Initial Environmental Examination

Project Number: 46391 - 001

May 2017

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

Prepared by Ha Noi Power Corporation for the Asian Development Bank

Initial Environmental Examination

May 2017

Loans 3161/8286–VIE: HANOI AND HO CHI MINH CITY POWER GRID DEVELOPMENT SECTOR PROJECT

Subproject: 110kV Tay Ho – Yen Phu Underground Cable Transmission Lines

ABBREVIATIONS

ADB:	Asian Development Bank
ADB SPS:	the ADB's Safeguard Policy Statement (2009)
BOD:	Biochemical Oxygen Demand
CEMP:	Construction/Contractor Environmental Management Plan
CEO:	Contractor's Environmental Officer
COD:	Chemical Oxygen Demand
CSC:	Contractor/Construction Supervision Consultant
DoNRE:	Department of Natural Resources and Environment
EA/IA:	Executing Agency and Implementing Agency (EVN HANOI and HANOI DPMB)
EARF:	Environmental Assessment and Review Framework
EIA:	Environment Impact Assessment
EMF:	electromagnetic field
EMP:	Environment Management Plan
ERP:	Emergency Response Plan
ESU:	Environmental and Social Unit of HANOI DPMB
EVN:	Electricity of Viet Nam
EVN HANOI:	Hanoi Power Corporation
GRM:	Grievance Redress Mechanism
HANOI DPMB:	Ha Noi Development Project Management Board
IEE:	Initial Environmental Examination
LEP2014	The Viet Nam Law on Environmental Protection
MoNRE:	Ministry of Natural Resources and Environment
PCB:	Polychlorinated biphenyls
PIC:	Project Implementation Consultant
PPC:	Provincial Peoples Committee
PPE:	personal protective equipment
REA:	Rapid Environment Assessment
ROW:	Right - of - way
DPMB:	Development Project Management Board
TSS:	Total Suspended Solids
UXO:	Unexploded Ordnance
WPC:	Ward People Committee

CURRENCY EQUIVALENTS

(As of May 2017)

Currency Unit	-	Vietnam Dong VND
1.00 VND	=	$ 0.000044
$1,00	=	22.700

WEIGHTS AND MEASURES

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

NOTE

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EXECUTIVE SUMMARY

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2. The Initial Environmental Examination (IEE) presented herein addresses the expansion of the 110 kV underground cables Tay Ho – Yen Phu subproject which transects through 6 wards of Tay Ho and Ba Dinh District. This represents one of the non - core subprojects that were identified by Electricity of Viet Nam (EVN) for Hanoi. The IEEs of other non - core subprojects[1] are being prepared separately.

3. EVN HANOI is the executing agency of the subproject, and the HANOI Development Project Management Board (HANOI DPMB) of EVN Hanoi is the implementing agency of the subproject.

A. Subproject Summary

4. The 110 kV underground cable line has a total length of 6,073 m. As the cable line is arranged inside the underground technical boxes which already exist or will be built beneath the roads.

5. The project will meet the load demand in the area, improve the reliability and flexibility of power supply, and increase the operational safety for Hanoi power grid.

B. Potential Impacts and Mitigation

6. 110kV Tay Ho - Yen Phu underground cable transmission line subproject indicates that the potential environmental impacts of the subproject will primarily occur during 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, damage to existing roads, increased risk of worker and public injury can be managed with standard construction practices and management guidelines (e.g., World Bank Group's Environment, Health and Safety Guidelines[2] 2007). There are no rare or endangered wildlife, critical habitat, or protected areas in the subproject sites which are located in the developed urban Hanoi.

7. The 110 kV underground cable line has a total length of 6,073 m As the cable line is arranged inside the underground technical boxes that are already existed or will be built beneath the roads, the subproject will not cause any land acquisition or resettlement. Details of the compensation and ground clearance are shown in the resettlement plan report of this project.

8. There are no expected negative induced, or cumulative environmental impacts associated with the subproject objectives of meeting the load demand in the area, improving the reliability and flexibility of power supply, and increasing the operational safety for Hanoi power grid.

9. The Environmental Management Plan (EMP) prepared for the subproject provides a comprehensive impacts mitigation plan, and environmental monitoring plan to minimize and manage the potential impacts of the subproject. The EMP also prescribes an Emergency Response Plan (ERP) for the construction sites; identifies the need for capacity development

[1] The non - core subprojects were developed by EVN to follow implementation of the higher priority core subprojects

[2] World Bank Group, Environmental, Health, and Safety Guidelines, April 30, 2007, Washington, USA. http://www.ifc.org/ifcext/enviro.nsf/Content/EnvironmentalGuidelines.

and training of the Environmental and Social Unit of HANOI DPMB (ESU) in environmental management and assessment as it focuses on the implementation of the EMP.

C. Conclusions

10. The IEE concludes that the feasibility design of the 110kV Tay Ho - Yen Phu underground cable transmission line subproject combined with available information on affected environments is sufficient to identify the scope of potential environmental impacts of the subproject. If significant changes to the subproject description do not occur at the detailed design phase and that new sensitive environmental or cultural resources are not determined, further detailed environmental impact assessment (EIA) of the subproject is not required.

II. INTRODUCTION

A. Background to IEE

11. The goal of the Hanoi and Ho Chi Minh City Power Grid Development Sector Project is to strengthen the capacity and reliability of the power infrastructure in Hanoi and Ho Chi Minh City through the rehabilitation and development of the 220 kilovolt (kV) and 110 kV high - voltage power transmission systems and associated substations to supply their medium voltage (MV) distribution system. The Project also aims to strengthen the institutional capacities of Hanoi Power Corporation (EVN HANOI) and Ho Chi Minh City Power Corporation (EVN HCMC) that are responsible for the power supply in their respective areas.

12. "110kV Tay Ho - Yen Phu underground cable transmission line" subproject will be implemented as part of a sector loan for the overall Project under ADB's Operation Manual Section D3 – Sector Lending. The subproject was selected by EVN HANOI as one of the non - core subprojects which are being further detailed and prepared for project implementation.

13. EVN HANOI is the executing agency of the subproject, and HANOI DPMB of EVN HANOI is the implementing agency of the subproject.

B. Assessment Context

14. The overall Project was assigned Environmental Category B pursuant to the ADB's Safeguard Policy Statement (2009) (ADB SPS)[2] and recent good practice sourcebook guidance[3]. 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 EMP[4]. The 110kV Tay Ho - Yen Phu underground cable transmission line subproject is located in suburban areas of Hanoi city, which was selected based on approved Environmental Assessment and Review Framework (EARF)[5], with low environmental sensitive objects and it is categorized as B under the ADB SPS (refer to REA checklist in Appendix A). The IEE was prepared for the 110kV Tay Ho - Yen Phu underground cable transmission line subproject in the feasibility design stage using available data and information on sensitive ecological and cultural receptors that exist for the subproject site.

15. The detailed design for the 110kV Tay Ho - Yen Phu underground cable transmission line subproject will follow subproject approval. The EMP that has been prepared for the subproject (Section VI) will need to be updated where necessary to meet the final detailed designs of the 110kV Tay Ho - Yen Phu underground cable transmission line subproject.

[2] ADB, 2009. Safeguard Policy Statement, ADB Policy Paper.
[3] ADB, 2012, Environmental Safeguards, A Good Practice Sourcebook, Draft.
[4] Footnote 2, pg 19.
[5] Environmental Assessment and Review Framework of Hanoi and Ho Chi Minh City Power Grid Development Sector Project. December 2013 < https://www.adb.org/projects/documents/ha - noi - and - Ho - chi - minh - city - power - grid - development - sector - project - earf>

III. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

16. Tay Ho - Yen Phu 110kV underground cable transmission line subproject will be implemented according to the directives set down for use of Official Development Assistance (ODA) by Government of Viet Nam Decree No.38/2013/ND - CP which was promulgated on 23 April 2013, and in accordance with the provisions for the parent sector project.

A. Viet Nam Regulatory Framework for Environmental Assessment

17. The Viet Nam Law on Environmental Protection (LEP2014) prescribes the requirements for environmental assessment for development and domestic project interventions that affect the natural and social environments; Government Decree 18/2015/ND - CP on environmental protection masterplan, strategic environmental assessment (SEA), environmental impact assessment (EIA), and EMP in conjunction with Circular 27/2015/TT - BTNMT dated 29 May 2015 on stipulation of specific articles of Decree 18 both elaborate the environmental assessment requirements specified by the LEP2014.

18. The updated screening criteria of Decree 18 distinguish projects that require an Environmental Impact Assessment (EIA) from projects requiring the simpler EMP. The difference between the two processes reflects the level of assessment, and final review and appraisal that is required.

19. The Decree 18 requires preparation of an EIA for the Tay Ho - Yen Phu110kV underground cable transmission line subproject. The EIA for the subproject has been prepared and approved by DONRE on April 2015

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

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

Environmental Protection regulations

- Law on Environmental Protection by the National Assembly on June 23, 2014 (Law No. 55/2014/QH13) (LEP 2014);
- Decree No. 38/2015/ND - CP dated April 24, 2015 of the Government on management of waste discarded materials;
- Decree No.18/2015/ND - CP dated February 14, 2015 on environmental protection masterplan, strategic environmental assessment, environmental impact assessment and environmental management plan.
- Decree No. 19/2015/ND - CP dated February 14, 2015 of the Government on detailing the implementation of some Articles of the LEP 2014;
- Circular No. 32/2013/TT - BTNMT dated October 25, 2013 by Ministry of Natural Resources and Environment promulgating national technical regulations on environment;
- Circular No.36/2015/TT - BTNMT dated June 30, 2015 on hazardous waste management;
- Circular No.27/2015/TT - BTNMT dated May 29, 2015 of the Ministry of Natural Resources and Environment on environmental protection masterplan, strategic environmental assessment, environmental impact assessment and environmental management plan.

Legal documents on electricity

- Electricity Law No. 28/2004/QH11, issued on 03 December2004;
- Supplemented Electricity Law No. 24/2012/QH13 by the National Assembly of the Socialist Republic of Vietnam dated November 20, 2012;

- Decree No.14/2014/ND - CP dated February 26, 2014 of the Government detailing the implementation of the Electricity Act on electrical safety;
- Decree No.137/2013/ND - CP of the Government providing detailed regulations for implementation of a number of articles of the Law on Electricity and the Supplemented Law on Electricity;
- Decree No. 68/2010/ND - CP dated June 15, 2010 of the Government stipulating sanctions in the field of electricity;
- Circular No.31/2014/TT - BCT dated Oct. 2nd, 2014 issued by the Ministry of Industry and Trade (MOIT) regarding the detailed regulation on some contents of electrical safety.

Other relative legal documents:

- Decree No. 45/2013/ND - CP dated May 10th, 2013 of the GOVERNMENT OF VIET NAM regarding the detailed regulation on some articles of the Labor Code on working hours, rest hours, occupational safety and occupational hygiene.
- Circular No.22/2010/TT - BXD dated Dec. 3rd, 2010 issued by the Ministry of Construction (MOC) regarding the regulation on labour safety during the project construction process.
- Decision No.3733/2002/QD - BYT issued by the Ministry of Health dated October 10th, 2002 regarding the promulgation of 21 labor hygiene standards, 5 principles and 7 labor hygiene measurements.

Environmental Standards and Regulations

- QCVN 05:2013/BTNMT - National technical regulation on ambient air quality;
- QCVN 26:2010/BTNMT - National technical regulation on noise.
- QCVN 27:2010/BTNMT - National technical regulation on vibration.
- QCVN 03: 2015/BTNMT – National technical regulation on the allowable limits of heavy metals in the soils.
- QCVN 08:2015/BTNMT - National technical regulation on surface water quality.
- QCVN 09:2015/BTNMT - National technical regulation on underground water quality.
- 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/BTNMT - National technical regulation on hazardous waste thresholds.

International Guidelines

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

Project related Documents

21. The size and location of the construction of Tay Ho - Yen Phu 110kV underground cable transmission line subproject basically comply with the approved planning. Specifically, the appropriate planning is reflected in the content of the following documents:

- Document No. 4813/SCT of the Department of Industry and Trade dated 19 November 2013 Hanoi on verification of conformity with the electricity planning;
- Decision No. 4351/QD - BCT dated 20 August 2011 of the Ministry of Industry and Trade to approve electricity development planning of Hanoi in 2011 - 2015 to 2020;
- Decision No. 2143/QD - dated 15 April 2013 of the Hanoi People's Committee on approval of additional "power development planning of Hanoi in 2011 - 2015, with a vision to 2020".
- Official document No. 667/UBND - QLDT dated August 4, 2014 by Tay Ho District People's Committee on the alignment of the 110 kV Tay Ho - Yen Phu underground cable;
- Official document No. 2014 by Ba Dinh District People's Committee commenting the alignment of the 110 kV Tay Ho - Yen Phu underground cable line;
- Official document No. 4730/QHKT - P7 Hanoi, dated November 4, 2014 by Hanoi Department of Architecture and Planning on the alignment of the 110 kV Tay Ho - Yen Phu cable line.
- Official document No. 2529/SNN - DD dated November 26, 2014 by the Department of Agriculture and Rural Development on the engineering design of the 110 kV Tay Ho - Yen Phu cable line.
- Official document No. 997/PCTH - P.KTAT dated July 9, 2014 by Tay Ho Power Company specifying the medium - voltage cable lines along the 110 kV Tay Ho - Yen Phu cable line.

C. ADB Safeguard Policy

22. The ADB SPS along with the good safeguard practice sourcebook clarify the rationale, scope and content of an environmental assessment 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). The Rapid Environmental Assessment (REA) checklist of the subproject is presented in Appendix A.
    - 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.

IV. DESCRIPTIONOF SUBPROJECT

23. The 110kV Tay Ho - Yen Phu underground cable transmission line subproject with a length of 6,073m is planned to be built in Quarter 4, 2017. The subproject consists of Construction of 110 kV double circuit underground cable lines from 220kV GIS Tay Ho substations to 110kV GIS Yen Phu substation.

A. 110 kV double circuit underground cable

24. Starting from the switchgear (bays numbers E08, E09) of the 220 kV Tay Ho substation, the cable line goes inside a cable trench (which is built under another project), reaching the alley No. 15 on An Duong Vuong Road and then going along the An Duong Vuong - Au Co - Nghi Tam 5 - meter frontage road. Then the cable line will cross to reach Yen Phu Road - Phu Duc Chinh Street - Chau Long Street and then terminate at the 110 kV Yen Phu substation.

25. The cable line has to cross over some locations as follows: below Nhat Tan Bridge, Lac Long Quan - An Duong Vuong T - junction; Au Co - Xuan Dieu T - junction, Thanh Nien - Yen Phu - Nghi Tam crossroad, and Pho Duc Chinh - Chau Long T - junction with highly traffic density.

26. The cable line has large navigating angles as the followings: the turning angle of the alley No. 15 An Duong Vuong, from the Alley No. 15 An Duong Vuong to the 4m frontage road at the flower garden near Nhat Tan Bridge (Phu Thuong traffic intersection), and from Chau Long to 110 kV Yen Phu substation.

27. The route mainly goes along a road adjacent to dyke slope with a narrow width of 3.5m to 6m and dense populated streets with crowded urban traffic. The 110kV UGC Transmission Line has the following parameters (Table 1):

Table 1: Technical parameters of the 110kV UGC transmission line

Voltage level	110kV
Number of circuits	2 circuits
Length	6,073 m
Starting point	Bays E08, E09 of the 220 kV Gis Tay Ho substation
Ending point	Bays E07, E08 of the 110 kV Gis Yen Phu substation
UGC	Single phase, core copper, cross section 1,200mm^2, XLPE insulation.
Laying cable Configuration	Set in HDPE pipe, buried directly in the ground
Earthing	Use independent grounding system, the grounding system in the cable connector location. Radial type, galvanized steel wire Ø12.
Bending cable box, connecting cable trench	In - situ cast concrete box/trench

(Source: Subproject basic design)

28. Location of the Tay Ho - Yen Phu110kV underground transmission line and 11 connection tunnel points are presented in the Figure 1.

(Note: Hầm nối= connection tunnel)

Figure 1: Subproject location and layout

B. Construction work

Civil work volume for transmission lines

29. The volume of construction materials are shown in Table 2.

Table 2: The volume of construction materials for construction work

No.	Materials	Unit	Quantity
1	Fine sand	m^3	0.266
2	Course sand	m^3	35.042
3	Wire	kg	81.529
4	Oil	kg	3.793
5	Macadam	m^3	67.004
6	Nail	kg	45.128
7	Brick 6x10,5x22	pieces	260
8	Splint plywood, Stand plywood, plywood	m^3	4.396
9	Lubricants	kg	2.950
10	Asphalt	kg	27.440
11	Plastic resin	kg	0.063
12	Bowl Plastic pipe d = 60mm, L = 6m	m	70.700
13	Chemical Plasticizing additive	kg	176.390
14	Welding rod	kg	34.154
15	Section Steel	kg	13.722
16	Plate steel	kg	10.537

No.	Materials	Unit	Quantity
17	Round steel	kg	9.242
18	Round steel D≤10mm	kg	204,377
19	Round steel D≤18mm	kg	5,205.060
20	Round steel D>10mm	kg	307.265
21	Cement PCB30	kg	27,789.104
22	Cement PCB40	kg	1,558.564

(Source: Project investment document)

30. The volumes of concrete, rubble, soil waste from demolition of pavement for the cable trench construction and construction of bending cable box, connecting cable trench is presented in Table 3.

Table 3: Volumes of concrete, rubble, soil waste during construction

TT	Construction activities	Asphalt concrete demolition volume (m^3)	Macadam roadbed demolition volume (m^3)	Soil excavating amount (m^3)
1	Demolition of pavement for the cable trench construction	1,751.28	6,457.83	11,656.94
2	Construction of cable connecting Tunnel (11 tunnels)	105.6	389.4	1,698.68
3	Construction of cable bending cable tunnel (3 tunnels)	7.32	24.0	71.07
	Total	**112.92**	**413.4**	**1,769.75**

Construction method of the underground cable

31. The general construction method for underground cable includes cable trench excavation, cable pull and scatter, and initial status recovery of cable trench. Structural cable trench from the top down as follows: asphalt and gravel roadbed 600mm thick; Natural land 500mm thick compacted, then a layer of cable signals mesh; 100mm thick concrete cable protection layer. The sequence steps are:

For cable trench:

- Cable is placed in the trench cable systems across the entire line
- Organize the site layout and traffic management properly
- Put signage system and signboards under construction requirements
- Cut the road surface, the size in accordance with the cable buried trench After using cutters for cutting road at two edges of cable trench,
- Excavation, constructed by Larsen or open slope
- Sprinkle with black sand
- Drag, cable laying
- Fill the black sand, compacted k = 0.9
- Place the fibber
- Pour the concrete plates
- Fill with soil
- Laying plastic cable signal
- Fill the rubble
- Recover of concrete pavement or mounted plastic mold asphalt and 110kV power cable signals

For basement cable connection, cable bending tunnel

- Demolition of the concrete pavement, asphalt
- Excavation, constructed by Larsen pressed
- Preparation of formwork, reinforcing steel
- Pouring the concrete basement, a cellar and hatch covers

- Perform cabling, installation of casing grounding cable boxes in the basement cable connector location

32. When construction is conducted at night, electric light will be hung along two edges of the cable trench and signal lights with each 10 ÷ 15 m.

33. During as well as after excavation, if it rains or groundwater filled up, pumps will be used to pump water out from the cable trench Pumps should be placed in the lowest position of the dug cable trench It could also create grooves, holes for draining and pumping water from the cable trench.

C. Raw materials, fuel, for the subproject

1. Materials

34. Supply of materials and equipment for the underground cable line come from domestic and international sources as follows:

- Sand, rock etc. are bought from the local agents
- Cement: taken at local dealers
- Reinforcement steel nails, earthing, concrete plates: get locally, processed at the factory
- Underground cables: taken from production facilities ordered by HANOI DPMB
- Wire, porcelain, accessories: imported materials, collected at the warehouse of HANOI DPMB

2. Transportation of materials

35. Construction materials and equipment will be transported through:

- *The long - distance transportation*: from the source to the site by truck Unloaded up and down manually and self - propelled crane;
- *Internal construction transport along the route*: The transfer of supplies from the warehouse to the staging point along the route on roads with cars;
- *The short - distance transport*: The transport of supplies and materials for collecting points along the route to the route through the soil, field border manually, semi–manually.

D. Waste treatment.

36. Domestic waste of workers will be collected into the garbage container. Construction contractors will contract with the specialized unit (e.g. Hanoi Urban Environment Co, Ltd) to disposal and treatment construction solid waste arise during the construction and installation of underground cables including soils, sand, packaging, wood, pieces of iron and steel scrap, nodes excess wires, the kind of waste is composed of the inert and less toxic substances. The total volume of construction waste generated will be about 17,369 tons which is equivalent to about 9.65 tons/day (source: subproject EIA). The disposal site is Nam Son landfill in Son Son District - Hanoi City In addition, construction waste such as iron, steel, paper, packaging that can be reused, should be collected and sold to recycling facilities so the impact will be minimized to the lowest level. Other construction waste like cement bags, clouts etc. will be classified to treat as in the Figure 2.

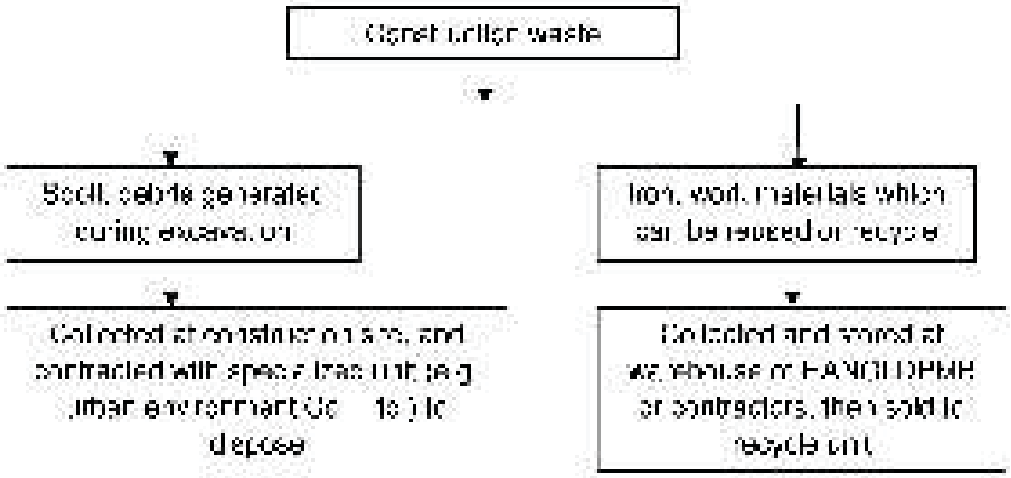


Figure 2. Management of construction waste

V DESCRIPTIONOFEXISTINGENVIRONMENT (BASELINE DATA)

37. The environmental baseline information was obtained primarily from Hanoi Statistical Yearbooks, state of the environment reports (SoER) prepared by Hanoi DoNRE, reports from EVN's technical consultant, and other environmental assessments conducted for the project area. The description of the affected environment focuses on natural features and land use.

A. Physical Environment

1. Climate

a Temperature

38. The climate of project area in Hanoi Capital is under the influence of the Northern region characterized by humid tropical monsoon, that is, hot and rainy summer, and cold and cloudless winter From May to October, hot and humid climate is dominant with the average temperature of 28.4°C From November to April of the following year, cold climate is seen with average temperature of 20.1°C. The values of the average temperature from 2009 to 2013 are shown in Table 4.

