Initial Environmental Examination

Project Number: 46391-001
January 2016

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

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

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

Subproject: 110kv Tan Hung Substation and Connection Line, Stage 2

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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 (of PMB)
ES	:	Environmental Staff (of contractors)
EVN	:	Viet Nam Electricity
EVN HANOI	:	Ha Noi Power Corporation
EVNHCMC	:	Ho Chi Minh Power Corporation
GHG	:	Greenhouse gas
GRM	:	Grievance Redress Mechanism
HCMC	:	Ho Chi Minh City
HN	:	Ha Noi
IA	:	Implementation Agency
IEE	:	Initial Environmental Examination
MoLISA	:	Ministry of Labour Invalids and Social Assistance
MoNRE	:	Ministry of Natural Resources and Environment
NPA	:	National Protected Area
OHL	:	Overhead line
PC	:	People's Committee
PCB	:	Polychlorinated biphenyls
PCR	:	Physical Cultural Resources
PIC	:	Project Implementation Consultant
PPC	:	Provincial People's Committee
PMB	:	Project Management Board

PECC4	:	Power Engineering Consulting Joint Stock Company 4
REA	:	Rapid Environment Assessment
ROW	:	Right-of-way
SLDC	:	Southern Load Dispatch Center
S/S	:	Substation
TSS	:	Total Suspended Solids
UGC	:	Underground cable
UXO	:	Unexploded Ordnance

CURRENCY EQUIVALENTS
(as of June 02nd, 2015)

Currency Unit	–	VND
$1,00	=	21.673 VND

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

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

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I. EXECUTIVE SUMMARY

1. The Project, financed through Asian Development Bank's (ADB) sector loan modality, will strengthen the capacity and reliability of the power infrastructure in Ha Noi and Ho Chi Minh City through the rehabilitation and development of the 110 kV and 220 kV substation and power transmission to supply their medium voltage (MV) distribution system. The Project will also strengthen the institutional capacities of 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 Subproject - "110kV Tan Hung Substation and Connection Line" Stage 2 within HCMC, which is a non-core subproject identified by Viet Nam Electricity (EVN) for Ho Chi Minh City. The subproject consists of construction of a new 110 kV substation and an approximately new 470m underground cable (UGC) in the HCMC center area. The IEEs of the other non-core subprojects are prepared separately.

A. Subproject Summary

3. The Tan Hung non-core subproject consists of a new 110 kV substation, 470 m 110kV underground cable transmission line and Extension of 110kV outgoing feeder bays at 110kV Chanh Hung substation (existing). The UGC route shall start from 110kV Chanh Hung substation (existing), then go under the canal bottom (at intersection of four canals such as Te, Doi, Tau Hu and Ben Nghe). After that, it will, go underground Vo Van Kiet avenue, and under the area nearby 8-8bis Ham Tu complex to go to the proposed site of 110kV Tan Hung substation. The UGC route shall go through the territories of Ward 1, District 5 and Ward 2, District 8, HCMC.

4. The subproject 110 kV Tan Hung substation will be constructed to meet the power demand supplying for the office-buildings, strongly dense residential areas of District 5, District 8, HCMC; and also support power supplying to the loads transmitted from the substations of 110kV Hung Vuong, 110kV Ben Thanh and 110kV Chanh Hung when necessary.

B. Potential Impacts and Mitigations

5. The IEE of the 110 kV Substation and UGC 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 areas of the city.

6. A part of planned urban technical infrastructure land (110kV substation) within 8-8bis Ham Tu complex, Ward 1, District 5 (already approved via detailed planning 1/500 by the PC of District 5) shall be permanently and temporarily acquired for the subproject (previously, it was area of old Cho Quan power plant, presently it has been site clearance, as an vacant land). The 5,300 m^2 for construction of 110kV Tan Hung substation has been assigned to the Ho Chi Minh Power Corporation (EVN*HCMC*) by the PC of District 5, HCMC. The temporarily acquired land is about 745m^2 along the UGC route.

7. The construction-related disturbances to the environment and community concern the short-term disturbances caused by the civil works that will occur to construct the new substation and the trenched UGC transmission line. The measures mitigating these impacts will be detailed in the Item VII of this Report.

8. There are no perceived negative induced, or cumulative environmental impacts of the subproject. Main objectives of the subproject are to supply to the load of the office-buildings, high densely residential areas of District 5, District 8, HCMC.

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

C. Conclusions

10. 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) is not required.

II. INTRODUCTION

A. Background to IEE

11. The Ha Noi and Ho Chi Minh City Power Grid Development Project 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 of the two cities. 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).

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

13. This IEE is prepared for the subproject "110kV Tan Hung Substation and Connection Line" Stage 2 in district 5 and 8 of Ho Chi Minh City. The IEEs of the other non-core subprojects are prepared separately.

B. Assessment Context

14. The subproject was assigned Environmental Category B pursuant to the ADB's Safeguard Policy[1] and recent good practice sourcebook guidance[2]. 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[3]. This IEE was prepared for the subproject 110 kV Tan Hung Substation and Connection Line in the feasibility design stage, using available data and information on sensitive ecological and cultural receptors that exist for the subproject site.

15. The IEE of the subproject is established in the period of Feasibility Study stage, the detail designs (technical design and detailed drawings) shall be implemented in the next stage. Therefore, the Environmental Management Plan (EMP) that has been prepared for the subproject (see section X) will need to be updated where necessary to meet the final detailed designs of the subproject.

III. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

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

A. Viet Nam Regulatory Framework for Environmental Assessment

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

B. Applicable Environmental Policies, Laws, Decrees, and Standards

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

Legal foundations on environment protection

[1] ADB, 2009. Safeguard Policy Statement, ADB Policy Paper

[2] ADB, 2012, Environmental Safeguards, A Good Practice Sourcebook, Draft.

[3] Footnote 2, page 19.

- Law on Environmental Protection No. 55/2014/QH13 passed by the National Assembly dated June 23rd, 2014;
- Decree No. 19/2015/ND-CP dated February 14th, 2015 of the Government on detailing the implementation of some Articles of the Law on Environmental Protection;
- Decree No. 18/2015/ND-CP dated February 14th, 2015 of the Government on Regulating Strategic Environmental Assessment, Environmental Impact Assessment and Environmental Protection Commitment;
- Decree No. 179/2013/ND-CP dated November 14th, 2013 of the Government, on the sanction of administrative violations in the domain of environmental protection;
- Decree No. 59/2007/ND-CP dated April 09th, 2007 of the Government on solid waste management;
- Circular No. 12/2011/TT-BTNMT dated April 14th, 2011 of the MoNRE, stipulating hazardous waste management.
- Circular No.27/2015/TT-BTNMT dated on May 29th, 2015 on strategy environmental assessment, environmental impact assessment, and environmental protection plan.

Legal foundations on Electricity

- Electricity Law No. 28/2004/QH11 dated December 03rd, 2004.
- Amended Electricity Law No. 24/2012/QH13, passed by the National Assembly dated November 20th, 2012, in effect on July 01st, 2013;
- Decree No. 14/2014/NĐ-CP dated February 26th, 2014 of the Government, providing details on implementing the Electricity Law on power safety, in effect on April 15th, 2014;
- Decree No. 134/2013/NĐ-CP dated October 17th, 2013 of the Government, providing penalty on administrative violations in Electricity sector, hydropower dam safety, using energy economically and effectively;
- Circular No. 31/2014/TT-BCT dated October 02nd, 2014 of the Ministry of Industry and Trade, providing details on a number content on Electricity safety.

Other related legal foundations*:*

- Decree No. 45/2013/ND-CP dated May 10th, 2013 of the Government, elaborating a number of articles of the labor code on hours of work, hours of rest, occupational safety and occupational hygiene;
- Circular No. 22/2010/TT-BXD dated December 3rd, 2010 of the Ministry of Construction, providing on labour safety in works construction;
- Decision No.3733/2002/QĐ-BYT issued by the Ministry of Healthcare dated October 10th, 2002 about the Application of 21 Labour Health and Safety Standards, 5 principles and 7 occupational hygiene parameters.

Environmental Standards and Regulations

- QCVN 05:2013/BTNMT – National technical regulation on quality of ambient air;
- QCVN 26:2010/BTNMT – National technical regulation on noise.
- QCVN 27:2010/BTNMT – National technical regulation on gravitation.
- QCVN 03:2008/BTNMT - National regulation on heavy metals concentrations in soil.
- QCVN 08:2008/BTNMT - National technical regulation on quality of surface water.

- QCVN 09:2008/BTNMT - National technical regulation on quality of groundwater.QCVN 14:2008/BTNMT - National technical regulation on quality of domestic wastewater.
- QCVN 14:2008/BTNMT - National technical regulation on domestic wastewater.
- QCVN QTD-5: 2009/BCT - National technical regulation on electrical engineering - electrical equipment verification of the system.
- QCVN QTD-6: 2009/BCT - National technical regulation on electrical engineering - electrical equipment maintenance, repair and operation of the system.
- QCVN QTD-7: 2009/BCT - National technical regulation on electrical engineering - Power project construction.
- QCVN 07:2009 - National technical regulations for classification of hazardous wastes thresholds.

Directives of Electricity Industry of Viet Nam and Information for subproject Tan Hung 110kV substation

- Decision No. 337/QĐ-UBND dated February 01st, 2010 of the PC of District 5, HCMC on approving detail planning scale 1/500 of 8-8bis Ham Tu complex, Ward 1, District 5.
- Correspondence No. 431/SCT-QLCL dated January 15th, 2015 of the Department of Industry and Trade of HCMC on the feedbacks on conformity with power development master plan of Subproject - "110kV Tan Hung Substation and Connection Line" Stage 2.

International Guidelines

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

C. ADB Safeguard Policy

19. The ADB Safeguard Policy Statement (ADB SPS, 2009) along with the ADB Environmental Safeguards, A Good Practice Sourcebook, 2012 clarifies 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).

- **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.

20. The 110kV Tan Hung substation and connection line is assessed into category B which is necessary to prepare an IEE. Appendix A presents the Rapid Environmental Assessment (REA) of the Subproject - "110kV Tan Hung Substation and Connection Line" Stage 2.

IV. DESCRIPTION OF THE SUBPROJECT

21. The Subproject - "110kV Tan Hung Substation and Connection Line" Stage 2 consists of 03 main components including: 01 newly constructed 110kV substation (110kV Tan Hung substation), 110kV UGC connection line and extension of outgoing feeder bays at existing 110kV Chanh Hung substation.

A. 110 kV Tan Hung Substation

22. 110kV Tan Hung substation: located in 8-8bis Ham Tu complex Ward 1, District 5, on the planned land for construction of 110kV substation, with area 5,300 m^2 (previously belonging to the scope of old Cho Quan power plant – presently is vacant land), belonging to the territory of Ward 1, District 5, HCMC. (Figure 1).

23. The geographical location of the substation is as below:

+ North: adjacent to planned site for 220kV Tan Hung substation future.

+ East: adjacent to planned road surrounding planned vacant land for office, commercial buildings, with area 7,632 m^2 within 8-8bis Ham Tu complex.

+ West: adjacent to the fence of existing 8-8bis Ham Tu complex.

+ South: adjacent to planned road surrounding planned vacant land for office of Youth Union of HCMC with area 5,000 m^2 within 8-8bis Ham Tu complex.

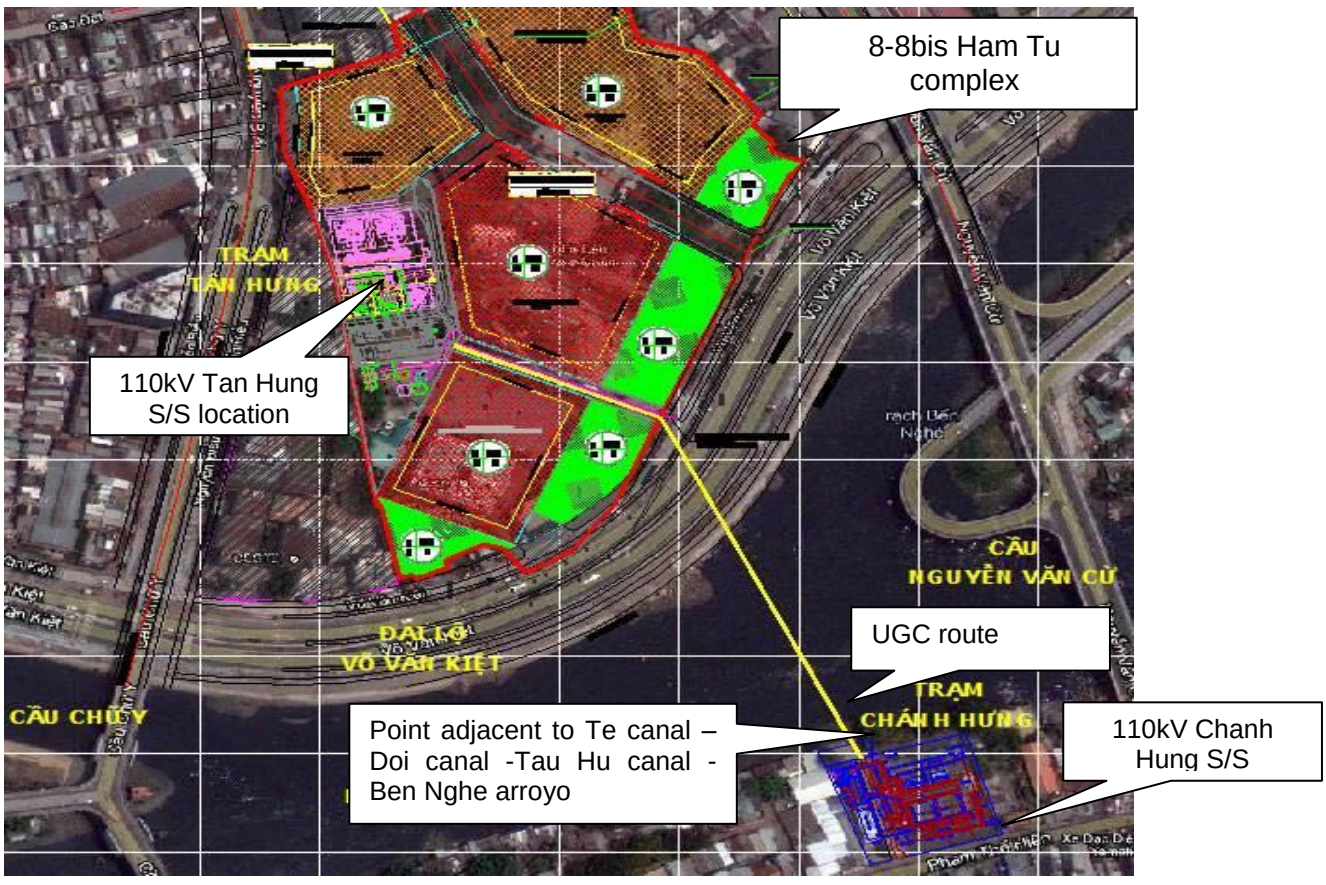


Figure 1. Location of newly 110kV Tan Hung substation (pink) and connection line (yellow)

The technical parameters of 110 kV Tan Hung substation is presented in Table 2.

Table 2. Technical parameters of 110 kV Tan Hung substation

Voltage level	110 kV, 22 kV, 15kV.
Capacity	2x63 MVA (in first stage, fully installing 02 transformers 63 MVA).
Side 110 kV	• Using H diagram with communicating circuit breaker. • 07 feeder bays
Side 22-15 kV	• Using diagram of 01 busbar system with section coupling breaker. • 26 feeder bays
Communication and SCADA	▪ Setting up optical cable channels Cho Lon - Tan Hung - A2 according to internal optical cable network of HCMC (network project MAN2). ▪ Equipped source supplying system for the telecommunication equipment at 110kV Tan Hung substation. Hotline channel and SCADA from Tan Hung to Southern Load Dispatch Centres (LDC) of HCMC and Southern Region (A2) for dispatching, management of power system.
Control and protection system	The substation is designed with new technology, computerized control system, having connection to system of A2 and HCM LDC.
System of lightning arrestors	▪ Protecting atmosphere over voltage spreading to transformers by lightning arresters. Lightning arresters shall be type of oxyded metal without gaps. ▪ Protecting directly lightning within substation by lightning rods installed on the peak of 110kV GIS houses.
Earthing system	Implementing earthing for 110kV GIS houses, earthing for transformers 110kV - 63MVA, capacitors rig, pump station …etc.

B. 110kV UGC connection line

24. The 110kV UGC route will supply power to 110kV Tan Hung substation which shall be 470m in length, starting from the existing 110kV Chanh Hung substation, under the canal bottom, then under Vo Van Kiet avenue, area nearby 8-8bis Ham Tu complex, and to the 110kV Tan Hung substation with suitable depths, particularly description with the divided sections is as below:

25. Section 1: Within 110kV Chanh Hung substation: length 100m.

Within the 110kV Chanh Hung substation, the UGC shall be arranged within the the cable concrete ditches from the connected point to G3 at the tail gate adjacent to canal (G3).

26. Section 2: Under the canal bottom at the intersection of four canals such as Te, Doi, Tau Hu and Ben Nghe: length 118m.

From G3, the UGC shall be put in HDPE conduit to be directly burried under the canal bottom with depth 11m fromthe canal bottom. Under this the canal bottom, presently it has had existing 15kV UGC route from 110kV Chanh Hung substation through the former Cho Quan switching substation. The 110kV UGC route shall be parallel with the said 15kV UGC route with a distance about 15m.

27. Section 3: Section crossing under Vo Van Kiet avenue: Length 60m.

From G5, the UGC route shall be arranged in high strength HDPE conduits directly burried under the road foundation to go G6.

28. Section 4: Within the land area 8-8bis (old Cho Quan power plant): Length 120m.

After crossing under Vo Van Kiet avenue, the UGC route shall be continuously going into the land area 8-8bis. The double circuits UGC shall be arranged in high strength HDPE conduits directly buried under ground along the internal road (8m) of 8-8bis Ham Tu complex (from

G7-G8). On the left side of the route is the road shoulder; on the right is 36 feeder bays of 110kV Tan Hung substation and drainage system along the internal road of 8-8bis complex.

29. Section 5; within scope of 110kV Tan Hung substation: Length 72m.

The UGC route shall be continuously arranged in high strength HDPE conduits directly burried underground and go to the control house of 110kV Tan Hung substation. In the control house, the UGC route shall be arranged on baskets and go to the outgoing feeder bays of 110kV GIS houses through 110kV underground ditches and baskets of 110kV GIS houses (G8 – ending point). The technical parameters of UGC are presented in Table 3

Table 3. Technical parameters of UGC connecting to 110kV Tan Hung substation

Voltage level	110kV
Number of circuit	02 circuits
Length	470m
Starting point	110kV busbar of Chanh Hung substation (belonging to the territory of Ward 2, District 8) (circuit 1).
Ending point	110kV busbar of Tan Hung substation (8-8bis Ham Tu complex, Ward 1, District 5).
Conductor	Single core cooper cable 1,200mm^2 insulation XLPE
Cable arrangement	To be conducted in HDPE conduits. The whole conduits shall be buried under ground, canal bottom.

C. Extension of 110kV outgoing feeder bays at 110kV Chanh Hung substation

30. The 110kV existing Chanh Hung substation is located at 122 Pham The Hien road, Ward 2, District 8, HCMC. Its location is described as below:

- Front side: Adjacent to Pham The Hien road.
- Back side: Adjacent to Te canal - Doi canal - Tau Hu canal - Ben Nghe arroyo.
- Two sides: Adjacent to residential areas.

The extension bays shall be located within scope of 110kV Chanh Hung substation.

