Draft Initial Environmental Examination

June2015

Preparation for Tranche 3 of ADB Multi-tranche Financing Facility for the Power Transmission Investment Program in Viet Nam

Second transformer bank for 220 kV Tra Vinh substation

Tra Vinh Province, Viet Nam

Prepared by

Southern Viet Nam Power Projects Management Board:

Electricity of Viet Nam

CURRENCY EQUIVALENTS

(asof24May 2015)

Currency Unit	–	Dong
D1.00	=	$0.00005
$1.00	=	D21,770

ABBREVIATIONS

ADB:	Asian Development Bank
AH:	Affected Household
AP:	Affected people
BOD:	Biochemical Oxygen Demand
COD:	Chemical Oxygen Demand
DoNRE:	Department of Natural Resources and Environment
DoLISA:	Department of Labor Invalids and Social Assistance
EA:	Executing Agency
ECA:	Environmental Compliance Audit
EIA:	Environment Impact Assessment
EMP:	Environment Management Plan
EO:	Environmental Officer
ESU:	Environmental and Social Unit
GRM:	Grievance Redress Mechanism
HCMC:	Ho Chi Minh City
IA:	Implementation Agency
IEE:	Initial Environmental Examination
MoLISA	Ministry of Labor Invalids and Social Assistance
PCB:	Polychlorinated biphenyls
PPC:	Provincial Peoples Committee

PTC4:	Power Transmission Company No.4
REA:	Rapid Environment Assessment
ROW:	Right-of-way
SPPMB:	Southern Viet Nam Power Project Management Board
TSS:	Total Suspended Solids
UXO:	Unexploded Ordnance

WEIGHTS AND MEASURES

km:	kilometre
kg:	kilogram
kV:	kilovolt
ha:	hectare
mm:	millimetre

EXECUTIVE SUMMARY

The National Power Transmission Corporation (NPT) of Viet Nam has requested that a second transformer bank for 220 kV Tra Vinh substation be included in Tranche III of the Multi-tranche Financing Facility (MFF) for the Power Transmission Investment Program (PTIP) for Viet Nam. The goal of the PTIP is to develop and improve the quality and reliability of power supply throughout Viet Nam. The second transformer bank for 220 kV Tra Vinh substation is one of nine individual subprojects that comprise Tranche III. The subproject will meet the immediate power needs of rapidly developing industrial development of Tra Vinh province and neighboring Vinh Long province.

Preliminary engineering designs,and safeguard requirements of the subproject have been completed including the approval of the EIA to meet the regulations of the Tra Vinh Provincial Department of Natural Resources and Environment (DONRE). The IEE presented herein was prepared pursuant to the ADB SPS (2009). The IEEs of the other eight subprojects of Tranche III were prepared separately.

Subproject Summary

The major components of the subproject are summarized below.

- Installation of the second transformer intothe new 23.7 ha 220 kV Tra Vinh substation, Luong Hoa Commune, Chau Thanh District, Tra Vinh province.
- Supporting fire extinguishers and emergency oil trap equipment

Potential Impacts and Mitigations

The IEE of the second transformer bank for 220 kV Tra Vinh substation indicates the impacts of the new transformer are restricted to the construction-installation phase of the transformer. The construction-related disturbances such as noise, dust, erosion, solid and liquid waste, reduced access, potential increased vehicle traffic and traffic accidents, increased risk of worker and public injury can be managed with standard construction practices and management guidelines (e.g., IFC / World Bank Environmental, Health and Safety Guidelines (2007) for electric power transmission and distribution projects).

Because the subproject will be constructed inside the existing Tra Vinh substation the subproject will not require resettlement or land acquisition. There are no perceived negative induced, or cumulative environmental impacts of the subproject. There are no rare or endangered wildlife species, critical habitat, or protected areas in the subproject site which is located in Tra Vinh. The substation is not near a national protected area.