Table 4: Monthly average temperature from 2009 to 2013 (°C)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year avg.
2009	15.4	22.0	20.6	24.1	26.4	29.6	29.1	29.2	28.3	25.9	21.2	19.5	24.3
2010	18.1	20.9	21.9	23.5	28.7	30.9	30.7	28.6	28.6	25.7	22.1	19.4	24.9
2011	12.8	17.7	17.1	23.8	27.2	29.5	29.9	28.9	27.6	24.5	23.8	17.4	23.4
2012	14.6	16.2	20.2	26.2	28.9	30.3	29.6	29.3	28.0	26.8	23.4	18.7	24.4
2013	15.3	19.9	24.0	25.0	28.9	30.0	28.7	29.1	27.0	25.6	22.8	16.3	24.4
Avg.	15.2	19.3	20.8	24.5	28.0	30.1	29.6	29.0	27.9	25.7	22.7	18.3	24.3

(Source: Hydro - meteorological Documentation Centre - National Hydro - meteorological Center, 2013 and Hanoi Statistical Yearbook, 2013)

b Rainfall and Humidity

39. The rainy season in Hanoi area occurs in the period from May to October months with the largest rainfall are usually July or August associated with tropical storm season in the Red River Delta. The smallest monthly rainfall is in February. The average rainfall from year to year is 1,6399mm. The largest monthly rainfall is 5414mm in 2009 - 2013 periods (appearing in Aug 2013). Monthly and yearly rainfall average is shown in Table 5.

Table 5: Monthly rainfall in Hanoi (mm)

Y / M	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2009	4.5	6.5	36.5	54.5	234.5	232.5	505.0	95.0	179.5	78.0	0.5	0.0	1427.0
2010	80.9	8.1	5.8	55.6	149.7	175.4	280.4	274.4	171.8	24.9	0.6	11.6	1239.2
2011	9.3	17.5	105.9	42.0	149.0	388.3	255.3	313.2	247.3	177.6	31.8	51.5	1788.7
2012	20.3	16.5	16.9	31.8	386.7	268.9	388.3	487.8	54.7	77.5	34.8	25.7	1809.9
2013	13.9	17.6	46.1	23.3	242.5	216.7	305.9	541.4	374.3	61.2	69.6	22.3	1934.8

Y M	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Avg.	25.8	13.2	42.2	41.4	232.5	256.4	347.0	342.4	205.5	83.8	27.5	22.2	1639.9

(Source: Hydro - meteorological Documentation Centre - National Hydro - meteorological Center, 2013 and Hanoi Statistical Yearbook, 2013)

40. Humidity in this area is subjected to seasonal variations; the highest values are in February and March when they can reach 90%. The lowest humidity, from November to January, is from 77% to 81%. The average moisture in the project area during the period from 2009 to 2013 is 79%. The average values of the monthly and yearly humidity during the period from 2009 to 2013 are shown in the Table 6.

Table 6: Average Relative Humidity in months (%)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Avg
2009	77	88	86	86	86	80	84	84	83	82	71	78	82
2010	81	80	78	85	81	74	74	82	79	70	71	77	78
2011	71	83	81	80	76	80	78	81	81	79	77	68	78
2012	83	83	83	80	76	80	78	81	81	79	77	68	78
2013	82	86	80	81	80	74	83	81	82	73	73	68	79
Avg	79	84	82	82	80	78	79	82	81	77	74	72	79

(Source: Hydro - meteorological Documentation Centre - National Hydro - meteorological Center, 2013 and Hanoi Statistical Yearbook, 2013)

c *Wind direction*

41. Hanoi is located in the monsoon influenced area. In summer, south - easterly monsoon winds are prevailing with frequency from 41.5% to 57.5%, bringing cool and moist air from the Pacific Ocean Prevailing in winter are northeast monsoon winds with the frequency 286% to 298%; dry in the early season and wet in the end. In winter, South-eastern monsoon appears with frequency of 28.3%, creating a pleasant weather. In addition, Hanoi summer is also affected by hot dry west monsoon with lesser frequency.

42. The northeast monsoon is the one with thunder storms that can create a wind pressure of 95daN/m2 and wind speed can reach up to 40m/s. The average wind speed during the year is: 28m/s; highest wind speed in the year: 45 m/s; the lowest wind speed in the year: 1m/s. Monthly average wind speed in the last 5 years is presented in Table 7.

Table 7: Monthly average wind speed in the last 5 years (m/s)

Month Year	1	2	3	4	5	6	7	8	9	10	11	12
2011	1.5	2.4	2.3	2.5	2.4	2.1	2.1	1.8	1.8	1.8	1.9	2.0
2012	1.2	2.3	2.3	2.1	2.40	2.1	2.1	1.8	1.5	2.7	2.9	2.1
2013	1.1	2.2	2.4	2.6	2.0	2.1	2.0	1.2	1.5	2.6	1.4	1.9
2014	1.1	1.7	1.9	2.1	2.2	2.1	2.0	1.9	1.8	2.8	3.1	2.0
2015	1.3	1.1	2.4	2.5	2.4	2.4	1.9	1.6	2.8	4.5	2.3	2.2

(Source: Hanoi Hydro - meteorological station, 2015)

d Sunlight hours

43. The total number of average hours of sunlight measured in Hanoi in 5 years, from 2009 to 2013, is 1,1912 hours/year. The sunlight regime is closely related to the radiation and cloudiness status. From December to April, due to the cloudy weather, the number of sunshine hours is as few as 5 hours, and a monthly average of only 700 hours From May the sunshine hours rise up to 1,317 hours/month. The duration of sunlight in year is shown in Table 8. The

total number of hours of sunshine per year is 10,636 hours/year. The highest month: 1514 hours/month (July 2015), Lowest Month: 4 hours/month (January 2015).

Table 8: Yearly and monthly sunlight hours from 2009 to 2013 (hrs) in Hanoi city

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2009	96.8	0.0	45.2	97.6	143.6	168.3	161.9	202.4	139.8	126.4	141.4	67.1	1390.5
2010	32.8	93.6	50.7	48.3	130.8	159.2	180.1	120.8	145.0	102.3	103.1	78.6	1245.3
2011	3.7	38.5	15.2	56.0	141.2	126.1	149.9	150.1	102.4	72.6	104.6	95.0	1055.3
2012	4.5	21.0	23.8	88.7	146.2	106.9	142.2	159.2	109.6	98.2	92.2	40.4	1032.9
2013	12.2	38.2	74.3	69.4	156.3	158.7	118.8	139.0	92.8	140.1	76.0	156.3	1232.1
Avg.	30	38.3	41.8	72	143.6	143.8	150.6	154.3	117.9	107.9	103.5	87.5	1191.2

(Source: Hydro - meteorological Documentation Centre - National Hydro - meteorological Center, 2013 and Hanoi Statistical Yearbook, 2013)

e Thunderstorms

44. Located in a storm prone area, the subproject is directly affected by storms and thunderstorms. Storm season lasts from June to September, with 1 - 2 storms per year of 12 level intensity and strong gales. During storms, wind speed may exceed level 12 (corresponding to 20 - year cycle). The storm rainfall can reach from 100 to 500 mm, or 1000mm at times.

45. Regarding thunderstorms, the number of thunderstorm days in Hanoi city on average is about 51 days, i.e., an average of 2191 hours. The average thunder density is 647; the peak month of thunderstorm is August.

2. Air quality and Noise

46. To assess the air quality of the subproject area, air and noise samples were taken at 7 points along the location of the 110 kV underground cable Tay Ho - Yen Phu and analysed by the EIA preparation team (Centre for Environmental Technology - Chemical Command) on 15 May 2015. The list of the sampling location is in Table 9, and the map of these locations is in Figure 3.

Table 9: Sampling Locations of Air and Noise

No.	Symbol	Coordinate		Location description
		E	N	
1	KK1	0584363	2331782	Area of 220 / 110kV Tay Ho substation
2	KK2	0585088	2331122	Entrance gate of Phan Chu Trinh High School
3	KK3	0585741	2330432	In front of house No 295 Au Co street, Nhat Tan, Tay Ho District
4	KK4	0586139	2329530	In front of entrance of Tu Lien Pagoda, Tay HoDistrict
5	KK5	0586655	2328877	At the beginning of lane 1, Tay Ho District
6	KK6	0587464	2327360	No 1 Thanh Nien Road, In front of the entrance to the Sofitel Plaza
7	KK7	0587444	2327331	Area of 110kV Yen Phu substation

Figure 3: Map of Air, noise, surface and underground water Sampling Locations

4.7 The results of analysis of air and noise samples around the area of project implementation are presented in Table 10.

Table 10: Monitored ambient air quality and noise in the subproject area

TT	Parameter	Unit	Results							QCVN 05:2013/ BTNMT	QCVN 26:2010/ BTNMT
			KK1	KK2	KK3	KK4	KK5	KK6	KK7		
1	Temperature	°C	35	36	34	35	34	36	35	-	-
2	Humidity	%	70	70	77	72	71	73	70		
3	Wind speed	m/s	1.7	0.5	1.5	1.2	1.4	0.7	0.6	-	-
4	Wind direction	-	SE	SE	SE	SE	SE	SE	SE	-	-
5	Pressure	mbar	1011	1011	1011	1011	1011	1011	1011		
6	Total suspended	µg/m³	115	86	78	74	119	81	101	300	-

TT	Parameter	Unit	Results							QCVN 05:2013/ BTNMT	QCVN 26:2010/ BTNMT
			KK1	KK2	KK3	KK4	KK5	KK6	KK7		
	dust										
7	CO	($\mu g/m^3$)	6200	5700	5400	4900	4700	6200	5500	30000	-
8	NO_2	($\mu g/m^3$)	95	89	76	73	78	79	82	200	-
9	SO_2	($\mu g/m^3$)	72	67	59	62	62	61	65	350	-
10	Noise	(dBA)	67	68	65	64	67	65	62	-	70
11	The electric field intensity	(V/m)	46	1,2	1,3	14	2,1	2,5	31	-	-
12	Magnetic field strength	(mA/m)	112	35	21	22	16	27	98	-	-

(Source: subproject EIA report, Centre for environmental treatment technology - Chemical Command, 5/2015)

Note:
" - ", "KPH": Not regulated,;
- QCVN 05: 2013 / BTNMT: national technical standards for the quality of ambient air
- QCVN 26: 2010 / MONRE: National Technical Regulations on noise

48. The results of analysis of dust and air pollutants such as CO, SO_2, and NO_2 are within the permitted limits of QCVN 05: 2013 / BTNMT, since subproject is located near West lake area, where the air quality is much better comparing with that in other parts in Hanoi. In addition, the sampling points are not at busy traffic roads, thus all values of air quality meet the standard.

49. Noise equivalent level measured in the locations along an underground cable in the range of 62 ÷ 68 dBA at day time. During night time the traffic is much less, it can assume that the noise at night time would be at lower range. Hence, the noise levels in the measurement locations are within the permitted standards, as defined in QCVN 26: 2010 / BTNMT.

50. The intensity of the electromagnetic field (EMF) measured along the underground cable (at the time of measurement) is much lower than the allowed limit of 5 kV / m under Decree 106/2005 /ND – CP. The measured EMF intensity are many times lower than the level recommended by safety organizations IRPA International Radiation which is 200 A/m.

51. Air quality around the subproject area is no signs of contamination, the monitored results are within the allowed national technical regulations. Thus, it can be concluded that air quality at project area is relatively good, ensuring the activities of the project and the health of workers.

3. Topography, Geology and Soil

a. Topography

52. The topography of 6 wards in the subproject area is similar. Located in central North Delta terrain, the topography of those wards is characterized as low plains, valleys, with absolute height varies between 5-6m and they are separated by rivers, canals and lakes.

b. Geology

53. According to the geological survey report for the underground cable by Thanh Nam JSC consulting and electrical construction on March 2015 the geological features of the area divided by layers from top to bottom as follows:

Layer 1: Fill soil Fill land consists mainly of clay, loam, sandy, thickness varied from 0.3m to 1.3 m (HN08). The average thickness is 0.83 m.

Layer 2: mixed clay; brown, grey-brown; Hard plastic state Located beneath the soil layer 1 is mixed clay layers; brown, gray-brown, hard plastic state. This layer is found at depths of 0.9 m to 4.5 m. The average thickness is 3.6 m.

Layer 3: mixed clay; grey, grey-brown; Soft plastic state - hard plastic. This layer is found at depths of 3.5 m - 7.7 m, averaging 5.96m.

c. Soil quality

54. To assess the soil quality in the subproject area, three soil samples at subproject areas were taken on May 2015 by EIA team (Construction and Environment Joint Stock Company Vinahenco). The list of the sampling location is in Table 11, and the map of these locations is in Figure 3.

Table 11: Locations for soil sampling

No.	Symbol	Coordinate		Location description
		E	N	
1	Đ1	0584373	2331779	In front of220 / 110kV West Lake substation
2	Đ2	0586140	2329532	In front of entrance of Tu Lien Pagoda, Tay Ho District
3	Đ3	0587446	2327335	Near 110kV Yen Phu substation

55. The analysed results of soil quality in the subproject site in Table 12 show that soil quality at the survey location has no sign of pollution. The heavy metal parameters are within the permitted limits of QCVN 03:2008/BTNMT. Thus, soil environmental quality is good in the subproject area, which facilitates the process of construction and operation of the subproject.

Table 12: The analysed results of soil quality in the subproject site

No	Parameters	Unit	Results			QCVN03:2008/BT NMT
			Đ1	Đ2	Đ3	
1	Pb	mg/kg dry soil	7.2	5.4	7.6	200
2	Cd	mg/kg dry soil	0.012	0.013	0.012	5
3	As	mg/kg dry soil	0.011	0.011	0.015	12
4	Zn	mg/kg dry soil	21.5	41.4	32.5	100
5	Cu	mg/kg dry soil	11.6	14.2	12.1	300
6	Humidity	%	16	18	15	-
7	Density	g/cm^3	1.42	1.51	1.53	-
8	Specific weight	-	2.75	2.62	2.71	-
9	Porosity	%	48.40	42.40	43.54	-

(Source: EIA report of 110Kv Tay Ho - Yen Phu underground cable transmission line, 2015)

Note:

- " - ":*No regulated level;*
- *QCVN03: 2015/BTNMT - National Technical standards on permissible limits of heavy metals in soil*

56. The monitored results of soil samples showed that all the analysed parameters of heavy metals in 3 soil samples are within allowed values which are regulated under national standard - QCVN 03: 2008 / BTNMT.

4. Surface water/groundwater resources and quality

a. Surface water resources

57. Project constructions areas are affected by hydrological characteristics of the Red River, which has hydrological characteristics, as follows: Red River is about 1 km to 5 km from the subproject site on the northeast. River water flows from north to south with a total length of 1,149 km, the basin area of about 143,700 km^2, average stream flow is 2650m^3. The water velocity in flooding season: 400m/s and in dry season is 40m/s. The average high water level:

9.75m. The content of the silt annual deposits: 80 - 130 million m^3. Red River hydrological regime is divided into 2 seasons: flood season starting in May to October, accounting for 70 - 80% of annual flow. The dry season lasts from November to April the following year, when the River has only 20 - 30% of the total flow rate of the year.

58. Also around the subproject area is Bai Tao Lake, Truc Bach lake, West lake and Nghi Tam Long pond that are approximately 50-500m from the subproject area. Those lakes/ponds serve as receiving water bodies for rain water and treated domestic waste water Lake/pond water is used for aquaculture cultivation purpose only. The hydrological regime of the lakes and pond is fluctuated by rain and dry seasons.

b. Groundwater resources

59. Reports on water quality in Hanoi presented that groundwater resources are being depleted and polluted. Ground water is exploited through a system of wells, with more than 170,000 wells, for extraction of 700,000 m^3 per day. The Center for Water resource monitoring and forecast (MONRE) also confirms that the depth of the water table in Hanoi is increasing, which means that groundwater is being depleted. By 2020, the extraction is expected to reach 14 million m^3 per day. Based on geological and hydrological surveys in the subproject area, groundwater levels are relatively stable in the boreholes, changing from 4.4m to 45m Surface water and groundwater are subject to seasonal fluctuations.

c. Surface Water Quality

60. Surface water and ground water samples were taken by EIA preparation team (Center for Environmental Technology - Chemical Command) in May 2015 in three locations at ponds and lakes (surface water samples) and in three locations along underground cable lines (underground water samples). The list of the sampling location is in Table 13, and the map of these locations is in Figure 3. The results of surface water analysis are presented in

61. Table 14.

Table 13: Surface and underground water quality sampling locations

No	Symbol	Coordinate		Location description
		E	N	
1	**Surface water samples**			
2	NM1	0585279	2330791	Bãi Tảo lake – 421 Âu Cơ, Nhật Tân, TâyHồ
3	NM2	0586120	2329478	Nghi Tàm Long pond - , lane 1 Âu Cơ, Tây Hồ
4	NM3	0587437	2327306	Trúc Bạch Lake - taken under Ngũ Xã bridge
	Groundwater samples			
5	NN1	0584362	2331791	Sample collected from household near 220 / 110kV West Lake Substation - 28m depth;
6	NN2	0586142	2329534	Sample collected from household near entrance of Tu Lien Pagoda, Tay Ho District - 30 m depth
7	NN3	0587445	2327332	Sample collected from household near 110kV Yên Phụ substation - 31m depth;

Table 14: Surface water Quality (May 2015)

TT	Parameter	Unit	Results			QCVN 08:2015/ BTNMT (B1)
			NM1	NM2	NM3	
1	pH	-	7,5	7,4	7,9	5,5 - 9
2	DO	mg/l	4,3	4,2	5,1	≥ 4
3	TSS	mg/l	22	26	38	50
4	COD	mg/l	24	**40**	**74**	30
5	BOD_5	mg/l	11	**21**	**29**	15
6	NH_4^+	mg/l	0.46	0.6	**3.4**	0.9
7	NO_2^-	mg/l	0.034	0.02	**0.066**	0.05
8	NO_3^-	mg/l	0.96	0.31	1.83	10
9	Fe	mg/l	0.7	0.6	0.76	1.5
10	Zn	mg/l	0.051	0.034	0.043	1.5
11	Pb	mg/l	< 0.003	0.0021	0.0013	0.05
12	As	mg/l	0.0003	0.001	0.02	0.05
13	Hg	mg/l	0.0003	0.0001	0.0001	0.001
14	Oil and grease	mg/l	0.21	0.4	**1.13**	1
15	Coliforms	MPN/ 100ml	7100	**8700**	**8800**	7500

(Source: Centre for environmental treatment technology - Chemical Command, 5/2015)

Note:

QCVN08:2015/BTNMT: National Technical Regulation on Surface Water Quality - Column B1: For water used for irrigation purposes or other uses that require the same water quality or intended uses as described in B2

62. Based on the analysis results, it can be assessed that almost all of the analysed parameters are within the limits permitted by QCVN08:2015/BTNMT. However, COD exceeded the permitted limit from 1.3 to 2.5 times (at NM2, NM3); BOD5 exceeded the permitted limit from 1.4 to 2.5 times (at NM2, NM3); NH^{4+} exceeded the permitted limit 1.3 time (at NM3); grease and oil exceeded the permitted limit 1.1 times (at NM3). The causes may be due to the pond is a source receiving wastewater and storm water runoff from areas that have not been thoroughly treated.

d. Groundwater quality

63. Groundwater samples were taken at drilled wells from households located along the underground cable in May 2015. The map of the sampling locations is in Figure 3. The results are shown in Table 15.

Table 15: The results of analysis of groundwater quality (May 2015)

No	*Parameters*	*Unit*	*Results*			*QCVN 09:2015/BTNMT*
			NN1	NN2	NN3	
1	pH	-	7.2	7.1	7.2	5.5 - 8.5
2	Total solid	mg/l	215	269	179	1500
3	Hardness (calculated according to $CaCO_3$)	mg/l	88	91.7	83.9	500
4	Ammonia	mg/l	0.012	0.024	0.016	1
5	Nitrite (NO_2^-)	mg/l	0.025	0.020	0.025	1.0
6	Nitrate (NO_3^-)	mg/l	1.7	1.57	1.56	15
7	Fe	mg/l	**7.5**	**7.6**	**8.7**	5
8	Mn	mg/l	**1.3**	**1.6**	**1.1**	0.5
9	Zn	mg/l	0.12	0.105	0.21	3.0
10	Cu	mg/l	0.58	0.03	0.036	1.0
11.	Pb	mg/l	<0.002	<0.002	<0.002	0.01
12	Cd	mg/l	<0.0001	<0.0001	<0.0001	0.005

No	Parameters	Unit	Results			QCVN 09:2015/BTNMT
			NN1	NN2	NN3	
13	As	mg/l	0.0014	0.0035	0.0018	0.05
14	Hg	mg/l	<0.0001	<0.0001	<0.0001	0.001
15	Coliform	MPN/100mL	1	1	2	3

(Source: Centre for environmental treatment technology - Chemical Command, 5/2015)

Note:"
QCVN09:2015/BTNMT - National Technical Regulation on groundwater quality

64. The results show that most of the analysed parameters are within the permitted limits of QCVN 09:2008/BTNMT. However, Fe content exceeds permissible limits from 1.5 to 1.7 times and Mn content exceeds permissible limits from 1.2 to 2.2 times. This indicates that the groundwater quality is slightly polluted by heavy metals due to anoxic condition of ground aquifer which makes Fe and Mn in soluble condition. The sources of Fe and Mn may come from industrial wastewater at surrounding area which percolates into ground aquifer.

B. Biological Environment

1. Biological resources

65. The project area runs along the route An Duong Vuong, Au Co, Nghi Tam, Yen Phu, Pho Duc Chinh Street, Chau Long Street that are located in the Phu Thuong Ward, Nhat Tan, Yen Phu, Quang An - Tay Ho , Truc Bach ward - Ba Dinh district. This area is fairly complete in terms of infrastructure. In the project area, ecological environment is poor, no rare animals and plants are present Based on actual survey process conducted by EIA team, the current state of biological resources in the subproject area can be described as follows:

- *Terrestrial flora*: In the subproject area are mainly artificial plant communities that include fruit trees and shade trees such as flamboyant, Acacia, Mango, Bananas, Grapefruit, Orange etc.
- *Terrestrial fauna*: In the subproject area are no endangered animals. The existing animals are mainly some reptiles, rodents, birds, and bats. Some captive animals such as buffalo, cows, goats, dogs, cats, chickens, geese etc. There is also the natural fauna such as mice, voles. Habitats include some types of sparrows, pigeons and frogs.
- *Aquatic ecosystem* (include both flora and fauna) in rivers and lakes in the project area include phytoplankton, algae such as diatoms, green algae, duckweed. Also in aquatic ecosystems are submerged trees, phragmites, and shrubs around the banks. Aquatic fauna species include fish, shrimp, crabs, snails etc. Zooplankton includes thyroid groups, zoo benthic crabs, snails, clams group as mussels bivalve molluscs, gastropods, molluscs, crustaceans, shellfish, aquatic insects, fish. Large part of river organisms concentrate on river bed and around banks to have shelter with more mud organic residue and to avoid strong currents.
- No big trees exist along the underground cable transmission line because cable tranche will be excavated on the surface of public road. Next to the road is an embankment covered by grasses only.

2. Land use

66. Total natural land area of 6 wards in the subproject area is 12.580,5 km^2, which is totally urban residential area. No land area is temporarily and permanently acquired by the subproject because the cable tranche will be laid under the road.

3. Wildlife

67. Based on actual situation and observation, it can be concluded that no endangered wildlife occurs any longer within the area. There are no animals that could interfere with or have impacts on the subproject site.

4. Conservation areas

68. According to the list of natural parks and conservation areas of Vietnam stipulated by Ministry of Agriculture and Rural Development, there are no conservation areas within the proximity of the subproject site.