D. Construction works

1. Civil work volume

31. Civil work volume of the subproject is described in Table 4:

Table 4. Main civil works volume

No.	Work contents	Unit	Quantity
I.	**Tan Hung 110kV substation**		
1.	Earth excavation	m^3	1,433
2.	Earth fill back	m^3	746
3.	Iron and steel	Ton	75.83
4.	Reinforced concrete	m^3	637
5.	Internal roads	m	58
6.	110kV GIS house (ground and first floor)	House	01
7.	Pump house	House	01
8.	Oil tank	Pcs.	01
9.	Firefighting tank	Pcs.	02
10.	Supplement and complete water supply and	System	01

No.	Work contents	Unit	Quantity
	drainage system		
11.	Supplement and complete fire protection system	System	01
12.	Transformer – 63MVA	Pcs.	02
13.	Erection of 15KV capacitor rigs	Rig	02
14.	Erection of 110kV GIS feeder bay	Bay	07
15.	Added erection of camera connecting to the existing camera	System	01
16.	Complete fire protection system	System	01
17.	Complete communication and SCADA system	System	01
18.	Erection of control and security system	System	01
II	**110kV Underground cable**		
1	Buried cable ditch MC-1.0B	m	70
2	Cable ditch (with excavation and filling back)	m	60
3	Cable ditch under canal bottom	m	118
4	Cable ditch (excavation and filling back)	m	120
III.	**Expansion of feeder bay in Chanh Hung 110kV substation**		
1	GIS equipment foundation	Pcs	1
2	1m-wide cable ditch	m	81
3	Erection of 110kV GIS bay for the 110kV TL	Bay	01
4	Pipe connected from busbar and GIS equipment	Pipe	03
5	Supplement collection of SCADA	System	01
6	Erection of 01 control and security cabinet	System	01

2. Construction method

a) The substation construction:

32. The construction method for each activity is described as follows:

- Leveling: Substation platform was leveled and designed in the early stages, this stage only implements leveling work in uneven positions (if any) at the expected locations of equipment.
- Transformer foundation: consolidated by reinforced concrete stake.
- Breakdown oil tank: reinforced concrete tanks made of durable B15 levels (M200), placed underground substation platform.
- Outdoor cable ditch: buried cable ditch made of durable B15 levels (M200), lining the bottom with durable B7.5 level (M100) and was sloped towards the water sump.
- Other items were built under the provisions of law and the current construction standards.

b) The connection line construction

33. Underground cable crosses over Vo Van Kiet avenue and Te canal (Tau Hu) will be constructed by Horizontal Directional Drilling method, as follows:

34. Drilling machine will be placed within Tan Hung 110kV substation, Drilling technic include automatic orientation, installation and pulling cable. By doing this, road survey will not be excavated for the TL construction, that help to not affect traffic activities.

Implementation sequence:

35. Horizontal Directional Drilling method is proposed to implement the following steps (Figure 2)

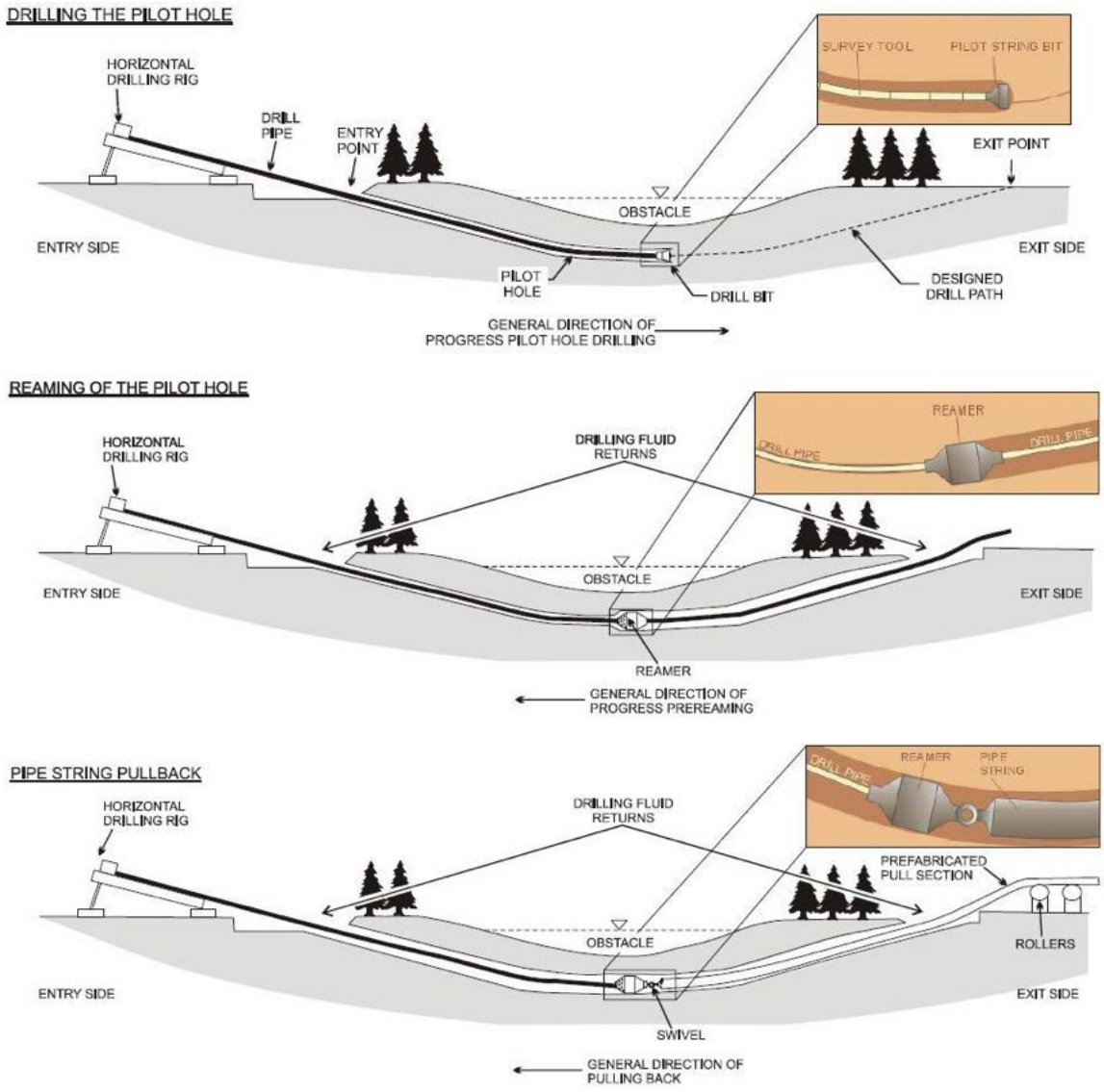


Figure 2: illustration of Horizontal Directional Drilling method

36. After construction of underground pile is completed, cables will be pulled through the pipe by the cable rollers and used winches, wire primers, lubricants to pull the cable.

c) Expansion of feeder bay in Chanh Hung 110kV substation

37. The construction method for each activity is described as follows:

- Equipment GIS foundation: reinforced concrete foundation made of durable B15 levels (M200, lining the bottom with durable B7.5 level (M100).
- Outdoor cable ditch: used buried cable ditch.
- The buried cable ditch made by reinforced concrete with durable B15 level (M200), lining the bottom with durable B7.5 level (M100) and was sloped towards the water sump.

- Dimension of cable ditch are 1.2m width and 1.0m depth. The covers of outdoor cable ditch made by reinforced concrete (M200).

3. Material demand and supply sources

38. Supply of materials and equipment for the subproject includes two categories, domestic and abroad as follows:

- The imported power equipment is transported from Ho Chi Minh City port, stored in a warehouse of EVNHCMC, then is transported to the site by trucks.
- Transformers supplied by investors will be transported to the subproject area, through separate contracts between specialized transport units with the HPPMB.
- The other materials and equipment will be domestically purchased.
- Sand gravel, cement will be taken in the vicinity of HCMC.
- Reinforced foundations, grounding: taken in the vicinity of HCMC and processed at the site.
- Coated steel and bolt types will be taken from the processing facilities in HCMC.
- Wire, fittings, insulation, equipment are stored in warehouse of HPPMB or contractors according to the kind of items.

39. Transport distance for imported materials/equipment is proposed to from Sai Gon Port to warehouse of HPPMB (at Vinh Loc B ward, Binh Tan district), and from the warehouse to the subproject site is about 15km. This route is proposed through national highway No.1A, provincial road No. 10, and Vo van Kiet avenue. Domestically purchased material will be transported from suppliers to the subproject site. The distance is about 10km (mainly on Vo Van Kiet avenue and provincial road No.10).

4. Waste treatment

40. Domestic waste of workers (about 12-16kg/day) will be collected into the garbage container. Construction contractors will contract with the specialized unit (e.g. HCMC Urban Environment Co., Ltd.) to disposal and treatment as stipulated by HCMC people's committee.

41. Excavated wastes (about 687m^3) and construction waste are proposed to be transported by trucks to a solid waste transfer station of HCMC Urban Environment Co., Ltd. at ward 7, district 11 (about 2km on the west far from the subproject site). From the transfer station, HCMC Urban Environment Co., Ltd will transport to their disposal sites or treatment plants. The selection of exactly disposal site or disposal plan will be performed by the contractors with the supervision of PMB. If contractors select the above proposed disposal plan, they have to contract with HCMC Urban environment Co., Ltd. or other units with the same function to treat and dispose excavated materials and construction waste from the subproject. If they select a disposal site near to the subproject site they have to consult with the local authorities (at communal level) to get the formal agreement. PMB will take responsibility for including these conditions into civil contracts and supervising the contractors' implementation.

42. Construction waste will be treated as the following diagram in Figure 3:

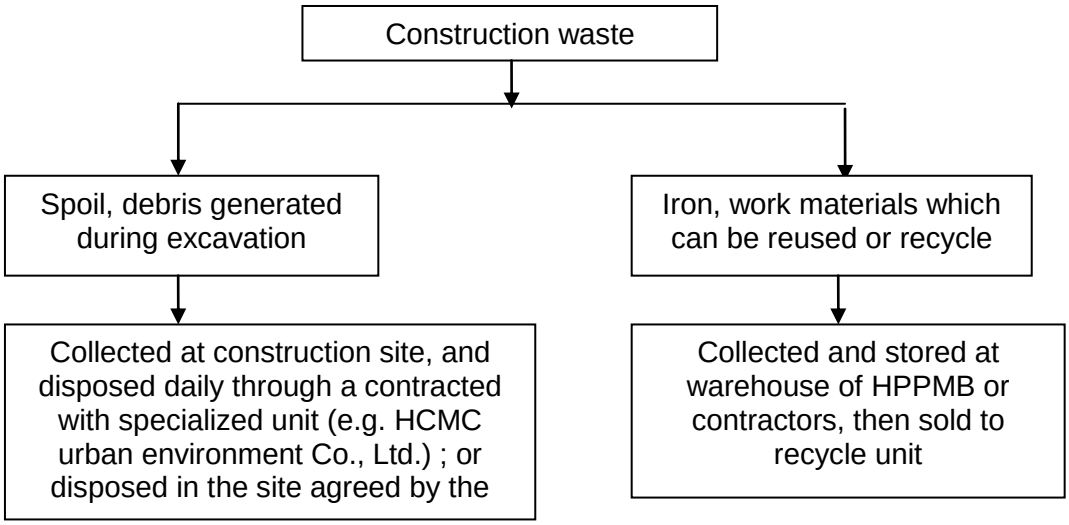


Figure 3. Management of construction waste

V. DESCRIPTION OF THE ENVIRONMENT

43. The environmental baseline information was obtained primarily from HCMC Statistical Yearbooks, state of the environment reports (SoER) prepared by HCMC DoNRE, reports from PECC4, and supplemented from the literature including other environmental assessment conducted for the same area. The description of affected environments focuses on natural features and land use.

A. Physical Environment

1. Climate

44. 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, and to be summarized as below.

a. Temperature

45. Air temperature is high and changes little in year-round. Annual average temperature is 26 – 28^{o}C, difference between the hottest month and the coldest month is about 3 – 4^{o}C. Average temperature in the coldest month is above 24^{o}C (Table 5).

Table 5. Temperature regime at Tan Son Nhat and Tan Son Hoa Meteorological Stations

Station	Feature	Months, year												
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Tan Son Nhat (*long-term average*)	T_{max} ^{o}C	36.4	38.7	39.4	40.0	39.0	37.5	35.2	35.0	35.3	34.9	35.0	36.3	40.0
	T_{min} ^{o}C	13.8	16.0	17.4	20.0	20.0	19.0	16.2	20.0	16.3	16.5	15.9	13.9	13.8
	$T_{average}$ ^{o}C	26.0	26.8	28.0	29.2	28.8	27.8	27.5	27.4	27.2	27.0	26.7	26.0	27.4
Tan Son Hoa *(2011)*	$T_{average}$ ^{o}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.

b. Sunlight hours

46. Average number of sunlight hours in Ho Chi Minh City is fairly high as compared with many other provinces in the country. Number of sunlight hours in a year is of 1,800 - 2,500 hours or more. Table 6 shows the average number of sunlight hours observed in Tan Son Hoa and Tan Son Nhat meteorological station.

Table 6: Average number of sunlight hours

Station	Months, year (hour)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Tan Son Nhat	245	246	272	239	195	171	180	172	162	182	200	226	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.

c. Humidity and Rainfall

47. The area is humid and there is little difference in rainfall between the monsoon seasons. Annual average humidity is about 78% - 82 %. Rainfall regime is divided into the separated two reasons such as rain season from May to October and dry season from November to the next year's April. Maximum rainfall in the region is 200 mm per day. Total annual average rainfall in the region is from 1,800 mm to 2,000 mm (see Table 7).

Table 7: Monthly and annual average rainfall and Humidity in Tan Son Nhat Station

	Months, year (mm)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Rainfall	12	4	13	51	207	294	307	281	305	291	135	28	1926
Humidity (%)	72	70	70	72	79	82	83	83	85	84	80	77	78
Humidity (%)	23	22	20	21	26	30	40	44	43	40	33	29	20

Source: Data of Tan Son Nhat station referred to national technical regulation on natural condition data in construction _QCVN 02:2009/BXD; data of Tan Son Hoa station %, statistic yearbook 2011 of HCMC.

d. Wind velocity

48. From November to April, the wind is mainly from the northeast and dry while from May to October the wind is mainly from the southwest and brings heavy rainfall to the low-lying plains and eastern slopes of the Truong Son Mountains. The annual average wind speed recorded at Tan Son Nhat is 2.8 m/s. The high number of thunderstorm days is mainly in the rainy season from May to October (Table 8).

Table 8: Wind velocity and Number of thunderstorm-days in Tan Son Nhat station

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

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

2. Ambient Air quality

49. Air quality in HCMC has been monitored frequently and almost focused on pollutants due to traffic activity. The monitoring has been conducted at 6 stations located in the territory of Ho Chi Minh city, including Dinh Tien Hoang (DTH) – Dien Bien Phu, An Suong, Go Vap, Hang Xanh, Nguyen Van Linh (NVL) – Huynh Tan Phat (HTP) (District 8), and Phu Lam stations. The monitoring results in 2012 and the first half of 2013 are presented in Table 9.

Table 9: Air pollutants measured in the 6 stations in 2012 and the first half of 2013

		Hang Xanh	DTH-DBP	Phu Lam	An Suong	Go Vap	HTP-NVL
CO *(mg/m^3)*	Average 2012	9.7	12.77	8.78	11.79	14.47	8.76
	% Samples over standard	1%	2%	0%	2%	1%	1%
	Average first half 2013	10.48	13.47	10.06	12.94	16.4	9.64
	% Samples over standard	0%	0%	0%	0%	3%	0%
particle content *(mg/m^3)*	Average 2012	0.44	0.53	0.51	0.65	0.5	0.51
	% Samples over standard	95%	98%	99%	100%	95%	91%
	Average first half 2013	0.43	0.46	0.51	0.61	0.5	0.52
	% Samples over standard	85%	98%	98%	100%	98%	88%
Lead *(mg/m^3)*	Average 2012	0.28	0.32	0.28	0.32	0.28	0.31
	Average first half 2013	0.32	0.36	0.33	0.39	0.3	0.34
NO_2 *(mg/m^3)*	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^3)*	Average 2012	77.89	78.49	76.97	80.14	77.89	77.3
	% Samples over standard	100%	100%	100%	100%	100%	98%

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

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

51. The second pollutant is dust which is also a serious concern in the monitoring program. In 2012, the measured values at the 6 stations were from 0.44 – 0.65mg/m^3, with 96% of them over the permitted standard of 0.30mg/m^3. However, in comparison to the

figures of 2011 and 2010, dust concentration tends to reduce. In the first half of 2013, the concentrations of dust were measured from 0.43 – 0.61 mg/m^3, with 95% over the standard.

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

53. Air quality in the subproject area was measured by the South environment and meteo-hydrology Branch and PECC4 in November 2014. The results show that air quality in the area is relatively good because most of analyzed parameters are under the permitted levels in QCVN 05:2009/BTNMT. However, noise at one point (KK1) is higher than the permitted level at QCVN 26:2010/BTNMT (see Table 10).

Table 10: Analyzed results of ambient air quality in the subproject site

No.	Parameters/ Unit		Analysis Method	Results mg/m^3		QCVN 05:2013/ BTNMT	QCVN 26:2010 /BTNMT
				023-KK(01)/ 2015	023-KK(02)/ 2015		
1.	Noise (')	dBA	Rapid measurement by meter TES 1351	76.5	69.4	--	**70**
2.	NO_2	mg/m^3	TCVN 6137:2009	0.069	0.084	**0.20**	--
3.	SO_2	mg/m^3	TCVN 5971:1995	0.053	0.072	**0.35**	--
4.	CO	mg/m^3	TCVN 5972:1995	4.13	4.81	**30**	--
5.	TSP (*)	mg/m^3	TCVN 5067:1995	0.17	0.15	**0.30**	--
6.	PM10	mg/m^3	TCVN 5067:1995	0.007	0.003	--	--
7.	Pb	mg/m^3	TCVN 6152:1996	0.006	0.005	--	--

(Source: The south environment and meteo-hydrology sub-institute, March/2015).

Note:

QCVN 05:2013/BTNMT: National technical regulation on ambient air quality

QCVN 26:2010/BTNMT: National technical regulation on noise

KK1: Area of 110kV Tan Hung substation, Ward 1, District 5.
KK2: Area of connection line route, Ward 1, District 5.

3. Topography, Geology and Soils

54. 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.

55. In general, the topography of Ho Chi Minh City is fairly diverse and therefore has good conditions for multi-faceted development. According to survey report of Subproject - "110kV Tan Hung Substation and Connection Line" Stage 2 in feasibility study, the geology and geography condition in the subproject area as summarized below.

56. The topography located 110kV Tan Hung substation is relative flat, negligible elevation variation, without inundation, available ground base elevation (ground base elevation of old Cho Quan power plant).

57. Geological structure in the investigation area is relatively simple. From top to bottom, beneath surface soil layer (concrete and soil foundation) is blackish grey clay, liquid state. Next reddish brown sandy clay layer mixed with lateritic gravel, very stiff state and yellowish brown clayey sand, very stiff to hard state (from 8m-11m, mixed with quartz grit) with better load bearing. According to site survey results and in LAB analysis, soil in the subproject area is classified as below:

- *Surface layer:* concrete and soil foundation. Concrete thickness is about 10cm. The soil foundation is lower the concrete layer and distributes at depth 2.0m, composition of blackish grey clayey sand mixed with gravel, plastic-soft state.
- *Layer 1 (CH):* clay, blackish grey, liquid state. Distribution from depth of 2.0m to 4.7m, thickness of 2.7m.
- *Layer 2 (CL):* sandy clay, reddish brown, mixed with lateritic gravel, very stiff state. Distribution from depth of 4.7m to 8.0m.
- *Layer 3 (SC):* yellowish brown clayey sand, very stiff to hard state, from 8.0m to 11.0m mixed with quartz grit. This layer is distributed from depth of 8.0m to end of borehole.

4. Surface water/groundwater resources

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

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

60. The proposed site of 110kV Tan Hung substation shall be located within 8-8bis Ham Tu complex, where without streams, rivers crossing through. The raining drainage system is mainly underground culverts and open ditches.

5. Water quality

61. Monitoring, analyzing to determine the water environmental quality was implemented by the south environment and meteo-hydrology sub-institute in March/2015 through sampling surface water samples at Te canal at route section C - D, where is the typical position of the subproject for sampling surface water. The results shown that all most the parameters are met the permitted level via QCVN 08:2008/BTNMT (Table 11).