The existing 220 kV Tra Vinh substation in which the new transformer will be installed is an associated facility of the new transformer. An Environmental Compliance Audit (ECA) of the substation was conducted to ensure there are not environmental issues or risks associated with the operation of the substation. The ECA indicated that the operation of the substation is fully

compliant with the laws and regulations of Viet Nam that govern environmental management of electric power substations.

The brief Environmental Management Plan (EMP) prepared for the subproject prescribes impacts mitigations and environmental monitoring to minimize and manage the potential impacts of the subproject. The EMP also prescribes an Emergency Response Plan (ERP) for the construction sites and identifies the need for capacity development and training of the IA/ESU in environmental management and assessment as focused on the implementation of the EMP.

Conclusions

The IEE concludes that the feasibility design of the second transformer bank for 220 kV Tra Vinh substation combined with available information on affected environments is sufficient to identify the scope of potential environmental impacts of the subproject. Providing that significant changes to the subproject descriptions do not occur at the detailed design phase, and new sensitive environmental or cultural resources are not determined, further detailed environmental impact assessment (EIA) of the subproject is not required.

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I. INTRODUCTION

1. The IEE presented herein was prepared pursuant to the requirements of the ADB SPS (2009). The IEEs of the other eight subprojects of Tranche III were prepared separately.

A. Assessment Context

2. The Tra Vinh subproject was assigned Environmental Category B pursuant to the ADB's Safeguard Policy[1] and recent good practice sourcebook guidance[2]. A category B project will have potential adverse impacts that are less adverse than the impacts of category A project, are site-specific, largely reversible, and can be mitigated with an environmental management plan[3]. The results of the rapid environmental assessment (REA) of the subproject are in Appendix A.

3. The IEE was prepared for the Tra Vinh subproject in the feasibility design stage using available data and information on sensitive ecological and cultural receptors that exist for the subproject site. The EIA required by the Viet Nam Law on Environmental Protection LEP (2014) and Decree 18/2015/ND-CP has been completed and approved by the Tra Vinh Provincial Department of Natural Resources and Environment (DONRE) (Appendix C)

4. The detailed designs for the extension of the Tra Vinh subproject will follow subproject approval. The Environmental Management Plan (EMP) that has been prepared for the subproject (see section IX) will need to be reviewed to ensure it meets the final detailed designs of the subproject.

II. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

5. The second transformer bank for 220 kV Tra Vinh substation will be implemented according to the directives set down for use of Official Development Assistance (ODA) by GoV Decree No. 131/2006/ND-CP which was promulgated November 9, 2006, and in accordance with the provisions of for the parent Sector Project.

A. Viet Nam Regulatory Framework for Environmental Assessment

6. The recently revised Viet Nam Environment Protection Law No. 55/2014/QH13 of 23 June 2015(LEP 2014)prescribes the requirements for environmental assessment for international and domestic project interventions that affect natural and social environments. Following the revised the LEP (2014) the supporting Government Decree 29/2011/ND-CP on strategic environmental assessment (SEA), and environmental impact assessment (EIA) was replaced withDecree 18/2015/ND-CP, dated 14 February 2015. Supporting Circular 27/2015/TT-BTNMT date 29/05/2015detail guideline for Decree 18.

7. The screening criteria of Decree 18 distinguish projects that require a full EIA from comparatively simpler projects that require an IEE [formerly EPC]. The difference between the government (GoV) EIA and IEE reflects the required level of assessment, and final review and appraisal that is required.The screening criteria for power transmission projects in the Decree

[1]ADB, 2009. Safeguard Policy Statement, ADB Policy Paper.
[2]ADB, 2012, Environmental Safeguards, A Good Practice Sourcebook, Draft.
[3]Footnote 6, pg 19.

18 have changed and are now based on voltage. All projects undertaken with voltages exceeding 110 kV require EIAs.

8. Thus, the required aGoV EIA to satisfy the GoV regulatory framework. The EIA was prepared and approved in accordance with Viet Nam Law and approved by the Tra Vinh PPC on 31 December 2014. The GoV Environmental Compliance Certificate (ECC) for the subproject is found in Appendix C.