C. Socio - economic conditions

Population

69. The subproject site is located in 6 wards that are Phu Thuong, Nhat Tan, Yen Phu (Tay Ho District) and Truc Bach (Ba Dinh District) with a total area of 12.580,5 km^2 and a population of 45,485 persons. The average density is 4,179 person/km^2. No ethic minority lives in the subproject area. Details of affected wards are described in Table 16.

Table 16: Demographic characteristics of affected wards

No	Ward	Natural area (Km^2)	Population *(Person)*	Population density *(persons/ km^2)*	Ethnic Minority
	Tay Ho District				
1	PhuThuong	6.016	7,386	1228	None
2	Nhat Tan	1.035	6,914	6680	None
3	Quang An	3.46	7,599	2196	None
4	Yen Phu	1.4295	11,254	7873	None
5	Tu Lien	3.51	7,095	2021	None
	Ba Dinh District				
6	Truc Bach	0.64	12,332	19269	None
	Total	**12.580,5**	**52,580**	**4179***(Average)*	

(*Sources: Ward socio - economic reports in 2014*)

Local Economy

70. In Hanoi, the average economic growth rate in period 2011-2015 reached 12-13%/year; from 2016 to 2020 to reach about 11-12% By 2015, per capita GDP of Hanoi is USD 4100-4300. The economic structure is as follows: services accounting for 54-55%, industry-construction accounts for 41-42% and agriculture 3-4%. In 2020, the service sector will account for 55.5 to 56.6%, industry-construction accounting for 41-42% and agriculture 2-2.5%. The growth rate of export value in Hanoi averaged 14-15%/year over the period 2011 to 2015 and 13-14% in the period 2016 – 2020.

Tay Ho District

71. During the 2010 - 2015 period, the economy managed by district, has been increased: 16% in production rate of economic sectors; 18 - 20% in production rate for the service sector; and 5,000 in the labour job market. The profits in the sectors of tourism, commerce, and services account for 80% of the total. The District also aims to decrease 50 poor households every year.

Ba Dinh District

72. During the 2011 - 2015 periods the average economy growth rate of district managed production section is: 14.5%/year in which: the production value of the services sector: 15%/year, production value of the industry: 8%/year. In 2015, the service sector accounts for 65 - 70% of the production value structure.

Tay Ho and Dong Da Districts

73. They are two urban district of Hanoi city where the economic activities are developed with high level. Along the streets where the underground cable transmission line runs under, there are many houses with small business and cultural – historical - education sites.

Social Infrastructure

a. Public Health and Sanitation

74. The subproject site is located in a distance of 5 km to the central area of Hanoi that means good access to social services from local to central level is secured. The local health facilities include health centres at ward level, first aid and medical assistance for minor illnesses and health care services for mothers and children, such as immunization, pregnancy care, family planning, etc. At upper levels there are hospitals at municipal and central level, in addition to a broader system of private clinics and hospitals of high quality and expertise.

75. Each ward at the subproject area has one clinic with one doctor and 3 to 5 nurses. 100% of households in 6 wards have access to electricity, tap water. Wastewater is collected sewage system and treated at Truc Bach wastewater treatment plant or city central wastewater treatment plant.

76. Solid waste is collected by Urban Environment Company (URENCO), which is State Enterprise directly managed by Hanoi People's Committee. This enterprise operates under the model of parent company – subsidiary. The company currently consists of 18 departments and units with more than 5,000 employees.

b. Education

77. Hanoi has hundreds of leading institutes, more than 50 universities and colleges that are training important labourers and supplying some 80,000 graduates to the labourer market. Tay Ho and Ba Dinh districts have highly developed educational infrastructure. In addition to public schools at all levels from pre - school to high school, this area possesses colleges and universities such as 01 vocational college, 01 college of Medicine - Pharmacology (Phu Thuong ward).

c. Communications

78. Hanoi is the biggest communications center in the country. Its communications network satisfies swift communication information demand nationwide and worldwide. Infrastructure for transport, communications and electricity are being constantly improved so that people's standard of living and access to services has improved appreciably. All households in the subproject area have TV and telephone. All communes or wards have their own mass communication facilities. The post office locations are a short distance for all people.

79. The subproject area is covered by post stations; many telephone networks as Viettel and VNPT telecommunications, and a number of other telecommunications companies. Internet services are very common and convenient in the area.

d. Water supply, electricity and transport

Water supply

80. Currently 100% of households from 6 wards are supplied with 120 liters drinking water/person/day from Da River water supply system.

Drainage

81. In Hanoi suburban areas, including the subproject area, the drainage system in general has not been completed; it is used for both sewage and storm water which are then discharged to the rivers and causes water pollution. The river/lake in the subproject area including Bai Tao Lake, Truc Bach lake, West Lake and Long pond that are listed as slightly polluted water bodies.

Power supply

82. Hanoi currently has 7 electric stations and 200kV and 500kV lines, 23 10kV electric downloading stations Levels of 35, 10kV and 6kV are gradually shrunk, and levels of 22kV/04kV are retained. A 22kV line in urban and neighbouring areas is designed.

Transport

83. Hanoi has a well-developed transport system. In Tay Ho and Ba Dinh districts the transportation system is highly developed with dense road network, which include asphalt streets, road tunnels at crossroad, road ring No. 2 and road ring No. 25 etc.

e. Cultural and Heritage Sites

84. Nhat Tan Ward has Tao Sach Temple, built in the Tien Le, In the temple are 29 steals of the times Temple is the sights, fascinating ceremony place.

85. Truc Bach ward has many historical ranked sites, such as: An Tri Temple; Chau Long pagoda; NguXa Pagoda; Am Pagoda and CauNhi Temple.

86. A list of cultural and heritage sites is presented in Table 17.

Table 17: Cultural and Heritage Sites around the subproject site

No	Sites	Distance to the project
1	Kim Liên Pagoda (lane 1 ÂuCơ),	15 m
2	TứLiên Temple (lane 123 ÂuCơ),	15 m
3	VạnNgọc Pagoda (85 ÂuCơ)	20 m
4	TứLiên Pagoda (113 ÂuCơ),	15 m
5	NghĩaDũng Temple (46 Thanh Niên),	50 m
6	Châu Long Pagoda (112 TrấnVũ),	200 m
7	NgũXã Temple(16 NguyễnKhắcHiếu),	150 m
8	ThầnQuang Pagoda(44 NguyễnKhắcHiếu)	150 m

(*Source: Subproject EIA, 2015*)

87. In addition to the above subjects, the project also could affect other sensitive infrastructures of nearby sites such as police headquarters of Yen Phu Ward, police headquarter of Nhat Tan Ward, complex offices of the State Treasury of Tay Ho District, Tay Ho district Court, people's Procure of Tay Ho district, the social Insurance Tay Ho district, Tay Ho district tax Department (614 Lac Long Quan); Hung Vuong vocational colleges (401 Au), Gateway to the West Lake Water Park (433 Au), Phan Chu Trinh High School (481 Au), CulturalHouse of 7B residential area of PhuThuong Ward (Lane 15 An Duong Vuong), Dinh Tien Hoang high School (67 Pho Duc Chinh), Truc Bach ward People's Committee (02 Truc Bach), Mac Dinh Chi secondary School (55 Truc Bach), Yen Phu Postal office (16 Yen Phu), Nhat Tan Kindergarten (31 lane 399 Au Co), Museum of Vietnam Literature (20B 275 lane 399 Au Co).

Subproject affected people

a. Affected households

88. The subproject is to be implemented over a relatively wide area. However, the construction of the cable line will not cause land acquisition impact as well as disruption to the businesses of the stores along the roads.

89. In term of environmental impact, 879 households and 8 public infrastructures/offices will be directly affected by the subproject activities such as dust, noise, traffic obstruction etc. The details of affected households and public infrastructures/offices by cable section are summarized in the Table18.

Table 18: Summary of household and objects directly affected by the project

No.	Wards	Household	Other subjects
1.	Nhật Tân	312	01 college; 01 Memorial monument
2.	Tứ Liên	34	01 pagoda - Tu Lien Pagoda
3.	Quảng An	184	01 pagoda
4.	Yên Phụ	222	01 parking area, 02 offices; 01 Sport field
5.	Trúc Bạch	127	01 secondary high school
Total		**879**	

(Source: Survey along the route)

b. Permanent/temporary land acquisition

90. No permanent/temporary land acquisition from local people, only permanently occupied land is urban land roads (6,400m^2). No resettlement compensation and site clearance occurs.

Additional features of 110 kVTay Ho - Yen Phu underground cable Transmission line

91. 110 kV Transmission line turned to 220 substation will be constructed mainly in agricultural land agricultural land for rice and vegetation crops and far from residential areas (Figure 4).

Starting point

Lane 15 An Duong Vuong

Small road parallel with Au Co road where the cable will be buried

Frontage 5m Au Co road where the cable will be buried next to dyke alignment

	
Pagoda at Frontage 5m road	Pagoda at Frontage 5m road
	
The underground cable cross the busy cross section	End point at 110 KW Yen Phu substation

Figure 4: **Views of subproject area**

VI POTENTIALENVIRONMENTALIMPACTSANDMITIGATION MEASURES

92. The assessment of potential impacts of the subproject is structured by the three development phases of the subproject defined by: pre - construction; construction; and post - construction operational phase. The potential impacts and mitigation measures of the each phase are discussed separately. This structure carried forward and also used to structure the EMP for the subproject. The subproject's items include: construction of the 110 kV underground cable line with a total length of 6,073 m.

A. Subproject Benefits

93. The construction of the "110 kV Tay Ho - Yen Phu underground cable" aims to:

i. Increase the reliability of power supply for Hanoi Capital;
ii. Increase power supply for Ba Dinh and Tay Ho districts, thereby reducing the loads for the 110 kV Chem - Yen Phu – Hoan Kiem lake - Tran Hung Dao - Mai Dong transmission line which is currently overloaded, especially in case of incidents;
iii. Reduce the loads of the 220/110 Tay Ho substation and increase power supply for 110 kV Yen Phu substation;
iv. Play a connecting role between the 220 kV Tay Ho substation and 110 kV Yen Phu substation, enhance the grid reliability, and meet the uninterrupted power demands of the critical loads of the city.

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

High risk due to inappropriate construction site arrangement

Impact

93. The construction site arrangement is very important regarding environmental impact reduction. The inadequate site arrangement can affect surrounding natural, social environment and infrastructures along An Duong Vuong, Au Co, Nghi Tam, Yen Phu Road, Pho Duc Chinh - Chau Long Street. There are several impact sources such as:

- Temporary storage of construction material and waste;
- The arrangement of material transportation and storage facilities.

94. However, this impact is negligible and short-term because working time will be arranged at night time and only immediately needed amount of construction material will be brought to the sites etc. This impact will be stopped when construction finishes.

Mitigation measures:

95. Construction site arrangement includes;

- The civil contractor will be responsible for contracting with specialized unit (e.g. Hanoi Urban Environment Company Limited) to collect, transport and dispose the asphalt concrete mass, refused excavated materials to the permitted disposal site. The proposed disposal site for construction material and domestic solid waste is Nam Son landfill in Son Son District - Hanoi City;
- Selection of transportation route: The Contractor will consult with local authorities and design engineers in the selection of the most appropriate transportation route for transportation of equipment and materials to reduce negative impacts;
- Contractors will obtain the license for safety and environmental requirements of mobilized machines and vehicles.

UXO Clearance

Impacts:

96. In the project area, UXO may still exist. Thus, if not implement UXO clearance, it may cause risks of worker's and people's life when conducting the project construction. Thus,

HANOI DPMB has sent the official letter No. 181/HANOI DPMB - KTGS dated 15 February 2017 to Hanoi Capital City Commander regarding the need of UXO clearance. The Hanoi Capital Commander has sent the letter No. 244/BTMCoB requesting the UXO clearance in the subproject area. Thus, the UXO clearance will be conducted right before the construction starts.

Mitigation measure:

97. HANOI DPMB will hire an army competent unit of Ministry of Defence to conduct UXO clearance before the construction starts.

98. The proposed guidance for UXO clearance is as follows:

- Execution of demining and UXO is done following these steps:
    + Covering UXO detection and clearance area,
    + Clearing the grounds
    + Detection by the detector to a depth of 03m
    + Mark, digging test and resolve signal to a depth of 03m
    + Detect bomb by detector to a depth of 5m (put in step with high sensitivity)
    + Excavation, checked resolve signal to a depth of 3m
    + Excavation, checked resolve signal to a depth of 5m
- Note: before detecting UXO under wet fields, marshes pond with a depth <0.5 m, it is must to embankment and drain water to avoid remaining tidy UXO. When detecting UXO on terrestrial land, warning boards and guard have to be arranged to avoid accidents due to entrance of people, animals or vehicles.
- Collecting, sorting, transportation management and destruction of mines and explosives are under strict safety standards for preservation, transport and use of explosives in TCVN 4586 - 1997, issued by Explosive Engineering Command Ministry, and the other current regulations.
- Competent unit shall be responsible to notify the military commander in the Hanoi city (Capital city commander) on the implementation mission: clearance location, construction schedules and staying time in the locality.

C. Potential Impacts and Mitigation Measures during Construction phase

99. The potential environmental impacts of the subproject are associated primarily with the construction phase of the subproject The main impacts of this phase are incurred from excavation of asphalt road for installation of underground cable The potential impacts include dust, noise, emissions, transportation obstacles and construction waste Other indirect impacts include increased traffic vehicles, the residence of workers, labor safety incidents and community safety

Air quality

Impacts

100. The main sources of air pollutant and noise could be come from dust, exhausts are generated by soil excavation of cable trench and transportation of construction materials, noise is generated by operation of construction machines, equipment and transportation vehicle.

101. *Dust generated by soil excavation of underground cable trenches*; According to the Vietnamese EIA calculation, dust generated per day during construction phase is 1.07 kg dust/day. The concentration of diffused dust can be calculated, and the result shows that the data meet the standard (QCVN 05:2013/BTNMT <300µg/m3) at the distance of 100m from the emission source. Therefore, dust from soil excavation and fill for civil works will not severely affect air environmental quality. However, dust generated by subproject could affect the local people living along streets where subproject takes place and traffic users on the

subproject implemented streets (An Duong Vuong, Au Co, Nghi Tam, Yen Phu Road, Pho Duc Chinh - Chau Long Street) along the project.

102. *Exhausts such as NOx, SO_2, CO generated by transportation means' activities and construction machines' and equipment's;* The level of emissions during this period is subject to high fluctuated; it depends on the speed of vehicles, construction activity intensity, temperature, wind direction and speed in the region, soil moisture and air temperature during the day. The transportation means use mainly gasoline and diesel oil During the operation, the fuel is burned and it will emit fumes sizeable amount contained air pollutants such as CO, CO_2, SO_2, NOx, VOC to the surrounding environment. Vehicles used in the transportation of construction materials are 5 ton - diesel engine truck. The calculated pollution loads of CO, SO_2, NOx, VOC are 78; 028; 1534 and 338 kg/day respectively. Therefore, exhausted gases from transportation of construction of material and waste may severely affect air environmental quality if they are not controlled/mitigated properly. Thus subproject activities will need appropriate mitigation measures to apply to minimize the impacts.

103. *Noise*: will be generated by activities of machines, equipment and means such as truck, bulldozer, excavator, and transportation activities etc. According to the results of baseline monitoring, the current noise level of the project area range from 62 to 67dBA (lower than the allowed level, which is 70 dBA). Upon operation of the project, predicted noise will increase from 1-2 dBA. In the case there are multiple sources, noise would excess the standard. Since the subproject area is very close to the crowded residential areas (5 m apart), appropriate mitigation measures need to apply to minimize the impacts. The sensitive receivers are local residential households living along the An Duong Vuong, Au Co, Nghi Tam, Yen Phu Road, Pho Duc Chinh - Chau Long Street, as well as schools, offices, temples etc. However, noise impact is mitigatable and short-term because the impact would only happen during the road surface cutting, in addition, the machines, equipment and means will be only operated during the afternoon time. Thus, noise impact does not last too long, only 2 - 3 hours during the road cutting of 50 m section each. It impacts only on some households living along transport roads and near the construction site.

Mitigation measures

- Construction units will frequently spray water at the construction sites and along the transport roads crossing residential areas of lane 15 An Duong Vuong, 5m frontage Au Co road to minimize dust. During the dry and hot days, spray minimum twice a day when the dust is visible with specialized water tankers of 4.5m^3. Cover the material storage, setting up appropriate of mobilized material to the site to ensure that material will not obstruct at the site and release dust;
- All vehicles used for construction, and equipment and machines emitting noise, exhausts, fume will be maintained properly to minimize emission, and not operated at night if impossible to minimize noise;
- Apply rolling construction method, and recover surface of road or pavements right after construction activities completed on these sections;
- Soil scattered on the paved road and public road shall be removed immediately;
- Contractors will ensure that transportation means, machines and equipment must have effective certificate of environmental standards achievement (QCVN 04: 2009/BGTVT and QCVN 05: 2009/BGTVT) issued by the register department before using for the subproject construction;
- The trucks transporting construction materials and excavated soil will be covered by canvas;
- Reduce excavation and filling duration, and excavated soil will be used to fill as soon as possible to reduce dust emission;

- All vehicles used for construction, and equipment and machines emitting noise, exhausts, fume will be maintained properly to minimize emission. The equipment, machines and vehicles causing large noise will be allowed to operate only during day time. Undertaking the manual works/activities during nigh - time to avoid traffic conflicts;
- Drivers will be requested not to make horn and to turn of the truck engine when the truck stops for long time at the clouded residential area to reduce noise and gas emission.

Water quality

Impacts

104. Sources causing impacts on water environment include domestic wastewater and construction wastewater. However, along the subproject area is no water bodies (lake or pond). West Lake and Red River are about 200 m from the underground cable line. Thus the water quality is not directly impacted by the subproject activities.

105. *Domestic wastewater* is generated by worker's life activities. During the construction phase, the subproject employs about 45 technicians and workers. The workers do not live and eat in the camps, the amount of water for domestic supply in the construction sites is mainly used for sanitary purposes. Thus, the water supply level at this stage is 60 liters/person/day.

106. Total volume of water supply is: 45 x 60 = 2,700 liters/day. The wastewater is counted for 100% of water supply (Source: Section a, Clause 1, Article 39 Decree 80/2014 / ND - CP), the wastewater volume is: 2,700 x 100% = 2,700 liters/day = 2.7 m^3/day.

107. Domestic wastewater with high levels of impurities, many pathogenic microorganisms, if not treated when discharged into the sewage running through the lines can cause water pollution, algae bloom (eutrophication), reduces the oxygen in the receiving water bodies.

108. *Construction Wastewater*: The amount of water used in the construction phase of the project is small, about 4m^3/day. Water is used mainly to mix the construction materials. This amount of water is being absorbed into the material and the amount of wastewater generated will be approximately 1 % of water supplied to construction, which is approximately only 0.04 m^3/day.

109. *Refused oil, lubricant and grease*; Spent oil, lubricant and grease, oily rags, grease, lubricant; waste sewage from washing machines, equipment and means with oil, grease and SS will pollute surface water source if not collected and treated properly.

110. These impacts is considered as minor because; (i) Workers will rent houses with available sanitation facilities; (ii) The amount of wastewater in small construction and pollutant concentrations are not high; (iii) Repairs of construction machines in the garage has been allowed to operate, with wastewater treatment works; and iv) existing drainage system is available around construction site which could be used to collect this type of waste water. However, the results from baseline survey show that most of the ambient surface water quality has been polluted. Thus appropriate mitigation measures need to apply to minimize any negative impacts from subproject activities.

Mitigation measures

- *For domestic wastewater*: During construction phase, the subproject has about 45 workers working at the site, the contractor will arrange installation of two mobile toilets. The hired mobile toilet (type used for civil works) with collected and treated tanks with three sections such as containing, depositing and filtering. Dimension of the collected and treated tank can be 4.2m^3 in total, with containing section – 2.1m^3, deposited section – 14m^3, and filtering section – 0.7m^3. Installation locations are arranged along underground cable line to workers use conveniently. Based on construction progress, the mobile toilets are moved accordingly. The waste from portable toilets is collected and treated 1 time / week by the regulated environment unit in the subproject area.

- *For construction wastewater*: Wastewater during construction of new transmission lines consists of mainly rainwater runoff into the cable trenches carrying the contaminants. Mitigation measures before buried cable, casting foundation or backfilled trench bottom is to arrange construction sewage collection holes for depositing SS before wastewater flows into the drainage system of the city. The detail for technical specification for these holes is depended on the existing land available along the excavated trench. The amount of water stored in the period from 12 - 24 hours, then pumping the water into sewage system.
- In addition, the contractors will follow strictly construction schedule; require workers to use water for proper purposes, avoiding wasteful use; no arrangement to gather materials near water.
- After the end of the construction lines process, utilizing soil of trench excavation to backfill the trench.
- To minimize the impact of storm water runoff to the drainage system along the underground cable transmission line construction area, the contractors will implement measures to:
    - Exploit available sewer drainage, maintain good working conditions of the sewer;
    - Create a groove around the pit area to collect wastewater and lead to the drainage system of the area;
    - Use or transport excavated soil immediately to reduce the amount of storage on the construction site;
    - Collect construction solid waste, domestic solid waste generated at the construction site and hire functional units to transport to Nam Son landfill, Soc Son District for treatment.
- *For oil and grease*; All the reparation and, maintenance of machines, equipment and transportation means will be implemented at garages not in the construction sites. Refused oil and grease, waste sewage from washing machines, equipment and means, clouts with oil, grease will be collected and treated at these garages as stipulated.

Soil environment

Impacts

111. Sources causing impacts on soil environment include: impacts due to domestic and construction solid wastes which could be listed as the below:

112. *Impacts due to domestic solid wastes created by workers' daily - life activities*; The number of workers is about 45 people. Thus, the domestic solid waste volume is about 225kg/day. The composition of domestic solid wastes includes: organic matters, plastic, paper, glass and other inorganic matter, of which organic matters are accounted for the main part. The domestic solid waste may contain pathogenic bacteria/viruses that are harmful for human health and domestic animals.

113. *Impacts due to construction solid wastes created by construction activities;* Construction solid wastes include: soil, concrete, rubble waste from pavement demolition activities. The estimated amount during the construction period is about: 26,339m^3 of concrete pavement demolition and earthwork 39,559m^3 (Source: subproject EIA, 2015).

114. During the construction process also generates waste of construction materials such as material damage, the waste from equipment protection material, empty cement sacks, steel, lubricants, fuels, and wood debris etc. Packaging materials such as wooden barrel, plastic, foam, cardboard boxes used for equipment and devices, electrical parts will also be generated.

115. The maximum amount of hazardous waste generated at entire route during construction, such as Hazardous waste such as oil cloth, lubricant, oil etc., is 180kg that come from the process of repair and maintenance of machinery and equipment used in construction, especially the transport and installation of the cable. The hazardous compositions include

waste oil, oily cloths, gloves and other oily waste types building with other hazardous components.

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

117. However, these impacts are small and short-term because; (i) workers will rent houses with available sanitation facilities; ii) the amount of domestic waste generated will be relatively small (22,5 kg/day); iii) the construction activities will not involve much hazardous substance; iv) the subproject is located in the crowded urban area, and no farming activities have been recorded and most activities will be implemented within ROW of subproject; v) almost excavated soil will be landfilled at the city disposal area. However, to minimize impact and ensure sanitation condition, the set of mitigation measures need to be implemented on the site.