Table 11. The analyzed results of surface water quality in the subproject area

No.	Parameters/ Unit		Method	Results	QCVN 08:2008/ BTNMT (column B1)
				353-NM(01)/2014	
1.	Temperature (*)	^oC	TCVN 6492:2011	27.5	--
2.	Colour (*)(*)	Pt - Co	Rapid measurement Hanna HI 96727	50	--
3.	Odor	--	Tasting	Not recognized strange odor	**Not detected**
4.	pH (*)	--	TCVN 6492:2011	7.03	**5.5-9**
5.	DO (*)	mg/L	Rapid measurement by Hanna Ecoscan DO6	5.53	**≥ 4**
6.	TSS (*)	mg/L	TCVN 6625:2000	15.0	**50**
7.	COD (*)	mg/L	SMEWW 5220C:2012	14	**30**
8.	BOD_5 (20^oC)	mg/L	TCVN 6001-2:2008	8	**15**
9.	$N\text{-}NH_4^+$ (*)	mg/L	SMEWW 4500-NH_3-F	0.043	**0.5**
10.	$N\text{-}NO_3^-$ (*)	mg/L	EPA 352.1	1.104	**10**
11.	$N\text{-}NO_2^-$ (*)	mg/L	TCVN 6178:1996	0.020	**0.04**
12.	PO_4^{3-} (*)	mg/L	TCVN 6202:2008	0.179	**0.3**
13.	Cl^- (*)	mg/L	TCVN 6194:1996	20.35	**600**
14.	Total Fe	mg/L	TCVN 6177:1996	1.150	**1.5**
15.	Lead (Pb)	mg/L	SMEWW 3113B, 2012	**Not detected**	**0.05**
16.	Total Coliform/100mL	MPN	TCVN 6187-2:1996	6,000	**7,500**

(Source: The south environment and meteo-hydrology sub-institute, March/2015).

Note:

- *Sampling position: at Te canal (the canal which the TL crosses over)*
- *Column B1: Water for irrigation watering purpose or other using purposes have equivalent quality requirements or using purposes as type B2 (B2-water for marine traffic activities and other purposes with low-requirements).*

B. Biological Environment

1. Vegetation and Land Use

62. According to survey results and relevant documents, the area of Subproject - "110kV Tan Hung Substation and Connection Line" Stage 2 has terrain type of relative flat with simple vegetation biological system. The vegetation cover in the subproject area is only bushy trees surrounding the proposed site of 110kV Tan Hung substation and some urban-green trees.

2. Wildlife

63. In the subproject area there are not any rare animals but only some common animals such as insects, mice and pets of surrounding households.

3. Conservation Areas

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

C. Socio-economic conditions

1. Population

District 8

65. There were two sources of population in the end of the previous century concentrated into the District 8 for resettlement and agricultural cultivation. First, poor laborers from the Northern, Central, and Southeastern Region went to these ports for selling their labor power to the port owners, rice and wheat grinding owners, businesses.. Second, farmers and poor laborers from the Western, Eastern Regions, from other localities also concentrated into the buffering area of the District 8. These caused the population of the district during the war years raised decades of thousand people, who work in the two main components of industry and agriculture.

66. Most residents of district 8 are Vietnamese account for about 85.4%, the Chinese also have been here very early at the rate of more than 11%; addition to the Cham, Khmer accounted for more than 0.3%.

67. The religion of the population in district 8 is mainly Buddhist (35%) with 52 temples built all over the place. Some other religions are: Roman Catholic (11.5%) with 12 churches, Protestant (0.4%) had five churches, Cao Dai (0.48%) and Islam (0.52%) have two churches, etc.

District 5

68. In 2014, the total number of people in the working age of the Ward 1, District 5 is 33,487 of which 32,204 people are in working age and 1,854 people are not in working age i

69. The number of workers engaged in business sector is 240,384 occupying 83.16%; The number of people work in tourism, transport services is 1850 occupying 0.64%; the remain people work in other sectors such as processing, etc. The population distribution in subproject area in presented in Table 12

Table 12. Population distribution in subproject area

Location			Population	Female (%)	Male (%)	Ethnic minority
City	District	Ward				
HCMC	District 5	Ward 1	33,487	49.7	50.3	0
	District 8	Ward 2	29,898	50.4	49.6	0
Total			63,385			0

(Source: Statically figures from economic-social report of Ward 1 (District 5), Ward 2 (District 8), HCMC, 2014.

2. Economic conditions

District 8

70. District 8 has been a poorest urban district in the city, with slum houses located nearby canals. However, with the concern of the city, along with the efforts of local authority and people, presently, the face of District 8 has been changed. The newly constructed bridges crossing over canals have made contributions to short the distance between District 8 and the center districts. Several public structures have been constructed.

71. According to statistics of the Bureau of Statistics of Ho Chi Minh City, in recent years, from 2005 - 2011, the district's economic development is encouraging. Economic structure gradually is shifted towards trade, services, industry. The improved economic environment attracts economic sectors involved in the production business that create new jobs. The value of private industrial production has increased from 1,274,833 million in 2005 to 3,368,301 million in 2011. The number of newly established enterprises has increased to 22.30% from the registered capital of 19.38%. By the end, 2010, the number of non-state enterprise with production and business activities in the district is 2745 units, in which: Collective: 18 units, Private: 374 units; Limited companies: 2,124; Joint Stock Companies

have state capital source: 12 units and joint stock companies without state capital source 217 units.

72. Commercial activities and services have been developed in various types, increased in quality and scale. The growth value of industrial production is 23.17%/year, exports increases by 26.27% / year.

District 5

73. District 5 is one of the important trade centers of the city. From the wholesale market in the district, the goods are sold all around the country and neighboring countries. Presently, it is the most active and dense economic area in HCMC. Through 30 years, the District has been changed in every aspect, economy attaining annual development rate, political stability, ensuring security order. Both living condition and spirit of the local people have been improved and enhanced. Economic, cultural and infrastructure works have been constructed day by day that have changed the urban landscape toward civilized, modern and improved living conditions for people.

3. Social Infrastructure

a. Public Health and Sanitation

74. The subproject area is close to the healthcare centers in HCMC. Mostly, the residential areas well contact with the medical services. The medical station can supply 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.

75. 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 4th 2012). The number of people with HIV is 49.429 people as per statistics in the first quarter of 2012.

76. At Ward 1 (District 5) and Ward 2 (District 8): 100% HHs can use clean water. The percentage of collecting/handling solid waste is about 95%. The percentage of HHs have suitable toilets is 100%.

b. Education

District 8

77. The education has many changes. The rate of 6 year old children attending the first class reaches over 99.9%. The performance training of primary and secondary education is rather good, keeping the level of achievement in literacy and universal primary education and secondary education standard education. There are many efforts to improve the overall quality of education, standardized level of teachers and staff education management.

District 5

78. Over the years, the district has set aside a large budget for the new construction, repair, and upgrade schools to create favorable learning conditions for the citizens to develop high quality human resources in the future. Today, district 5 has been recognized achievement of universal primary and secondary education. Ten (10) wards have been completed secondary school. Each year, from 98.1 to 99.8% of children graduated from primary schools and secondary school. District 5 is the center of the city's higher education with leading universities such as: University of Pedagogy, University of Natural Sciences, University of Medicine and Pharmacy, University of Saigon... etc.

c. *Communications*:

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

d. *Water and electricity*:

80. The subproject area has tape water supplying system, which is the main source for daily activities. Presently, the load of District 5, District 8 is mainly supplied from 220kV substations of Tao Dan, Phu Lam and supported from Hoc Mon, Thu Duc, Nha Be. This is the area with dense population and high commercial activities.

e. Infrastructure for transportation

District 8:

81. Traffic in District 8 is most convenient by waterway system, which includes 23 large and small canals in the district ward connecting with other places in the city. However, the road system of District 8 also quite developed. Pham The Hien Street of District 8 connects to the city center, interconnecting roads and alleys are made spider traffic system throughout the District. Especially, there are 44 bridges in District 8 with total length of over 2,500 m. The Y-shaped bridge, Nhị Thien Duong, Cha Va, Hiep An bridges with large tonnage long built and upgraded several times increase the traffic key. District has 14 wharfs and 4 ports that are Chanh Hung, Duong Ba Trac, Binh Dong, Binh Loi port.

District 5

82. District road system has been built and developed rapidly. The District has 97 streets with a total length of 54,988m, which consists of 17 main roads with a total length of 23,535m, 12 roads in the regional road system with a total length of 13,680m, 47 internal roads with a total length of 17,673m and 46,385m alley.

83. On the territory, there are important traffic projects such as: East – West Highway, Nguyen Van Cu street of the city.

84. The marine traffic system is mainly through Ben Nghe arroyo (Tau Hu canal), with the same length with the District length, which is about 4 km.

4. Cultural and Heritage Sites

85. HCMC is one of largest and oldest city in Vietnam, and has many cultural and heritage sites. The most prominent cultural and heritage sites in the city center are the Reunification Palace, and Notre-Dame Cathedral. The city has various museums, including the Ho Chi Minh City Museum, Museum of Vietnamese History, the Revolutionary Museum, the Museum of Southeastern Armed Forces, the War Remnants Museum, the Museum of Southern Women, the Museum of Fine Art, the Nha Rong Memorial House.

86. PECC4 has surveyed cultural and heritage sites within the scope 500m from the proposed site. The results are presented in the Table 13 below. Based on the scope of the subproject, it can be confirmed that the subproject activities will not have impacts to these structures. PECC4 confirms that the partial distance is accepted and ensuring not effects to these objects.

Table 13. Cultural, historical, and social works within scope 500m of the subproject

Subproject Components	Infrastructure Name	Distance and direction from subproject items
110kV Tan Hung substation	College of Foreign Economic Relations of HCMC	405 m toward the Northwest
Extension of feeder bays at 110kV Chanh Hung substation	Binh Xuyen church	270 m toward the South
	Mong Trieu church	360m toward the Southeast

(Source: Survey of PECC4)

5. UXO Clearance

87. After decades of war, UXO remains a significant issue in Vietnam. However, the proposed site of substation construction, which previously was Cho Quan power plant, was not a battle of the previous war. Hence the possibility of remaining UXO due to war is negligible. Therefore, for this subproject, the UXO clearance will not be implemented.

6. Subproject affected people

88. There will not be any affected HHs/persons due to loss of land and assets when implementing the subproject since the proposed substation site is located within 8-8bis Ham Tu complex, Ward 1, District 5 (already approved detailed planning scale 1/500 by the PC of District 5), previously it was the old Cho Quan power plant, presently being site clearance, as a vacant land, and presently being managed by EVNHCMC; the UGC route shall be submerged going underground. The temporarily and permanently acquired land is as below.

a. Permanently acquired land

89. It shall be including: (i) 5,300 m^2 for constructing 110kV Tan Hung substation (old Cho Quan power plant, presently being site clearance, as a vacant land), and presently being managed by EVNHCMC.

b. Temporarily acquired land

90. It will be included land along the UGC route, which is about 745m^2 of temporarily affected land under the ground, the submerged part under the position adjacent to Te canal - Kinh Doi canal - Tau Hu canal - Ben Nghe arroyo, Vo Van Kiet avenue. The UGC will be directly buried under the canal bottom, road foundation therefore it will not affect to the upper traffic activities. For the section going within the land area of 8-8bis complex - old Cho Quan power plant, the UGC will be directly buried under the ground along the internal road (8m) of 8-8bis Ham Tu complex (from G7-G8), on the left is walking side, and the right is 36 middle-voltage feeder bays of 110kV Tan Hung substation and drainage system along the internal road of 8-8bis Ham Tu complex. The existing traffic routes are presently managed by the Transport Department of HCMC and the PCs of District 5 and District 8. During the subproject implementation, the traffic routes will be normally used with limiting truck load based on the load pavement capacity.

91. The subproject will temporarily use land belonging to the panned land for 110kV substations (area 5,300 m^2) for warehouse 77m^2, camp 20m^2. After completed subproject construction, it will be recovered the ground to the original condition.

92. There are no households affected by the subproject. Table 14 present the subproject affected land.

Table 14. Affected land of the subproject

No.	District/Ward	Permanently acquired land		Temporarily acquired land	
		The area (m^2)	Number of AH	The area (m^2)	Number of AH
1	Ward 1 – district 5	5,300	0	399.4	0
2	Ward 2 - District 8			345.6	0
	Total	**5,300**	**0**	**745**	**0**

D. Environmental Features of Substation and Transmission Line Sites

93. In addition to the key natural and social environment features in the project area described as above, some other features of the project site are as follows:

(i) *The proposed substation* is located on the vacant land with bush and grass. This land owned by EVNHCMC. There are no local people living in the proposed land area for the substation construction.

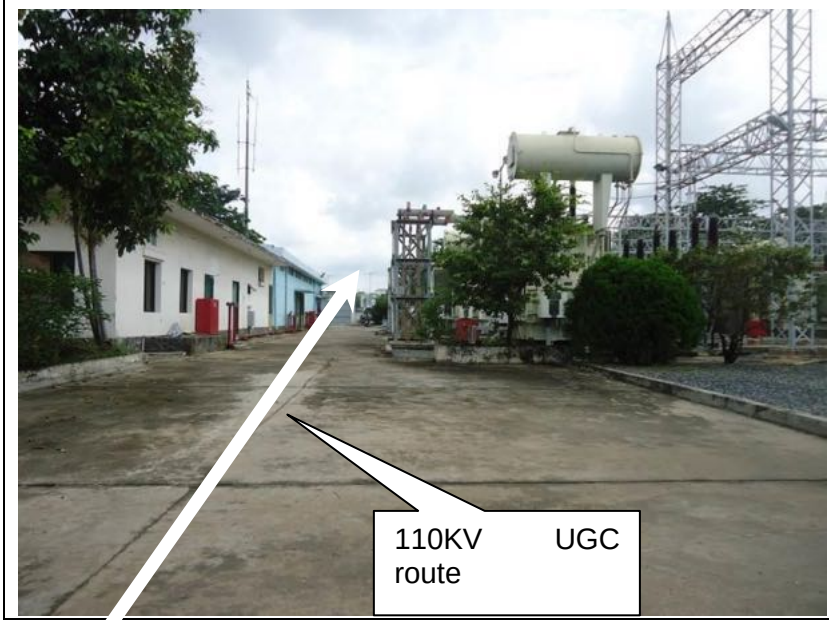
(ii) *The underground cable* is proposed to cross over Vo Van Kiet avenue and Te Canal. Vo Van Kiet avenue (or East-West venue) is a new road for the south area with an aim to reduce traffic jam for HCMC. This avenue meets the demand of transport from ports to the Northeast and southwest area, Mekong Delta provinces, or other provinces. This is the crowded road with high traffic density. Therefore, selection the construction method for the transmission line (TL) crossing over the road is very important to minimize impact on traffic activity. The subproject is expected to use Horizontal Directional Drilling method for construction this TL's section. In addition, the canal which the TL crosses over is the third grade canal. This allow 101-300 ton-load vessels to transport on. Therefore, the TL have to be buried under the canal bottom the expected depth is 11m, and will be constructed by Horizontal Directional Drilling method.

(iii) *Residential area around the Tan Hung 110kV substation*: The Northeast is contiguous with commercial office building of Sai Gon –Vina Land Company While the south and southwest is border with the residential area of district 5-ward 1 (60m far from the subproject site).

94. Figure 3 shows the status of proposed subproject site, including the site for constructing the 110kV Tan Hung substation, traffic roads, canal routes that the UGC route passing through.

Figure 3a:

Proposed site of 110kV Tan Hung substation (vacant land area located at the photo center).

	Figure 3b: The UGC section crossing under Tau Hu canal and Vo Van Kiet avenue (vision from 8-8bis Ham Tu complex).
	Figure 3c: UGC section crossing under canal (vision from 110kV Chanh Hung substation).
	Figure 3d: UGC section submerged going within 110kV Chanh Hung substation.

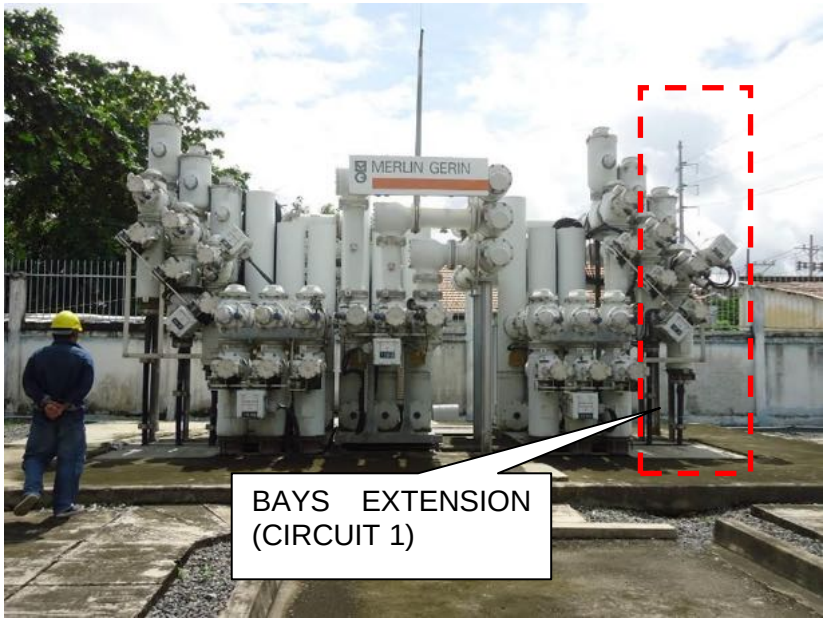


Figure 3e:

The proposed site extending bays at 110kV Chanh Hung substation.

Figure 3. Photos of proposed site of 110kV Tan Hung substation and UGC route

VI. POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES VII.

95. Potential impact assessment of the subproroject is structured by 03 phases: pre-construction, construction and post-construction. The subproject's construction items including 110kV Tan Hung substation, underground cable route and extension of outgoing feeder bays at 110kV Chanh Hung substation are addressed within this assessment.

96. Potential impacts from common activities within 3 phases can be adressed at the same time to minimize the potential impacts. Potential impacts specific for the subproject components will be discussed separately. This structure will be used for preparing Enviromental Management Plans (EMP) that will be prepared for the subproject (Section X).

A. Subproject Benefits

97. The single comprehensive benefit of the subproject is the provision of needed electrical power to commercial offices, residential areas with dense population density of District 5, 8 of Ho Chi Minh City; concurrently providing power for loading receiving from 110kV Hung Vuong, 110kV Ben Thanh and 110kV Chanh Hung Substations when neccessity. The additional electrical power will significantly reduce power outages or brownouts that occur in the area, and the need to shunt electrical power from other parts of the city.

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

a. Detailed design

98. Impacts: if the detailed design does not consider the environmental issues (e.g. wrong site selection, not suitable construction technology, hazardous material use etc.), the subproject can cause some negative impacts during construction and operation. Particularly, (i) Wrong subproject site selection can increase the chances of encroachment on cultural or natural sensitive sites if lacking of the carefully consideration; (ii) the subproject will severely affect traffic on road and waterway if detailed design selects the excavating method for constructing the route crossing over HW (Vo Van Kiet avenue) and canal (Te canal); (iii) During technology selection, if PCB transformer type is selected, the subproject will cause pollution and negative impacts during the operation phase; PCB is a toxic substance which can damage human health by causing cancer through food chain, therefore oil with PCB component is one of substances forbidden for use in Vietnam.

99. Mitigation measures***:*** During detailed designs, the Consultants have to consider to environmental issue for the design, specifically:

(i) Arrange the substation site transmission line direction to avoid cultural and historical heritages, and other sensitive areas, during the feasibility study, the project management board has to consulted Department of Industry and Trade of Ho Chi Minh City, the DPC of district 5 and district 8, CPC of ward 1 and ward 2 to agree upon the location of the substation and connection line;

(ii) Select HDD method for construction of the connection line's sections through Vo Van Kiet avenue and Te Canal in order to minimize disturbance on traffic;

(iii) Select transformer without PCB, design the depth to bury cable for ensure electromagnetic field not affect people health. EO of PMB with the support from PIC will be responsible to review detailed design of the subproject to ensure proposed mitigation measures included in the detailed design. Furthermore, after feasibility study was approved, the PMB will notify the local authorities and people of activities and schedule of the subproject, so that they can organize their production and business suitably. PMB also coordinate in environmental protection monitoring, and notify the DoNRE the subproject commencement.

b. Bidding document establishment:

100. Impacts: if terms of reference in the bidding documents of civil works and equipment supply contracts exclude provisions for environmental protection, it will result in contractors will be not legally responsible for implementing prevention and mitigation measures as prepared in the IEE/EMP and detailed design. This can bring the disturbance and pollution during construction and operation phase of the subproject.