B. Power Transmission Sector Regulatory Framework

9. Table 1 summarized key laws and policies governing the power sector in Viet Nam that apply to the subproject. Specific legal directives and required approvals for the subproject are summarized in Table 2.

Table 1.Power Network Legislation and Associated Legal Instruments

Laws and Regulations	Description
A. Law	
Law No. 24/2012/QH13 issued on November 20, 2012	Amends and supplements a number of articles of the Electricity Law No. 28/2004/QH11 of December 3, 2004
Electricity Law No. 18/2004/QH11 dated December 3,2004	Prescribes the electricity development planning and investment; electricity saving; electricity markets; rights and obligations of organizations and individuals conducting electricity activities and using electricity; protection of electric equipment and facilities, electricity works and electric safety.
B. Decrees	
Decree No 81/2009/NĐ-CP, issued August 17, 2005	On the safety and protection of high-voltage power grids.
Decree No 14/2014/ND-CP dated February 26, 2014	Decree stipulates in detail the implementation of electricity law regarding electricity safety, including: safety in generation, transmission, distribution and use of electricity in production; compensation and assistance of housing, works, land and plants in the safety corridor of overhead power transmission line upon the construction of high-voltage grid.
C. Circular	
Circular No 22/2010/BXD issued on December 3, 2010	Regulation on labor safety in work construction, construction and installation of equipment which are newly built, repaired, renovated, relocated, embellished or restored; dismantling of works and warranty for maintenance works.
Ministry of Industry and Trade Circular No. 03/2010/TT-BCT, issued January 22, 2010	Regarding protection on high-voltage power network

Land Development and Construction Regulatory Framework.

10. Directives for land development and construction that are relevant to the power transmission sector are summarized in Table 2.

Table 1.Applicable land development and construction law and policy

Laws	Description
A. Law	
Land Law No 45/2013/QH13 dated November 29, 2013	This Law prescribes the regime of land ownership, powers and responsibilities of the State in representing the entire-people, owner of land and uniformly managing land, the regime of land management and use, and the rights and obligations of land users.
B. Decrees	
Decree No. 44/2014/ND-CP dated May 15, 2014	This Decree regulates methods for land pricing, adjustment to land price brackets and land price lists, specific land pricing and provision of consultancy on land pricing.
Decree No. 37/2014/ND-CP dated May 15, 2014	The Decree details some articles of the Law on Land concerning compensation, support, and resettlement upon land expropriation by the State.
C. Circulars	
Circular No. 36/2014 / TT-BTNMT dated June 30, 2014	Specifying detailed methods of valuation of land prices, construction, adjustment of land prices; specific land prices valuation and land prices valuation consulting service.
Circular No. 37/2014/TT-BTNMT dated June 30, 2014,	Providing detailed regulation on compensation, assistance, and resettlement when the State acquires land.
Document of Prime Minister No. 1665/TTg-CN, dated October 17, 2006	Regarding management of clearance of site, mine and explosive ordnance for construction

C. ADB Safeguard Policy

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

12. 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 and FI projects is normally not required but environmental implications need to be reviewed.

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

13. The following are additional applicable directives for environmental assessment and protection for domestic and international development in Viet Nam:

Table 3: Environmental Protection Laws and Regulations

Laws and Regulations	Description
A. Laws	
Law on Environmental Protection No. 55/2014/QH13, in effect on January 1, 2015	This Law provides statutory provisions on environmental protection activities; measures and resources used for the purpose of environmental protection; rights, powers, duties and obligations of regulatory bodies, agencies, organizations, households and individuals who are tasked with environmental protection.
Biodiversity Law No. 20/2008/QH12 dated November 13, 2008	Pursuant to the 1992 constitution of the Socialist Republic of Vietnam, which was amended and supplemented under Resolution 5/2001/QH10dated December 25, 2001 of the 10th National Assembly, this law stipulates biodiversity conservation and sustainable development.
B. Decrees	
Decree No. 18/2015/ND-CP, dated Feb. 14, 2015	Provides the requirements for Environmental Protection Plan, Strategic Environmental Assessment, Environmental Impact Assessment and Environmental Protection Scheme.This Decree took effect on April 1, 2015.
Decree No. 19/2015/ND-CP, dated Feb. 14, 2015	Regulation detailing a number of articles of the Environmental Protection Law. This Decree took effect on April 1, 2015.
Decree No 80/2014/ND-CP issued on August 6, 2014	This Decree regulates drainage and treatment of wastewater in urban areas, industrial zones, economic zones, processing and export zones, and rural residential areas. It also prescribes the rights and obligations of organizations, individuals and households having activities related to drainage and treatment of wastewater within Vietnam's territory.
Decree No.179/2013/ND-CP dated November 14, 2013	This Decree took effect on December 30, 2013 and prescribes the sanction on administrative violations on the domain of environmental protection.
Decree No.59/2007/NĐ-CP dated April 9, 2007	Prescribes the regulations on solid waste management
C. Circulars	
Circular No.27/2015/TT-BTNMT dated May 29, 2019	Guidance for Strategic Environmental Assessment, Environmental Impact Assessment, and Environmental Protection Plan.
Circular No. 01/2012/TT-BTNMT dated March 16,	Regulation on setting-up, assessment, approval, inspection and certification of the implementation of detailed environmental

Laws and Regulations	Description
2012	protection project; setting up and registration of simple environmental protection projects.
Circular No. 22/2014/TT-BTNMT dated May 5, 2014	Provides the guidelines for the implementation of the Government's Decree No. 35/2014/ND-CP of April 29, 2014, amending and supplementing a number of articles of the government's decree No. 29/2011/ND-CP of April 18, 2011, providing strategic environmental assessment, environmental impact assessment and environmental protection commitment.
Circular No 12/2011/TT-BTNMT dated April 14, 2011	Regulation on the management of Hazardous Waste. Under this law, generators of hazardous waste are required to register with MONRE/DONRE and to have separate hazardous waste storage area. The treatment and disposal of hazardous waste should be contracted through a registered hazardous waste management company.
Circular No. 39/2010/TT-BTNMT dated December 16, 2010	National technical regulation on noise (QCVN 26/2010/BTNMT) and on vibration (QCVN 27/2010/BTNMT)
Circular No 25/2009/TT-BTNMT dated November 16, 2009	National technical regulation on hazardous waste threshold (QCVN 07:2009/BTNMT).
Circular No 32/2013/TT-BTNMT dated October 25, 2013	National technical regulation on ambient air quality (QCVN 05/2013/BTNMT)
D. Decisions	
Decision No. 16/2008/QD-BTNMT dated December 31, 2008	National technical regulation on surface water quality (QCVN 08.2008/BTNMT); Underground water quality (QCVN 09/2008/BTNMT) and Domestic wastewater (QCVN 14/2008/BTNMT)

Environmental Standards and Regulations

Water quality:

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

Air Quality:

- QCVN 05:2013 – Standards for ambient air quality
- QCVN 06:2008 – Maximum allowable concentration of hazardous substances in the ambient air
- TCVN 6438:2001 – Maximum permitted emission limits of exhausted gases from vehicles

Solid Waste Management:

- QCVN 07:2009– National technical regulations for classification of hazardous wastes
- QCVN 25:2009 – National technical regulations for wastewater of solid waste sites
- QCVN 03:2008/BTNMT: -National regulation for heavy metal concentrations in soil

Vibration and Noise:

- QCVN 26:2010/BTNMT: national technical standard for noise
- TCVN 6962: 2001 Allowable vibration level for public and residential areas
- TCVN 6962:2001: - Allowable vibration and shock from construction activities

International Guidelines

- IFC/World Bank Group, 2007. EHS Guidelines for Electric Power Transmission & Distribution
- AWWA Standard Methods for the Examination of Water and Wastewater