Mitigation measures

118. Measures to reduce domestic solid waste activities are;

- The contractor will prepare a Waste Disposal Plan as part of the Construction/Contractor Environmental Management Plan (CEMP).
- Provide sufficient funding to hire workers with adequate housing and sanitation
- Tidy ground construction area daily
- Establish regulation, education and training of workers with hygiene awareness in the field
- Arrangement of 4 bins with capacity of 60 liters, with a lid and wheels to easily move, put in the position next to portable toilets respectively
- Periodically dispose rubbish to the nearest collecting point; Frequency: 1 day / time
- Disposal of solid wastes into canals, stream, other watercourses, agricultural field and public areas shall be prohibited
- Burning of construction and domestic wastes shall be prohibited

119. Measures to reduce construction waste are;

- Utilize salvage excavated soil, rock for filling cable trench
- Excavated soil which cannot be reused will be collected and transported to the disposal site agreed by the local authorities through consultation with them
- Reuse/recycle as much as possible construction solid waste such as empty cement sacks, wooden barrel, plastic, foam, cardboard boxes etc. Those cannot be reused, disposed properly should not be left over on soil surface
- Compact at places with soil filling and excavation activity to mitigate soil erosion and washing
- Completely finish each work item before start other one. Conduct site cleaning, levelling and compaction after construction completion to return the ground for local people to continue their production or grow trees on the site

120. Mitigation measures for hazardous waste are;

- Classification of waste in accordance with regulations on hazardous waste management
- Hazardous waste will be managed in accordance with Circular No 36: 2015 / TT - BTNMT dated 04/24/2015 on the management of hazardous waste
- Arrangement of 01 containers of hazardous waste prevention; 24 liter capacity, with lids and label
- Hazardous wastes such as paint containing can, clouts with oil and grease, failed fluorescent lamp, etc. must be collected into tanks and kept temporarily at the construction site, then hiring competent unit for transporting to treat in accordance with current regulations
- Organize collection and transport of all kind of solid wastes periodically in order to minimize the impact on the environment

Impacts on Local Traffic

Impacts

121. Cable trench construction will affect transportation routes due to the gathering of materials, machinery and equipment and transporting raw materials such as iron, steel, cables lay down cable, threaded cable also affects traffic, hindering traffic flow.

122. The transportation of materials for the construction will increase the volume of traffic inroads and increase traffic density on the roads of An Duong Vuong, Au Co, Nghi Tam, Yen Phu Road, Pho Duc Chinh - Chau Long streets. This may probably contribute to more traffic jams during peak hours, increase traffic accidents, and affect the quality of local roads Dropping out of transported materials will also increase dust and traffic accident risks on residential area and sensitive receptors.

123. In addition local traffic could be impacted during construction of underground cables on the route where the underground cable crossovers some complicated positions or passes through intersections such as: below the Nhat Tan Bridge, Lac Long Quan Street - An Duong Vuong junction, Au Co road - Xuan Dieu Junction, Crossroads Thanh Nien - Yen Phu - Nghi Tam and Pho Duc Chinh Street - Chau Long junction with high traffic density. Cable has large steering angle at the position navigation: steering angle 15 An Duong Vuong turn lane, Lane 15 and 4 m frontage An Duong Vuong road; Chau Long Street - Yen Phu110kV Station.

124. However, there will be small and short term impact on local traffic since i) the number of operating trucks per day is 65 trips (Source: Project Justification); ii) Transportation time of the subproject materials is estimated at 6 months iii) no heavy equipment will be transported to the construction sites.

Mitigation measures:

125. During construction, workers will follow the team in accordance with the assignment, working in shifts, with specific times. A reasonable construction schedule will be planned to avoid the rush hour when construct underground cable below the Nhat Tan Bridge and at the intersections: Lac Long Quan Street - An Duong Vuong junction,Au Co road - Xuan Dieu Junction, Crossroads Thanh Nien - Yen Phu - Nghi Tam and Pho Duc Chinh Street - Chau Long junction.

126. The other mitigation measures are;

- The Contractor will prepare, educate workers, and implement a Transportation and Traffic Management Plan as part of the CEMP.
- Prepare implementation plan for the underground cable installation at every inter-cross location. This includes the appropriate time and work type to be conducted at each specific road sections.
- Contact with Hanoi Transportation Division for coordination to ensure construction safety and uninterrupted traffic activities
- Arrange reasonable work to avoid traffic obstacle
- At the locations where the underground cable section crossing over the roads, it need to set signal light when constructing at night, particularly in the road section Lane 15 An Duong Vuong, 5m frontage Au Co road, Yen Phu, Pho Duc Chinh, Chau Long street
- Put up warning boards at dangerous road sections that are: steering angle 15 An Duong Vuong turn lane, Lane 15 and 4m frontage An Duong Vuong road; Chau Long Street - Yen Phu110kV substation where traffic accidents can occur
- Transportation means serving the subproject implementation need to obey speed limits stipulated by the Government
- Limit transportation of materials in rush hours (during 6 to 8 am and during 4 to 6 pm) to avoid traffic jam
- Transport materials with the allowable load. Not expand trucks' body.

- Clean soil and construction materials on road surface; level, compact, recover and return the initial status of the earth roads if being damaged by the project activities just after completing the construction
- In the process of using a dedicated car drag line, especially over roads will install speed limit signs or barriers limiting the accidents that may occur

Occupational health and safety of workers

Impacts:

127. Construction activities may cause health harm and danger of the 45 workers' lives. The accident may occur since almost many section of underground cable trench will be installed on the crowded streets which may lead to high risk of hitting between traffic vehicle and workers on the site. Moreover, as designed many sections and activities of the subprojects will need to implement during night time which may cause high risks for workers during operation of construction machine/equipment if light will not be sufficiently maintained. Beside, occupational health issues could be results of low quality of living condition may cause eye affection, skin disease and hear relative disease and electric shocks during connecting and test electric with the existing substations. However, the risks/failures could occur at low probability because: i) workers who operate machine will require professional skills as regulation; ii) as mentioned above, demand of transportation is not much; iii) as stated in design report, workers are supported to rent housing guarantee sanitary conditions, light; and iv) testing of electric equipment will require strict and specific procedures which will help to reduce electric shocks. However, these impacts are small and short term and last only during the construction phase (6 months) and will stop when the subproject construction phase finishes.

Mitigation measures

- Occupational Health and Safety Plan (OHSP) will be prepared as part of CEMP and implemented by the contractor
- All workers will be examined health, especially people working at deep trench, and equipped sufficiently personal protective equipment (PPE) such as hard hats, safety gloves, safety belt, ear protection etc. This must be strictly imposed.
- All construction equipment and tools will be carefully examined for quality and quantity before use.
- For people working at depth, the installation of cables will be carefully checked before going to trench.

128. Contractor need to work with Contractor/Construction Supervision Consultant (CSC), Project Implementation Consultant (PIC) and HANOI DPMB.

- HANOI DPMB to establish labour safe regulations on the sites required by law and by good engineering practice, which include: electric safety, operating equipment - general safety requirements
- Carefully check boom guy, cable clip before load heavy objects
- For trench excavation: Strictly implement safety measures while excavating cable trench; Apply measures to consolidate the trench wall by pressing soil on the wall surface
- Use suitable means of transport. Check the load of the vehicles before use, fasten seatbelt 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

- 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.
- Contractors will prepare emergency measures on time. When accident occurs, conduct in site first aid, then quickly drive the wounded to hospital for treatment. The address and phone number of the nearest hospital to call ambulance needs to be available at site. Besides, it must be equipped medicine cabinet for aid.

Community health and safety

Impacts

129. Impacts on health and safety of local people and traffic users on the main roads of subproject areas may include dust and noise generated from construction, which will be affect households close to the site and officers of substation route. Traffic safety is also main impacts in the main intersections, nearby roads as defined in Impacts on Local Traffic section due to road surface occupation, conflict between construction equipment and transport vehicles on the road. Electric shock and other accident may occur to local people since they are illegal entering construction sites.

130. However, these impacts are considered as minor and short term since: i) the construction scale is small, which is concentrating on each short section (about 50 m) when one section is finished the following section will be just started; ii) construction activities will be relatively short time and construction area will be fenced by iron sheets and within the ROW.

Mitigation measures:

131. To mitigate these potential impacts, the civil contractor will, as part of the CEMP, develop a Community Health and Safety Plan (CHSP) that incorporates good international best practice and recognized standards. The CHSP should include:

- Specific emergency response procedures for traffic accident, working accident, electrocution. The detail guidance is described in the emergency response plan (Appendix D)
- Communication systems and protocols, interaction with local and regional emergency and health authorities;
- Install barriers (temporary fence) at construction areas to deter people access to the site;
- The local people shall not be allowed in high risk areas (excavation sites and areas where heavy equipment is in operation);
- Provide warning signs as noted in *Impacts on local traffic* section;
- When fire occurs due to electricity, first notice immediately to authorized unit to cut off power, then comply with the procedures of firefighting
- Coordinate with the local government of district and commune to propaganda and disseminate knowledge about safety to communities living near areas of underground cable trench

Social disturbance

Impacts

132. It is estimated that 45 workers will be mobilized on the construction site. The concentration of workers could lead to several social problems on the sites such as:

- Social evils and diseases transmission could negatively affect local residents as well as workers due to low living condition of workers which could lead to the appearance of eye

disease, skin disease, and respiration cases and then it would be spread out in the local communities

- Conflict between workers and local people;
- Traffic safety in the main intersections as defined in Impacts on Local Traffic section. Uncontrolled and poor construction schedule could lead to high risks of traffic accident, especially during rush hours

133. However, these impacts are insignificant, short term, only occur in the construction phase along 6,073 km of underground cable and it will stop when the project construction finishes.

Mitigation measures

- 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 Government of Viet Nam's regulations on Occupation, Safety, and public health, and the World Bank's Environment, Health, and Safety Guidelines (2007)[6] that govern the safe and orderly operation of civil works
- Equip medicine cabinet for protecting workers' health in time
- Construction units will implement temporary residence registration and provide accurate information about the quantity and stay time of all construction workers to Commune People Committees (CPCs) within the project area during the construction phase. They will 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 contractor shall be strictly treated in accordance with laws
- Propagandize, educate workers and create good relations with local people in order to avoid conflicts arising. HIV/AIDS education will 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

Biological impacts

134. No typical or high value vegetables covered along the underground cable transmission line because cable tranche are located in the crowded urban areas. Adjacent to the subproject site is an embankment with grasses, almost no big trees along the underground cable transmission line. The main vegetables could be listed as urban landscape trees such as tropical almond, flamboyant, acacia etc. Moreover, no trees will be removed or cut by subproject activities. Therefore, subproject will not cause impacts on biological system.

Repair, restore, and return the ground after construction completion

135. 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, sewage system and public infrastructures damaged by the subproject construction
- Require the Contractor within 30 days after the end of construction to dismantle, move all materials, components redundant, construction waste to designated location, which is Nam Son landfill, Soc Son District, Hanoi city; to move machinery and equipment used in construction works out of construction site

[6] http://wwwifcorg/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B - %2BGeneral%2BEHS%2BGuidelinespdf?MOD=AJPERES

- For the underground cable construction, cleaning and restoration of the ground on each construction phase. Ensure to restore to the original state by 5am on the next day.
- The construction contractor will prepare regulation prohibiting the dumping of ground cleaning waste to the neighbourhood

D. Potential Impacts and Mitigation Measures during Operation phase

136. The potential impacts of the operation of the Tay Ho - Yen Phu110kV underground cable transmission line and mitigation measures for the impacts are described as follows:

Prevention of cable break incident

Impacts

137. During operation, underground cable could be broken due to digging activities of other works, or being corrosive because of acidic rain water or leakage of industrial wastewater. However, these impacts are mitigatable and rarely happened since (i) construction of underground cables is strictly in accordance with Decree No106/2005 / ND - CP of the Government dated 17 August 2005 regarding detailing and guiding the implementation of some provisions of the Electricity Law on protection secure high - voltage power grid works, safety corridors of underground cable protection; (ii) cable is placed inside durable HDPE pipe then buried tightly in the ground across the entire line.

Mitigation measures

138. To prevent cable break accidents the following measures will be implemented:

- Within underground high voltage electricity cable protection corridors, prohibits digging, piling, discharging industrial waste water, which can cause corrosion damage. Investors will implement measures to protect the safety of cables and cable structures
- Maintain the drainage ditch on the cable routing area to avoid water pregnant that may cause water percolating into cable trench
- Where incidents occur and cables are broken immediately notify the nearest power agency for handling measures: power cuts, technical staffing to inspect and repair

Occupational health and safety of the workers during the underground cable periodic maintenance process:

Impacts

139. The occupational health and safety issues during the operation and maintenance of underground cable transmission line include electrocution risk due to exposure to high voltage systems when maintaining and repairing the underground cable transmission line or living near the cable trench, which includes.

- *Exposure to high voltage systems*: Workers may come in contact with power lines/equipment during the maintenance and repair of the facilities and electrocution from direct contact with high voltage electricity is a hazard directly related to facilities
- *Exposure to EMF*: Typically, workers repairing and maintaining the underground cable transmission line have higher exposure to EMF than community because of working in close proximity to electric power equipment

Mitigation measures:

140. The Operator of the underground cable will follow the IFC (2007) and EVN guidelines when carrying out maintenance of the underground cable transmission line. Some of 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

- Provision of PPE for workers, safety measures, personal safety devices, and other precautions during maintenance work of the underground cable transmission line

141. 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

142. In addition, in the operation phase, training for workers will be conducted 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.

143. Coordinate with the local authorities at commune, district levels to propagandize, disseminate knowledge of safety to communities and residents living near the underground cable trench.

Community Health and Safety

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 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) In general electric fields are the strongest close to the source and diminish with distance

Mitigation measures:

144. To prevent electrocution risk: Hanoi Power Company will implement the following:

- Comply with operation procedures and safety requirements;
- Monitor minimum approach distances for excavations, tools, vehicles, pruning, and other activities when working around the underground cable trench
- Observe/test EMF at resident's buildings for treating appropriately if any complaint

145. 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 community Potential health effects associated with exposure to EMF is not well-established due to lack of empirical data demonstrating adverse health effects. However, the community will be warned about the safety distances from the underground cable trench through warning marks and prohibition of digging into the cable trench area.

Climate Change

146. The climate change would affect the subproject components by increasing flood intensity and frequency. Based on the Regional Global Circulation modeling project greenhouse - climate change induced changes to the frequency and severity of rainfall events in the subproject area. In recent years there is a change of time and intensity of rain in the Hanoi area. Together with the expansion of cities and the progress of construction of the drainage system of the city of the level and extent of flooding due to rainfall has increased in scope and magnitude. So during the construction process, designed must consider this factor.

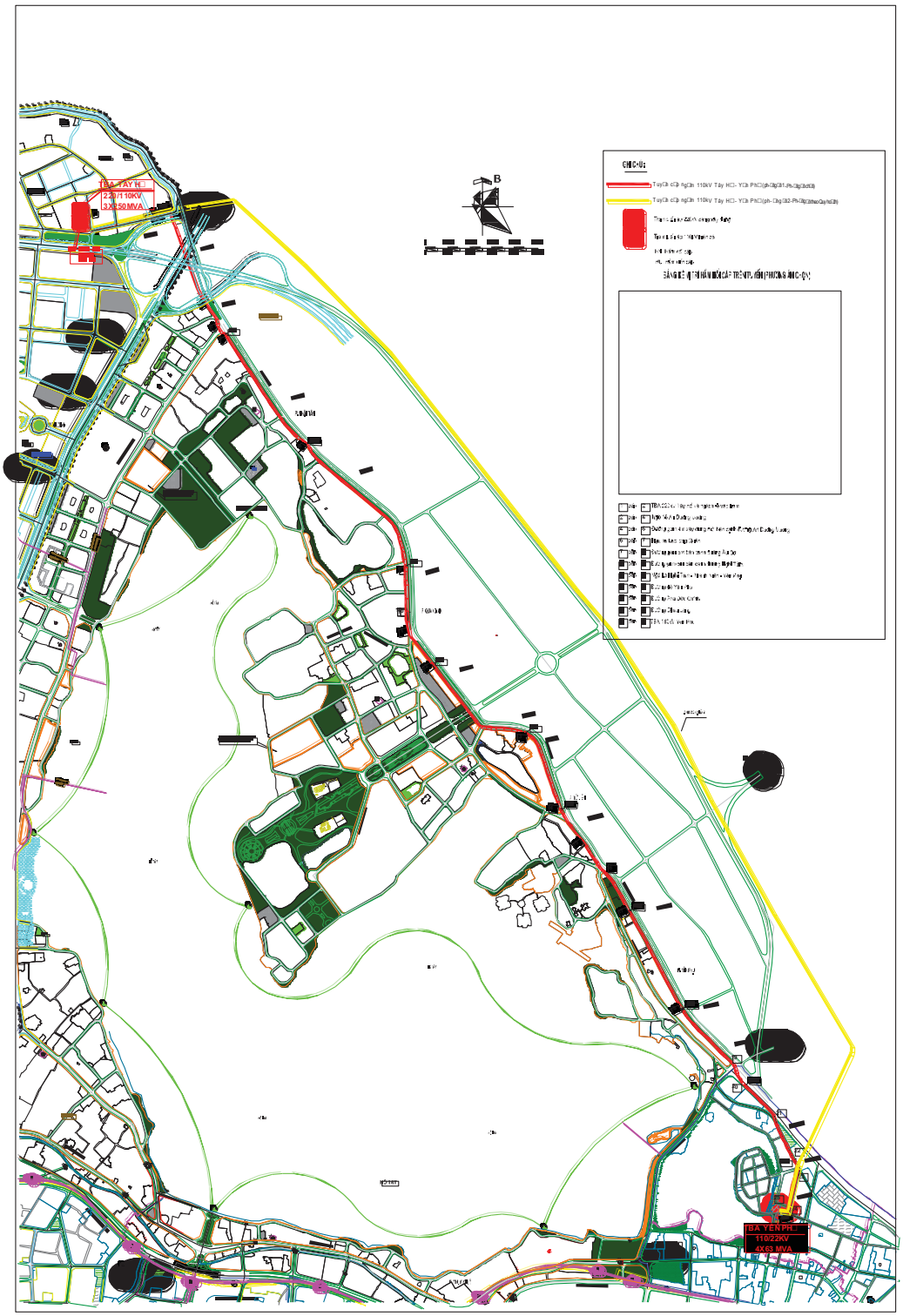
VII ANALYSIS OF ALTERNATIVES

147. Based on the subproject requirements and in accordance with the existing grid structure in the region, JSC Thanh Nam Electric Construction and Investment Consultancy Company 4 has conducted field survey and proposed 02 alignment alternatives to build underground cable route 110kV Tay Ho - Yen Phu as follows:

Alternative 1 (proposed selected alternative): 110kV underground cable - starts from 220kV Tay Ho substation, turns out to the lane 15 An Duong Vuong Street, goes in parallel with the existing 110kV underground cable on the Lane 15. Then it goes along An Duong Vuong - Au Co road (located under the south frontage roads along the Red river dyke foot) and then continues along the Yen Phu street - Pho Duc Chinh - Chau Long to Yen Phu 110kV substation.

Alternative 2 (Following the construction planning of Hanoi): 110kV underground cable - starts from 220kV Tay Ho substation, turns out to the lane 15 An Duong Vuong Street, crosses over the Red River dike at intersections of Nhat Tan Bridge, outside the dyke. Then cable is planned to goes along the riverside until Yen Phu area where the cable line cuts the dike to goes along Pho Duc Chinh Street - Chau Long street to Yen Phu 110kV substation.

The map of two alternative options is in



148. **Figure 5**, and the comparisons of the two alternatives are presented in Table 19.

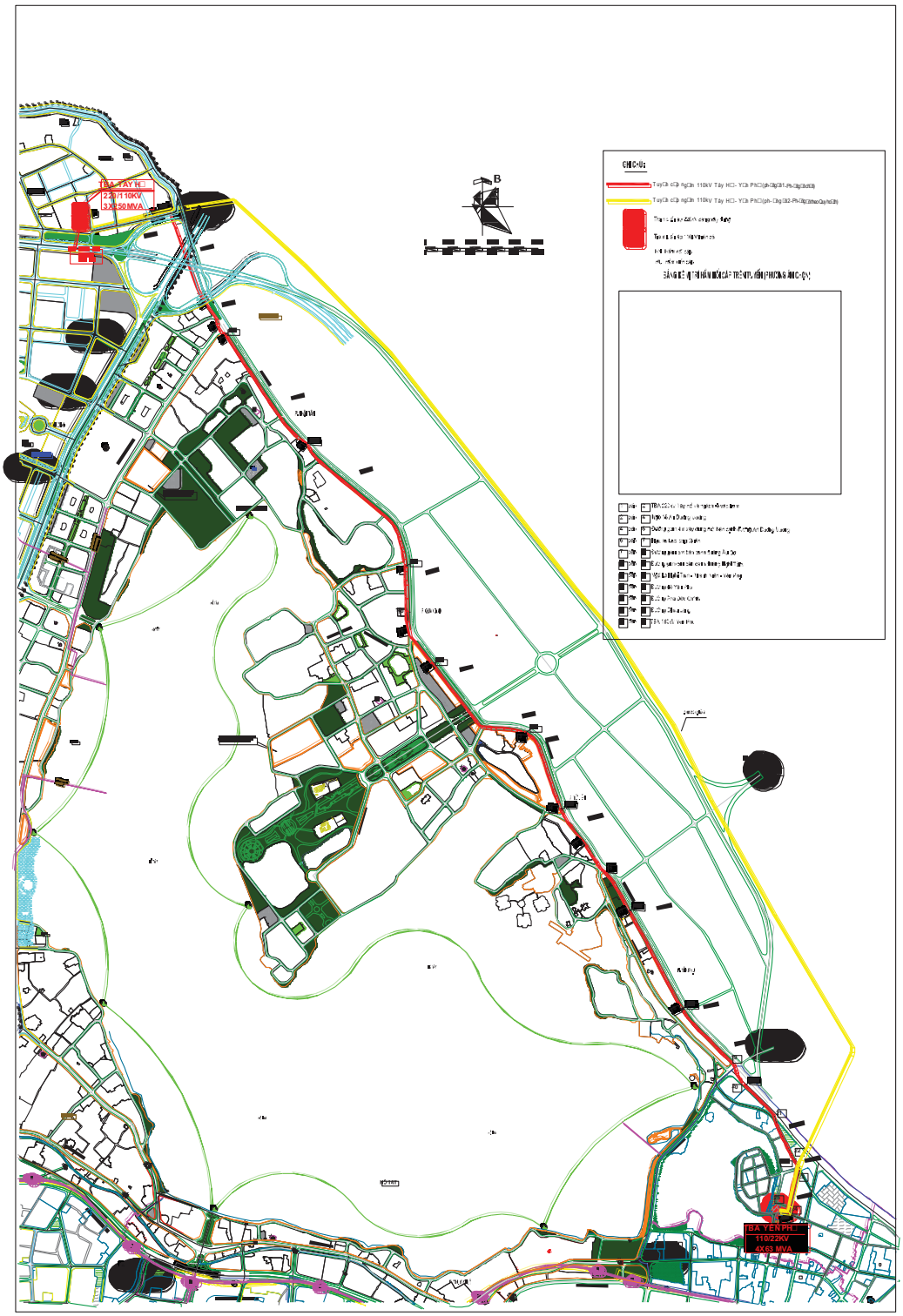


Figure 5: Map of Alternative Options

Red line: Alternative 1 (Selected Option)
Yellow line: Alternative 2 (Plan under general construction planning of Hanoi City)

Table 19: Comparison of the two Alternatives

Compare items	Alternative 1 (Selected Option)	Alternative 2 (Plan under general construction planning of Hanoi City)
City Planning	No conflict with other local planning. The underground cable route has been proposed by the Institute of Urban Planning. This is also approved by all related organizations, such as: the Hanoi People's Committee, the Department of Planning and Architecture of Hanoi, Ba Dinh People's Committee, the Department of Agriculture and Rural Development, as well as units having underground works on the passing routes	Consistent with general construction plan of Hanoi. However, now the planed road on the left bank of the Red River dike is not constructed yet, so the cable construction on this road cannot be implemented.
Natural conditions, levelling volume, foundation construction	Spacious, relatively flat and dry topography; geological structure is clay, hardened state	Spacious, relatively flat and dry topography; geological structure is clay, hardened state
Cutting across the existing underground infrastructure	Cutting across the existing 110 kV underground cable in Lane 15 An Duong Vuong and intersections Phu Thuong (In these sections, HDPE pipes have already been pre - installed). The route also cuts some communication lines, drainage system along frontage roads adjacent to the foot of the embankment, and along Pho Duc Chinh Street and Chau Long Streets	Cutting across the existing 110 kV underground cable in Lane 15 An Duong Vuong and An Duong Vuong - Yen Phu embankment 2 times. The route also cuts across some communication lines, drainage system along frontage roads adjacent to the foot of the embankment, and along Pho Duc Chinh Street and Chau Long Streets
Infrastructure	Facilitate the process of construction and operation and management of cable line	Not facilitate to the process of construction and operation and management of cable line because the road on the left bank of the Red River dike is not constructed yet
Environmental impacts and Compensation	Impact on the environment is limited; clearing and compensation is small	Impact on the environment is limited; clearing and compensation is small
Permanent land acquisition	6400m^2	6750m^2
Land Type	Transportation Land	Transportation Land

149. The comparison of 02 alternatives showed that the alternative 1 has no conflict with other local planning, facilitates the construction work, acquires fewer land area. In addition, the route was agreed by the Hanoi departments and Hanoi People committee. Therefore, the Alternative 1 has been selected.