101. Mitigation measures: State in bidding documents that contractor must have experience in EMP implementation, or provide staff with sufficient experience; bidding document and works contracts have to include provisions that require contracts to comply with the mitigation measures suggested in IEE. The mitigation plan is organized into a series of mitigation sub-plans that address specific potential impact areas of the subproject. The sub-plans will assist the contractors with the development of their SEMPs as part of their bid documents, and ultimately will allow the EO/IA, PIC, and contractors to focus more or less on the different potential impact areas as they arise with the implementation of the final designs of the subproject. Therefore, EO of PMB have to ensure that the civil work contracts are included mitigation sub-plans of the EMP which are drafted for example for: a) Tree and Vegetation Removal and Site Restoration, b) domestic waste from workers; c) excavated waste and hazardous waste; d) Noise Dust, and exhausts; e) Liquid Waste; f) Construction and Urban Traffic; g) Worker and Public Safety; h) Cultural chance finds.

c. UXO determine and clearance:

102. Impacts. PMB's Consultants contacted to Ho Chi Minh city High Command in December 2012 on UXO remaining after the war on the subproject site. The agency provide information that the subproject area used to be the substation of Cho Quan Power Plant before 1975 where was strictly protected by the old government. There has been no UXO existing in the subproject area. Therefore, for this subproject, the UXO detection item will not be implemented.

c. Land acquisition and compensation:

103. Impacts*:* There is no impact on people due to land acquisition and compensation because the following reasons:

- Total area of permanent acquisition land for constructing 110kV Tan Hung Substation is 5,300m^2 which is located in 8-8bis Ham Tu complex, Ward. 1, District 5. This location used to belong to the Cho Quan Power Plant area, but now managed by EVN*HCMC*. There are no household located in this area. Therefore, it is no need to acquire land and compensation.

- UGC route goes in 8-8bis Ham Tu Complex, beneath the bottom of Te canal and crossing through Vo Van Kiet avenue. Therefore there is no need to have site clearance and compensation.
- For the extension of bay 110kV transmission line at 110kV Chanh Hung substation, it is implemented within the area of the existing Chanh Hung substation, therefore no need of land acquisition and compensation.

104. Mitigation measures: the subproject's Resettlement Due Diligence Document has been clearly described no impact due to land acquisition and compensation.

d. Construction site arrangement:

105. Impacts: There are several impact sources which could be arise from inadequate construction site arrangement, such as disposal site selection, the planning of transportation and storage facilities.

(i) The selection of disposal site in city is more difficult than that in rural because of high population density and lack of land area. Disposal site will affect local land area and cause air, water pollution for citizens living near this site, if the selection process is not careful;

(ii) The subprojects, particularly substation, will have some huge equipment like transformer, its transportation can cause some damage for roads surface and traffic activities. Also, material transportation will release dust which can affect air environment along transport route (national highway 1A, provincial road 10, Vo van Kiet avenue, and roads near to the subproject site such as Nguyen Bieu street, Cao Dat street),

(iii) Stockpile and material gathering site can cause temporary acquiring land and

(iv) Affect people living near the site because of the movement of vehicle in and out the stockpile, and dusty around the gathering site.

106. Mitigation measures: the mitigation measures could be included:

(i) The disposal site is proposed to be in ward 7 of district 11 with 2km on the west far from the subproject site. The license for disposal will be obtained by contractors before commencing the subproject. PMB will supervise and include this requirement in civil work contracts.

(ii) Constructor will develop the transportation plan for equipment and material to reduce the negative impacts.

(iii) Constructor will arrange the temporary yards for stockpile and material gathering within in the 8-8bis area in order to avoid arising impacts due to land acquisition.

(iv) Constructors should obtain the license for safety and environment requirement of mobilized machines and vehicles.

e. Environmental management capacity development and enhancement

107. It is needed to provide PMB and contractors environmental training during pre-construction phase. This aims to prevent or avoid impacts from the subproject's management and implementation, such as during the process of detailed design, biding document establish, construction site arrangement as well as during the construction phase.

C. Potential Impacts and Mitigation Measures during Construction phase

1. Potential impacts and mitigation measures for construction activities

108. The following activities will be undertaken during construction that will impact on the environment. While construction activities will be of short duration and the areas will recover quickly, the main mitigation measure is to schedule construction activities wherever possible to be completed during the dry season.

109. The environmental impacts generated by the subproject that can affect traffic activities on Vo Van Kiet avenue, highway 1A, provincial road No. 10, and some roads near to the subproject (Nguyen Bieu, Cao Dat, etc.), residential area and social works of ward 1- district 5, are described below.

a) Tree cutting and site clearance

110. Impacts*:* Cutting tree due to site clearance can reduce tree quantity in the subproject area, which can reduce the source of oxygen supply and microclimate regulation for the urban area near to the subproject site. However, the vegetation cover of the substation area is mainly grass and bushes, the cutting tree will insignificantly affect the subproject area.

111. Mitigation measures: In order to ensure that tree cutting and site clearance will not affect the vegetation cover of subproject area, the proposed measures are (i) Minimize cutting trees and other vegetation in all construction locations and along the traffic road. (ii) Regrow and protect trees and vegetation cover as much as possible,; (iii) Clear and return site the temporary acquired areas for construction materials storage.

b) *Noise, dust and exhausts*

112. Impacts*:* noise, dust and exhausts are generated from excavation, construction activities, and transport means.

- *Dust generated from excavation*: Based on the volume of excavated and refilled materials, the concentration of diffused dust which is calculated at the distance of 10m from the excavated site equals 60µg/m^3. When this figure is plus the basic value which measured at the subproject in table 10, the concentration of dust is 210 µg/m^3 (meet the standard QCVN 05:2013/BTNMT - <300 µg/m^3). Therefore, dust from excavation and civil works will not severely affect air quality. With the calculated result of concentration of dust, the impact object is ambient air in the construction site, the residential area near the site will not be affected. The impact will be last 30 days during excavation for substation and 10 days during excavation for transmission line.

- *Dust and exhausts such as NOx, SO_2, CO generated from vehicles, and construction machines*: everyday, there will be approximate 2 bulldozers, 2 excavators and 2 vehicles which will run through the transport route to supply materials for civil works. They will create the small volume of dust and emission, so the impacts from this activity will be negligible. Dust and exhaust gases from vehicles affect ambient air along the transport route (highway 1A, provincial road 10, Vo van Kiet avenue, and roads near to the subproject site such as Nguyen Bieu street, Cao Dat street), and in the construction site. The impact will be last 6 months during construction phase.

- *Noise generated by construction and transportation activities*: Noise will be generated by activities of machines, equipment and means such as vehicles, bulldozer, excavator,… According to calculation results, noise generated by these machines, equipment and means will reduce lower than the allowable limit (70dB) at the distance of above 50m. The subproject area is far from the nearest crowded residential areas with distance about 45m. In addition the machines, equipment and means will be only operated in the daytime. Thus, noise impact is insignificant and short term.

113. Mitigation Measures.

- In order to reduce impacts due to dust from excavation, the schedule for excavation and filling need to be reduced and excavated soil should be used to fill right after complete work, frequently water the construction sites.

–The mitigation measures to reduce dust, noise, exhausts from transport means and construction machines include: Transportation means, machines and equipment in list of means, machines and equipment to be obliged to register technique and environment safety must have effective certificate of environmental standards achievement issued by the register department; frequently water the construction sites, along construction material

transportation roads; all of means transporting construction materials and air dispose equipment must be maintained properly to minimize air waste, and not work at night if could not minimize noise;

- Implement appropriately equipment, machines and vehicles maintenance; replace equipment, machines and vehicles causing large noise; build fence to temporarily avoid noise around the working area if possible to reduce the diffusing of dust, exhausts and noise.

c) *Concentration of workers and domestic wastes generated (domestic wastewater and rubbish)*

114. Impacts: Concentration of workers for constructing the subproject can cause some impacts (i) generation of domestic waste including rubbish and sewage from workers (ii) generation of social problems, spread diseases. These are analyzed as follows:

- There are approximate 30 workers mobilized for the subproject construction. Thus, volume of rubbish from workers is predicted to be **about** 12-15kg/day (0.4-0.5kg/day/person) while volume of domestic wastewater is about 3.3*m^3/day (100 l/day/person)*. Rubbish is easily decomposed that can cause dirty and insanitary situation in workers' camp, if it is not collected regularly. Wastewater contains high BOD_5, SS, Nitrate and coliform that can pollute surface water resource such in Te canal. However, impact is insignificant because of the small volume of domestic solid waste and wastewater. Impact is expected to happen in worker's camp and hired houses for workers during 6 month of construction of the subproject.

- Concentration of workers (30 people) in the subproject site can cause disorder and insecurity, disturbance in the locality (ward 1 of district 5 is 60m far from the subproject site towards the south) due to conflicts between workers and local people, social evils; increase infectious diseases generation etc. These impacts are insignificant, short-term, only occur in the construction phase (about 6 months) and will stop when the project construction finishes.

115. *Mitigation measures:* Contractors have to implement the following measures:

- Arrange hygiene camps or hire residents' houses for workers' stay; hire mobile toilet with septic tank for camps, and put dustbins at camps for collecting domestic sewage, rubbish;
- Contract with specialized unit to collect rubbish and treat adequately;
- Worker camps must have adequate rainwater drainage system;
- Local labors will be hired as much as possible to prevent or minimize influx of migrant workers, and incidence of social diseases and community chaos.
- Examine periodically workers' health.
- Manage and educate workers to enhance their awareness of environmental sanitation and health protection.
- In order to minimize the risk of injury to the local residents and the workers, it needs to comply with the GOV's regulations on Occupation, Safety, and public health, or the World Bank's Environment, Health, and Safety Guidelines (2007) that govern the safe and orderly operation of civil works should be followed.
- Equip medicine cabinet for protecting workers' health in time.
- Establish the specific food safety regulations for construction workers.
- Construction units will implement temporary residence registration and provide accurate information about the quantity and stay time of all construction workers to CPCs within the project area during the construction phase. They should also

establish the relationship with the local authorities to discuss and take decisions necessary for their management.

- Require workers not to take part in or cause social evils; any contravener shall be strictly treated in accordance with laws
- Establish rules in camp. Propagandize, educate workers and create good relations with local people in order to avoid conflicts arising. HIV/AIDS education should be given to workers.
- Require workers to respect and not to violate the cultures, habits and customs, religious beliefs, historical and cultural parks, pagodas, and temples in the localities.
- Make a good relationship and proper coordination with the local authorities to manage their workers.
- PMB will be responsible for including these requirements in the contract documents

d) *Solid waste and hazardous waste from excavation, site clearance, and civil works*:

116. Impacts. Solid waste from construction including refused rock and soil, debris generated by excavation and site clearance, refused and dropped construction materials such as cement bags, clouts, scrap irons, etc. The excavated material volume is proposed to be 1,433 m^3 for the Tan Hung substation, most of them are reused for filled the substation level and foundation, the remaining (687m^3) will be disposed. The solid waste can be swept away due to rainwater which can obstruct water drainage and cause locally inundation in the construction site and the surrounding area. Uncontrolled disposal of the volume of waste leads to lose urban aesthetic. However, the impacts due to excavated waste are assessed at the insignificant level because of the small volume of waste and temporary impact. The impacts will be happened during the excavation time (about 15 days for substation area, and 4 days for each section of connection lines) and construction time (6 months).

Hazardous waste from civil works is waste oil, grease and oily clouts from maintenance of construction equipment, devices, machines and transport means. The subproject is proposed to have 9 means/devices using oil for construction, so the volume of waste oil and grease due to construction is about 63 liters/time of maintenance. Each mean/device is proposed to renew oil/grease every five or six months. Therefore, with 6 months construction, total volume of waste oil/grease of the subproject is approximate 63 liters. The impact is assessed at the medium level and need to have a strictly procedure of treatment. Impact objects are soil and water environment around the construction site and contractors' garages. However, the impact is only happened once during the construction time. Other hazardous waste generated during construction activities are paint containing can; clouts with oil, grease; failed fluorescent lamp, which is proposed to have small volume and to be infrequently generated during construction phase.

117. Mitigation measures. Contractors have to maximum salvage excavated soil at the construction locations according to excavation and filling balance method, part of refused soil and rock; refused and dropped construction materials must be classified in-situ, salvaged for reusing or selling. At the construction site, it is needed to have big recycle bin for collecting construction waste. Contractors hire local competent unit for collecting excavated and construction waste and transporting to suitably treat. If excavated soil is suspected contamination, it must be tested, and disposed in designated sites and identified as per local regulations.

Contractor need to implement the following Hazardous waste treatment as follows: waste grease, oil: implement equipment, machines and vehicles repair and maintenance at local garages. Waste grease, oil will be collected to treat at this garage as stipulated. Other hazardous wastes must be collected into sand tank kept temporarily at the construction site, then hiring competent unit for transporting to treat in accordance with current regulations. PMB/IA will be responsible for including these requirements in the contract documents.

e). Construction wastewater and rainwater

118. Impacts due construction and rainwater include:

- *Construction wastewater*: Construction water is arisen from foundation pits and washing vehicles/machines. Water pumped from foundation pits and washing vehicles/machines is mainly turbid and non-toxic. The water pumped from foundation pits are mainly from rainwater or underground water (if any), so the impacts will be very small if the construction schedule is arranged in dry season. Water washing vehicles/machines will be mainly generated in garages or washing stations near the subproject site. Specific locations of garages or washing stations will be existing garages or washing stations in the locality or that will be selected by the contractors. This water causes an increase of turbidity of water if releasing without treatment. However, the impact is small and temporary during 6 months of construction.

-*Rainwater*: Rain water can bring many things (like solid waste, refused construction materials or even material in the storage yards) from the ground into the surface water, which results to increase turbidity of surface water. The impacted object is water quality of Te canal near the subproject site. According the basic data on climate in the subproject site described in Part V, HCMC has 6 rainy months from May to October. Therefore, this impact can be avoid or minimized by arranging the construction time in the dry season.

119. Mitigate measures: for water quality include:

- Temporarily arrange the drainage system of rainwater; Pumped water from foundation pit at construction sites to prevent standing water and local flood; Have mud sand, suspended solids in rainwater and water pumped from foundation pits settled before pumping into environment; Manage not to allow soil, sand flowing into water source; Ensure that path leading to surface waters (ponds, channel, canal) is maintained and/or enhanced to sustain existing storm water storage capacity; protect surface waters from silt and eroded soil..

- Contractors should contract with a garage area near subproject area (district 5 or district 8) to implement equipment services, refueling, and wash down. The maintenance area/garage should be provided with oil and grease traps/oil collection system to prevent oil from being washed into the offsite drainage canals.

f). Impacts on traffic activities and road quality

120. Impacts on traffic activities include:

Impacts on traffic road: Increased movement of construction vehicles along roads is identified as a possible impact on traffic. The urban roads can be used to transport are highway 1A, Provincial road No. 10, Vo Van Kiet avenue, etc. These roads are relatively crowed so movement of large construction vehicles along these roads may cause temporary impact on travel. This will disrupt the normal traffic patterns and may expose the citizens to risk of injury or accidents, In addition, heavy truck can damage roads surface if they run into the roads which only bear the lower load. However, there will be 2 material transport vehicles running along transport route every day, and some heavy vehicles for big equipment transport (such as transformers, cable roller, pallet cable) will run several times during construction phase. Therefore, they will cause insignificant increase in traffic density on roads.

– *Impact on waterway*: The underground cable is expected to cross over an avenue and a canal, there will not cause disruption to road and waterway traffic because the Horizontal Directional Drilling method will be applied for constructing these sections. Specifically, Tau Hu canal (Grade III canal) has high intensity of waterway means of transportation (ship load of 101~300 tons). However, the connection line is located underground with 11m deep from the bottom of Tau Hu canal. So not impact on ships, boats travelling on this canal.

121. Mitigation measures: Contractors will also advise communities of upcoming construction activities and the effects that it may have on traffic volumes. Contractors will also ensure that access is not to be impeded by construction operations to residences. Contractors will implement following measures: arrange suitable transportation time; avoid concentrate transportation in rush-hours; speed limits for transportation vehicles for construction; if possible, heavy vehicles for construction should use another route, another lane, not using route/lane with many people; use special purpose trucks when transporting oversize and overweight equipment; transport with designed load in order to avoid collapse and damage surface road; Recover, repair, upgrade the roads if damages caused by the project. Horizontal directional drilling method will be applied to construct the sections crossing over Vo Van Kiet avenue and Te canal.

g). Impacts on the existing Chanh Hung Substation and other TLs

122. Impacts*:* When constructing the underground cable within the existing Chanh Hung substation (see Figure 3d) as well as connecting to the national grid system, Chanh Hung substation will have to cut off the electricity from 1- 2 days. Therefore, construction of the underground cable will impact on the substation operators; power cut for connecting the subproject to the national grid system will impact on the substation's production activities and power supply for people's life and production activities in the subproject area.

-The connection line crosses 02 times with the existing 0.4kV distribution line. However, the connection line of the project is an underground cable, thus it has no impact on the existing distribution line.

123. Mitigation measures include:

- Coordinate with management unit of the Chanh Hung substation to cut off power to ensure safety during connecting the subproject to the national grid system.
- Inform people for their life and production arrangement before cut-off power.
- Prepare readily all things for connecting to the power grid sytem in order to cut-off power duration of Chanh Hung substation is min.

h). Impacts on the existing underground works and urban landscape

124. Impacts: According to survey report conducted in Aug. 2012, the existing underground works in the project area and surrounding areas include:

- Chanh Hung – Cho Quan 15kV underground cable is located 15m far from the underground cable of the subproject in Tau Hu canal.
- The underground cable of the subproject crosses with the underground power supply system, and the underground water supply and drainage system running along Vo Van Kiet venue.

However, due to features of the subproject's underground cable (XLPE cable) and its arrangement inside force-resistant blastic pipe (HDPE) burried deeper than these works. Therefore, the underground cable of the subproject will not impact on above mentioned underground works. During construction of the subproject, soil and filling excavation for construction will impact on urban landscape. However, construction activities is mainly within the scope of the existing Chanh Hung substation and the connection line is short and constructed underground, thus urban landscape will be impacted insignificantly with a small and local scope. This impact will be finished after completing the subproject construction (about 6 months).

125. Mitigation measures*:* Clear refused filled and excavated soil and construction materials every day at the construction sites, especially the construction sites is near the traffic roads. Clear, level, compact and return the impacted locations to the initial status right after completing construction.

i). Labour safety for workers

126. Impact*:* Construction activities may cause health harm and danger of the workers' lives, specifically:

- Workers can get some disease due to unhygienic condition of worker camp;
- Accidents can be happened during operation of machines, vehicles or working at height;
- Traffic accident during transportation of facilities, materials for construction of the subproject; and
- Electric shocks during connecting and test electric with the existing substations. These impacts last during the construction phase and will stop when the subproject construction phase finishes.

127. Mitigation measures*:*

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

- Substation, towers, steel structures and equipment must have earthing system.
- Contractors will prepare emergency measures on time. When accident occurs, conduct in-site first aid, then quickly drive the wounded to hospital for treatment. It must keep a phone number of the nearest hospital to call ambulance. Besides, it must be equipped medicine cabinet for aid.
- As existing commune health services are unable to accommodate additional patients from the construction workforce, the contractor will be required to provide first-aid facilities for the workers. At least one trained first-aid worker should be available at each construction camp.
- PMB will be responsible for including these requirements in the contract documents.

i). Community health and safety

128. Impacts: Subproject construction would cause impacts to community health and safety as following:

- Accidents due to increased traffic activities from the transport of materials;
- Fires, emergency spills of materials;
- Accidents of residents if they enter into work areas without permission, for example, falling into foundation pits and the entrance of underground cable trench, electric shock during testing electric, etc. Citizens living in the residential area at ward 1-district 5 (60m on the south far from the subproject site) may be affected by these impacts. However, these impacts are insignificant and short-term, they occur only in the construction phase (about 6 months) and will stop when the project construction finishes.