International Environmental Management Conventions

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

- Stockholm Convention on Persistent Organic Pollutants (2002) see link http://www.pops.int/documents/implementation/nips/submissions/nip_vietnam.pdf
- Convention Concerning the Protection of the World Cultural and Natural Heritage (1972)
- Vienna Convention for the Protection of the Ozone Layer (1985)
- Montreal Protocol on Substances that Deplete the Ozone Layer (1987)
- Copenhagen Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, Copenhagen (1992)
- United Nations Framework Convention on Climate Change (1992)
- Convention on Biological Diversity (1992)

III. SUBPROJECT DESCRIPTION

15. The 220 kV Tra Vinh substation with a new transformer will improve its existing capacity to meet peak load demand, and socio-economic development of Tra Vinh province, specificallyChau Thanhdistrict and area. The project also provide power supply to enhance the provincial power supply stability, provide safe operation of the electric line network provided, and supply the surcharge for domestic use in Tra Vinh. Part of the neighboring Vinh Long Province will also beneficial to this project.

16. The main work of this project is the installation of the second transformer and associated equipment in the same premise of the existing Tra Vinh substation. A set of additional supporting equipment, i.e. fire extinguishers and emergency oil trap, for the safe operation of the entire substation will also be set into place.

17. The substation infrastructure is located in an area of 23,700m^2 in Luong Hoa Commune, Chau Thanh District, Tra Vinh Province in the southern part of Viet Nam. It is bounded by rice fields to the north, east, west and the National Highway 60 to the south (Figure 1).

A. Primary electrical component.

- Capacity ratio: 125/125/40MVA
- Group of winding: YNa0d11
- High voltage winding: potential level 225+8x1,25%kV with rated capacity of 125MVA
- Medium voltage winding: potential level 115kV with rated capacity of 125MVA
- Low voltage winding: potential level 23kV with rated capacity of 10MVA

18. The 2nd transformer utilizes the diagram similar to the existing transformer which is summarized as below and in Figure 2:

1. 220kV side: the same system diagram with additional feeder for the 2nd transformer
2. 110kV side: the same system diagram, with additional feeder for the 2nd transformer, 01 feeder bay to Long Duc and 01 feeder bay to CauKe installed in the 1st phase will be activated
3. 22 kV side: the same system diagram with, with additional outdoor feeder to switch from the power supply of local 22kV grid to the supply from the second transformer.

