĐỊNH CƯ

LIST OF PARTICIPANTS  
DANH SÁCH NGƯỜI THAM DỰ

Date (Ngày tháng):

Location (địa điểm): Xã Bình Hưng - H. Bình Chánh - TP. HCM

No. TT	Họ và tên (Name)	Nam (M)	Nữ (F)	Chức vụ (Position)	Cơ quan/Địa chỉ (Organization/Address)	Chữ ký (Signature)
1	Hồ Phát	✓		Hộ dân	Ấp 3 - Bình Hưng	[Signature]
2	Trần Văn Hùng (Chị Nguyễn Thị Thảo)	✓		Hộ dân	Ấp 1/50, Ấp 1	[Signature]
3	Nguyễn Long Hùng (Chị Nguyễn Thị Thảo)	✓		Hộ dân	Ấp 1/50, Ấp 3	[Signature]
4	Trần Văn Hùng (Chị Nguyễn Thị Thảo)	✓		Hộ dân	Bình Hưng Ấp 3A	[Signature]
5	Nguyễn Văn Hùng (Chị Nguyễn Thị Thảo)	✓		Hộ dân	Bình Hưng Ấp 3A	[Signature]
6	Nguyễn Văn Hùng	✓		Hộ dân	Bình Hưng Ấp 3A	[Signature]
7	Lê Thị Nguyệt		✓	Hộ dân	Bình Hưng Ấp 3A	[Signature]
8	Lê Thị Nguyệt		✓	Hộ dân	Bình Hưng Ấp 3	[Signature]
9	Võ Thị Trúc Liên (Chị Nguyễn Thị Thảo)		✓	Hộ dân	Bình Hưng Ấp 3	[Signature]
10						
11	Đào Công Hồ	✓		Hộ dân	Bình Hưng Ấp 3A	[Signature]
12	Nguyễn Ngọc Châu	✓		Hộ dân	Bình Hưng Ấp 3	[Signature]
13	Nguyễn Ngọc Châu (Chị Nguyễn Thị Thảo)			Hộ dân	Bình Hưng Ấp 3	[Signature]
14	Hồ Công	✓		Hộ dân	Bình Hưng Ấp 3A	[Signature]
15	Nguyễn Văn Hùng	✓		Hộ dân	Bình Hưng Ấp 3A	[Signature]
16	Nguyễn Thị Vân		✓	Hộ dân	Bình Hưng Ấp 3A	[Signature]
17	Nguyễn Văn Hùng	✓		CT. UBND	Xã Bình Hưng	[Signature]
18	Phạm Văn Hùng	✓		PCUBND	Xã Bình Hưng	[Signature]
19	Nguyễn Văn Hùng	✓		VP-KT. UBND	Xã Bình Hưng	[Signature]
20	Hồ Công Lĩnh	✓		Chuyên viên môi trường	Tổ vận động 3	[Signature]
21	Lê Thị Nguyệt Xuân		✓	Chuyên viên xã hội	Tổ vận động 3	[Signature]
22	Võ Hữu Thắng	✓		Chuyên viên	Ban CHOT, TCty	[Signature]
23	Nguyễn Thị Loan		✓	Trưởng ADB		[Signature]
24	Nguyễn Thị Thanh Vân		✓	Trưởng ADB		[Signature]
25	Trần Minh Sơn	✓		Chuyên viên	Ban QLLA	[Signature]

## B. MINUTES OF MEETING-BINH HUNG COMMUNE

<b><i>Comments/questions from local authorities</i></b>	<b><i>Answers of project owners and consultants company PECC4</i></b>
<p>How height of the transmission line is compared with the ground surface?</p> <p>Due to water level increasing, the elevation of a house foundation is raised so the transmission line needs to be also raised.</p> <p>- The specific criteria need to be informed to the local people to know the safety distance</p>	<p>The line section crossing the resident area is over 8m in height.</p> <p>The difference between the lowest point of the transmission line and the highest point of the ground surface is 4m</p>
<p>Is there any construction solution when implementation crosses Highway 50?</p>	<p>When buiding crossing Highway 50, the constructor must be have a permission before that.</p>
<p>When implementing construction work in night time, the team work must ensure that living and production of the local people will not affected.</p> <p>Construction work is required to finish at the same night.</p>	<p>Implementing construction work will be conducted according to the short sections and the ground will be restored the same as the first situation only for one day.</p>
<p>Highway 50 is usually inundated at 4:00PM and 5:00AM so this problem must be considered carefully when establishing the construction schedule.</p>	<p>Will consider this factor when establishing the construction schedule</p>

Hanoi and Ho Chi Minh City Power Transmission Development Sector Project  
DỰ ÁN NGÀNH PHÁT TRIỂN ĐƯỜNG DÂY TRUYỀN TẢI ĐIỆN THÀNH PHỐ HÀ NỘI  
VÀ HỒ CHÍ MINH