VIII INFORMATION DISCLOSUREAND PUBLIC CONSULTATION

A. Public Consultation

150. The stakeholder consultation procedure was developed to meet the requirements of meaningful consultation as stipulated by the ADB SPS as well as LEP2014. The strategy embodied the principles of meaningful engagement, transparency, participation, and inclusiveness to ensure that affected and marginalized groups such as women, and the poor, were given equal opportunities to participate in the design of the subproject.

Identification of Stakeholders

151. 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) Ward People's Committee, People's Council, (ii) EVN HANOI, (iii) HANOI DPMB;
- Organizations/unions/associations such as Women Union and Father Land Front that provided various information for the design of the subproject, and that might participate in implementation of measures and interventions;
- Households and enterprises living along the underground cable transmission line can be people who will be directly affected or be adversely impacted or can be people who will be received benefits from the determination and implementation of mitigation measures against adverse impacts, and
- Organizations, individuals affected by the subproject

Public consultation procedures

152. Public consultation meetings consisted of the following procedures:

- Engineering consultant introduced the subproject "Tay Ho - Yen Phu 110kV underground cable transmission line" and the length/technical features of the underground cable transmission line
- Environmental consultant presented requirement of the ADB SPS and environmental policy, safety regulations of the Vietnam power sector, anticipated environmental impacts and respective mitigation measures (to be developed in the IEE), grievance redress mechanism for environment and resettlement problems;

153. During the meeting, people presented their questions and comments on environmental issues. The representative of HANOI DPMB and consultants answered and explained all questions of the participants.

Results of Public Consultation

154. Formal public consultation meetings were held to discuss the location and potential environmental and social impact of the subproject. Five public consultations were held in 05 Wards. Total 87 persons participated in the meetings. The minutes of meetings are presented in Appendix B. The consultation dates and number of participants is as in Table 20.

Table 20: Time and venue of public consultation meetings

No	*Commune*	*Time*	*Venue*	*Participants*		*Total of participants*
				Female	**Male**	
1	Nhat Tan	1 July 2016	WPC Office	3	11	14
2	Quang An	29 June 2016	WPC Office	3	7	10
3	Truc Bach	30 June 2016	WPC Office	12	9	21
4	Tu Lien	28 June 2016	WPC Office	9	12	21
5	Yen Phu	5 July 2016	WPC Office	8	13	21
	Total			**35**	**52**	**87**

155. The main comments of wards' authorities and affected people are as follows:

- The local people agree with the construction of the subproject. However, on the 5 m wide route high residential density, with preschools, elementary school, the project owner (HANOIDPMB) should choose the construction company having good engineering experience and responsibility to avoid causing trouble to local people during the construction process
- Construction units should implement construction works safety to not affect households around the construction area. After the construction finished at night, return the ground properly to not affect population movement. The construction units should make plans to drain water from trenches during raining season.
- Construction unit should return ground properly to the initial state, to avoid affecting the lives of the people, construct with a reasonable plan to avoid affecting existing underground infrastructures. If damage occurs, repair it immediately
- Ward people support the construction at night time, but contractor must clean the construction area before dawn
- To avoid upsetting to people daily life, affecting the business of shops, the reasonable construction time should be selected. The noise of construction machinery equipment should be mitigated by covering/fencing the construction site safely and properly. When a problem arises, investors and contractors should actively carry out their responsibilities, contact local authorities and residents to resolve satisfactorily
- The construction company should perform a rolling construction, repay the same ground to avoid affecting residential and business area households. Contractors should execute quick, keep hygienic environment and place iron plates on the road to avoid obstructing traffic for vehicles

156. The summary of comments/questions from local authorities/people and answers of project owners and consultants are summarized in Table 21. Required input from stakeholders and response from project owners will occur through the Grievance Redress Mechanism.

Table 21: Discussion summary of public consultation

No.	*Comments*	*Response of Owner/consultant*	*Response from Project*
1	**Nhat Tan Ward**		
	Before construction starts a survey should be made, because the 5m frontage current route includes cable television systems, electricity line, and water supply pipe. Based on that an appropriate plan to build an underground cable should be developed Avoid disturbing daily - life activities of people - The Project owner is requested to coordinate with the Department of Construction to conduct constructive and reasonable plan to prevent the overlaps of construction and digging (because the drainage systems will be upgraded on 5 m wide road) - The local people agree with the construction of the subproject. However, there are many houses, kindergarten, elementary schools on the 5 m wide route. Therefore, the project owner should choose the construction company having good engineering experience and responsibility to avoid causing trouble to people living during the construction process	Contractor will implement measures to mitigate impacts. In case of any incident affecting people's equipment and structures, the Contractor will have the timely corrective plan, as prescribed by law.	Mitigation measures are presented in Section X Environmental Management Plan

	- The project owner should send all related documents to the affected ward before construction starts. Contractors should commit to return the ground as original state to ensure safety for people		
2	**Quang An Ward**		
	- The project owner should choose construction units capable and qualified to perform the project. During the construction process, when the incident occurs, contractor should timely resolve to not affect the lives of people - Prior to the construction starts, a meeting between the construction company and the Ward PC should be conducted. A minute of meeting will be kept in ward as a basis to monitor the contractor performance during the construction process. - Currently beneath 5m frontage roads are many infrastructural utilities such as: Power lines, cable lines, water lines. Therefore the construction unit should chose the optimal construction plan to avoid affecting the existing infrastructure. When construction work taken at night, the work section should be cleanly finished before dawn - The construction company should perform a rolling construction; rehabilitate the ground to avoid affecting residential and business area households. Contractors should execute quick, keep hygienic environment and place thick iron plates on the road to avoid obstructing traffic for vehicles.	Contractor will take measures as stated in IEE to mitigate impacts. In case of any incident affecting people's equipment and structures the Contractor will have a timely corrective plan, as prescribed by law	Mitigation measures are presented in Section X Environmental Management Plan
3	**Truc Bach Ward**		
	- Ward people support the construction period at night, but after construction must clean before dawn - Ward people support the implementation of the project construction background in the middle of the road, when construction is complete return road as the original condition - Contractors should keep the area of construction clean, collect garbage every day, have methods to minimize noise during construction at night time, return neat ground before dawn - Contractors should provide the optimal method for utilities remedy in case construction affects electricity or water supply utilities; limit water and electricity cuts during construction to minimize affecting people's daily life - Taking lesson learned from conducted/conducting projects, contractors should collected waste and garbage according to regulations, put construction site signs, repair the damaged power and water lines immediately to avoid affecting the life and business of the people - To avoid upsetting to life, affecting the business of shops the reasonable construction time should be selected. Noise of construction machinery equipment should be mitigated by covering/fencing the construction site safely and	Contractor will take measures as outlined to mitigate impacts. In case of any incident affecting people's equipment and structures the Contractor will have the timely corrective plan, as prescribed by law	Mitigation measures are presented in Section X Environmental Management Plan

	properly. When a problem arises, investors and contractors should actively carry out their responsibilities, contact local authorities and residents to resolve satisfactorily		
4	**Tu Lien Ward**		
	- The construction units should have a team of technical expert. - When construction finishes the contractors should restore the ground to the original condition - The agreement signed between the construction company and the governmental authority needs to present to the people in order local people can monitor the implementation of mitigation measures during the construction process - Avoid making noise during construction at night - Construction unit should return ground properly to the initial state, to avoid affecting the lives of the people, construct with a reasonable plan to avoid affecting existing infrastructural underground If damage occurs, repair it immediately	Contractor will take measures as outlined to mitigate impacts. In case of any incident affecting people's equipment and structures the Contractor will have the timely corrective plan, as prescribed by law	Mitigation measures are presented in Section X Environmental Management Plan
5	**Yen Phu Ward**		
	- Construction units should implement construction works safety to not affect households around the construction area - After the construction finished at night, return the ground properly to not affect traffic movement - The construction units should make plans to drain water from trench during raining season - Currently under 5m roads are electricity and water pipeline, therefore, the construction company should have specific emergency plan if something goes wrong and appropriate release plan to not affect the daily life of the people - The project owner should ensure construction progress as planned, to avoid affecting the daily life of the local people	Noted The design, construction and operation of the underground cable transmission line is subjected to safety regulations to avoid potential risks	Mitigation measures are presented in Section VI Potential Impacts and Mitigation Measures Section X Environmental Management Plan
	Conclusion: The Ward People's Committees of 6 wards and affected people agree and will support the construction of "Tay Ho - Yen Phu 110kV underground cable transmission line" subproject		

157. In short, the local people agree with the implementation of the subproject; concerns were primarily on ensuring mitigation measures of the contractor, as well as the responsibilities of involved parties in cases of incidents and damage to property and threatening people's safety. After the explanation and clarification of missing information by the consultant, local community and authorities agreed completely with the project.

158. Before commencing the construction, the project owner shall notify the Ward People's Committees (WPCs) on the progress of construction, publicize approved IEE, EMP and EIA in Vietnamese in WPC offices.

B. Information disclosure

159. Formal information disclosure to the affected persons and stakeholders of "Tay Ho - Yen Phu 110kV underground cable transmission line" subproject that presented in the IEE aims to continuing the process of information disclosure and participation of relevant parties as the subproject is implemented. As part of the communication strategy for the relevant parties (stakeholders), regular information exchange meetings with stakeholders are strongly encouraged throughout the implementation of the subproject.

160. IEE must be easily to understand in order that the stakeholders can comment in written and verbal form in local language of Vietnamese.

C. Future Consultation Activities

161. At a minimum, Executive Summary of the IEE written in Vietnamese will be distributed to all Ward People Committees of the subproject area. IEE will be available also at the HANOI DPMB in Hanoi City when it is approved by ADB. The final English IEE will be available on the ADB website upon ADB's approval of the document.

162. HANOI DPMB will, before starting the construction work, i) dispatch a focal person, who clearly understands the subproject, and who will be responsible for the communication with stakeholders; and ii) announce a detailed implementation schedule to the relevant local authorities (WPCs) and the communities in the subproject area.

163. In addition, during subproject construction phase, HANOI DPMB and construction unit will continue to receive feedback from communities and affected households. All their feedbacks will be supervised and monitored by HANOI DPMB.

164. Following the loan agreement of the project[7], HANOI DPMB will disclose environmental monitoring reports translated into Vietnamese, to the affected persons promptly upon ADB approval by placing the document at constructor office at construction site and at ward office.

165. Similarly, all reports on public consultation with the stakeholders prepared by the EA/IA will be available at all WPC offices and HANOI DPMB offices.

[7] Schedule 5, Para 10, a) of LOAN AGREEMENT (Ordinary Operations) DATED 7 NOVEMBER 2014 <https://www.adb.org/sites/default/files/project-document/149476/46391-001-lbj.pdf>

IX GRIEVANCE REDRESS MECHANISM

166. A well-defined grievance redress and resolution mechanism will be established to address affected persons grievances and complaints regarding environmental issues, land acquisition, compensation and resettlement in a timely and satisfactory manner. Particularly, the compensation of land acquisition and environmental issues will be done right after the complaint being identified is correct. All affected peoples of 6 wards of Tay Ho and Ba Dinh Districts were made fully aware of their rights, and the detailed procedures for filing grievances and an appeal process during public consultation meeting. The grievance redress mechanisms will be translated into Vietnamese and distributed to WPCs. Affected people can have this information from WPC offices.

167. Affected peoples are entitled to lodge complaints regarding any aspect of affected environments such as noise and pollution. Affected peoples complaints can be made verbally or in written form. In the case of verbal complaints delivered by telephone calls (the phone number is written in the subproject's information board), the person receiving phone call will make a note then transfer it to the committee on grievance. The committee on grievance, consisted by HANOI DPMB, Commune People Committee and Contractor, will be responsible to make a written record during the first meeting with the affected peoples.

168. The designated grievance committee who is responsible for handling complaints shall exercise all efforts to settle affected peoples issues at the ward level through appropriate community consultation. All meetings shall be recorded and copies shall be provided to affected peoples. A copy of the minutes of meetings and actions undertaken shall be provided to the EA/IA, and ADB upon request.

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

Stage 1: Complaints from affected peoples for the first time shall be lodged verbally or in written form to the Contractor. The complaints shall be received by the Contractor and discussed with the affected peoples to seek possible solutions.

Stage 2: If no understanding or amicable solution can be reached or if no response is received from the Contractor within 5 days from the day the complaint is received, the affected peoples can elevate the case to the HANOI DPMB. The HANOI DPMB is responsible to work with the Contractor for resolutions.

Stage 3: If no understanding or amicable solution can be reached again, the affected peoples can appeal to WPC. The WPC will review and issue a decision on the appeal within 15 days from the day the complaint is received. All meetings shall be recorded and copies of the minutes of meetings will be provided to affected peoples.

Stage 4: If no understanding or amicable solution can be reached or if no response is received from the WPC within 15 days from the day the complaint is received, affected peoples can elevate the case to the District People's Committee. The District People's Committee is expected to respond within 15 days upon receiving the affected peoples appeal.

Stage 5: If the affected people is not satisfied with the decision of the District Office, or in the absence of any response, the affected peoples can appeal to the Hanoi Municipal People's Committee (MPC). The Hanoi MPC will review and issue a decision on the appeal within 30 days from the day the complaint is received.

Stage6: If the affected people is still not satisfied with the decision of the Hanoi People' Committee or in the absence of any response within the stipulated time, the affected peoples, 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 EVN HANOI, PPC, DPC, WPC and the affected peoples.

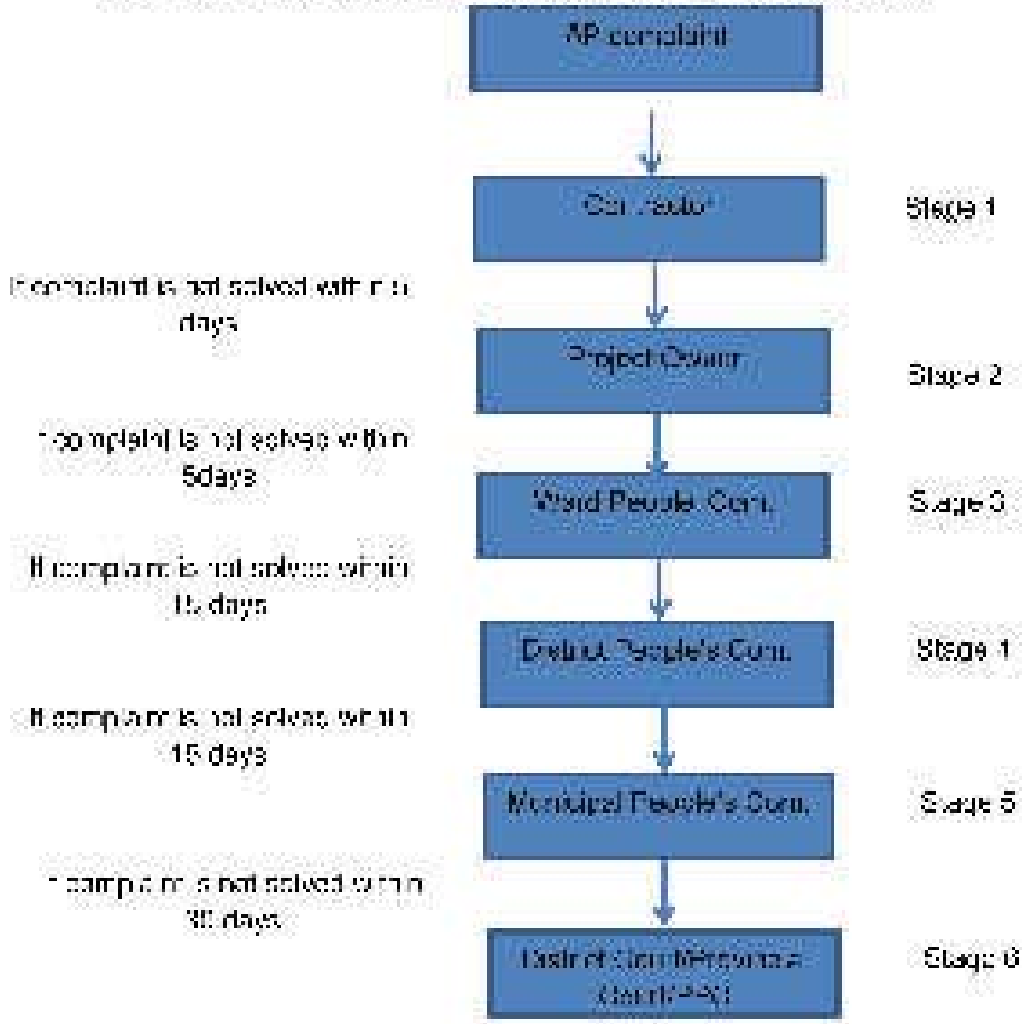


Figure 6: Summary of Grievance Redress Mechanism

170. EA-IA will be responsible for checking the procedures and resolutions of grievances and complaints. EA-IA must have expertise and experience in social and environmental issues associated with infrastructure developments. EA-IA may recommend further measures to be taken to redress unresolved grievances. The environmental specialist at PMU-DPMB will provide the necessary training to improve grievance procedures and strategy for Peoples Committees when required.

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

172. If efforts to resolve disputes using the grievance procedures remain unresolved or unsatisfactory, affected peoples have the right to directly address their concerns or complaints with the ADB Southeast Asia Department through the ADB Viet Nam Resident Mission (VRM).

If affected peoples are still not satisfied with the responses of VRM, they can directly contact the ADB Office of the Special Project Facilitator.

X ENVIRONMENTALMANAGEMENT PLAN

A. Mitigation

173. An EMP has been prepared for the subproject "110 kV Tay Ho –Yen Phu underground cable transmission line" with the purpose of integrating the results of the IEE into a formal management plan that is implemented in parallel with the subproject to prevent or minimize 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 a part of the IEE

174. The EMP consists of an impacts mitigation plan, a monitoring plan, and an emergency response plan. EMP also prescribes the institutional responsibilities for the implementation of the EMP is a management tool that provides a set of directives and guidelines that the HANOI DPMB follows to prevent or minimize unnecessary environmental impacts of the subproject.

175. 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 22.

176. The Contractor must develop emergency or incident response procedures during construction and operation phases of the 110 kV Tay Ho - Yen Phu underground cable transmission line to protect workers and the public. The emergency response plan (ERP) outlines the roles and responsibilities of persons from first identification of an incident or emergency to the final steps of safe and complete closure of the situation. The detailed requirements for the ERP are described in Appendix D.

Table 22: Environmental Impact Mitigation Plan

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[8] (USD)	Responsibility	
							Supervision	Implementation
Pre - Construction								
Contract with contractor(s)	Incorporation of IEE and EMP into bidding documents and contracts	Environmental mitigation measures indicated in the IEE, and the EMP will be included in contractor's bidding documents, technical specifications, and contracts for civil constructions and equipment installations. All contractors will be required to strictly comply with the EMP.	Final siting	Before construction initiated	Contractor's bidding documents incorporated IEE and EMP	No marginal cost	PIC	EA/IA
Contract with other	Compliance with the Law	Identify a specialized unit (e.g. Hanoi Urban Environment	All sites	Before const	Once with	No marginal	PIC	Contractor

[8] Costs will need to be updated during detailed design phase.

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[8] (USD)	Responsibility	
							Supervision	Implementation
entities	on Environmental Protection	Company Limited) to collect, transport and dispose the asphalt concrete mass, refused excavated materials to the permitted disposal site and make a contract with them.		ruction initiated	permitted license for disposal site and contract for solid waste disposal	cost		
Detailed design	Incorporation of IEE and EMP into the detailed design	The environmental mitigation measures indicated in the IEE and the EMP will be incorporated into the detailed design.	All sites	Before construction initiated	Once with detailed designs documents	No marginal cost	PIC	EA/IA
Construction/Contractor Environmental Management Plan (CEMP)	CEMP Review and Approval	Contractors will develop CEMP that outlines the manner by which they will comply with the requirements of the IEE and EMP. This will include: - Waste Disposal Plan[9] - Transportation and Traffic Management Plan[10] - Occupational Health and Safety Plan (OHSP)[11] Community Health and Safety Plan (CHSP)[12]	Final siting	Before construction initiated	Once with Contractor Environmental Management Plan (CEMP)	No marginal cost	PIC	Contractor

[9] See para 118 of the IEE.
[10] See par 126 of the IEE.
[11] See par 127 of the IEE.
[12] See par 131 of the IEE.