Figure 1.Location of 220 kV Tra Vinh substation

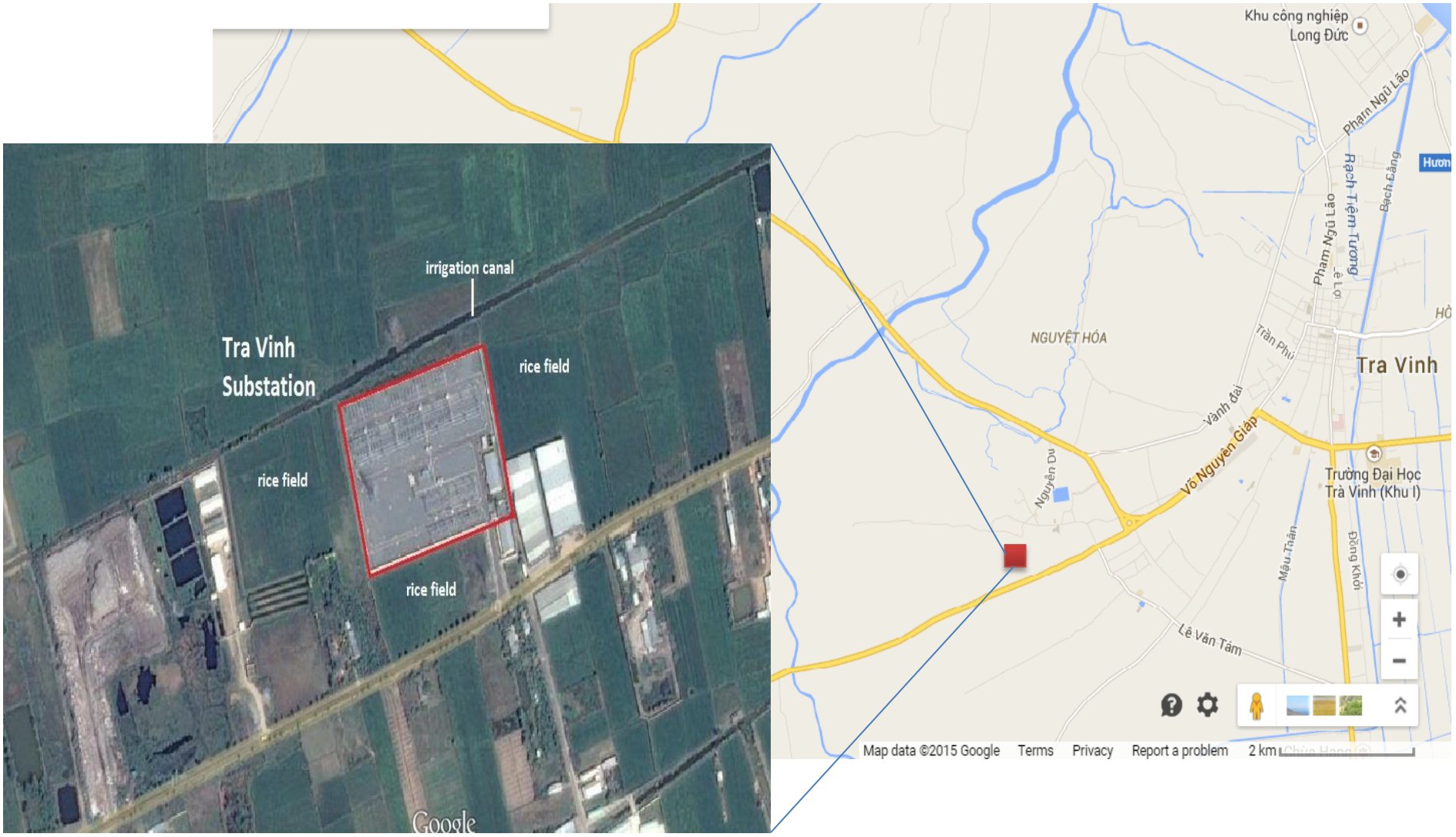
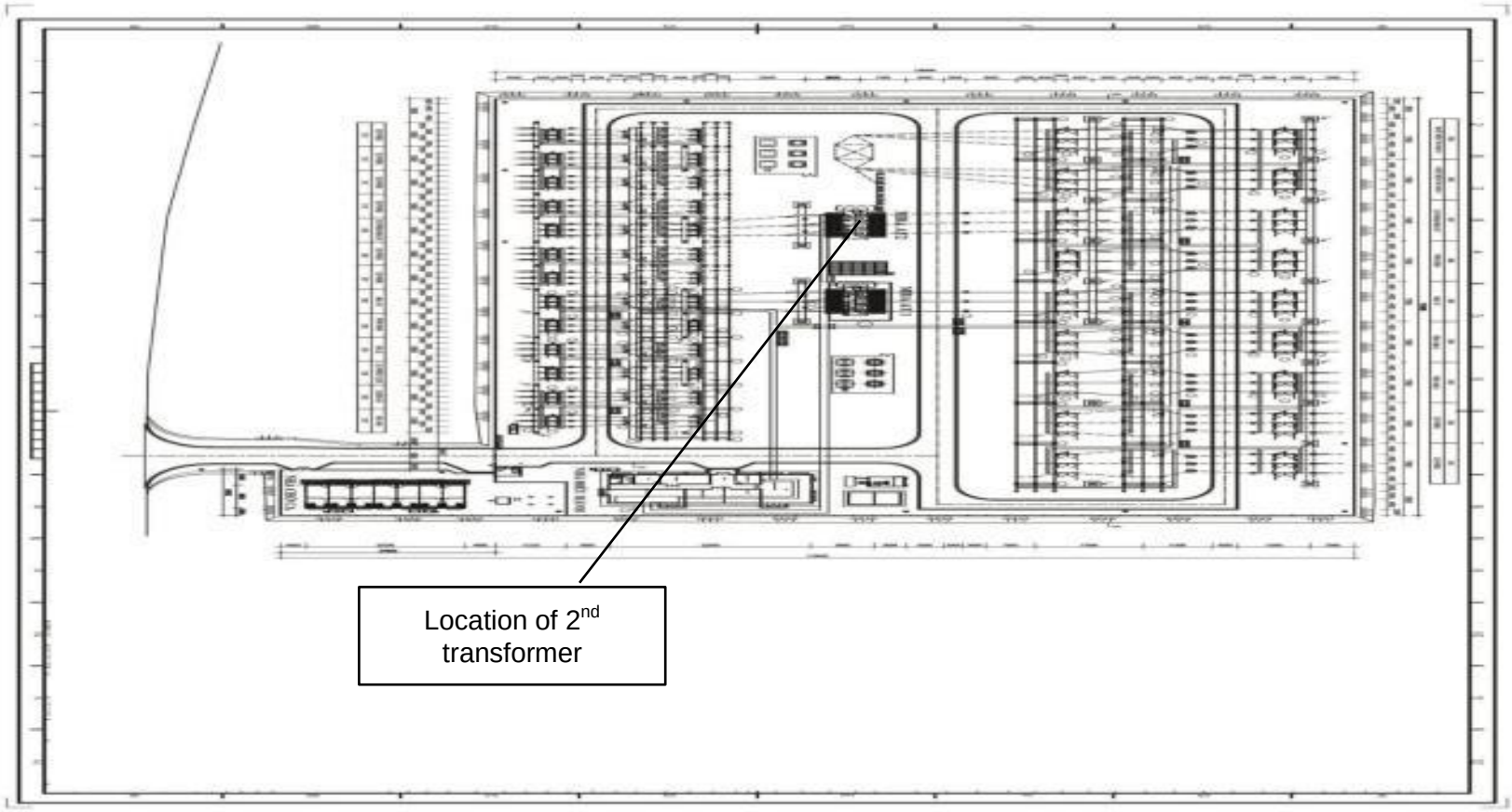