129. Mitigation measures: To mitigate these potential impacts, the civil contractor will develop a community health and safety plan (CHSP) that incorporates good international best practice and recognized standards.

The CHSP should include emergency response and preparedness procedures to be developed in close consultation with potentially affected communities and local authorities. The plan should include specific emergency response procedures, communication systems and protocols, interaction with local and regional emergency and health authorities, provision of emergency equipment and facilities such as fire truck, emergency service vehicles,…. The CHSP should also include the requirement for the erection of safety barriers either as tape or fencing as determined by the risk to prevent unauthorized access to the construction areas. Warning signs around sites are to be printed clearly in Vietnamese language.

- Set up warning boards to warn people.
- Installation of lightning protection systems in the substation and the UGC as stipulated.
- When fire occurs due to electricity, first notice immediately to authorized unit to cut off power, then comply with the procedures of fire fighting.
- Coordinate with the local government of district and commune to propaganda and disseminate knowledge about safety of the ROW of the substation and the UGC to communities living near these areas.
- Implementation of these measures will be the responsibility of the contractor. PMB will be responsible for including these requirements in the contract documents.

2. Protection Areas, Rare and Endangered Species, and Physical Cultural Resources (PCR)

130. Impacts*:* The substation and underground cable route is not located in a protected area, and there are no rare or endangered wildlife in the area.

131. Mitigation measures: Chances of detection of valuable relics and cultural values should be anticipated by contractors, especially during the excavation process. Site supervisors should be on the watch for finds. When detection of valuable relics and cultural values, stop immediately all work, untouched to anything of them. And EA/IA informs the authorized agency (DoCST) to determine their value and treat appropriately. Work at the found site will be stopped until DoCST allows to be continued working.

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

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

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

D. Potential Impacts and Mitigation Measures during Operation phase

133. Expected adverse impacts during the operational phase of the substation and underground cable are generally related to occupational and community health and safety issues, and pollution issues due to worker's waste and hazardous waste. Impacts are reversible, manageable, and can be mitigated with proper engineering and management controls. HCMC high voltage Company will be responsible for the operation of the subproject and its ancillary services.

1. Occupational Health and Safety

134. Impacts*:* Occupational health and safety issues during the operation of the subproject include electrocution risk due to exposure to high voltage systems when conducting maintenance and repair or living/working within the scope of high voltage systems; accident risks due to working in heights; potential exposure to electric and magnetic fields when living/working in the substation area. Other accidents that may occur include lightning, fire and explosion.

- Exposure to high voltage systems: Workers may come in contact with electric equipment during the maintenance and repair of the facilities and electrocution from direct contact with high-voltage electricity is a hazard directly related to these facilities.
- Working at height: Accidents may occur when working at height. However, a working safety plan may be implemented to reduce risks that include testing of structural integrity prior to proceeding with the work and the use of fall protection measures.
- Exposure to electric and magnetic fields (EMF): Typically, workers living/working (on duty shift) in the substation area have higher exposure to EMF than surrounding community because of working in close proximity to electric equipment.
- Impact of EMF on operators when living/working in the substation area is follows:

For the substation:

Under Decree No. 14/2014/ND-CP dated Feb. 26th, 2014 promulgated by the GoV, working time at place with EMF is regulated as in Table 15:

Table 15: EMF intensity and allowable limits of working time during one day

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

Under Decree No. 14/2014/ND-CP, EMF has to ≤ 5kV/m at any point at the height of 1m from the ground outside of house and ≤ 1kV/m at any point at the height of 1m from the ground inside of house. Underground the standard on industrial frequency EMF intensity enclosed with Decision No. 3733/2002/QĐ-BYT issued by the MOH, max. allowable limit on EMF intensity at working place is 25kV/m.

Calculation result based on Japan's CRIMAG model, EMF intensity of unprotected 110kV charge carrier at distance of 7m in comparison with the carrier is 1kV/m. Thus, EMF intensity outside of the scope of 7m-radius from the 110kV transformer and round the substation is ≤ 1 kV/m. Calculated EMF intensity at some other locations within the 110kV substation is as in Table 16

Table 16: EMF intensity at some other locations and the connection line within the 110kV substation

No.	110kV substation	Max. EMF intensity (kV/m)	Allowable limits (kV/m)		
			Decree No. 14/2014/ND-CP		Decision No. 3733/2002/ QD-BYT
			Inside of house	Outside of house	
1	Yard of the substation	4.31	1	5	25
2	Under 110kV transmission line (within the substation)	0.57	1	5	25
3	In control house	0.68	1	5	25

Like this, outside of the scope of 7m-radius from the transformer, EMF intensity meets the regulations in Decree No. 14/2014/ND-CP in the locations inside of house. At other locations within the substation, EMF intensity value is lower than the allowable limits at Decision No. 3733/2002/QD-BYT of the MOH. On the other hand, according to design, the transformer is protected by insulating materials, so EMF intensity round the transformer will be reduced significantly. Moreover, operators of the substation are arranged to work in shifts, crews ensuring working time as stipluated, ensuring time for contacting with EMF. Thus EMF will not impact on the substation operators' health.

For the connection underground cable:

Due to the structure of underground cable, it will not have EMF outside of the cable cover. Voltage will reduce through insulating layers XLPE and EMF intensity is essentially zero outside of the cable cover. Thus, risk of negative effects to health due to electromagnetic field caused by the operation of the underground cable section is essentially zero, but also not affirmed because negative effects to health due to electromagnetic fields have not been proved by the medical profession.

135. *Mitigation measures:* HCMC high voltage Company will be follow the IFC (2007) and EVN guidelines when carrying out maintenance of the transmission line and the substation. Some of the prevention and control measures when working with electrical systems are:

- Restricting access to electrical equipment, except workers who are trained and certified to work on electrical equipment. Properly limit time for contacting with EMF for trained workers.
- Adherence to electrical safety standards.
- Proper grounding transmission line.
- Provision of PPE for workers, safety measures, personal safety devices, and other precautions during maintenance work or if working in close proximity to the TL.
- Periodically measuring EMF under the provisions of Electricity industry.
- Follow safety measures when working at height during maintenance and repair electric equipment in the substation, particularly:
- All workers will be examined health for working at height, equip sufficiently labour protection tools and cloths.
- Workers who climb on towers will have Safety Certificate of Class 3 or above and sufficient conditions for working at height. Safety belts will be attained used standard of the nearest inspection, not exceed over 6 months. During movement and working at height, workers will wear safety belts and the safety leather belts must be tightly tied with the tower.
- All equipment, tools and means will be carefully examined for quality and quantity before used. It should carefully check the suspending cables before climbing on the tower.
- Not permitted to work at height when it is going in night; it has fogs; it has strong wind with above class V.
- Occupational EMF exposure will be minimized through the implementation of an EMF safety program that includes:
- Identification of potential exposure levels in the working area including survey of exposure levels and establishment of safety zones
- Properly limit time for contacting with EMF for trained workers as stipulated and those equipped with appropriate PPE when entering safety zones.
- Utilization of personal monitors during work activities.
- Post safety signs and warning signs.

In addition, in the operation phase, training for workers will be conduct so that worker can respond to risks/failures and meet the operation procedures. An emergency and safety guideline will be prepared and disseminated to the workers for handling risks/failures occurring in the operation process, e.g risks of electric shock, fire, and explosion. Coordinate with the local authorities at commune, district levels to propagandize, disseminate knowledge of safety of the ROW to communities and residents living near the connection underground cable.

2. Community Health and Safety

136. Impacts*:*

- *Electric shock risk*: the community can be exposed to electric shock hazards as a result of direct contact with high voltage electricity or from contact with tools, vehicles, or other devices that come in contact with high-voltage electricity.

- *Exposure to Electromagnetic Field (EMF)*: The transmission frequency commonly used in transmission systems ranges from 50 Hz - 60Hz which is considered to be an extremely low frequency (IFC, 2007). Effects reduce with distance and electric fields also become shielded by trees, buildings, and other materials that conduct electricity. In general electric fields are the strongest close to the source and diminish with distance.

The subproject will be designed and constructed in compliance with regulations on technique and high voltage network, EMF must be ensured ≤ 5kV/m at any point outside the houses at the height of 1m from the ground and ≤ 1kV/m at any point inside the houses at the height of 1m from the ground meeting the regulations at Decree No. 14/2014/ND-CP.

Calculation result based on Japan's CRIMAG model, EMF intensity of unprotected 110kV charge carrier at distance of 7m in comparison with the carrier is 1kV/m. Thus, EMF intensity outside of the scope of 7m-radius from the 110kV transformer and round the substation is ≤ 1 kV/m. Furthermore, Tan Hung 110kV substation is rounded by fence, EMF intensity is measured, checked periodically each 6 months by the operation management unit as stipulated. So people living outside of the substation fence will not be impacted by EMF due to the substation operation.

137. Mitigation measures*:*

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

- Conduct earthing for the substation and the connection line.
- To ensure absolute safety, operators must comply with operation procedures and safety requirements;
- Provision of warning signs, anti-climbing boards, and anti-approach boards to the substation.
- Check earthing system of the substation and connection line as stipulated.
- Observe/Test EMF at resident's buildings round the substation and the connection line for treating appropriately if any complaint.
- Observe guidelines regarding minimum approach distances for excavations, tools, vehicles, pruning, and other activities when working around power lines and the substation.
- The entrance to all buildings, vaults, rooms, or enclosures containing exposed live parts or exposed conductors should be kept locked unless such entrances are under the observation of a qualified person at all times.
- Switchboards, panel boards, industrial control panels, meter socket enclosures, and motor control centres that are likely to require examination, adjustment, servicing, or maintenance while energized should be field marked to warn qualified persons of potential electric arc flash hazards.
- Equip with electromagnetic coats to staffs who have to work in areas with high electromagnetic field. Also, when working in areas with high influence of the electric field, operators must comply with standard on the allowable limits on industrial frequency EMF intensity;
- Fully equip labor protection instruments, compliance with regulations on working time in areas with high EMF intensity to ensure safety;
- Perform work shifts to ensure the time for contacting with the EMF in the specified limits.

To prevent impacts of EMF: The World Health Organization (WHO) reported that there is inconclusive evidence about substantive long-term health issues related to radiation emanating from low frequency electric fields at levels generally encountered by members of the public. The potential health effects associated with exposure to EMF is not well-established due to lack of empirical data demonstrating adverse health effects. However, the public should be warned about the safety distances from the transmission system and power lines through

warning signs and the restrictions on erecting any houses or buildings within the RoW and earth zone are to be enforced by operation unit.

3. Worker's waste and hazardous waste

138. Impacts*:* Domestic wastewater and rubbish of operational workers: wastewater is forecasted about 0.63m^3/day from 14 workers (who will work in shift). Components of the wastewater comprise SS, BOD/COD, N, P and microorganism. Rubbish from the workers will be approximate 4.2-5.6kg/day. Rubbish is one of easy disintegrated types and cause bad odor, unhygienic if it is not treated or disposed.

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

139. Mitigation measures*:* Wastewater will be released into septic tank under toilets within the substation. Rubbish will be collected into bins arranged around the working office, then it will be collected, transported and treated by specialized unit (e.g. HCMC Urban Environment Co., Ltd) hired by operation unit.

Transformer operation regulation, not allow to release oil in environment. This oil will be checked annually and filtered to continuous use. Oil will be only released when the transformer gets a risk, but it will be collected into the emergency oil tank built under the transformer. Waste oil and other hazardous waste will be collected, transported and treated by the specialized unit who has been permitted to operation in hazardous waste collection and treatment. The operation unit will be responsible for contracting with the specialized unit.

4. Climate change

140. Regional and Global Climate Change Modeling Project shows that 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 infilling to a grade that will be resilient to flooding associated from a 100 year storm. Similarly, the UGC transmission line will be designed to withstand long periods of overlying standing water from flooding.

VIII. GRIEVANCE REDRESS MECHANISM

141. 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 (Figure 4). 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 CPC of affected communes. The Commune PC will inform it to all Aps for their reference.

142. APs are entitled to lodge complaints regarding any aspect of affected environments, land acquisition 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.

143. An appointed Grievance Committee with environmental and social issues 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, and ADB upon request.

144. The procedures for grievance redress is defined below and summarized in Figure 4. 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.

i) Step 1: APs can lodge their grievance/complaint verbally or in written form to the Contractor/SPMB because initial environment issues will be most likely be construction-related. The Contractor/PMB is responsible for receiving, discussing, negotiating with the APs to solve their grievance/complaint 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) If no understanding or amicable solution can be reached or if no response is received from the Contractor/SPMB within 15 days from filing the complaint, the APs can elevate the case to the Ward/Commune People's Committee (CPC). The CPC wil respond within 15 days upon receipt of APs complaints. All meetings shall be recorded and copies of the minutes of meetings will be provided to APs.

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

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

v) Step 5: If the AP is still not satisfied with the decision of the HCMC People' Committee or in the absence of any response within the stipulated time, the APs, as a last resort may submit his/her case to the Court at City level. The court will address the appeal by written decision and submit copies to the respective entities which include the EA, PPC, DPC, CPC and the APs. If, however, the AP is still not satisfied with the City Court's decision, the case may be elevated to the court at higher level (the Higher Court).

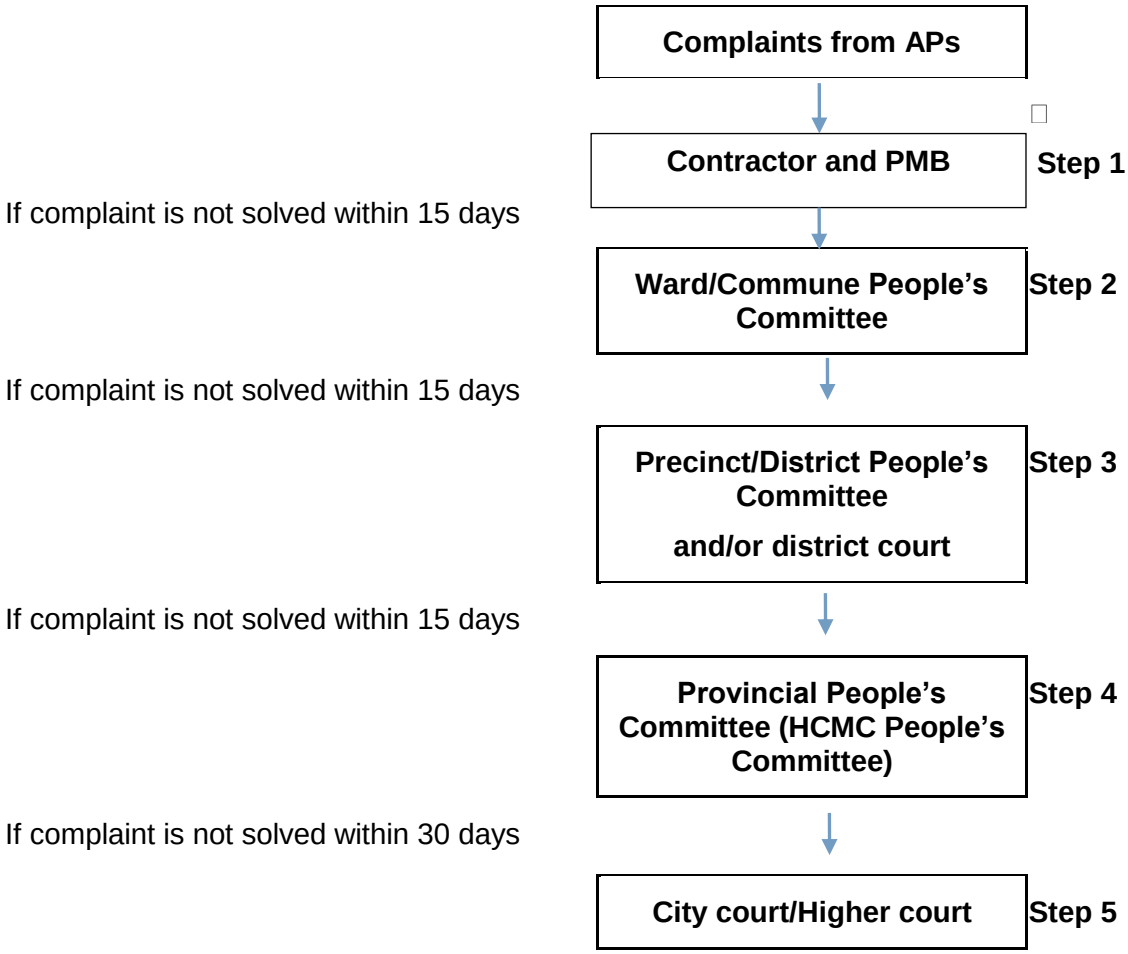


Figure 4. Public grievance redresses process

145. 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 redress unresolved grievances. Environmental specialists will provide the necessary training to improve grievance procedures and strategy for the members of the grievance committee when required.

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

147. If all efforts to resolve disputes under the grievance procedures remain unresolved or unsatisfactory, AHs have the right to directly discuss their concerns or problems with the ADB office in Southeast Asia through the ADB office in Viet Nam. If APs are still not satisfied with the responses of the ADB office in Viet Nam, they can directly contact the ADB Office of the Special Project).

IX. ENVIRONMENTAL MANAGEMENT PLAN

148. An EMP has been developed for the implementation of the 110 kV Tan Hung substation and connection line. 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.

149. 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.

150. Environmental impact mitigation plan has been developed based on each subproject activities with respective impact and mitigation measure. Also, the plan identifies the reports, responsibility of subproject's stakeholders as well as estimated cost for implementing mitigation measures. Detailed contents are shown in Table 17.