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[8] (USD)	Responsibility	
							Supervision	Implementation
UXO clearance (bombs, mines and other explosives)	Impact on people's and worker's safety	- HANOI DPMB will engage an authorized UXO clearing contractor to conduct UXO removal and ensure that the civil work shall be only commenced after the UXO clearing form has certificated that the subproject are already been cleared - Engage an authorized UXO clearing contractor, the execution of demining and UXO is done following these steps: +Covering UXO detection and clearance area, +Clearing the grounds +Detection by the detector to a depth of 0.3m +Mark, digging test and resolve signal to a depth of 0.3m +Detect bomb by detector to a depth of 5m (put in step with high sensitivity) +Excavation, checked resolve signal to a depth of 3m +Excavation, checked resolve signal to a depth of 5m - Collecting, sorting, transportation management and destruction of mines and explosives are under strict safety standards for preservation, transport and use of explosives in QCVN 02:2008/BCT on National technical regulation on safety in the storage, transportation, use and disposal of industrial explosive materials, and the other current regulations - Ensure that the contractors shall only commence site works after the UXO clearing agency has certified that the project areas are already been cleared	All construction sites	At the beginning of the subproject construction	Once	Will be determined by assigned military unit before UXO clearance	HANOI DPMB	CEO/Government of Viet Nam
Construction site arrangement	No impact This activity help to prevent or avoid	- The civil contractor will be responsible for contracting with specialized unit (e.g. Hanoi Urban Environment Company Limited) to collect, transport and dispose the asphalt concrete	Subproject site	Before construction begins	01 time Before construction	No marginal cost	HANOI DPMB/ PIC	HANOI DPMB/contractors

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[8] (USD)	Responsibility	
							Supervision	Implementation
	impacts by disposal and civil works	mass, refused excavated materials to the permitted disposal site. The proposed disposal site for construction material and domestic solid waste is Nam Son landfill in Son Son District - Hanoi City. - Contractor develops Transportation and Traffic Management Plan for equipment and materials to reduce negative impacts - Contractors must have the license for safety and environmental requirements of mobilized machines and vehicles			n begins			
Construction Phase								
Concentration of workers and domestic wastes generated	Generate domestic wastes causing environmental pollution; generate social problems, spread diseases	A Waste Disposal Plan will be prepared as part of the CEMP and implemented by the contractor. The measures to be applied include: - Rent residents' houses for workers' staying - Prepare at least two mobile toilets with septic tank for camps and put dust bins (sufficient for 225kg/day of solid waste) at camps for collecting domestic sewage, rubbish and treating them adequately - Examine periodically worker health - Equip medicine cabinet for protecting workers' health in time - Manage, propagandize and educate to enhance the awareness of environmental sanitation and health protection for workers - Construction units under HANOI DPMB will implement temporary residence registration for all construction workers to WPCs within the project area, and establish the relationship with the local authorities to discuss and take decisions necessary for their management	All worker temporary houses	Throughout construction phase	Monthly	No marginal cost	HANOI DPMB/ CEO	ESU/contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[8] (USD)	Responsibility	
							Supervision	Implementation
		- Require workers not to take part in or cause social evils; any contravener shall be strictly treated in accordance with laws - Propagandize, educate workers and create good relations with people in order to avoid conflicts arising HIV/AIDS. Education will be given to workers. It needs to comply with the Government of Viet Nam's regulations on Occupation, Safety, and public health, or the World Bank's Environment, Health, and Safety Guidelines (2007)[13] that govern the safe and orderly operation of civil works - 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						
Excavated soil, debris, other hazardous wastes generated by soil filling and excavation cable trenches installation of cable and transportation means	Cause surface water pollution by refused soil, debris, other hazardous wastes	A Waste Disposal Plan will be prepared as part of the CEMP and implemented by the contractor with measures to be applied include: - Solid waste will be collected at the construction site and the hired environment unit to transport to the Nam Son landfill site at Soc Son district, Hanoi city - After each working day, solid waste generated during underground cable construction is collected in containers or sacks, then gathered at the construction site, late day hired environment unit will collect and ship out of the construction area - Maximize salvage excavated soil, for filling cable trench, according to excavation and filling balance method - Excavated soil which can not be reused will be collected and transported to the disposal site	All construction sites	Throughout construction phase	Monthly	Included in the construction contract	PIC / CEO and DONRE	ESU/contractor

[13] http://wwwifcorg/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B - %2BGeneral%2BEHS%2BGuidelinespdf?MOD=AJPERES

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[8] (USD)	Responsibility	
							Supervision	Implementation
		agreed by the local authorities through consultation with them - Collect, salvage matters such as steel pieces, cement sacks, wooden barrels, to reuse or sell. For other refused construction materials which cannot be reused, hire local competent unit for collecting and transporting to the disposal site for burying along with rubbish - If excavated soil is suspected contamination, it must be tested, and disposed in designated sites and identified as per local regulations <u>For hazardous waste,</u> - Classification of waste in accordance with regulations on hazardous waste management - Hazardous waste generated will be managed in accordance with Circular No. 36: 2015 / TT - BTNMT dated 04/24/2015 on the management of hazardous waste - Machines, construction equipment repair and maintenance will not take place in the construction area - Arrangement of 01 containers of hazardous waste prevention; 24 liter capacity, with lids and label - Hazardous wastes such as paint containing can, clouts with oil and grease, failed fluorescent lamp, etc. must be collected into tanks and kept temporarily at the construction site, then hiring competent unit for transporting to treat in accordance with current regulations - Organize collection and transport of all kind of solid wastes periodically in order to minimize the impact on the environment						
Construction activities and	Noise, dust and exhausts impact on	- Construction units will frequently spray water at the construction sites and along the transport roads crossing residential areas	All construction	Beginning of construction	Monthly	No marginal cost	PIC/CEO	ESU/Contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[8] (USD)	Responsibility	
							Supervision	Implementation
transportation of materials	ambient air environment quality	of lane 15 An Duong Vuong, 5m frontage Au Co road to minimize dust. During the dry and hot days, spray minimum twice a day when the dust is visible with specialized water tankers of 4.5m^3 - All vehicles used for construction, equipment and machines emitting noise, exhausts, fume will be maintained properly to minimize emission, and not operated at night if impossible to minimize noise - Contractors will ensure that transportation means, machines and equipment must have effective certificate of environmental standards achievement (QCVN 04: 2009/BGTVT and QCVN 05: 2009/BGTVT) issued by the register department before using for the subproject construction - The trucks transporting construction materials and excavated soil will be covered by canvas - Setting up appropriate mobilized material to the site to ensure that material will not obstruct at the site and release dust; - Reduce excavation and filling duration, and excavated soil will be used to fill as soon as possible to reduce dust emission - Only operate equipment, machines and vehicles causing large noise at day time	n sites	(for license of equipment, machines and means) and throughout construction phase				
Construction materials transportation, and storage	Traffic accidents, increase in traffic activities, damage to roads, traffic disruption	Transportation and Traffic Management Plan will be prepared as part of the CEMP and implemented by the contractor. The measures to be applied include: - plan for the underground cable installation at every inter-cross location. This includes the appropriate time and work type	All construction sites	Throughout construction phase	Monthly	No marginal cost	PIC/CEO	ESU/contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[8] (USD)	Responsibility	
							Supervision	Implementation
		to be conducted at each specific road sections - Contact with Hanoi Transportation Division for coordination to ensure construction safety and uninterrupted traffic activities - Arrange reasonable work to avoid traffic obstacle - At the locations where the underground cable section crossing over the roads, it need to set signal light when constructing at night, particularly in the road section Lane 15 An Duong Vuong, 5m frontage Au Co road, Yen Phu, Pho Duc Chinh, Chau Long street - Put up warning boards at dangerous road sections that are: steering angle 15 An Duong Vuong turn lane, Lane 15 and 4m frontage An Duong Vuong road; Chau Long Street - Yen Phu 110kV Station where traffic accidents can occur - Transportation means serving the subproject implementation need to obey speed limits stipulated by the Government - Limit transportation of materials in rush hours to avoid traffic jam - Transport materials with the allowable load and not expand trucks' body - Clean soil and construction materials on road surface; level, compact, recover and return the initial status of the earth roads if being damaged by the project activities just after completing the construction						
Occupational health and safety of workers	Worker injury and health	Occupational Health and Safety Plan (OHSP) will be prepared as part of the CEMP and implemented by the contractor with measures to be applied include: - All workers must be examined health, especially people working at height, and equipped	All construction sites	Throughout construction phase (fulltime)	Monthly	No marginal cost	PIC/CEO	ESU/ contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[8] (USD)	Responsibility	
							Supervision	Implementation
		sufficiently labor protection tools. This must be strictly imposed. - All construction equipment, tools will be carefully examined for quality and quantity before used - Contractor need to work with CSC, PIC and HANOI DPMB. to establish labour safe regulations on the sites required by law and by good engineering practice, which include: electric safety, operating equipment - general safety requirements, general safety requirements - Carefully check boom guy, cable clip before load heavy objects - For trench excavation: Apply measures to consolidate the trench wall by pressing soil on the wall surface - 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 - Before switching on power to test the power grid and electrical equipment, it must stop relative all works and people without relative task must go out of the danger area - Fuse of the electrical networks connected to electrical equipment which will be installed must be disconnected during connection time Fuse is only closed to adjust the equipment after everyone is in a safe location - Contractors have to prepare emergency measures in time When accident occurs, conduct						

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[8] (USD)	Responsibility	
							Supervision	Implementation
		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						
Community health and safety	Local people injury and health	- (HANOi DPMB) should choose the construction company having good engineering experience and responsibility to avoid causing trouble to local people during the construction process - The civil contractor will be required to develop, as part of the CEMP, a community health and safety plan (CHSP) that incorporates good international best practice and recognized standards. The CHSP should include: Specific emergency response procedures for traffic accident, working accident, electrocution The detail guidance is described in the emergency response plan (Appendix D); Communication systems and protocols, interaction with local and regional emergency and health authorities; - Install barriers (temporary fence) at construction areas to deter people access to the site; - The local people shall not be allowed in high - risk areas (excavation sites and areas where heavy equipment is in operation); - Provide warning signs as noted in impacts on local traffic section; - When fire occurs due to electricity, first notice immediately to authorized unit to cut off power, then comply with the procedures of firefighting - Coordinate with the local government of district and commune to propaganda and disseminate knowledge about	All construction sites	Throughout construction phase (fulltime)	Monthly	No marginal cost	PIC/CEO	ESU/ contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[8] (USD)	Responsibility	
							Supervision	Implementation
		safety to communities living near areas of underground cable trench - HANOI DPMB will be responsible for including these requirements in the contract documents						
Repair, restore, return the ground after construction completion	Mitigate impacts on environment after construction	- Repair, recover, and return the road sections, culverts, drainage system and public infrastructures damaged by the subproject construction - Require the Contractor within 30 days after the end of construction to dismantle, move all materials, components redundant, construction waste to designated location, which is planned waste dump at Lien Ha commune, Dan Phuong, Hanoi; to move machinery and equipment used in construction works out of construction site - For the underground cable construction, cleaning and restoration of the ground on each construction phase Ensure restore to the original state by at 5 am the next day - The construction contractor will prepare regulation prohibiting the dumping of ground cleaning waste to the neighborhood	All construction sites	Throughout construction phase until the project is put into operation	Monthly	No marginal cost	PIC/CEO	ESU/ contractor
Operation phase								
Operation of underground cable	Cable break incident	- Within underground high - voltage electricity cable protection corridors, prohibits digging, piling, discharging industrial waste water, which can cause corrosion damage Investors will implement measures to protect the safety of cables and cable structures - Maintain the drainage ditch on the cable routing area to avoid water pregnant that may cause water percolating into cable trench - Where incidents occur cables are broken immediately notify				Included in O & M cost		

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[8] (USD)	Responsibility	
							Supervision	Implementation
		the nearest power agency for handling measures: power cuts, technical staffing to inspect and repair						
Occupational health and safety of the workers during the underground cable periodic maintenance process	Affect workers' health and safety	1. 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 - Provision of PPE for workers, safety measures, personal safety devices, and other precautions during maintenance work of the underground cable transmission line 2. 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 3. 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, eg risks of electric shock, fire, and explosion.	ROW	Fulltime	Biannual	Included in O & M cost	The high voltage grid management of Hanoi City	

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[8] (USD)	Responsibility	
							Supervision	Implementation
		4. Coordinate with the local authorities at commune, district levels to propagandize, disseminate knowledge of safety to communities and residents living near the underground cable trench						
Community Health and Safety during the underground cable periodic maintenance process	Impact on Community Health and Safety	- To prevent electrocution risk, Hanoi Power Company will implement the following: - To ensure absolute safety, operators must comply with operation procedures and safety requirements; - Periodically check the distance from wire to the ground and/or other objects as stipulated Monitor minimum approach distances for excavations, tools, vehicles, pruning, and other activities when working around the underground cable trench - Observe/Test EMF at resident's buildings for treating appropriately if any complaint - To prevent impacts of EMF:, the community will be warned about the safety distances from the underground cable trench through warning marks and prohibition of digging into the cable trench area	ROW	Fulltime	Biannual	Included in O & M cost	The high voltage grid management of Hanoi City	

CEO = Constructor Environmental Officer, HANOI DPMB = Ha Noi Development Project Management Board, O&M = Operation and Management, PIC = Project Implementation Consultant, UXO = Unexploded Ordinance

B. Monitoring

Environment Effects Monitoring

177. The environmental effects monitoring plan for the EMP is provided in Table 23. 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.

178. The Contractor, particularly the contractor's environmental officer (CEO) will be responsible for the implementation of the environmental monitoring program. The ESU and CEO will coordinate with the contractor. The PIC/ESU will provide logistical support to the Contractor where necessary for the implementation of environmental monitoring plan.

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

180. After construction is completed the potential impacts of the operation of the new 110kV Tay Ho - Yen Phu underground cable transmission line subproject will be monitored by EVN HANOI.

Performance Monitoring

181. Performance monitoring is required to assess the overall performance of the EMP. A performance monitoring system is normally developed by EVN HANOI for the subproject. Selected 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 24.

Table 23: Environmental Effects Monitoring Plan

ENVIRONMENTAL EFFECTS MONITORING							
Environmental Indicators	**Location**	**Means of Monitoring**	**Frequency**	**Reporting**	**Responsibility**		**Estimated Cost (USD)**
					Supervision	**Implementation**	
Pre - construction Phase							
A) Air quality and microclimate: dust, CO, NO_x, SO_2, Noise B) Affected surface water quality: TSS, oil and grease, BOD_5, TDS, TP, TN	At 3 monitoring points (at the gate of 220kV Tay Ho substation; at the Xuan Dieu - Au Co junction and at 110kV Yen Phu substation)	Using field and analytical methods approved by MoNRE	One measurement	One baseline supplement report before construction phase starts	PIC/ESU	EIA preparation consultant	Included in EIA preparation cost
Analysis of soil quality, heavy metals (Zn, Pb, As, Cu, Cd), oil and other plant protection chemicals	Possible contaminated lands at all excavation sites	Using analytical methods approved by MoNRE	One measurement	One baseline supplement report before construction phase starts	PIC/ESU	EIA preparation consultant	Included in EIA preparation cost
Construction Phase							
					(A - B):		

A) Air quality: dust, wind, , pressure, noise, vibration, TSP, CO, SO_2, NO_2, electric field intensity, EMF intensity and noise B) Surface water pH, DO, TSS, COD, BOD_5, NH_4^+, NO_2^-, NO_3^-, Fe, Zn, Pb, As, Hg, Grease and Oil, Coliforms C) Public comments and complaints D) Incidence of worker or public accident or injury	A) at 3 monitoring points (at the gate of 220kV Tay Ho substation; at the Xuan Dieu - Au Co junction and at 110kV Yen Phu substation) B) at 3 monitoring points (at Bai Tao Lake; at Nghi Tam Long pond; under NguXa bridge - Truc Bach lake) C) Using hotline number placed at constructio	A) Using field and analytical methods approved by MoNRE Including visual observations of dust and noise from contractor and public reports B) Using field and analytical methods approved by MoNRE C) Information transferred by telephone hotline number posted at all construction sites D) regular reporting by contractors/ESU	A) Once during construction period and daily visual records B) Once during construction period C) Continuous public input D) Continuous	Quarterly	ESU	Safeguard Officer of Contractor	A, B Include in the construction cost, from that, the analysing cost is about 550$ (Source: VN EIA) C, D: no marginal cost
					(C and D) and daily observations:		no marginal cost
					EVN HANOI/ESU	contractor	

	n areas D) At all construction areas						
Operation Phase							
Incidence of worker accidents, or spills on hazardous materials, noise and EMF	At substation	Regular documentation and reporting	Continuous(except EMF for every 6 month)		EVN HANOI /HANOI DPMB		O and M

Table 24: Performance Monitoring Indicators for Subproject

Activities of subproject	Mitigation activities	Key Indicator	Performance
Pre - construction Phase			
Contract with contractor(s)	Mentioned in Table 22	Contractor's bidding documents incorporated IEE and EMP	Mitigation measures sta implemented
Contract with other entities	Mentioned in Table 22	License for disposal site and contract for solid waste disposal	Solid wastes are collect and disposed in assigne disposal site
Detailed design	Mentioned in Table 22	The environmental mitigation measures indicated in the IEE and the EMP will be incorporated into the detailed design.	Mitigation measures sta are implemented
Construction/Contractor Environmental Management Plan (CEMP)	Mentioned in Table 22	Contractor Environmental Management Plan	The Waste Disposal Pla and Traffic Managemer Occupational Health an (OHSP) are strictly follo
UXO	Mentioned in Table 22	UXO disarmament	No risk of life safety of v
Construction site arrangement	Mentioned in Table 22	- License of disposal - Transportation plan - License for safety and environment ensure of vehicles/machines	By end of pre - construc with contractors to cl observation in the co checking the arrangeme
Construction Phase			
Concentration of workers and domestic wastes generated	Mentioned in Table 22	Hygiene situation, availability of toilet and waste basket Residential register of workers Educating and training about health and hygiene for workers	Rigorous program of pro worker's camp
Excavated soil, debrides, other hazardous wastes generated by soil filling and excavation cable trenches, installation of cable and transportation means	Mentioned in Table 22	Solid waste and liquid waste treatment system Hazardous waste: Oil, gasoline, grease collection and treatment license	Rigorous program of pro and store all waste fror practiced, and manage - Rigorous program manage and store construction sites practi
Noise, dust and exhausts due to construction activities and transportation of materials	Mentioned in Table 22	dust, CO, NO_x, SO_2, noise levels meet Vietnamese standards	The parameters of ai exceed the level at subp Complying with mitiga dust, noise and hazardo
Construction materials transportation, and storage	Mentioned in Table 22	Frequency of disruptions and blocked roadways is reduced Maintenance and operation method of equipment, machines, and vehicles	Disruptions, stoppages managed to absolute m
Conduct installing process of underground cables	Mentioned in Table 22	Number and duration of cut of is minimized	Ensure the normal prod transportation, living co people at the surroundi
Community and worker safety	Mentioned in Table 22	Frequency of injuries are reduced	Adherence to Governm occupational health and
Repair, restore, return the ground after construction completion	Mentioned in Table 22	Remain construction material at the site are collected Construction solid waste; un - clearance of worker camp etc. are cleaned	Recovery of constructio construction solid waste camp etc.

Activities of subproject	Mitigation activities	Key Indicator	Performance
Operation phase of underground cable transmission line			
Maintenance of underground cable area	Mentioned in Table 22	Frequency of accidents, and damage is reduced EMF monitoring	No increase in pre - cor frequency
Prevention of cable break incident	Mentioned in Table 22	Number of cable break incident is reduced	In compliance to Goverr regulations on noise, EI prevention
Occupational health and safety of the workers during the transmission line periodic maintenance process	Mentioned in Table 22	Frequency of injuries are reduced	Adherence to Governr occupational health ar regulations
Community Health and Safety	Mentioned in Table 22	Frequency of injuries are reduced	Adherence to Governr occupational health ar regulations

Reporting

182. Regular reporting on the implementation of mitigation measures and on monitoring activities is required. Reporting is the responsibility of HANOI DPMB's ESU. The proposed timing of contractor's reporting is from starting construction time - Quarter 4 2017 to the end of construction phase, which is on monthly basis. The CSC has to submit monthly report to the HANOI DPMB The Project owner with assistance of PIC compiles monthly reports provided by the contractor to prepare semi-annual environmental report to submit to ADB.

C. Implementation Arrangements

Institutional arrangements and responsibilities

183. Responsibilities for implementing the EMP shall be borne by all stakeholders in the project implementation process, including:

- **Electricity of Vietnam Hanoi (EVN HANOI)** is the executing agency which takes ultimate responsibility for overseeing the successful implementation of the environmental safeguards for the subprojects as required by both Viet Nam and the ADB.
- **Hanoi Power Management Board (HANOI DPMB)** which is a subsidiary of EVN HANOI is the implementing agency of the subproject, and is responsible for the preparation and implementation of the EMP that is prepared for the IEE of the subproject in accordance with the EARF[14]. HANOI DPMB has dedicated 2 personnel for the Environmental and Social Unit (ESU) which is responsible for all environmental and social safeguard activities. The HANOI DPMB will also be responsible for obtaining any regulatory approvals and maintaining compliance with the Government of Viet Nam's environmental laws as applicable to projects proposed for financing. The HANOI DPMB will also be responsible for obtaining any regulatory approvals and maintaining compliance with the Government of Viet Nam's environmental laws as applicable to projects proposed for financing.
- **Hanoi DPMB's Environmental and Social Unit (ESU)**: The responsibilities of the ESU include ensuring that the project selection criteria are met in consultation with the EA/IA, preparation of timely IEE document, and that the EMP is implemented successfully. The ESU is responsible to ensure meaningful public consultation is conducted as prescribed by IEE and the ADB SPS, and the CEMP is prepared by the contractor before the construction starts. The ESU works closely with the PIC to implement the EMP for each subproject. The ESU also supervises and monitors the preparation and implementation of the CEMP by the CEO, and prepares and submit semi-annual monitoring reports to ADB.
- **Construction Supervision Consultant (CSC):** The responsibilities of the CSC are to supervise and monitor quality of all construction activities as well as environmental mitigation measures implementation of the constructor. The CSC is mobilised by HANOI

[14] See footnote 5.

DPMB at the same time as a contractor. The CSC is often a construction consulting Company. Total 5 engineers are assigned for this subproject. There are one GIS (Gas Insulation Switchgear) engineer, 2 electricity engineers and 2 civil engineers. The 2 civil engineers monitor both construction quality and environment, health and safety performance

- **The Project Implementation Consultant (PIC)**: Assist EVN/PMB in preparation of IEEs for noncore subprojects and in monitoring and evaluation of safeguards compliance.
- **The Contractor and the Contractor's Environmental Officer (CEO)** of the Contractor will prepare CEMP and make other plans necessary for the implementation of the EMP as required and ensure strict implementation of the mitigation measures outlined in the EMP and the CEMP.
- **Environmental Monitoring Consultant (EMC) of the Contractor:** 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 ESU.
- **Local governments and communities** are responsible for monitoring the implementation of the EMP as brought forward in the commitment of the Contractor
- **The Department of Natural Resources and Environment (DoNRE)** is the provincial agency which oversees environmental management of Hanoi. The DoNRE with District staff provides direction and support for environmental protection-related matters including application of the LEP2014, EIA, and environmental standards.
- **ADB** will conduct due diligence environmental issues during the project review missions ADB will review the semi-annual monitoring reports submitted by the HANOI DPMB and will disclose the reports on its website. If the HANOI DPMB fails to meet safeguards requirements described in the EMP, ADB will seek corrective measures and advise the HNAOI DPMB on items in need of follow-up actions.