Figure 2.Plan view Tra Vinh 220 kV substation


Location of 2nd transformer

IV. DESCRIPTION OF THE ENVIRONMENT

A. Physical Environment

1. Climate

19. The subproject area is situated in the Southern Climate Zone which is typified by a tropical monsoon climate characterized by high temperatures with very little seasonal variation. Annual average temperature is about 28^{o}C. There are two seasons a year: a) dry season from December to April; and b) rainy season from May to November. Tra Vinh climate is influenced by 2 monsoons from the southwest and northeast.

a. Temperature

20. Air temperature is high and changes little in year-round for recent years. Annual average temperature for the period 2011 – 2013 is 26.9 – 27.1^{o}C. The mean difference between the hottest month and the coldest month in 2013 is about 3^{o}C. The cool months of year are from December to January (Table 3).

Table 2.Ttemperatureregime at Cang LongStation in Tra Vinh Province (^{o}C)

Station	Year	Mean Value by Month												YearAvg
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Cang Long	2011	25.6	25.7	27.4	27.9	27.6	27.1	27.2	27.2	26.9	27.3	27.1	26.0	26.9
	2012	26.0	26.7	28.0	27.7	27.6	27.8	27.1	27.6	26.1	27.2	27.5	27.2	27.2
	2013	25.6	26.7	27.7	28.4	28.5	27.7	27.0	27.3	26.8	27.0	27.2	25.4	27.1

Source: Tra Vinh Statistical Yearbook 2013

21. According to the report of the Working Group on Climate Change and Development, (2007), in the Mekong region) average temperatures over the last century, have risen between 0.3 to 0.8°C. Further temperature increases are expected along with more extreme weather events, such as floods and droughts, changes in the amount and distribution of rainfall, disruption of seasonal monsoons, and rising sea levels.

b. Sunlight

22. Average total sunlightin Tra Vinh is approximately 2,600 hours per year. Sunlight during the dry season is greater than during the rainy season (Table 4). There are remarkable fluctuations in sunshine duration from year to year and between months without a clear pattern.