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập - Tự Do - Hạnh phúc

Bình Hưng, Ngày 1 tháng 11 năm 2012

BIÊN BẢN HỌP THAM VẤN CỘNG ĐỒNG VỀ ĐÁNH GIÁ MÔI TRƯỜNG,  
TÁI ĐỊNH CƯ VÀ PHÁT TRIỂN DÂN TỘC THIỂU SỐ

Tiêu dự án: ...Trạm biến áp 220 kV Quận 8 và đường dây 220 kV Nam S G  
Phường/Xã: ...Bình Hưng... Quận/Huyện: Bình Chánh Thành phố Hồ Chí Minh - Quận 8

I. Thành phần tham dự

- Ông/Bà Phan Thanh Nhã..... Chức vụ Phó chủ tịch UBND
- Ông/Bà Nguyễn Văn Lạc..... Chức vụ Phó ET.....
- Ông/Bà Võ Văn Thắng..... Chức vụ Ban & HQT EVN HCM
- Ông/Bà Huỳnh Thanh Long..... Chức vụ VP - KT - UBND
- Ông/Bà Lê Thị Ngọc Hương..... Chức vụ Tư vấn điện 3
- Ông/Bà Trần Mạnh Sơn..... Chức vụ Ban QL Dự ÁN H C
- Đại diện những người bị ảnh hưởng: ..... người (chi tiết xem danh sách đính kèm)



I. Nội dung tham vấn

- **Tư vấn thiết kế giới thiệu dự án:** Vị trí trạm, tuyến đường; vị trí và chiều dài tuyến đường dây trên địa bàn phường, xã.
- **Tư vấn môi trường trình bày về:** Chính sách môi trường của ADB; Các quy định về môi trường trong ngành điện của chính phủ Việt Nam; Các tác động về môi trường và các biện pháp giảm thiểu tương ứng (như trong IEE); Cơ chế khiếu nại khi có các vấn đề môi trường xảy ra
- **Tư vấn xã hội/tái định cư trình bày về:** Kế hoạch tái định cư của ADB; Những tác động khi thu hồi đất và các tài sản trên đất; Những chính sách của Chính phủ nước Cộng hòa xã hội chủ nghĩa Việt Nam và địa phương, chính sách của dự án trong vấn đề bồi thường thiệt hại khi Nhà nước thu hồi đất đai và các tài sản trên đất; Các tác động thu hồi đất/tái định cư dự kiến trên địa bàn; Các phương án bồi thường đề xuất (theo Khung chính sách của dự án đã được phê duyệt); Tổ chức thực hiện, kế hoạch thực hiện kế hoạch tái định cư.

Hanoi and Ho Chi Minh City Power Transmission Development Sector Project  
DỰ ÁN NGÀNH PHÁT TRIỂN ĐƯỜNG DÂY TRUYỀN TẢI ĐIỆN THÀNH PHỐ HÀ NỘI  
VÀ HỒ CHÍ MINH

III. Ý kiến thảo luận

III.1 Về các tác động môi trường tiêu cực và biện pháp giảm thiểu

- Vì nước thủy triều lên thường xuyên, các gia đình xây nhà cao nên cần làm đường dây cao hơn nhiều so với mặt đất
- Cần đưa tiêu chí cụ thể để người dân biết khoảng cách an toàn
- Quên là 50 hay ngập nước vào 4h chiều và 5h sáng nên cần chú ý đặc điểm này khi đặt lịch và biện pháp thi công
- Khi thi công vào ban đêm phải bảo đảm không gây ảnh hưởng đến sinh hoạt và sản xuất của người dân
- Cần hoãn tất công việc xây dựng ngay trong đêm

III.2 Về các vấn đề thu hồi đất và các tài sản trên đất và các chính sách

- Đề nghị Nhà nước giải quyết các hộ gia đình cho người bị ảnh hưởng.
- Đề nghị cho các hộ gia đình trợ giúp quá trình thi công.
- Giải quyết vấn đề bồi thường về việc cho gia đình di dời đất đai hoặc thay đổi địa điểm.
- Cần có các biện pháp để dân bỏ việc, đảo công trình để đi nhà ở tạm thời. Nếu ảnh hưởng gia đình.

IV. Kết luận

UBND xã Bình Hưng và các hộ bị ảnh hưởng nhất trí với chủ trương xây dựng trạm biến áp 220KV và đường dây 220KV Nam Sài Gòn - Quận 8 và đồng ý với các biện pháp giảm thiểu về môi trường và xã hội do dự án đề ra

Đại diện Chủ đầu tư

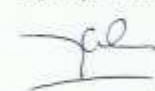
Đại diện cộng đồng

Đại diện tư vấn

Đại diện UBND xã

  
Phan Thanh Nhã

  
Hà Công

  
Lê Thị Mỹ Xuân



Phan Thanh Nhã



C. PICTURES- BINH HUNG COMMUNE



## 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)	<ul style="list-style-type: none"> <li>- Communicates / alerts the EERT.</li> <li>- Prepares the emergency site to facilitate the response action of the EERT, e.g., vacating, clearing, restricting site.</li> <li>- When necessary and requested by the EERT, lends support / provides assistance during EERT's response operations.</li> </ul>
External Emergency Response Team (EERT)	<ul style="list-style-type: none"> <li>- Solves the emergency/incident</li> </ul>
Contractor Resources	<ul style="list-style-type: none"> <li>- Provide and sustain the people, equipment, tools and funds necessary to ensure Subproject's quick response to emergency situations.</li> <li>- Maintain good communication lines with the EERT to ensure prompt help response and adequate protection, by keeping them informed of Subproject progress.</li> </ul>