Table 17. Environmental Impact Mitigation Plan

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measure	Location	Timing	Activity reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
Pre-construction phase, detailed design								
Detailed designs, Update EMP, bidding document establishment	No impacts. But the activities will design and proposed mitigation measures for impacts during construction and operation phase	1. Work with PIC to oversee detailed design of project. Ensuring the following contents: a) Arrange the substation site transmission line direction to avoid cultural and historical heritages, and other sensitive areas; during the feasibility study, the project management board has to consulted Department of Industry and Trade of Ho Chi Minh City, the DPC of district 5 and district 8, CPC of ward 1 and ward 2 to agree upon the location of the substation and connection line. b) select HDD method for construction of the connection line's sections through Vo Van Kiet avenue and Te Canal. c) select transformer without PCB, design the depth to bury cable for ensure electromagnetic field not affect people health. 2. After feasibility study was approved, the PMB will notify the local authorities and people of activities and schedule of the subproject, so that they can organize their production and business suitably. PMB also coordinate in environmental protection monitoring, and notify the DoNRE the subproject commencement.. 3. State in bidding documents that contractor must have experience in EMP implementation, or provide staff with sufficient experience; bidding document and works contracts have to include provisions	Subproject location	Before the construction commencement	When designing details, establishing bidding documents, and when feasibility study is approved	No marginal cost	PMB/PIC	IA/EO of PMB PIC

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measure	Location	Timing	Activity reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
		that require contracts to comply with the mitigation measures suggested in IEE. 4. Ensure that the updated IEE contents are included in bidding documents, and requirements of EMP budget must be specified. PMB work with PIC to update IEE, including: (i) Review final subproject site to define existence of valuable historical or cultural resources. Updating and planning management historical or cultural resources if those are discovered during the project implementation. (ii) Identify new potential impacts of the subproject to include in the EMP with special attention to residential areas. (iii) Update mitigation measures and monitoring requirements in the EMP where necessary to protect affected environments. (iv) Submit updated EMP with new potential impacts to ADB for review 5. Ensure that the civil work contracts are included mitigation sub-plans of the EMP.						
Bidding document establishment	if terms of reference in the bidding documents of civil works and equipment supply contracts exclude provisions for environmental protection, it will	6. State in bidding documents that contractor must have experience in EMP implementation, or provide staff with sufficient experience; bidding document and works contracts have to include provisions that require contracts to comply with the mitigation measures suggested in IEE	Subproject location	Before the construction commencement	When establishing bidding documents	No marginal cost	PMB/PIC	IA/EO of PMB PIC

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measure	Location	Timing	Activity reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
	result in contractors will be not legally responsible for implementing prevention and mitigation measures as prepared in the IEE/EMP and detailed design							
UXO determine and clearance	No impact	7. For this subproject, the UXO detection item will not be implemented because Ho Chi Minh city High Command in December 2012 provide information that the subproject area used to be the substation of Cho Quan Power Plant before 1975 where was strictly protected by the old government, there has been no UXO existing in the subproject area.						
Land acquisition and compensation	No impact	8. The subproject's Resettlement Due Diligence Document has been clearly describe and resolved the impacts due to land acquisition and compensation.						
Construction site arrangement	No impact. This activity help to prevent or avoid impacts by disposal and civil works	9. The license for disposal will be obtained by contractors before commencing the subproject. PMB will supervise and include this requirement in civil work contracts. 10. Constructor will develop the transportation plan for equipment and material. 11. Constructor will arrange the temporary yards for stockpile and material gathering within in the 8-8bis area in order to avoid arising impacts due to land acquisition.	subproject site	Before the beginning of the subproject construction	01 time before the beginning of the subproject construction	No marginal cost	PMB/EO/PIC	Contractors

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measure	Location	Timing	Activity reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
		12. Constructor should obtain the license for safety and environment requirement of mobilized machines and vehicles.						
Environmental management capacity development and enhancement	No impact. This activity help to prevent or avoid impacts by training/education and help good management of environmental issues of the subproject	13. Develop and implement training plan on environmental management capacity and awareness enhancement and development for staffs of IA/EO/ES to be able to fully implement the EMP, and to manage implementation of mitigation measures by contractors 14. Develop and implement training plan for contractors in order to enhance/improve awareness of environmental protection and implement effective mitigation measures.	IA/EO office	From before the beginning of the subproject construction	01 time before the beginning of the subproject construction, 02 times afterward (if necessary) or after each event	No marginal cost	PIC	PIC
4. Construction Phase of Subproject								
Tree cutting and site clearance	Loss of vegetation and landscape deformation	15. Trees and other vegetation in all construction locations and along the traffic road are in need of protection, minimize cutting. 16. Regrow and protect trees and vegetation cover as much as possible. 17. Clear and return site, the temporary acquired areas for construction materials storage.	All construction locations	From the beginning to the completion of the subproject construction implementation	Monthly	Included in contract documents	PIC/EO	ES/Contractor
Noise, dust and exhausts due to construction activities and transport means	Noise, dust and exhausts generated by construction activities and transportation of materials, this will impact on ambient air environment	18. Transportation means, machines and equipment in list of means, machines and equipment to be obliged to register technique and environment safety must have effective certificate of environmental standards achievement issued by the register department. 19. Frequently water the construction sites,	All construction sites	Construction commencement (for license of means, machines, construction equipment) and during construction duration.	Monthly	Included in contract documents	PIC/EO	ES/Contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measure	Location	Timing	Activity reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
	quality	along construction material transportation roads. 20. All of means transporting construction materials and air dispose equipment must be maintained properly to minimize air waste, and not work at night if could not minimize noise. 21. Implement appropriately equipment, machines and vehicles maintenance. 22. Replace equipment, machines and vehicles causing large noise. 23. Build fence to temporarily avoid noise around the working area if possible.						
Concentration of workers and domestic wastes generated (domestic sewage and rubbish)	Generate domestic wastes causing environmental pollution; generate social problems, spread diseases	24. Arrange hygiene camps or hire residents' houses for workers' stay; hire mobile toilet with septic tank for camps, and put dustbins at camps for collecting domestic sewage, rubbish; 25. Contract with specialized unit to collect rubbish and treat adequately; 26. Worker camps must have adequate rainwater drainage system; 27. Local labors will be hired as much as possible to prevent or minimize influx of migrant workers, and incidence of social diseases and community chaos. 28. Examine periodically workers' health. 29. Manage and educate workers to enhance their awareness of environmental sanitation and health protection. 30. In order to minimize the risk of injury to the local residents and the workers, it needs	All worker camps	Throughout construction phase	Monthly	Included in contract documents	IA/EO	ES/contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measure	Location	Timing	Activity reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
		to comply with the GOV's regulations on Occupation, Safety, and public health, or the World Bank's Environment, Health, and Safety Guidelines (2007) that govern the safe and orderly operation of civil works should be followed. 31. Equip medicine cabinet for protecting workers' health in time. 32. Establish the specific food safety regulations for construction workers. 33. Construction units will implement temporary residence registration and provide accurate information about the quantity and stay time of all construction workers to CPCs within the project area during the construction phase. They should also establish the relationship with the local authorities to discuss and take decisions necessary for their management. 34. Require workers not to take part in or cause social evils; any contravener shall be strictly treated in accordance with laws. 35. Establish rules in camp. Propagandize, educate workers and create good relations with local people in order to avoid conflicts arising. HIV/AIDS education should be given to workers. 36. Require workers to respect and not to violate the cultures, habits and customs, religious beliefs, historical and cultural parks, pagodas, and temples in the localities. 37. Make a good relationship and proper coordination with the local authorities to						

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measure	Location	Timing	Activity reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
		manage their workers. 38. PMB will be responsible for including these requirements in the contract documents						
Solid waste (refused rock and soil, debris) and hazardous waste, from excavation, site clearance and civil works (generated by rock and soil filling and excavation for cable trenches, and equipment, devices, machines and transportation means)	Cause soil and surface water pollution by refused rock and soil, debris, hazardous wastes	<u>Solid waste treatment</u> 39. Maximum salvage excavated soil at the construction locations according to excavation and filling balance method. Part of refused soil and rock; refused and dropped construction materials must be classified in-stitu, salvaged for reusing or selling. 40. At the construction site, it is needed to have big recycle bin for collecting construction waste. 41. Contractors hire local competent unit for collecting excavated and construction waste and transporting to suitably treat.. 42. If excavated soil is suspected contamination, it must be tested, and disposed in designated sites and identified as per local regulations. <u>Hazardous waste treatment</u> 43. For waste grease, oil: implement equipment, machines and vehicles repair and maintenance at local garage. Waste grease, oil will be collected to treat at this garage as stipulated. 44. Other hazardous wastes must be collected into sand tank kept temporarily at the construction site, then hiring competent unit for transporting to treat in accordance with current regulations.	All construction sites	Throughout construction phase	Monthly	Included in contract documents See monitoring plan	IA/EO	ES/contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measure	Location	Timing	Activity reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
Construct drainage system and rain water pumped from foundation pits	Deposit mud sand; reduce suspended solids in surface rainwater and water pumped from the foundation pits; Prevent rainwater and water pumped from the foundation pits from overflowing on the ground	45. For *domestic water:* Contractors have to arrange hygiene camps or hire residents' houses for workers' stay; hire mobile toilet with septic tank for camps for collecting and treating domestic sewage; propagandize, educate awareness of environmental sanitation for workers; use many local labors as possible as to reduce migrant labors. 46. *For rainwater and construction waste:* Temporarily arrange the drainage system of rainwater, water pumped from foundation pit at construction sites to prevent standing water and local flood., deposit mud sand, suspended solids in rainwater, water pumped from foundation pits before pumping into environment. Manage to not allow soil, sand flowing into water source. 47. Ensure that path leading to surface waters (ponds, channel, and canal) is maintained and/or enhanced to sustain existing storm water storage capacity. Protect surface waters from silt and eroded soil. 48. Contractors should contract with a garage area near subproject area (district 5 or 8) to implement equipment services, refueling, and wash down. The maintenance area/garage should be provided with oil and grease traps/oil collection system to prevent oil from being washed into the offsite drainage canals	All construction sites.	Design and construction phase	Monthly	Included in contract documents	PIC/EO	ES/contractor
Construction materials transportation, and constructing sections	Damage road surface, traffic accidents, increase in traffic	49. Contractors will also advise communities of upcoming construction activities and the effects that it may have on traffic volumes. Contractors will also ensure	All construction sites.	Throughout construction phase	Monthly	Included in contract documents	PIC/EO	ES/contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measure	Location	Timing	Activity reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
through roads	activities, damage to roads, traffic disruption	that access is not to be impeded by construction operations to residences. 50. Arrange suitable transportation time. Avoid concentrate transportation in rush-hours. 51. Speed limits for transportation vehicles for construction. 52. If possible, heavy vehicles for construction should use another route, another lane, not using route/lane with many people. 53. Use special purpose trucks when transporting oversize and overweight equipment; transport with designed load in order to avoid collapse and damage surface road. 54. Recover, repair, upgrade the roads if damages caused by the project. 55. Horizontal directional drilling method will be applied to construct the sections crossing over Vo Van Kiet avenue and Te canal.						
Construction of the underground cable within the existing Chanh Hung substation; and connection to the national grid system	Impacts on the existing Chanh Hung substation's power supply and production activities, and the substation operators	56. Coordinate with management unit of the Chanh Hung substation to cut off power to ensure safety during connecting the subproject to the national grid system. 57. Inform people for their life and production arrangement before cut-off power. 58. Prepare readily all things for connecting to the power grid system in order to cut-off power duration of Chanh Hung substation is minimum.	The existing Chanh Hung substation's power supply and production activities, and the substation operators	Throughout the construction process of the underground cable within the existing Chanh Hung substation	Monthly	Included in contract documents	PIC/EO	ES/contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measure	Location	Timing	Activity reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
Construction of the substation and the connection line (the underground cable)	Impacts on urban landscape	59. Clear refused filled and excavated soil and construction materials every day at the construction sites, especially the construction sites is near the traffic roads. Clear, level, compact and return the impacted locations to the initial status right after completing construction	All construction sites.	Throughout construction phase	Monthly	Included in contract documents	PIC/EO and Utility company	ES/contractor
Occupational health and safety of workers	Worker injury and health	60. Health and safety plan (HSP) will be prepared and implemented by the contractor. 61. All workers will be examined health, especially people working at height, and equipped sufficiently labor protection tools such as hard hats, safety gloves, safety belt, ear protection etc. This must be strictly imposed. 62. All construction equipment, tools will be carefully examined for quality and quantity before used. 63. For people working at height: must comply with requirements for working at height as proposed. 64. Carefully check boom guy, cable clip before load heavy objects. 65. For underground cable trench and foundation excavation: - Strictly implement safety measures while excavating foundation pits. - Apply measures to consolidate the slope of underground cable trench and foundation pits	All construction sites.	During construction phase	Monthly	Included in contract documents	PIC/EO	ES/contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measure	Location	Timing	Activity reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
		in dangerous positions during construction; 66. Use suitable means of transport. Check the load of the vehicles before use, fasten and comply with safety regulations on transportation. 67. Strictly comply with safety norms for installation of electrical equipment and relative regulations. 68. Workers conducting transport and installation of electrical equipment must understand regulations on installation and transport safety of electrical equipment. 69. Use specialized tools and devices to anchor, fasten electrical equipment during movement and installation process. Not use steel wires, cables, chains to tie the insulation parts, the connectors of the base holes. 70. Before switching on power to test the power grid and electrical equipment, it must stop relative all works and people not on the duty must go out of the danger area. 71. Fuse of the electrical networks connected to electrical equipment which will be installed must be disconnected during the connection time. Fuse is only closed to adjust the equipment after everyone is in a safe location. 72. Substation, towers, steel structures and equipment must have earthing system. Contractors will prepare emergency						

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measure	Location	Timing	Activity reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
		measures on time. When accident occurs, conduct in-site first aid, then quickly drive the wounded to hospital for treatment. It must keep a phone number of the nearest hospital to call ambulance. Besides, it must be equipped medicine cabinet for aid. 73. As existing commune health services are unable to accommodate additional patients from the construction workforce, the contractor will be required to provide first-aid facilities for the workers. At least one trained first-aid worker should be available at each construction camp. 74. PMB will be responsible for including these requirements in the contract documents.						
Community health and safety	Local people injury and health	75. Civil contractor will be required to develop a community health and safety plan 76. Set up warning boards to warn people. 77. Installation of lightning protection systems in the substation and the UGC as stipulated. 78. When fire occurs due to electricity, first notice immediately to authorized unit to cut off power, then comply with the procedures of fire fighting. 79. Coordinate with the local government of district and commune to propaganda and disseminate knowledge about safety of the ROW of the substation and the UGC to	All construction sites.	During construction phase	Monthly	Included in contract documents	PIC/EO	ES/contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measure	Location	Timing	Activity reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
		communities living near these areas. 80. Implementation of these measures will be the responsibility of the contractor. PMB will be responsible for including these requirements in the contract documents.						
Detect cultural and historical properties or values	Avoid damage to cultural and historical properties or values	81. Chances of detection of valuable relics and cultural values should be anticipated by contractors, especially during excavation process. Site supervisors should be on the watch for finds. 82. When detection of valuable relics and cultural values, stop immediately all work, untouched to anything of them. And EA/IA informs the authorized agency (DoCST) to determine their value and treat appropriately. 83. Work at the found site will be stopped until DoCST allows to be continued working.	All construction sites	At the beginning, and throughout construction phase	Monthly	Included in contract documents	PIC/EO	ES/Contractor
Repair, restore, return the ground after construction completion	Mitigate impacts on environment after construction	84. Repair, recover, and return the road sections, culverts, drainage system and public infrastructures damaged by underground cable construction. 85. Clear, level and restore the ground after construction completion. Grown trees in temporarily acquired areas.	All construction sites.	Throughout construction phase until the project is put into operation	Monthly	Included in contract documents	PIC/EO	ES/contractor
Post-construction of subproject								
Operation Phase								
Operation of substation and connection underground cable	Risk of occupational accidents for operators	86. Some of the prevention and control measures when working with electrical systems: (i) Restricting access to electrical equipment	Within the area of substation and along	Fulltime	Biannual	Operation and Management cost	HCMC high voltage Company	

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measure	Location	Timing	Activity reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
		except workers who are trained and certified to work on electrical equipment. Properly limit time for contacting with EMF for trained workers. (ii) Adherence to electrical safety standards. (iii) Proper grounding transmission line. (iv) Provision of PPE for workers, safety measures, personal safety devices, and other precautions during maintenance work or i working in close proximity to the TL. (v) Periodically measuring electric field under the provisions of Electricity industry. 87. Follow safety measures when working at height during maintenance and repair electric equipment in the substation, particularly: (i) All workers will be examined health for working at height, equip sufficiently labour protection tools and cloths. (ii) Workers who climb on towers will have Safety Certificate of Class 3 or above and sufficient conditions for working at height Safety belts will be attained used standard of the nearest inspection, not exceed over 6 months. During movement and working at height, workers will wear safety belts and the safety leather belts must be tightly tied with the tower. (iii) All equipment, tools and means will be carefully examined for quality and quantity before used. It should carefully check the suspending cables before climbing on the	connection underground cable					

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measure	Location	Timing	Activity reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
		tower. (iv) Not permitted to work at height when it is going in night; it has fogs; it has strong wind with above class V. 88. Occupational EMF exposure will be minimized through the implementation of an EMF safety program that includes: (i) Identification of potential exposure levels in the working area including survey of exposure levels and establishment of safety zones (ii) Properly limit time for contacting with EMF for trained workers as stipulated and those equipped with appropriate PPE when entering safety zones. (iii) Utilization of personal monitors during work activities. (iv) Post safety signs and warning signs. 89. In addition, in the operation phase, training for workers will be conduct so that worker can respond to risks/failures and meet the operation procedures. An emergency and safety guideline will be prepared and disseminated to the workers for handling risks/failures occurring in the operation process, e.g risks of electric shock, fire, explosion. Coordinate with the local authorities at commune, district levels to propagandize, disseminate knowledge of safety of the ROW to communities and residents living near the connection underground cable.						
	Health and safety of citizens and local	90. To prevent electrocution hazards, HCMC high voltage Company will	Within the area of	Fulltime	Biannual	Operation and Management	HCMC high voltage Company	

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measure	Location	Timing	Activity reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
	communities	implement the following: (i) Conduct earthing for the substation and the connection line. (ii) To ensure absolute safety, operators must comply with operation procedures and safety requirements; (iii) Provision of warning signs, anti-climbing boards, and anti-approach boards to the substation. (iv) Check earthing system of the substation and connection line as stipulated. (v) Observe/Test EMF at resident's buildings round the substation and the connection line for treating appropriately if any complaint. (vi) Observe guidelines regarding minimum approach distances for excavations, tools vehicles, pruning, and other activities when working around power lines and the substation. (vii) The entrance to all buildings, vaults rooms, or enclosures containing exposed live parts or exposed conductors should be kept locked unless such entrances are under the observation of a qualified person at all times. (viii) Switchboards, panel boards, industrial control panels, meter socket enclosures, and motor control centres that are likely to require examination, adjustment, servicing, or maintenance while energized should be field marked to warn qualified persons of	substation and along connection underground cable			cost		

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measure	Location	Timing	Activity reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
		potential electric arc flash hazards. (ix) Equip with electromagnetic coats to staffs who have to work in areas with high electromagnetic field. Also, when working in areas with high influence of the electric field operators must comply with standard on the allowable limits on industrial frequency EMF intensity; (x) Fully equip labor protection instruments compliance with regulations on working time in areas with high EMF intensity to ensure safety; (xi) Perform work shifts to ensure the time for contacting with the EMF in the specified limits. 91. To prevent impacts of EMF: the public should be warned about the safety distances from the transmission system and power lines through warning signs and the restrictions on erecting any houses or buildings within the RoW and earth zone are to be enforced by operation unit.						
	Domestic waste from workers and hazardous wastes.	92. Wastewater will be released into septic tank under toilets within the substation. Rubbish will be collected into bins arranged around the working office, then it will be collected, transported and treated by specialized unit (e.g. HCMC Urban Environment Co., Ltd) hired by operation unit. 93. Transformer operation regulation, not allowed to release oil in environment. This oil will be checked annually and filtered to continuous use. Oil will be only released when the transformer gets a risk, but it will be	The substation	Fulltime	Biannual	Operation and Management cost	HCMC high voltage Company	

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measure	Location	Timing	Activity reporting	Estimated Cost (USD)	Responsibility	
							Supervision	Implementation
		collected into the emergency oil tank built under the transformer. Waste oil and other hazardous waste will be collected, transported and treated by the specialized unit who has been permitted to operation in hazardous waste collection and treatment. The operation unit will be responsible for contracting with the specialized unit.						

A. Institutional Arrangements and Responsibilities

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

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

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

154. The responsibilities of the EA/PO with support from EVN include:

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

155. The responsibilities of the EO of IA include:

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

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

156. The responsibilities of the PIC are:

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

157. The responsibilities of Environmental Staff (ES) of Contractor include:

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

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

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

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

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

B. Monitoring Plan

161. The environmental monitoring plan for the EMP is provided in Table 18. 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.

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

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

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

C. Performance Monitoring

165. Performance monitoring is required to assess the overall performance of the EMP. A performance monitoring system is normally developed by the EA for the subproject. Select indicators of major components of the environment that will be affected primarily by the construction phase are drawn from the mitigation and monitoring plans and summarized in Table 19.

D. Reporting

166. Regular reporting on the implementation of mitigation measures and on monitoring activities during construction phase of the subproject is required. Reporting is the responsibility of IA/EO and should be conducted in conjunction with regular meetings with stakeholders as part of the continuation of stakeholder communications. The mitigation and monitoring plans (Tables 17 and 18) summarize proposed timing of reporting.

167. A report on environmental monitoring and implementation of EMP will be prepared quarterly for the EA by the IA/EO. The IA report will compile monthly reports provided by the ES of contractor, the reports of the EMC on monitoring, and input from the international and national environmental specialists of the PIC. The IA/EO report will also be sent semiannually to ADB. The reports will table all indicators measured with the monitoring plan of EMP including performance monitoring indicators (Table 19), and will include relevant environmental quality standards as regulation.