184. The specific responsibilities of the parties concerned are indicated in the Table 25.

Table 25: Stakeholder's Responsibilities

Stakeholder	Responsibilities
Electricity of Vietnam (EVN HANOI)	• General oversight role in the construction phase • Overall responsibility for the implementation of the EMP during operational phase
Hanoi Development Power Management Board (HANOI DPMB)	• Establish an Environment Unit led by an Environmental Staff to implement EMP tasks • Manage, implement and supervise the compliance of the EMP and any conditions for approval, including the supervision of construction and operation of all Board staff and Contractor • Evaluate the performance of EMP and conduct revisions, or suspension of operations in cases of violating the conditions of the EMP, which can cause serious impacts on the local community • Ensure the effective communication and dissemination of content and requirements in EMP to the Contractor • Assist the Contractor in preparing the CEMP and reviewing and approve the CEMP • Supervise CEMP implementation performance • Report EMP performance to EVN, ADB • Prepare summary reports on Project's environmental activities upon request • Brief the Project's information in community meetings • Ensure continuing communication with local communities and fulfill commitments to facilitate for community consultations during project life
Contractor/Construction Supervision Consultant (CSC)	• Prepare and implement Environmental Supervision Plan during construction phase

Stakeholder	Responsibilities
	• Prepare and implement Environmental Monitoring Plan during construction phase • Report on any incidents or non - compliances of EMP to HANOI DPMB • Ensure adequate education and training to all staff related to environmental supervision • Provide recommendations on EMP performance to HANOI DPMB
Project Implementation Consultant (PIC)	• Assist EVN/HANOI PBMB for monitoring and evaluation of safeguards compliance • Maintain close coordination with the safeguard team throughout the project life • Work with ESU to provide education and training for awareness building on safeguards issues • Work with ESU to prepare the semimanual report; Asist ESU to guide contractor in CEMP preparation
Contractor and Contractor's Environmental Officer (CEO)	• Prepare SEMP and keep records and necessary data as required in EMP and submit to CSC • Ensure that workers are informed of purposes of EMP and aware of necessary measures to implement EMP • Prepare and submit monthly reports on any environmental issue, and on implementation of the CEMP at the construction site
Environmental Monitoring Consultant (EMC) (Hired by contractors)	• Implement the environmental sampling required for monitoring plan of EMP that cannot be conducted by the contractor and ESU/CEO • Perform required laboratory analyses for monitoring program detailed in EMP; and • Prepare and submit quarterly reports to ESU on monitoring activities
Local authorities and community	• Participate in monitoring EMP implementation

Institutional Capacity Review and Needs

185. Currently there is insufficient experience and capacity for environmental assessment and management in EVN HANOI for the implementation of the EMP, and to develop future safeguards for the non-core subprojects. The PIC with assistance from the ESU of the subproject has developed and delivered training courses to the HANOI DPMB staff including the CEO. The purpose of the course(s) is to strengthen the ability of the subproject owner including the ESU to oversee implementation of the EMP by construction contractors, and EMC. Costs for training is included in PIC's contract.

186. Training on the implementation of an EMP has addressed two thematic areas. The first area is principles of environmental assessment and management focused on the potential impacts of subproject activities on the natural and social environments. The second area is environmental safeguard requirements of the ADB and Government of Viet Nam with specific reference to the EMP.

Estimated Cost of EMP

187. The marginal costs for implementing the EMP are primarily for environmental monitoring because the costs for implementing impact mitigation measures are included in the construction costs in contractor bid documents. The preliminary cost for the implementation of the EMP for the subproject is summarized in Table 26.

188. Thus, the cost for EMP is 2550 USD for sample analyses and Environmental emergency The cost for other monitoring activities is included in working contracts of all units.

Table 26: Estimated costs for Environmental Monitoring Plan of EMP

Activity Type	Estimated Cost (USD)
Pre - construction Phase	
Environmental quality	Included in the EIA cost

Construction Phase	
Monitoring Environmental quality	No marginal cost It is included in the construction contract of contractor The Environmental parameter analysing cost is 550$
Inspecting environmental compliance	No marginal cost. It is included in the CSC
Environmental emergency (oil spill, fire, accidents)	2000$
Operation Phase	
Monitoring environmental quality (EMF measurement)	No marginal cost It is included in the operation budget of the substation
Public input	no cost
Training and capacity development of EVN HANOI/PPBM (including ESU)	No marginal cost It is included in the PIC's contract
Total	2,550 USD

XI CONCLUSIONS AND RECOMMENDATION

189. The IEE of Tay Ho - Yen Phu 110kV underground cable transmission line indicates that potential environmental impacts are largely construction-related impacts which can be mitigated and managed.

190. The civil construction impacts of elevated dust, noise, traffic disruptions and sedimentation, and public and worker safety are assessed as medium and can be managed effectively with standard construction practices

191. The public consultation meetings underscored the need for effective management of construction impacts such as noise, dust, traffic disruptions, and public safety as indicated in the EMP. Especially, the public concerns were raised on ensuring mitigation measures of the contractor, as well as the responsibilities of involved parties in cases of incidents and damage to property and threatening people's safety. The safe operation of the underground cable transmission line was significantly focused by local residents.

192. 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. If significant changes do not occur to the design of one or more of the subproject components and those new sensitive environmental components are not identified in pre-construction phase, further detailed environmental impact assessment of the subproject is not required.

REFERENCE CITED

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EIA report for subproject Tay Ho - Yen Phu 110kV underground cable transmission line

General Statistics Office, 2013 Hanoi City Statistical Yearbook 2013

APPENDICES

A. Rapid Environmental Assessment (REA) Checklist

B. Minutes of Public Consultation Meetings, Hanoi

C. Letter of Hanoi Capital Command regarding UXO clearance

D. Emergency Response Plan

APPENDIX A: Rapid Environmental Assessment (REA) Checklist

Instructions:

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

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

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

Country/Project Title: **Hanoi and Ho Chi Minh City Power Grid Development Sector Project - Loan 3161/8286 - VIE**

Sector Division: **Tay Ho - Yen Phu 110kV underground cable transmission line**

Screening Questions	Yes	No	Remarks
A Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
Cultural heritage site		X	
Protected Area		X	
Wetland		X	
Mangrove		X	
Estuarine		X	
Buffer zone of protected area		X	
Special area for protecting biodiversity		X	
B Potential Environmental Impacts Will the Project cause…			
▪ Encroachment on historical/cultural areas, disfiguration of landscape and increased waste generation?		x	
▪ Encroachment on precious ecosystem (eg sensitive or protected areas)?		x	

Screening Questions	Yes	No	Remarks
▪ alteration of surface water hydrology of waterways crossed by roads and resulting in increased sediment in streams affected by increased soil erosion at the construction site?		x	
▪ damage to sensitive coastal/marine habitats by construction of underground cables?		x	The underground cables are not located in the sensitive coastal/marine habitats
▪ deterioration of surface water quality due to silt runoff, sanitary wastes from worker - based camps and chemicals used in construction?		x	No impact level during construction phase because the subproject area is not adjacent to the water bodies No chemicals used in construction mitigation measures will be implemented
▪ increased local air pollution due to rock crushing, cutting and filling?		x	Low level There is no rock crushing, cutting in the project The mitigation measures will be implemented to reduce air pollution
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?		x	
▪ chemical pollution resulting from chemical clearing of vegetation for construction site?		x	
▪ noise and vibration due to blasting and other civil works?		x	No blasting Medium impact level due to noise and vibration occurred during road cutting and movement of construction vehicles along access road in construction phase Mitigations for noise and vibration caused by construction - related activities are specified by the EMP for the subproject
▪ dislocation or involuntary resettlement of people?		x	The project affects farming land for rice, tea and aquaculture without houses/accommodations Required compensation for land loss is addressed by RDDD for subproject
▪ dis - proportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		x	No ethnic minority groups in the subproject area

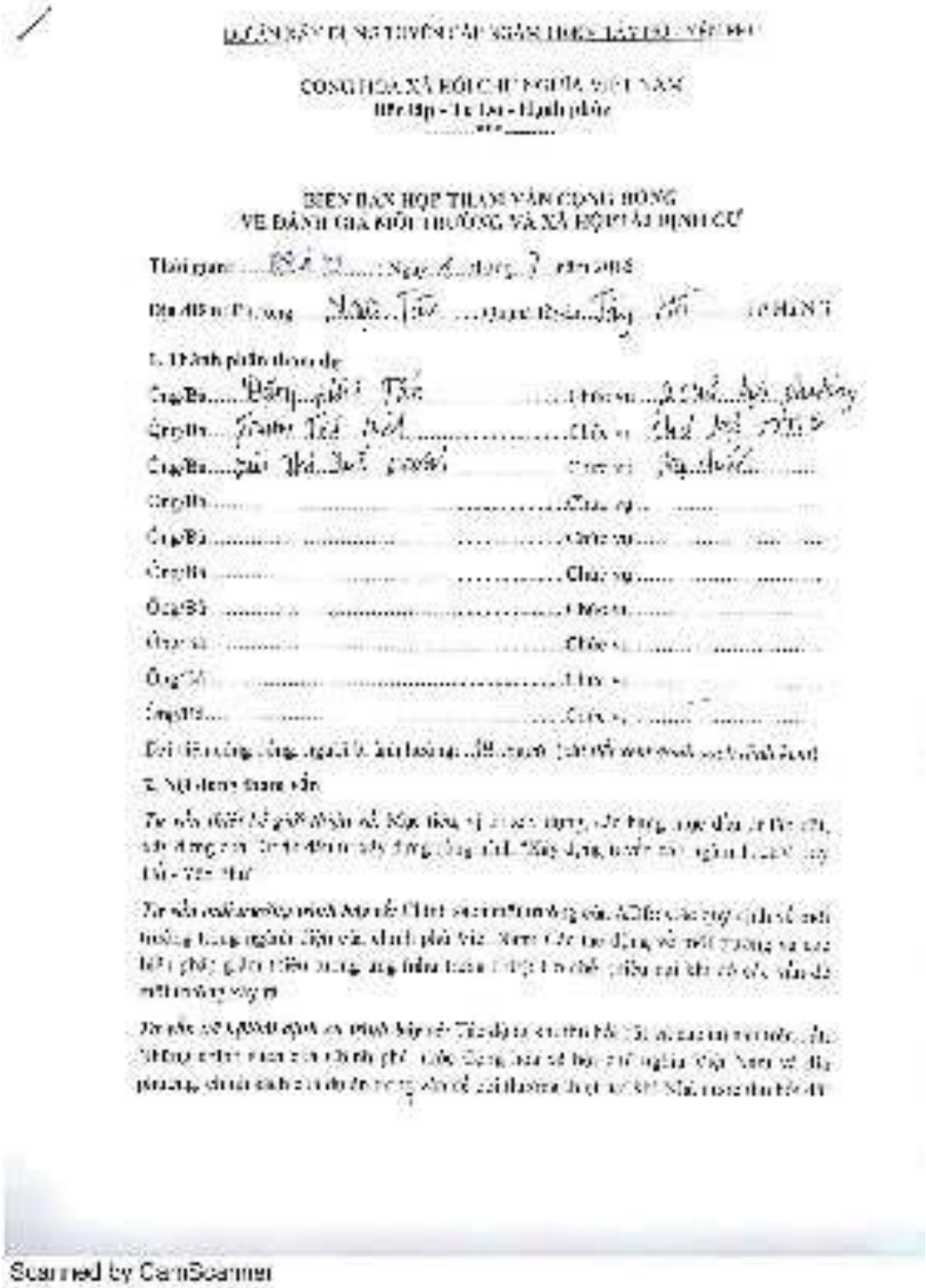
Screening Questions	Yes	No	Remarks
▪ social conflicts relating to inconveniences in living conditions where construction interferes with pre - existing roads?		x	Small impacts Noise and dust from excavation and construction works will have insignificant impacts on household who are living nearby However, the Project owner, contractors will implement the proposed mitigation measures such as: no transport in rush hours, repair damaged road after the construction etc.
▪ hazardous driving conditions where construction interferes with pre - existing roads?	x		Small impact The digging cable ditches on roadways and increase of project heavy trucks can cause risk in traffic accident However, mitigation measures, and ensuring safety will be taken strictly, assailing, set the speed control signs, traffic regulation etc.
▪ creation of temporary breeding habitats for vectors of disease such as mosquitoes and rodents?		x	
▪ dislocation and compulsory resettlement of people living in right - of - way of the power transmission lines?		x	No displacement due to construction of underground cable transmission line
▪ environmental disturbances associated with the maintenance of lines (eg routine control of vegetative height under the lines)?		x	
▪ facilitation of access to protected areas in case corridors traverse protected areas?		x	No protected areas within 10 km of the project area
▪ disturbances (eg noise and chemical pollutants) if herbicides are used to control vegetative height?		x	
▪ 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	No impact Only 25 workers work in the subproject area
▪ social conflicts if workers from other regions or countries are hired?		x	No impact All workers are Vietnamese Workers from other regions or countries are not hired

Screening Questions	Yes	No	Remarks
▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?	x		Small impact Since the number of workers is small, no worker camps are built but hired local houses However, the Contractor shall implement measures to ensure the hygiene and health of workers and local people, such as hiring hygiene sufficient accommodation, and hiring specialized units to collect waste daily
▪ risks to community safety associated with maintenance of lines and related facilities?	x		
▪ community health hazards due to electromagnetic fields, land subsidence, lowered groundwater table, and salinization?		x	Minor impact No land subsidence, lowered groundwater table, and salinization would be happed Electromagnetic fields occur in operation phase - Electromagnetic field of the substation will not affected surrounding communities
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?	x		There is minimal risk that accidents could happen but not expected to be significant If so, measures will be in place to deal with them
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project (eg, high voltage wires, and transmission towers and lines) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	x		Low risk level There is no transmission line 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**	**Remarks**
▪ Is the Project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes (see Appendix I)?		x	The project areais located in an elevated area which is 0.4m higher than ground and the risk of flooding is minimal The underground cable transmission line construction will be affected by temporary flooding
▪ Could changes in precipitation, temperature, salinity, or extreme events over the Project lifespan affect its sustainability or cost?		X	
▪ Are there any demographic or socio - economic aspects of the Project area that are already vulnerable (eg high incidence of marginalized populations, rural - urban migrants, illegal settlements, ethnic minorities, women or children)?		X	
▪ Could the Project potentially increase the climate or disaster vulnerability of the surrounding area (eg, 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 MEETINGS AND LIST OF PARTICIPANT

I. Nhat Tan Ward



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

BIÊN BẢN HỌP THAM VẤN CỘNG ĐỒNG
VỀ ĐÁNH GIÁ MÔI TRƯỜNG VÀ XÃ HỘI TÁI ĐỊNH CƯ

Thời gian: ... Ngày ... tháng ... năm 2018

Địa điểm: Phường ... Quận ... TP HCM

1. Thành phần tham dự:

Ông/Bà: ... Chức vụ: ...

Ông/Bà: ... Chức vụ: ...

Ông/Bà: ... Chức vụ: ...

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Ông/Bà: ... Chức vụ: ...

Ông/Bà: ... Chức vụ: ...

Đại diện cộng đồng người bị ảnh hưởng: ... (danh sách theo phụ lục đính kèm)

2. Nội dung tham vấn:

Ý kiến của người bị ảnh hưởng: ...

Ý kiến của chính quyền địa phương: ...

Ý kiến của cơ quan chủ dự án: ...

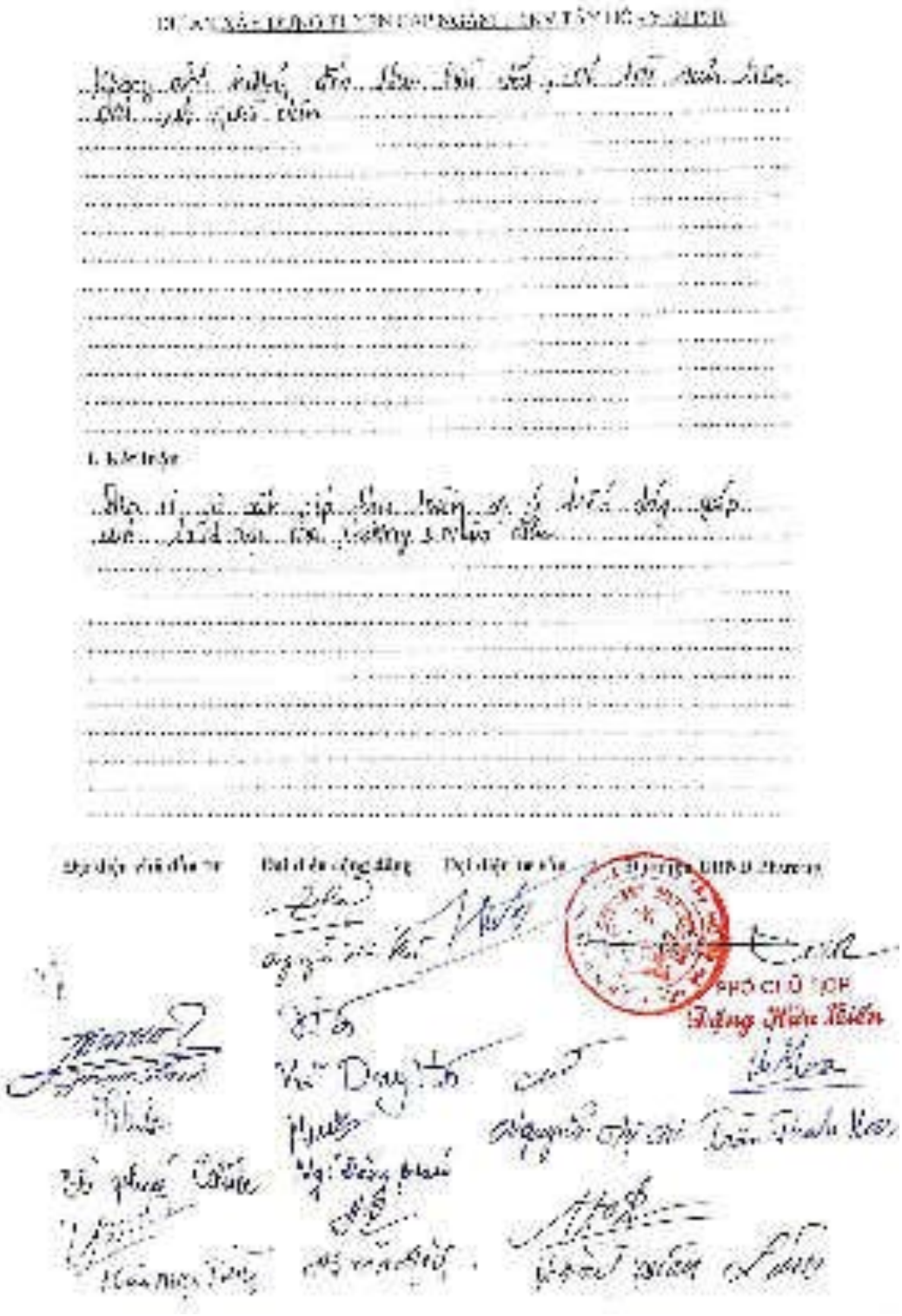
[illegible]

3. Ý kiến thẩm tra

3.1. Về các đề xuất, kiến nghị của cơ quan, tổ chức, cá nhân

[illegible]

3.2. Về các nội dung đề nghị điều chỉnh, các đề xuất khác của cơ quan, tổ chức, cá nhân



VIỆN LÂM LÂM KHOA VIỆT NAM
TRUNG TÂM NGHIÊN CỨU VÀ
TƯ VẤN VỀ PHÁT TRIỂN
Dự án: .....

Mẫu số C103-HD
(Ban hành theo QĐ số 19/2006/QĐ-BTC
ngày 30/3/2006 của Bộ Tài Chính)

BẢNG KÊ .....
Số.....

Nội dung: .....
Đại diện: .....
Thời gian: ..... ngày ... tháng ... năm ....

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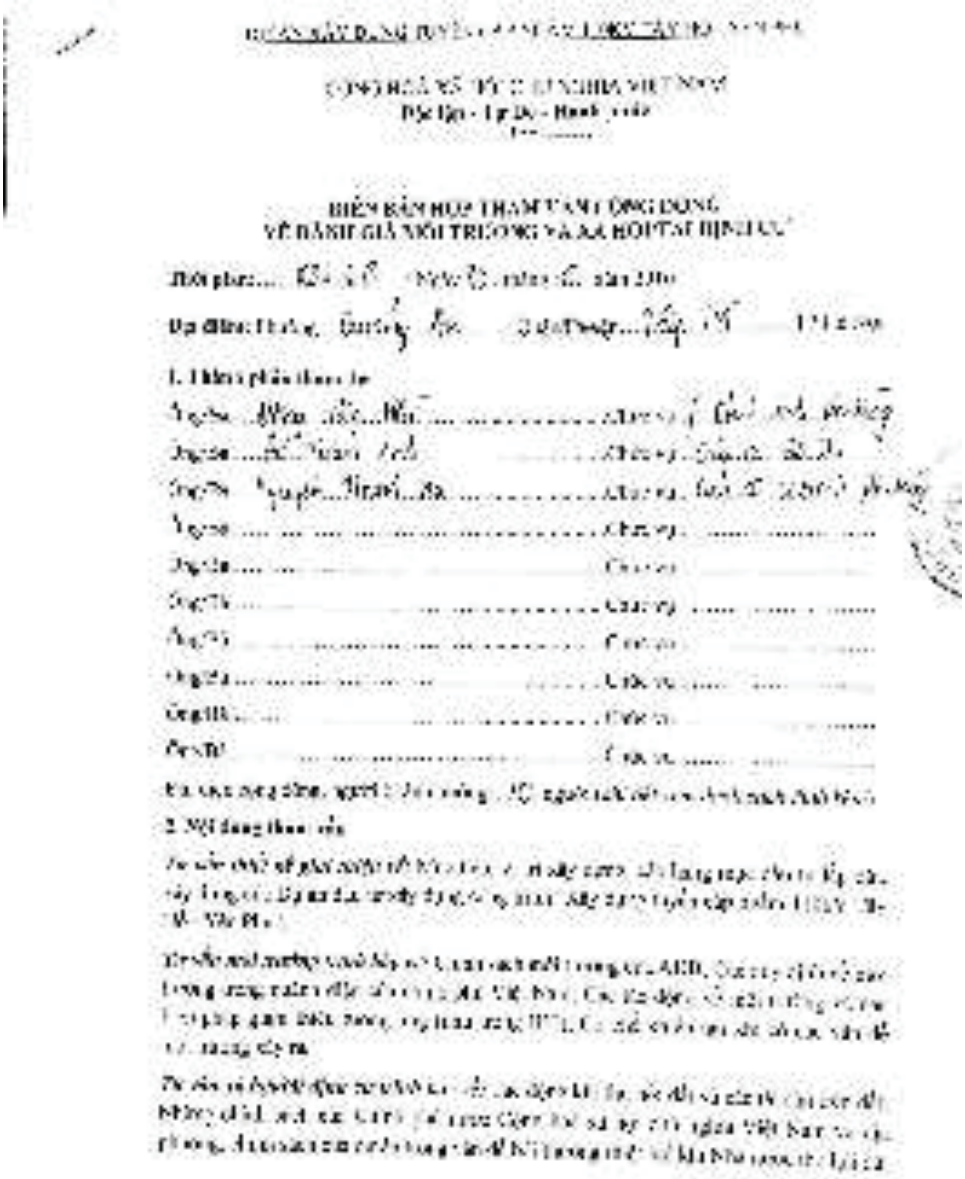
II. Quang An Ward



BIÊN BẢN HỌP THAM VẤN CỘNG ĐỒNG
VỀ ĐÁNH GIÁ MÔI TRƯỜNG VÀ AA ĐỐI TÁC HIỆU QUẢ

VIỆN KHOA HỌC KINH TẾ VIỆT NAM
TRUNG TÂM NGHIÊN CỨU VÀ TƯ VẤN VỀ PHÁT TRIỂN

Mẫu số C38a-HD
(Ban hành theo QĐ số 19/2006/QĐ-BTC ngày 30/3/2006 của Bộ Tài chính)

Huyện: .....

BẢNG KÊ .....

Số: .....

Họ và tên người nhận tiền: .....

Địa chỉ: .....

Nội dung: .....