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 EA/IA, 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; iii) estimated magnitude of the situation; iv) estimated persons harmed; v) 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
<ul style="list-style-type: none"> <li>▪ Move out as quickly as possible as a group, but avoid panic.</li> </ul>	<ul style="list-style-type: none"> <li>▪ All workers/staff, sub-contractors, site visitors to move out, guided by the ERT.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Evacuate through the directed evacuation route.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The safe evacuation shall have been determined fast by the ERTL/Deputy ERTL and immediately communicated to ERT members.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Keep moving until everyone is safely away from the emergency site and its influence area.</li> </ul>	<ul style="list-style-type: none"> <li>▪ A restricted area must be established outside the emergency site, all to stay beyond the restricted area.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Once outside, conduct head counts.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Foremen to do head counts of their sub-groups; ERTL/Deputy ERTL of the ERT.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Report missing persons to EERT immediately.</li> </ul>	<ul style="list-style-type: none"> <li>▪ ERTL/Deputy ERTL to communicate with the EERT.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Assist the injured in evacuation and hand them over to the ERT first-aiders or EERT medical group</li> </ul>	<ul style="list-style-type: none"> <li>▪ ERT to manage injured persons to ensure proper handling.</li> </ul>
<ul style="list-style-type: none"> <li>▪ If injury warrants special care, DO NOT MOVE them, unless necessary and instructed/directed by the EERT.</li> </ul>	<ul style="list-style-type: none"> <li>▪ ERTL/Deputy ERTL communicates with EERT to get instructions/directions in handling the injured.</li> </ul>

**Table 3. Response Procedure During Medical Emergency**

Procedure	Remarks
<ul style="list-style-type: none"> <li>▪ Administer First Aid regardless of severity immediately.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Fundamentals when giving First Aid:               <ul style="list-style-type: none"> <li>- Safety first of both the rescuer and the victim.</li> <li>- Do not move an injured person</li> </ul> </li> </ul>

Procedure	Remarks
	unless: <ul style="list-style-type: none"> <li>- victim is exposed to more danger when left where they are, e.g., during fire, chemical spill</li> <li>- it would be impossible for EERT to aid victims in their locations, e.g., under a collapsed structure</li> <li>- instructed or directed by the EERT.</li> <li>▪ First AID to be conducted only by a person who has been properly trained in giving First Aid.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Call the EERT emergency medical services and/or nearest hospital.</li> </ul>	<ul style="list-style-type: none"> <li>▪ ERTL/Deputy ERTL or authorized on-site emergency communicator</li> </ul>
<ul style="list-style-type: none"> <li>▪ Facilitate leading the EERT to the emergency site.</li> </ul>	<ul style="list-style-type: none"> <li>▪ ERTL/Deputy ERTL to instruct:               <ul style="list-style-type: none"> <li>- 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.</li> <li>- Other ERT members to clear access road for smooth passage of the EERT.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>▪ If applicable, vacate site and influence area at once, restrict site, suspend work until further notice.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Follow evacuation procedure.</li> </ul>

**Table 4. Response Procedure in Case of Fire**

Procedure	Remarks
<ul style="list-style-type: none"> <li>▪ Alert a fire situation.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Whoever detects the fire shall immediately:               <ul style="list-style-type: none"> <li>- call the attention of other people in the site,</li> <li>- sound the nearest alarm, and/or</li> <li>- 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)</li> <li>- report/communicate the emergency situation to the ERTL/Deputy ERTL.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>▪ Stop all activities/operations and evacuate.</li> </ul>	<ul style="list-style-type: none"> <li>▪ All (non-ERT) workers/staff sub-contractors, site visitors and concerned public to move out to safe grounds following the evacuation procedure.</li> </ul>

Procedure	Remarks
<ul style="list-style-type: none"> <li>▪ Activate ERT to contain fire/control fire from spreading.</li> </ul>	<ul style="list-style-type: none"> <li>▪ 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.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Call the nearest fire and police stations and, if applicable, emergency medical services.</li> </ul>	<ul style="list-style-type: none"> <li>▪ When alerting the EERT, ERTL will give the location, cause of fire, estimated fire alarm rating, any injuries.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Facilitate leading the EERT to the emergency site.</li> </ul>	<ul style="list-style-type: none"> <li>▪ ERTL/Deputy ERTL to instruct: <ul style="list-style-type: none"> <li>- 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.</li> <li>- some ERT members to stop traffic in, and clear, the access road to facilitate passage of the EERT.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>▪ ERT to vacate the site as soon as their safety is assessed as in danger.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Follow appropriate evacuation procedure.</li> </ul>