Table 18. Environmental monitoring plan

Environmental Indicators	Location	Means of Monitoring	Frequency	Reporting	Responsibility		Estimated Cost (USD)
					Supervision	Implementation	
Pre-construction Phase							
Update where necessary baseline on sensitive receptors (e.g., cultural property and values, new schools or hospitals, rare/endangered species, critical habitat along the ROW and the substation area	A. ROW B. Substation	Original field work, community consultations	Once	Once	PIC/PMB	PMB (Monitoring Consultant)	$ 1,000.
Construction Phase							
A) Air quality: dust, CO, NO_2, SO_2, noise B) Affected surface water quality: pH, TSS, oil and grease, COD, BOD_5, NO^-_3, PO_4^{3-}, Coliform C) Domestic solid waste (worker) and construction solid waste inside and outside construction sites including worker camps. D) Public comments and complaints. E) Incidence of worker or public accident or injury.	A) 02 positions; one in substation and the other in the UGC. B) 01 position at Te canal. C) All construction sites and worker camps. D) Using hotline number placed at construction areas. E) At all construction areas.	A-B: Using field and analytical methods in accordance with current regulations. Include visual observations of dust and noise from contractor and public reports. C) Visual observation. D)Information transferred by telephone hotline number posted at all construction sites. E) Regular reporting by contractors/PMB.	(A - C): Once per 3 month D) Continuous E) Continuous	monthly	(A - C):		
					PMB	PMB (Monitoring Consultant)	A & B: $ 1,500 C: $350
					(D & E) observation		
					PMB	Contractor	D&E: $200
Operation phase							
Domestic solid waste of the operators and hazardous waste from the substation operation	The substation location	Visual observation, regular reporting of the substation operation management unit	Each 3 months	Biannual	EVNHCM		O&M cost
Incidence of worker accidents, or maintenance of the ROW	The substation and the UGC	Regular documentation and reporting	Continuous		EVNHCM		O&M cost
Electromagnetic field monitoring	In the Substation and along the UGC	Equipment for measuring electromagnetic field	Biannual	Biannual	EVNHCM		

Table 19: Performance Monitoring Indicators for the Subproject

Activities of the subproject	Mitigation activities	Key Indicator	Performance Objective	Data Source
Pre-construction Phase				
Detailed designs, update EMP, bidding document establishment, the project approval and submission	Mentioned in Table 17	Design documents; Updated EMP Requirements of EMP (SEMP).	All mitigation measures are considered during detailed designs. All stakeholders contacted during IEE re-contacted for follow-up consultation EMP appended to bidding documents with clear instructions to bidders for SEMP	Design documents EMP Bid documents
Bidding document establishment	Mentioned in Table 17	provisions of environmental protection in bidding document	contractor must implement EMP during construction work	
Land acquisition and compensation	Mentioned in Table 17	Mentioned in RDD	Mentioned in RDD	RDD
Construction site arrangement	Mentioned in Table 17	- License of disposal. - Transportation plan. - Location of temporary area for stock pile and material gathering. - License for safety and environment ensure of vehicles/machines.	By end of pre-construction phase, meeting with contractors to check licenses and observation in the construction site for checking the arrangement.	Monitoring by PIC/PMB
Training of PMB/EO	Mentioned in Table 17	Training course(s) and schedule.	By end of pre-construction phase, required course(s) that will be delivered are designed and scheduled.	Course(s) outline, participants, and schedule
Construction Phase				
Tree cutting and site clearance	Mentioned in Table 17	- Implemental protection measures for trees and other vegetation. - Implemental measure cut down trees and other vegetation. - Implemental measure clear and return site, the temporary acquired areas for construction materials storage. Important habitat, rare or endangered species if presenting during tree cutting and site clearance.	Trees and other vegetation in all construction locations. All present critical habitat and rare and endangered species if unchanged, and unharmed.	Monitoring by EMC

Activities of the subproject	Mitigation activities	Key Indicator	Performance Objective	Data Source
Noise, dust and exhausts due to construction activities and transportation means.	Mentioned in Table 17	Dust, CO, NO_2, SO_2, noise levels meet Vietnamese standards	The content must not exceed the level at pre-subproject. Comply with mitigation measures for water quality mentioned in table 15	EMC and monitoring report of contractors
Concentration of workers and domestic wastes generated (domestic sewage and rubbish)	Mentioned in Table 17	Residential register of workers. Food safety regulations. Educating and training about health protection and hygiene for workers. Hygiene situation, availability of toilet and waste basket. Rainwater drainage system in worker camps. Compliance with the regulations on Occupation, Safety, and public health. Examine periodically workers' health. Measures for health protection for workers. Worker management and coordination with the locality for managing workers Affected surface water quality (pH, TSS, oil and grease, COD, BOD_5, NO_3^-, PO_4^{3-}, Coliform) due to domestic sewage from workers	- Rigorous program of procedures to manage worker's camp, including rigorous program of procedures to manage and store all domestic waste from workers' life activities. - Meet the GoV environmental standards and criteria. Comply with mitigation measures for water quality.	EMC and contractor monitoring reports
Construct drainage system of rainwater, pump water from the foundation pits	Mentioned in Table 17	Affected surface water quality (pH, TSS, oil and grease, COD, BOD_5, NO_3^-, PO_4^{3-}, Coliform)	Meet the GoV environmental standards and criteria. Comply with mitigation measures for water quality	EMC and contractor monitoring reports
Solid waste (refused rock and soil, debris) and hazardous waste, from excavation, site clearance and civil works (generated by rock and soil filling and	Mentioned in Table 17	Solid waste and liquid waste treatment system Hazardous waste: Oil, gasoline, grease collection and treatment license	- Rigorous program of procedures to manage and store all waste from construction camps and sites practiced, and manage earthworks. - Rigorous program of procedures to manage and store all waste from sites practiced.	EMC and contractor monitoring reports,

Activities of the subproject	Mitigation activities	Key Indicator	Performance Objective	Data Source
excavation for cable trenches, and equipment, devices, machines and transportation means)				
Construction materials transportation, and storage	Mentioned in Table 17	Frequency of disruptions and blocked roadways is reduced Maintenance and operation method of equipment, machines, and vehicles	Disruptions, stoppages, or detours are managed to absolute minimum	Public input, contractor and EMC reports
Construction of the underground cable within the existing Chanh Hung substation; and connection to the national grid system	Mentioned in Table 17	Duration of cut-off power Methods and preparation for connecting the subproject to the national grid system	Minimized time of cut-off power, impact on the existing Chanh Hung substation's power supply and production activities, the substation operators, and local people life and production activities due to cut-off power for connecting the power gird	EMC and contractor monitoring reports
Construction of the substation and the connection line (the underground cable)	Mentioned in Table 17	Clear refused filled and excavated soil and construction materials. Clear, level, compact and return the impacted locations to the initial status right after completing construction	Minimize impact on urban landscape.	EMC and contractors monitoring reports
Public and workers health and safety of community	Mentioned in Table 17	Frequency of injuries are reduced	Adherence to the GoV occupational health and Safety regulations	Contractor reports
Detect cultural and historical properties or values	Mentioned in Table 17	Cultural and historical properties are conserved	No valued cultural property, or unearthed valuable relic is harmed in any way	Public input, and contractor reports
Environmental recovery (repair, restore, return the ground) after construction completion	Mentioned in Table 17	Remain construction materials at the site are collected Construction solid waste; un-clearance of worker camp etc. are cleaned.	Recovery of construction site; remove construction solid waste; clean worker camp etc.	Site observation; Contractor and EMC monitoring reports
Operation Phase of Substation and UGC				
Worker and Public Safety	Mentioned in Table 17	Frequency of accidents, and spills Electromagnetic field monitoring	No increase in pre-construction frequency	EVNHCMC

Activities of the subproject	Mitigation activities	Key Indicator	Performance Objective	Data Source
Environmental hygiene in the subproject area	Mentioned in Table 17	Collection of rubbish, sewage and hazardous waste	Hygiene and clean have to be ensured. Hazardous waste has to be collected, treated as stipulated.	EVNHCMC

X. ESTIMATED COST OF EMP

168. The costs for implementing the EMP are primarily for environmental monitoring because the costs for implementing impact mitigation measures are included with the construction costs in contractor bidding documents. From Table 16 the preliminary cost for the implementation of the EMP for the subproject including an estimated environmental training budget for EVN*HCMC*/PMB is approximately USD $4,050.0 which is summarized in Table 20

Table 20: Estimated costs for Environmental Monitoring Plan of EMP

Activity Type	Estimated Cost (USD)
Pre-construction phase	
Updating Environmental Baseline	
Cultural receptors	$ 1,000.00
Inspecting site clearance	including in consultancy cost
Construction Phase	
Inspecting environmental quality	$ 1,500.00
Inspecting environmental compliance	$ 550.00
Operation Phase	
Inspecting environmental quality (electromagnetic measurement)	O&M cost (average $1,000.00 per year)
Training and capacity development of EVN*HCM* / PPBM / EO	$ 1,000.00
Total	**$ 4050.00**

169. The environmental costs in Table 20 are for field sampling and laboratory analyses which include professional per diems of technicians.

170. An estimated budget of USD $1,000.00 is required for training of the PO/PMB/EO 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 PMB/EO during the pre-construction phase.

XI. INFORMATION DISCLOSURE AND PUBLIC CONSULTATION

A. Public Consultation

171. A public consultation strategy with the stakeholders was established to meet the requirements of the consultant as stipulated by the SPS (2009). This strategy embodied the principles of meaningful, transparent and comprehensive consultation to ensure that affected people groups and fragile people groups such as women and poor people, were given equal opportunities to participate in the design of the subproject.

1. Identification of Stakeholders

172. Stakeholders were identified and participated in consultation. Communication with Stakeholders focused on the affected organizations and communities, and persons directly affected by the proposed subproject. The stakeholders of the subproject include

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

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

2. Public consultation meeting

174. Formal community consultation meetings were held to discuss the location and impact of the transmission line and substation for both environmental and social aspects. Public consultations were held in Ward 1 - District 5 on June 01st 2015 with 03 participants; and Ward 2 - District 8, HCMC in August 7th 2012 with 03 participants.

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

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

176. During the meeting people raised their questions and comments on the environmental issues. PECC4's consultants answered and explained all questions to the participants. Mostly the raised concerns relating to traffic due to the subproject not required compensation.

177. The participants of the public consultation meeting included Commune leaders, representatives of affected persons. The list of participants is attached in the Minutes of Public Consultation Meeting in Appendix B.

3. Results of Public consultations

178. Comments/questions of the local authorities/people include as in Table 20:

Table 20. Summary of feedbacks/ questions of the local authorities and people, Project Owner's /Consultant's answer, and project's response

Meeting place and time	Comments/questions of the local authorities and people during the public consultation meetings	Project Owner's/ PECC4 Consultant's answer	Project Response (issues are addressed by EMP)
Ward 1, District 5 dated June 01st, 2015	**** Comments on negative environmental impacts and mitigation measures***: - The PO should closely coordinate with local authorities for well managing workers, avoiding conflicts between workers and local people.	Agreed. The PO shall refer this issue in bidding documents required contractor to implement measures mitigating environmental impacts, including strictly managing construction workers, ensuring safety during construction.	EMP already provided mitigation measures when concentrating mass construction workers at Table 15.
	- It should check electromagnetic field strength for avoiding impacts to people during operation.	Agreed. It shall be strictly implemented by the PO. Following provisions at Decree No. 14/2014/ND-CP dated February 26, 2014.	EMP already provided mitigation measures for these impacts during operation phase at Table 15.
	- The PO should recover incidents, repair roads if any damages during construction and operation.	Agreed. The PO and Contractor shall repair, recover any damages caused by the subproject.	EMP already provided mitigation measures for these impacts during construction and operation phase at Table 15.
	**** Comments on land acquisition, compensation and resettlement plan***: - The PO should implement following existing regulations of Viet Nam. - The PO should coordinate with locality to handle grievances, complaints if any.	Agreed. The PO commits to handle grievances, complaints satisfactorily, suitably with laws of Viet Nam.	IEE already provided in Item IX.
Ward 2, District 8 dated August 07th, 2012	- The PO is requested to fully implement provisions in accordance with Environmental law dated November 29, 2005 of the GOV; fully implement provisions in accordance with Decree No. 29/2011/ND-CP dated April 28, 2011 on "Providing on strategic environmental assessment, environmental impacts assessment, environmental protection commitments" of the GOV and other regulations.	Agreed. The PO commits to follow Environmental law 2014 (replacing for Environmental protection law 2005) and decrees, circulars.	EMP provided that the PO, construction contractor shall strictly follow Environmental protection law and other related documents when implementing the subproject.

	- The subproject shall not implement site clearance, not effect to HHs surrounding the subproject area but it will affect to traffic activities because the T/L crossing through Vo Van Kiet avenue therefore it is proposed to have suitable construction method to mitigate traffic jam on this route.	Agreed. The PO, construction contractor commit to have suitable construction method to mitigate traffic jam on Vo Van Kiet avenue.	EMP provided these mitigation measures in construction and operation phase at Table 15.

B. Information disclosure

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

180. 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 EVN*HCMC* website, at the EVN*HCMC* 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.

181. The people's committees of Ward 1-district 5 and ward 2-district 8, and affected people were received the draft IEE in Vietnamese version during the public consultation process. The final IEE (after receiving the letter of No objection from ADB) will be translated into Vietnamese language, then send to each ward people's committees for disclosure. By doing this, local people and local authorities can easily refer the final IEE.

XII. EMERGENCY RESPONSE PLAN

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

XIII. INSTITUTIONAL CAPACITY REVIEW AND NEEDS

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

184. 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

185. The initial examination of the 110kV substation and connection line subproject in HCMC indicates that potential environmental impacts are construction-related impacts and that can be mitigated and managed.

186. 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).

187. 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

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APPENDICES

Appendix A: Rapid Environmental Assessment (REA) Checklist

Appendix B: Minutes of Public Consultation Meetings

Appendix C: Emergency response plan

Appendix D: Vietnamese EIA certificate

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

Component: 110kV Tan Hung Substation and connection line – Stage 2

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Cultural heritage site		X	No cultural heritage in the project area.
▪ Protected Area		X	
▪ Wetland		X	
▪ Mangrove		X	
▪ Estuarine		X	
▪ Buffer zone of protected area		X	
▪ Special area for protecting biodiversity		X	
▪ Canal system	X		Going underground at a depth of 11m from canal bottom section which adjacent to Te canal - Doi canal - Tau Hu canal - Ben Nghe arroyo
B. Potential Environmental Impacts **Will the Sub-project cause…**			
▪ Encroachment on historical/cultural areas, disfiguration of landscape and increased waste generation?		x	The subproject will not affect local historical-cultural sites. Project owner and contractor will seriously implement mitigation measures for minimizing waste during 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		x	There is no river, stream flowing through the subproject area.

Screening Questions	Yes	No	Remarks
increased sediment in streams affected by increased soil erosion at the construction site?			The underground line route lies underground at a depth of 11m from canal bottom section which adjacent to Te canal - Doi canal - Tau Hu canal - Ben Nghe arroyo.
▪ damage to sensitive coastal/marine habitats by construction of underwater cables?		x	There is no underwater cable by the subproject area.
▪ Deterioration of surface water quality due to silt runoff, sanitary wastes from worker-based camps and chemicals used in construction?	x		Construction waste water is discharged into the surface water; the turbidity parameter of water is raised by that. The mitigation measures will be implemented
▪ Increased local air pollution due to rock excavation and filling, crushing?		x	There is no rock excavation and filling, crushing for constructing the subproject. Only use rock for concrete and preventing from collapse with 4 x 6 dimensions.
▪ Risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?	x		To minimize potential risks, an Occupational Health and Safety Plan (OHSP) will be developed and implemented.
▪ Chemical pollution resulting from chemical clearing of vegetation for site clearance?		x	No use chemical clearing of vegetation
▪ Noise and vibration due to blasting and other civil works?		x	Minor impact level due to noise and vibration occurred during movement of construction vehicles along access road in construction phase. There is no mining activity.
▪ Dislocation or involuntary resettlement of people?		x	Only a part of the submarine cable route affects soil, planned land, and the rest mostly goes under the roadway, sidewalk. There is not affected household
▪ Dis-proportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		x	There are not ability happening. The social impact assessments are implemented separately.
▪ Social conflicts relating to inconveniences in living conditions where construction interferes with pre-existing roads?	x		Small impact. The construction of underground cable routes on roadways and sidewalks, will hinder traffic. However the mitigation measures have been launched with high feasibility such as: finish construction of each section completely, put signboards, barriers down; clearing the site daily to ensure traffic is returned to normal temporarily, repair roadbed damaged after construction.
▪ Hazardous driving conditions where construction interferes with pre-existing roads?	x		Small impact. Digging cable trench, cabling vault on roadways, sidewalks could cause traffic accidents to people in traffic. However, mitigation and ensured safety measures will be taken seriously, like fencing, placing speed control signs,

Screening Questions	Yes	No	Remarks
			regulating traffic...
▪ Creating a favorable environment for mosquito and harmful insects developing?		x	There are no water pools for a long time by subproject. Site always are cleaned and reinstated after the complete work.
▪ Dislocation and compulsory resettlement of people living in right-of-way of the power transmission lines?		x	The project will only construct underground cable along the roads and empty land, not cut through houses.
▪ Environmental disturbances concerrned about the maintenance of TLs (e.g. cutting down trees under the ROW)?		x	The connection line route of the project is underground line, therefore in the process of development and maintenance there is no need to cut trees.
▪ Facilitation of access to protected areas in case the TL traverse protected areas?		x	There are no protected areas in subproject area.
▪ Disturbances (e.g. noise and chemical pollutants) if herbicides are used to control vegetative height?		x	The herbicide is not used.
▪ Large population influx during project construction and operation that cause increased burden on social infrastructure and services (such as water supply and sanitation systems)?		x	The proposed labour is 40 people. The houses of local people will be employed for living so that the hygiene system and water supply system are not built.
▪ Social conflicts if workers from other regions or countries are hired?	x		Hiring workers to the subproject construction site can cause some impacts on local communities. For mitigation, contractors will be given preference to employ labour who is the local people.
▪ Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?	x		There are no workers camps are built but hired local houses. Diseases can communicate. The hygiene area of hired local houses can not ensure. The Contractor shall implement measures to ensure the hygiene and health of workers and local people.
▪ Risks to community safety associated with maintenance of lines and related facilities?	x		The risk from operation is rarely happen. A safe plan are prepared and implemented by operation unit.
▪ Community health hazards due to electromagnetic fields, tower fall down, lightning, land subsidence, lowered groundwater?	x		The impact is very small. Underground cables are designed according to current standards so electromagnetic fields do not affect the public health. Cable tunnel subsidence risk can occur if heavy vehicle traveling on the road is not properly defined, or by the construction of Infrastructure. However, most of cables go under sidewalks, roadways, canals so the likelihood of incident is very small.
▪ Dangerous to health and public safety due to transportation, storage and use and / or handling materials such as explosives, fuel and other chemicals during construction and operation?		x	There are no transport, use, store and disposal of materials such as explosives for the subproject. The petrol using for machines, equipments and transport that will be bought at the depot in area, that

Screening Questions	Yes	No	Remarks
			are not stored and transported.
▪ Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the subproject (e.g., substation, underground cable) could result in injury to the community throughout project construction, operation and decommissioning?	x		Low risk level. These risks may be happened only at locations of the substation but that 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 The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks.	Yes	No	Comments
▪ Is the Subproject area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes?	x		The subproject area has been suffered by local flood due to rain (flooded level about 20-30 cm). This is because of the effects of the urbanization process in the region. Also, the area has elevation about 5-10m which can be affected by tides and sea water level rises due to climate change.
▪ Could changes in precipitation, temperature, salinity, or extreme events over the Subproject lifes pan affect its sustainability or cost?		X	
▪ Are there any demographic or socio-economic aspects of the Subproject area that are already vulnerable (e.g. high incidence of marginalized populations, rural-urban migrants, illegal settlements, ethnic minorities, women or children)?		X	
▪ Could the Subproject potentially increase the climate or disaster vulnerability of the surrounding area (e.g., increasing traffic or housing in areas that will be more prone to flooding, by encouraging settlement in earthquake zones)?		x	

Appendix B. Minutes of public consultation

- Minute of Public Consultation Meeting on Environment and Resettlement, at Ward 1, District 5.
- Minute of public consultation meeting on Resettlemental Plan, environmental management plan at Ward 2, District 8.