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III. Truc Bach Ward

DỰ ÁN XÂY DỰNG TUYẾN CÁP NGẦM 110kV TÂY HỒ - VẠN PHÚC

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

BIÊN BẢN HỌP THAM VẤN CỘNG ĐỒNG
VỀ ĐÁNH GIÁ MÔI TRƯỜNG VÀ XÃ HỘI/TÁI ĐỊNH CƯ

Thời gian: ... giờ ... ngày 02 tháng 5 năm 2016

Địa điểm: Phường Trúc Bạch, quận Ba Đình, TP Hà Nội

I. Thành phần Cuộc họp

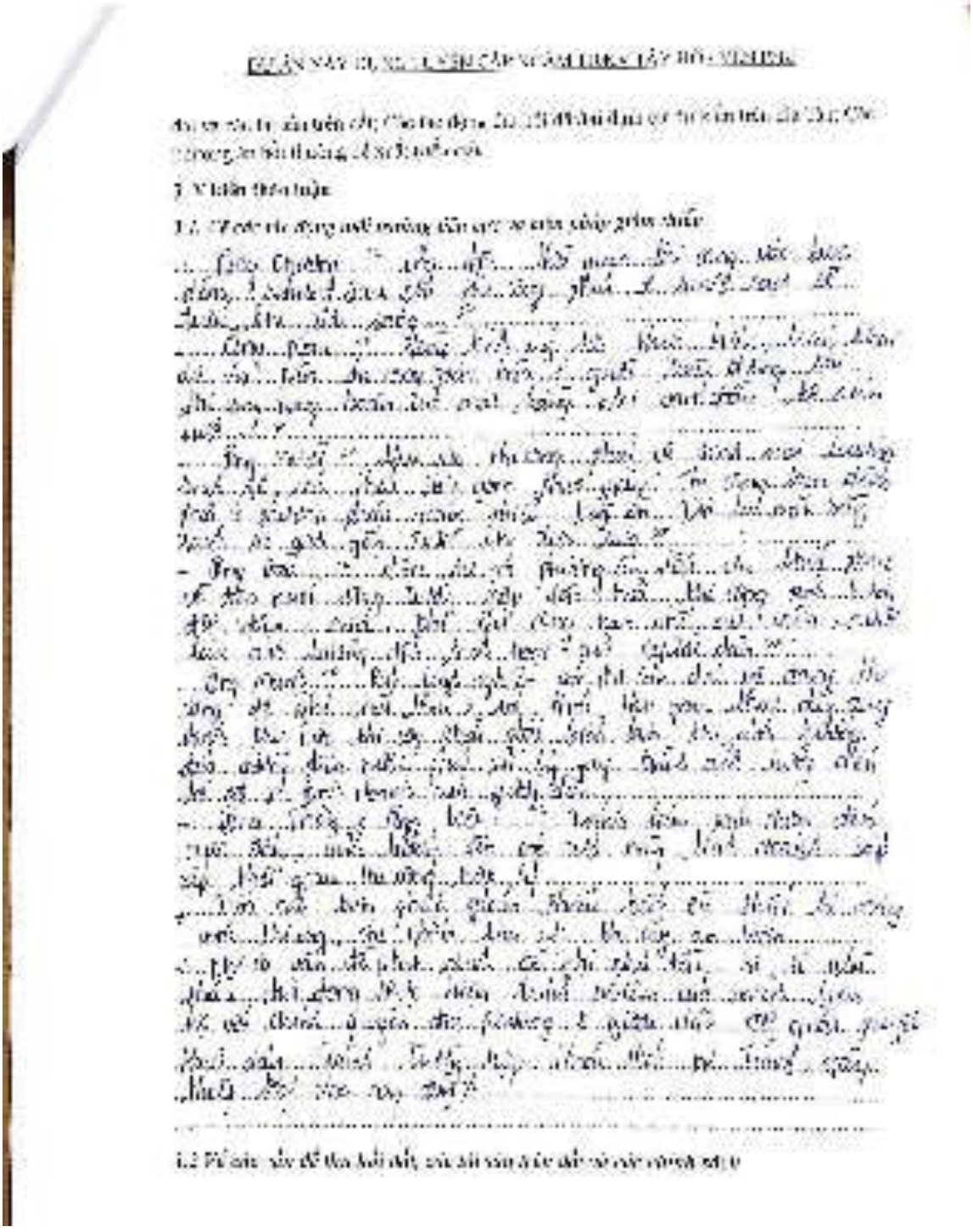
Đại diện Chủa, người sử dụng đất bị ảnh hưởng: ... người (có mặt theo danh sách đính kèm)

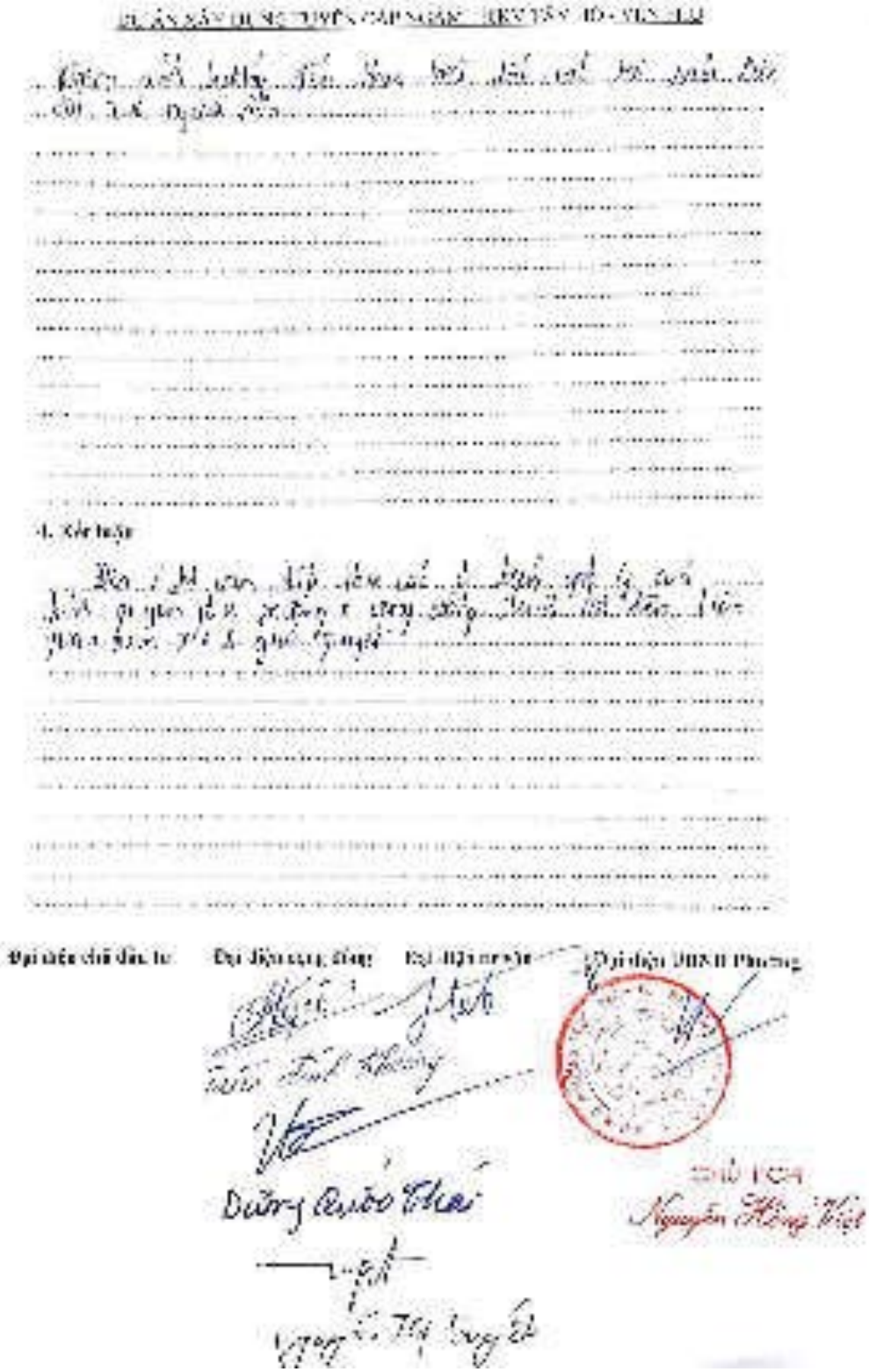
II. Nội dung tham vấn

Tư vấn thiết kế giới thiệu về Mục tiêu, quy mô, địa điểm xây dựng của Dự án; Tổng mức đầu tư; Loại, cấp công trình xây dựng; tuyến cáp ngầm 110kV Tây Hồ - Vạn Phúc.

Tư vấn môi trường trình bày về Chính sách môi trường của ADB; Các quy định về môi trường trong ngành điện của chính phủ Việt Nam; Các tác động về môi trường và các biện pháp giảm thiểu trong giai đoạn thi công, IEEs; Cơ chế khiếu nại khi có các vấn đề môi trường xảy ra.

Tư vấn xã hội/tái định cư trình bày về: Các dự án có liên quan đến đất và các tài sản trên đất; Những chính sách của Chính phủ nước Cộng hoà xã hội chủ nghĩa Việt Nam về các chương trình bồi thường của Dự án trong vấn đề bồi thường giải phóng mặt bằng. Nhà nước thu hồi đất,





VIỆN HÀN LÂM KHOA HỌC VIỆT NAM
TRUNG TÂM NGHIÊN CỨU VÀ TƯ VẤN VỀ PHÁT TRIỂN
Dự án : .....

Mẫu số C10-HD
(Ban hành theo Quyết định số 19/2006/QĐ-BTC ngày 30/3/2006 của Bộ Tài Chính)

BẢNG KÊ ..... Số: .....

Nội dung: .....
Địa điểm: .....
Thời gian: ..... ngày ... tháng ... năm .....

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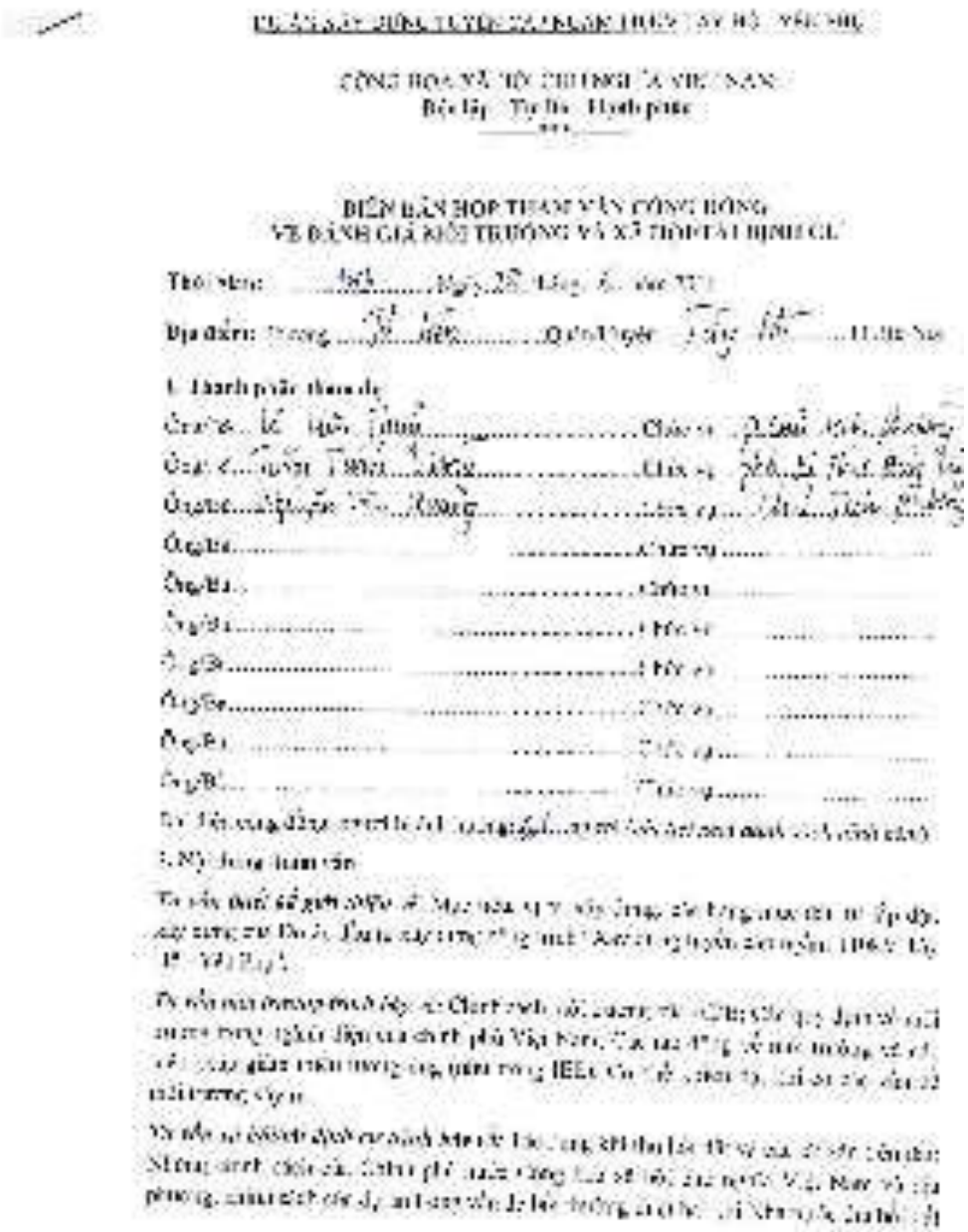
IV. Tu Lien Ward



CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

BIÊN BẢN HỌP THAM VẤN CỘNG ĐỒNG
VỀ ĐÁNH GIÁ MÔI TRƯỜNG VÀ XÃ HỘI TÁI ĐỊNH CƯ

[illegible]

3. [illegible]

3.1 [illegible]

[illegible]

3.2 [illegible]

[illegible]

VIỆN HÀN LÂM KHOA HỌC VIỆT NAM
TRUNG TÂM NGHIÊN CỨU VÀ TƯ VẤN VỀ PHÁT TRIỂN
Dự án: .....

Mẫu số C40a-HD
(Ban hành theo QĐ số 19/2006/QĐ-BTC ngày 30/3/2006 của Bộ Tài chính)

BẢNG KÊ .....
Số: .....

Nội dung: .....
Địa điểm: .....
Hôm qua: ..... ngày, từ ngày ..... đến ngày .....

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V. YenPhu ward

DỰ ÁN ĐẦU TƯ NÂNG CẤP NGẦM HÓA TÂN HỘI - YÊN LỘ

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

BIÊN BẢN HỌP THAM VẤN CỘNG ĐỒNG
VỀ ĐÁNH GIÁ MÔI TRƯỜNG VÀ XÃ HỘI TẠI ĐỊNH CƯ

Thời gian: ..... Ngày ... tháng ... năm 2021

Địa điểm: Phường ..... Quận/Huyện ..... TP. HÀ NỘI

1. Thành phần tham dự

Ông/Bà ..... Chức vụ .....
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Ông/Bà ..... Chức vụ .....
Ông/Bà ..... Chức vụ .....
Ông/Bà ..... Chức vụ .....

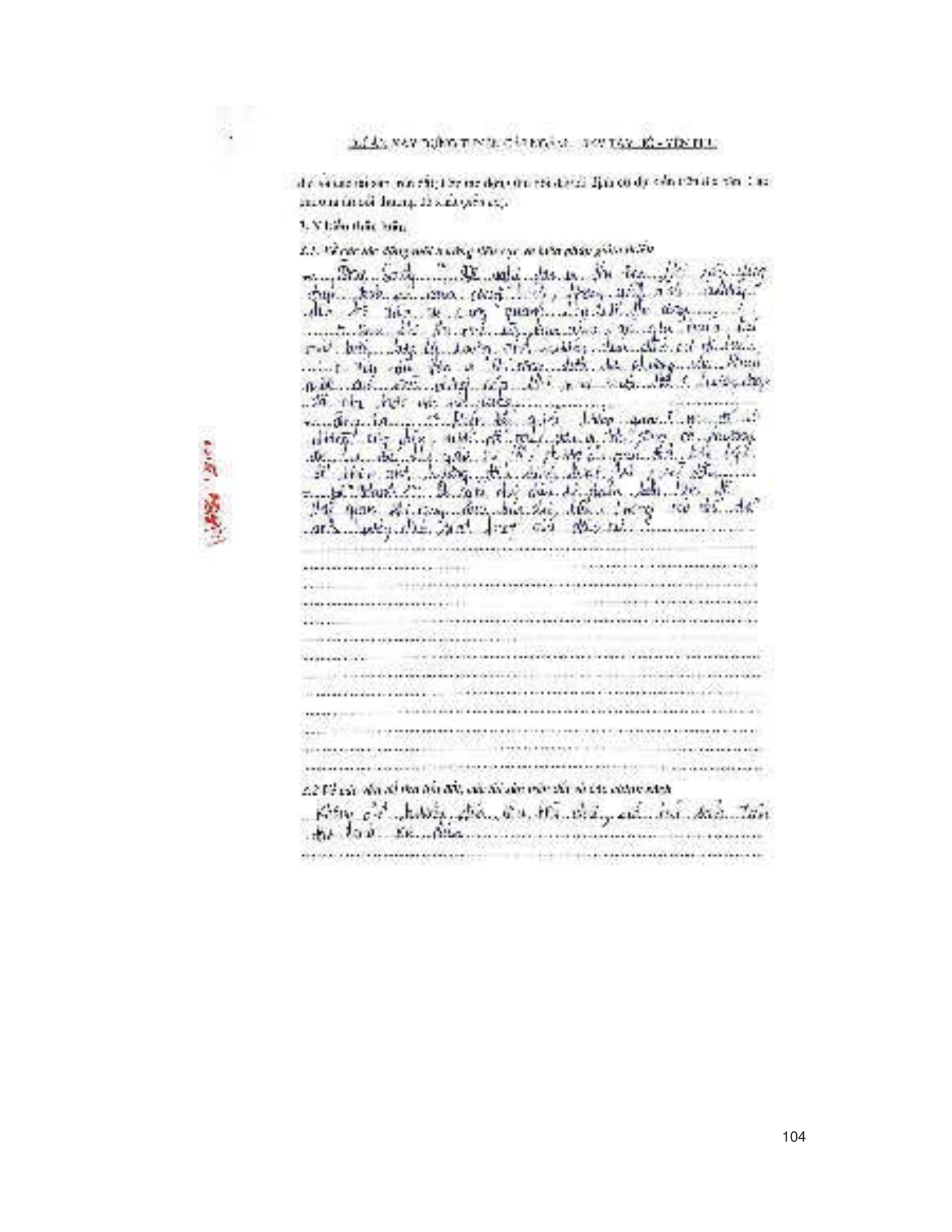
Đại diện cộng đồng người bị ảnh hưởng: ... (số người phải ghi rõ danh sách đính kèm)

3. Nội dung tham vấn

Tư vấn thiết kế giới thiệu về Dự án đầu tư xây dựng tuyến đường sắt đô thị Tân Hội - Yên Lộ.

Tư vấn môi trường giới thiệu về Chương trình môi trường của ADB. Các quy định về môi trường, xã hội áp dụng cho dự án đầu tư. Nội dung về các tác động môi trường và các biện pháp giảm thiểu tương ứng (nếu có). Có thể đưa ra các vấn đề môi trường cần ...

Tư vấn xã hội giới thiệu về Chính sách tái định cư của ADB. Các quy định về bồi thường, hỗ trợ và tái định cư. Mục tiêu chính sách của Chính phủ nước Cộng hòa xã hội chủ nghĩa Việt Nam và địa phương, chính sách của các ngân hàng, vấn đề bồi thường, hỗ trợ, tái định cư. Nhà nước thu hồi đất



4. Kết luận

Đại diện chủ đầu tư | Đại diện cộng đồng | Đại diện tư vấn | Đại diện UBND Phường

CHỦ TỊCH

VIỆN LÂN LÂM KHOA HỌC VIỆT NAM
TRUNG TÂM NGHIÊN CỨU VÀ TƯ VẤN VỀ PHÁT TRIỂN

Mẫu số C40a-HD
(Ban hành theo QĐ số 19/2006/QĐ-BTC ngày 30/3/2006 của Bộ Tài chính)

Đơn vị: .....

BẢNG KÊ ĐẦU SÁCH XUẤT BẢN

Nội dung: .....

Địa điểm: .....

Thời gian: ..... ngày ... tháng ... năm ... đến ngày ... tháng ... năm ...

Số TT	Tên sách	Địa chỉ Đơn vị đặng ký	Số lượng đặt	Ký nhận
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APPENDIX C: LETTER OF HANOI CAPITAL COMAND REGARDING UXO REQUIREMENT

BỘ TƯ LỆNH THỦ ĐÔ HÀ NỘI
BỘ THAM MƯU

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - tự do - Hạnh phúc

Số: 4949/BTM-CVĐ

Hà Nội, ngày 15 tháng 10 năm 2017

V/v thông báo tình hình bom mìn, vật nổ trong quá trình thi công dự án xây dựng

CÔNG VĂN ĐẾN
Số: 1054
Ngày 18 tháng 10 năm 2017

Kính gửi: Ban Quản lý các dự án phát triển Điện lực Hà Nội.

Bộ Tham mưu Bộ Tư lệnh Thủ đô Hà Nội nhận được Công văn số 181/HANOI DPMB.KTGS ngày 15/10/2017 của Ban Quản lý dự án phát triển Điện lực Hà Nội về việc xin ý kiến tình hình bom mìn, vật nổ tồn dư tại các vị trí thực hiện dự án "Xây dựng tuyến cáp ngầm 110kV Tây Hồ - Yên Phụ" trên địa bàn quận Tây Hồ và quận Ba Đình.

Thực hiện chức năng tham mưu giúp Lãnh đạo thành phố Hà Nội về công tác quốc phòng, quân sự địa phương và quản lý các hoạt động liên quan xử lý bom mìn, vật nổ tồn đọng trên địa bàn. Căn cứ kết quả điều tra, khảo sát, lập bản đồ ô nhiễm bom mìn, vật nổ trên địa bàn thành phố Hà Nội năm 2012; đối chiếu với bản vẽ thông tuyến của dự án. Bộ Tham mưu có ý kiến như sau:

Trong 02 cuộc kháng chiến chống Pháp và Mỹ, Thủ đô Hà Nội là trọng điểm đánh phá của địch nên nhiều loại bom đạn, vật nổ vẫn còn tồn tại, hiện nay nhiều địa điểm trên địa bàn vẫn chưa có điều kiện rà soát, xử lý bom mìn, vật nổ. Đối với một số dự án "Xây dựng tuyến cáp ngầm 110kV Tây Hồ - Yên Phụ" trên địa bàn quận Tây Hồ và quận Ba Đình trong những năm qua chưa được tổ chức rà phá bom mìn, vật nổ.

Trước khi triển khai thi công dự án, Ban Quản lý các dự án phát triển Điện lực Hà Nội nên tiến hành khảo sát, dò tìm và xử lý bom mìn, vật nổ để bảo đảm an toàn cho quá trình thi công./.

Nơi nhận:
- Như trên;
- Đ/c Tư lệnh;
- Đ/c Phó Tư lệnh (để b/c);
- Lưu: VT, QHQC.

KT. THAM MƯU TRƯỞNG
PHÓ THAM MƯU TRƯỞNG

Đại tá Nguyễn Hữu Linh

APPENDIX D: EMERGENCYRESPONSEPLAN

1The 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 will ensure:

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

2The 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, eg, 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

3The 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

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

5Prior 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

6The 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

7To 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

8To 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

9Means 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 ERT Land, if ERTL is not available, the Deputy ERTL are authorized to communicate with the EERT Exceptional cases to this rule may be necessary and will 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 actionsFor an effective reporting/alerting of an emergency situation:

(i) The name and contact details of the relevant persons and institutions will 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, substation

(ii) All Subproject sites will 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 will 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 every one 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 injury warrants special care, DO NOT MOVE them, unless necessary and instructed/directed by the EERT	ERTL/Deputy ERTL communicates with EERT to get instructions/directions in handling the injured

Table 27: 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: - Victims exposed to more danger when left where they are,eg, during fire, chemical spill - it would be impossible for EERT to aid victims in their locations, eg, 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 influence area at once, restrict site, suspend work until further notice	Follow evacuation procedure

Table 4: Response Procedure in Case of Fire

Procedure	Remarks
Alert a fire situation	Who ever 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 neares 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 siteHe/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