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

BIÊN BẢN HỌP THAM VẤN CỘNG ĐỒNG VỀ MÔI TRƯỜNG VÀ TÁI ĐỊNH CƯ
Minute of Public Consultation Meeting on Environment and Resettlement

Quận 5, Ngày 01 tháng 6 năm 2015

Tiểu dự án (Name of subproject): TBA 110kV Tân Hưng và đường dây đấu nối
Phường/Xã (Ward/Commune): Phường 1, Quận/Huyện (District): Q.5
Thành phố (City): T.p HCM

1. **Ý kiến về các tác động môi trường tiêu cực và biện pháp giảm thiểu**
   (Comments on Negative Environmental Impact and Mitigation Measures)

- Kiến nghị chủ dự án phối hợp chặt chẽ với địa phương làm tốt công tác quản lý công nhân, tránh xảy ra xung đột giữa công nhân và người dân địa phương.
- Cần kiểm tra cường độ điện trường để tránh ảnh hưởng đến người dân khi vận hành.
- Chủ dự án phải khắc phục các sự cố, sửa chữa đường xá nếu làm hư hỏng trong việc xây dựng và vận hành.

2. **Ý kiến về các vấn đề thu hồi đất, đền bù tài sản và và kế hoạch tái định cư**
   (Comments on land acquisition, asset compensation and resettlement plan)

- Đề nghị chủ dự án thực hiện đúng theo các quy định hiện hành của Việt Nam.
- Đề nghị chủ dự án phối hợp chặt chẽ với địa phương nếu có khiếu kiện, khiếu nại xảy ra.

3. **Kết luận (Conclusion)**

- Thống nhất chủ trương của dự án.
- Đề nghị chủ dự án với đơn vị thi công thực hiện đúng các luật quy định hiện hành.

Đại diện Chủ đầu tư (Project Owner Representative)	Đại diện cộng đồng (Community Representative)	Đại diện tư vấn (Consultant Representative)	Đại diện UBND phường (Commune PC Representative)
	Nguyễn Quốc Phong	Nguyễn Văn Thanh	THÔNG QUA UBND P.1-Q.5 Ngày 1 tháng 6 năm 2015 TM.UBND.P.1 CHỦ TỊCH Hoàng Tuấn Vinh

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

THAM VẤN CỘNG ĐỒNG VỀ MÔI TRƯỜNG VÀ XÃ HỘI/TÁI ĐỊNH CƯ
Pubic consultation on environment and social/resettlement

DANH SÁCH NGƯỜI THAM DỰ
List of participants

Ngày - tháng (Date): 01/06/2015
Địa điểm (Location): P1 - Q5 - TpHCM

No. TT	Họ và tên (Name)	Nam (M)	Nữ (F)	Chức vụ (Position)	Địa chỉ (Address)	Chữ ký (Signature)
1.	Hoàng Tuấn Vinh	V		P.CT	P1 - Q5	
2.	Trần Thị Thanh Lan		V	CT MTTQ	P1 - Q5	
3.	Nguyễn văn Thanh	V		Cán bộ	Đơn vị tư vấn	
4.	Nguyễn Quốc Phong	V		Người dân	P1 - Q5	

LIST OF PARTICIPANTS

Date : 1st June 2015

Location: Ward 1 – district 5

No.	Name	Male	Female	Position	Address	Signature
1	Hoang Tuan Vinh	X		Deputy chairman of ward PC	ward 1 – district 5	
2	Tran Thi Thanh Lan		x	Chairman of ward Fatherland Front Committee	ward 1 – district 5	
3	Nguyen Van Thanh	X		Consultants	PECC4	
4	Nguyen Quoc Phong	X		Local people	ward 1 – district 5	

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

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

Tên Dự án : Trạm biến áp 110kV Tân Hưng và đường dây đấu nối
Địa điểm : UBND Phường 2, Quận 8, TP Hồ Chí Minh
Ngày họp : Ngày 7 tháng 8 năm 2012

I. THÀNH PHẦN THAM DỰ

A. Đại diện UBND Phường 2, Quận 8

1. Ông (Bà): Phạm Chí Hiến — Chức vụ: CT UBND Phường 2
2. Ông (Bà): Nguyễn Văn Nhân — Chức vụ: Cán Bộ địa chính
3. Ông (Bà): Dương Thị Quỳnh Châu — Chức vụ: CT Hội Phụ Nữ

B. Ban quản lý Dự án Lưới điện TP Hồ Chí Minh

1. Ông (Bà): Lê Thị Bích Vân — Chức vụ: Cán bộ

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

1. Ông (Bà) Nguyễn Đức Hoàng — Chức vụ: Cán bộ TV
2. Ông (Bà) Phan Văn Luân — Chức vụ : Cán bộ TV

II. NỘI DUNG CUỘC HỌP:

1. Đại diện Công ty cổ phần Tư vấn Xây dựng Điện 4 báo cáo các nội dung sau:
   a. Thông tin chung về dự án
   b. Mô tả dự án (giai đoạn xây dựng, vận hành)
   c. Các ảnh hưởng của dự án đến môi trường, kinh tế xã hội.
   d. Phương án bồi thường, tái định cư và chính sách của Ngân hàng Thế giới và chính phủ Việt Nam.
   e. Kế hoạch bồi thường, tái định cư.
   f. Những khiếu nại.
   g. Kế hoạch quản lý môi trường.
   h. Biện pháp giảm thiểu và giám sát những tác động của dự án đến môi trường.
2. Ý kiến của UBND Phường 2 :

- Đề nghị thực hiện đầy đủ các quy định theo Luật Bảo vệ môi trường ngày 29/11/2005 của Chính phủ trong quá trình thi công vận hành dự án, theo Nghị định số 29/2011/NĐ-CP ngày 28/04/2011 về "Quy định đánh giá môi trường chiến lược, đánh giá tác động môi trường, cam kết bảo vệ môi trường" của Chính phủ Và các quy định khác.

- Dự án không phải giải phóng mặt bằng không ảnh hưởng đến các hộ xung quan khu vực dự án nhưng ảnh hưởng lớn đến vấn đề giao thông khi đường dây đấu nối cắt

qua Đại Lộ Võ Văn Kiệt nên đề nghị có biện pháp thi công hợp lý để giảm thiểu tối đa việc ùn tắc giao thông trên tuyến đường này.

3. Cuộc họp kết thúc cùng ngày.

Đại diện Công ty cổ phần Tư vấn Xây dựng Điện 4	Đại diện Ban quản lý Dự án Lưới điện TP Hồ Chí Minh	Đại diện ỦY BAN NHÂN DÂN PHƯỜNG 2
Ng Đức Hoàng		Phạm Chí Hiển

DANH SÁCH THAM GIA THAM VẤN CỘNG ĐỒNG

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

Dự án: TBA 110 Tân Hưng

Ngày 7 tháng 02 năm 2012; Tại : UBND Phường 2, Quận 8

TT	Họ và tên	Địa chỉ	Chức vụ, Nghề nghiệp	Ghi chú
1	Phạm Chí Hiền		CT UBND Xã	
2	Nguyễn Văn Nhân		Cán bộ Địa chính	
3	Dương Thị Quỳnh Châu		Cán bộ Phụ Nữ	
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LIST OF PARTICIPANTS

Date : 7th August 2012

Location: Ward 2 – district 8

No.	Name	Address	Position	Note
1	Pham Chi Hien		Chairman of ward PC	
2	Nguyen Van Nhan		Land official	
3	Duong Thi Quynh Chau		Women work official	

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 technical requirements, human and financial resources for quick response during construction.

Table 1: Roles and Responsibilities in Emergency Incident Response

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

3. The CERT 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 CERT.

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

5. Prior to the mobilization of civil works, the Contractor, through its Construction Manager, ERTL, in coordination with the PO/PMB, 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;

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 CERT;

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

iii) made arrangements with the EERT;

iv) conduct proper training of CERT members, and encouraged trained volunteers from the labour force;

v) conduct orientation to all construction workers on the emergency response procedures at grassroots level, particularly evacuation procedures, evacuation routes, among others; and

vi) conduct 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 CERT.

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

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

For effective communication / warning of an emergency:

(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.

- PMB Office, SS.

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

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

Emergency Response Situations

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

Table 2: Evacuation Procedure

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

Table 3: Response Procedure During Medical Emergency

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

Procedure	Remarks
influence area at once, restrict site, suspend work until further notice.	

Table 4: Response Procedure in Case of Fire

Procedure	Remarks
Alert a fire situation.	Whoever detects the fire shall immediately: - call the attention of other people in the site, - sound the nearest alarm, - any CERT member among the construction sub-group contacts the fire department (in this case it should be agreed on that it is alright for any CERT member in the sub-group to alert the fire department). - Report/communicate the emergency situation to the ERTL/Deputy ERTL.
Stop all activities/operations and evacuating.	All (non-CERT) workers/staff sub-contractors, site visitors and concerned public to move out to safe grounds following the evacuation procedure.
Activate CERT to control fire from spreading.	Guided by the training they undertook, CERT members assigned to mitigate the fire shall assess their own safety situation first before attempting to control fire spread.
Call the nearest fire and police stations, if applicable	When alerting the EERT, ERTL will give the location, cause of fire, estimated fire alarm rating, any injuries.
Facilitate leading the EERT to the emergency site.	ERTL/Deputy ERTL to instruct: - An CERT member to meet the EERT in the access road or strategic location and lead them to the site. He/she shall hold the orange safety flag to get their attention and lead them to the site. - Some CERT members to control the traffic in the access road to facilitate passage of the EERT in location.
CERT evacuate the site as soon as, if applicable.	Follow appropriate evacuation procedure.

Appendix D. Vietnamese EIA certificate

HO CHI MINH CITY PEOPLE'S COMMITTEE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT
Ref.No.: 1005/QD-TNMT-CCBVMT

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

DECISION

Regarding approval on environmental impact assessment report of "110kV Tan Hung substation and connection line" stage 2 in district 5 and district 8 of Ho Chi Minh City gird power projects management board

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

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

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

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

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

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

According to the suggestion of Evaluation Committee of environmental impact assessment report of "220kV-110kV Cau Bong – Binh Tan transmission line" project at Binh Tan, Binh Chanh, Hoc Mon, and Cu Chi districts of Ho Chi Minh City of Ho Chi Minh City Grid Power projects management board, which was met in January 14th, 2015 at Department of natural resources and environment;

Consider the revised and supplemented report on environmental impact assessment of "110kV Tan Hung substation and connection line" stage 2 at district 5 and district 8, HCMC attached letter No. 2384/ALD-CBDT dated June 17th, 2015 by Ho Chi Minh City Grid Power projects management board;

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

DECISION:

Article 1. Approve the contents of the environmental impact assessment report of "110kV Tan Hung substation and connection line" stage 2 at district 5 and district 8, HCMC which is established by Ho Chi Minh City Grid Power projects management board (after here called Project Owner with the following main contents:

1. Scope and scale of the project:

1.1. Scope: the project is proposed to implement in district 5 and district 8 of HCMC

1.2. Scale:

- Newly construct a substation with 5,300m^2 in the complex area 8-8bis Ham Tu street, ward 1, district 5. The substation is closed type with GIS technology equipment, and capacity of 02x63 MVA and voltage level of 110/22/15kV.
- Newly construct a 110kV connection line with the following features:
  - Voltage level: 110kV
  - Number of circuit: double circuit
  - Location: underground cable along the existing Chanh Hung substation → cannal (at intersection of Te canal, Doi, Tau Hu and Ben

Nghe canal) → Vo van Kiet avenue → the area of 8-8bis Ham Tu area → Tan Hung 110kV substation

- Starting point: at busbar of Chanh Hung 110kV substation in ward 2, district 8; starting point of 110kV underground cable from the 220kV substation, district 8 to Chanh Hung substation.
- Ending point: busbar 110kV at Tan Hung substation, in the complex area in 8-8bis Ham Tu street, ward 1, district 5.
- The route length: 470m
- Wire: cooper with 1 axis at 1,200 mm^2 XLPE.
- Arrangement: within HDPE DN225 pipe. Total pipes will be buried underground, and under canal bottom.

- Expansion of feeder bay 110kV at Chanh Hung substation: installing 01 bay for 110kV transmission line; GIS equipment will be compatible with the existing GIS equipment.

2. Requirements of environmental protection for the project:

2.1. Implement mitigation measures, population treatment during construction phase for dust, noise, vibration, emission, sewage and solid waste, which complies to national technical regulations on environment such as QCVN 05:2013/BTNMT; QCVN 06:2009/BTNMT; QCVN 26:2010/BTNMT; QCVN 27/2010/BTNMT; QCVN 14:2008/BTNMT; apply mitigation measures for impacts on traffic activity in the project area and communication wire, other power lines during construction phase of the project;

2.2. Drainage system have to be separately divided for rainwater and wastewater; the project have to construct collection and treatment measures of domestic wastewater for operation phase, which have to comply with national technical regulation on domestic wastewater No. 14/2008/BTNMT (column B, K=1.2) and legally connect to regional drainage, construct pits after treatment facilitating checking and monitoring.

2.3. Classification, storing and contracting with a specialized agency to collect, transport, treat normal waste, and hazardous waste under the current regulations.

2.4. Implement mitigation measures for impacts on electromagnetic field, safety in grounding wire for houses under the ROW;

2.5. Implement labour safety measures, responding and preventing plans for risk of fire and electric shock; ensure safety of management, operation, repairing, and maintenance for power works;

2.6. Implement environmental management plan during the project's construction and operation phase. Implement environmental monitoring plan, report to Department of Natural resource and Environment (Environmental Protection Brach) and authority agencies on periodic environmental monitoring results.

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

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

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

Article 4. The approval decision on environmental impact assessment report of ""110kV Tan Hung substation and connection line" stage 2 at district 5 and district 8, HCMC of Ho Chi Minh City Grid Power projects management board is the basis for approving the project

investment; and the basis for the national authority agencies to check, inspect the environmental protection of the project.

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

Receipt:
- HCMC Grid Power projects MB;
- HCM city PC;
- DOIT;
- DPCs/offices of NRE of district 5;
- DPCs/offices of NRE of district 8;
- Director of DONRE;
- Archival, Environmental protection brach (Mr.Thao 09)

PP.DIRECTOR
DEPUTY DIRECTOR

(signed)

Nguyen Thi Thanh My

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

Số: 1005 /QĐ-TNMT-CCBVMT

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

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

QUYẾT ĐỊNH

Về việc phê duyệt Báo cáo đánh giá tác động môi trường dự án thành phần – giai đoạn 2 "Trạm biến áp 110 kV Tân Hưng và đường dây đấu nối" tại quận 5 và quận 8 của Ban quản lý Dự án Lưới điện Tp. Hồ Chí Minh

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

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

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

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

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

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

Theo đề nghị của Hội đồng thẩm định Báo cáo đánh giá tác động môi trường dự án thành phần – giai đoạn 2 "Trạm biến áp 110 kV Tân Hưng và đường dây đấu nối" tại quận 5 và quận 8, họp ngày 08/4/2015 tại Sở Tài nguyên và Môi trường;

Xét nội dung Báo cáo đánh giá tác động môi trường Dự án thành phần – giai đoạn 2 "Trạm biến áp 110 kV Tân Hưng và đường dây đấu nối" tại quận 5 và quận 8 đã được chỉnh sửa, bổ sung kèm văn bản giải trình số 2384/ALĐ-CBĐT ngày 17/6/2015 của Ban quản lý Dự án Lưới điện Tp. Hồ Chí Minh;

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

QUYẾT ĐỊNH:

Điều 1. Phê duyệt nội dung Báo cáo đánh giá tác động môi trường Dự án thành phần – giai đoạn 2 "Trạm biến áp 110 kV Tân Hưng và đường dây đấu nối" tại quận 5 và quận 8, thành phố Hồ Chí Minh được lập bởi Ban quản lý

1

Dự án Lưới điện Tp. Hồ Chí Minh (sau đây gọi là Chủ dự án) với các nội dung chủ yếu sau đây:

1. Phạm vi, quy mô của Dự án:

1.1. Phạm vi: Dự án được triển khai trên địa bàn quận 5 và quận 8, Thành phố Hồ Chí Minh.

1.2. Quy mô Dự án:

– Xây dựng mới Trạm biến áp trên mặt bằng rộng 5.300 m^2 trong khu khu phức hợp 8-8bis Hàm Tử , phường 1, quận 5. Trạm được thiết kế theo kiểu kín sử dụng thiết bị công nghệ GIS, công suất của Trạm 02x63 MVA và cấp điện áp 110/22/15kV.

– Xây dựng mới đường dây đấu nối 110 kV với các thông số chủ yếu sau đây:

+ Cấp điện áp: 110kV.

+ Số mạch: 2 mạch.

+ Vị trí: Đi ngầm dọc trong trạm Chánh Hưng → vị trí tiếp giáp giữa kênh Tẻ - Kinh Đôi và kênh Tàu Hủ - rạch Bến Nghé → dưới đại lộ Võ Văn Kiệt → phần đất gần khu phức hợp 8-8bis Hàm Tử → trạm biến áp 110 kV Tân Hưng.

+ Điểm đầu:

- Thanh cái 110kV trạm Chánh Hưng, phường 2, quận 8.
- Đầu tuyến cáp ngầm 110kV từ Trạm biến áp 220kV, quận 8 đến trạm Chánh Hưng.

+ Điểm cuối: Thanh cái 110kV trạm biến áp Tân Hưng, thuộc khu phức hợp số 8-8 bis Hàm Tử, phường 1, quận 5.

+ Chiều dài tuyến: 470m.

+ Cáp dẫn điện: Cáp đồng 1 lõi 1.200 mm^2 điện XLPE.

+ Bố trí cáp: Luồn trong ống nhựa chịu lực HDPE DN225. Toàn bộ được chôn ngầm dưới đất, dưới lòng kênh.

– Mở rộng ngăn đường dây 110kV tại trạm Chánh Hưng: lắp 01 ngăn đường dây 110kV, thiết bị GIS tương thích với thiết bị GIS hiện hữu.

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

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

2.2. Xây dựng tách riêng hệ thống thoát nước mưa và nước thải; có biện pháp thu gom, xử lý nước thải sinh hoạt phát sinh từ giai đoạn vận hành của Dự án đảm bảo đạt Quy chuẩn kỹ thuật quốc gia về nước thải sinh hoạt

2.

QCVN 14:2008/BTNMT (cột B, K=1,2) và đấu nối đúng quy định vào hệ thống thoát nước khu vực; xây dựng hố ga sau xử lý thuận tiện cho công tác kiểm tra, giám sát;

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

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

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

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

Điều 2. Ban quản lý Dự án Lưới điện Tp. Hồ Chí Minh có các trách nhiệm sau đây:

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

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

Điều 3. Trong quá trình thực hiện nếu Dự án có những thay đổi so với các khoản 1 và 2 Điều 1 của Quyết định này, Chủ dự án phải có văn bản báo cáo và chỉ được thực hiện những thay đổi sau khi có văn bản chấp thuận của Sở Tài nguyên và Môi trường.

Điều 4. Quyết định phê duyệt báo cáo đánh giá tác động môi trường của Dự án thành phần – giai đoạn 2 "Trạm biến áp 110 kV Tân Hưng và đường dây đấu nối" tại quận 5 và quận 8 của Ban quản lý Dự án Lưới điện Tp. Hồ Chí Minh là căn cứ để quyết định việc đầu tư Dự án; là cơ sở để các cơ quan quản lý nhà nước có thẩm quyền kiểm tra, thanh tra việc thực hiện công tác bảo vệ môi trường của Dự án.

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

Nơi nhận:
- Ban Quản lý Dự án Lưới điện Tp.HCM;
- Ủy ban nhân dân Tp.HCM;
- Sở Công thương;
- UBND/ phòng TNMT quận 5;
- UBND/ phòng TNMT quận 8;
- Giám đốc Sở;
- Lưu: VT, TĐMT, CCBVMT (A.Thảo,09).

KT.GIÁM ĐỐC
PHÓ GIÁM ĐỐC

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
SỞ TÀI NGUYÊN VÀ MÔI TRƯỜNG
THÀNH PHỐ HỒ CHÍ MINH

Nguyễn Thị Thanh Mỹ

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