Table 3.Average number of sunlight hours (hrs)

Station	Year	Mean Value by Month												YearAvg
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
CangLong	2011	189.9	225.8	204.0	244.2	175.8	158.8	179.1	200.6	142.9	217.5	188.7	176.4	192.0
	2012	206.8	237.1	246.7	242.9	198.3	189.2	196.5	227.3	115.5	184.9	214.6	238.8	208.2

Station	Year	Mean Value by Month												YearAvg
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	2013	203.7	231.5	284.9	191.9	204.6	142.0	160.5	183.5	132.5	174.1	199.7	149.6	188.2

Source: Tra Vinh Statistical Yearbook 2013

c. Humidity and Rainfall

23. The Tra Vinh area is humid and there is little difference in rainfall between the monsoon seasons. Annual average humidity is about 83% - 85 %. Table 6 shows the significant difference between dry season and rainy season rainfall. Total annual average rainfall in the region is around 1500mm. Drought events are found common in Tra Vinh due to the fact that rainfall is not rich and very seasonal.

Table 4.Monthly mean humidity in Cang Long Station (%)

Station	Year	Mean Value by Month												YearAvg
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Cang Long	2011	81	77	77	79	85	85	84	87	86	86	85	83	83
	2012	82	79	81	85	87	86	87	85	90	86	86	82	85
	2013	80	78	78	84	87	88	87	87	88	87	85	83	84

Source: Tra Vinh Statistical Yearbook 2013

Table 5.Monthly rainfall in Cang Long Station (mm)

Station	Year	Mean Value by Month												YearAvg
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Cang Long	2011	1.1	-	3.2	13.8	297.6	341.7	174.6	324.3	189.5	243.0	301.6	6.8	172.5
	2012	0.8	8.8	73.2	33.3	261.6	141.4	292.3	62.4	391.6	379.1	37.5	18.4	141.7
	2013	74.1	3.5	0.3	90.0	106.0	216.2	172.9	174.3	259.5	147.6	165.7	28.4	119.9

Source: Tra Vinh Statistical Yearbook 2013

24. The yearly evaporation ranges from 48 mm in July to 111 mm in March. The highest evaporation during the dry season is from December to April, especially in areas of high sand dunes and coastal areas.

d. Wind velocity.

25. Along the65 km coastline of Tra Vinh the average wind speed approaches 3-4 m/s typically, with gusts up to level 6 m/s. The dominant wind directions include northeast and east - northeast. In the monsoon northeast wind speed is about 1-5 m/s. In days of rains, tropical

depressions or storms wind speed may reach 10m/s. In the inner area, however, a mild wind velocity is observed throughout the year (Table 7).

Table 6.Wind velocity and Number of thunderstorm-days in Cang Long station

Parameters	Months, year												
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Year (Avg.)**
Wind velocity (m/s)	2.0	2.4	2.2	1.6	1.3	1.7	1.8	2.1	1.5	1.3	1.5	1.7	1.8
Number of thunderstorm -days (day)	0.2	0.1	1.4	6.0	15.1	11.5	12.3	11.9	14.5	13.1	4.5	1.2	91.7

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

2. Air quality

26. Ambient air quality in Tra Vinh is good according to theTra Vinh Development Master Plan 2011-2015 (Table 8). Air pollutants are concentrated in urban areas with the increasing use of motorbikes and other personal motorized vehicles and in local inner waterways.

27. The EIA team analyzed air quality at the Tra Vinh substation site. The results shows that the air quality (SO_2, NOx, CO, dust) of the area is satisfactory as required by QCVN 05:2008/BTNMT. Noise level is also within GoV standard, compared to QCVN26:2010/BTNMT.

Table 7. Air pollutants at Tra Vinh substation

no	Sampling location	Noise	Dust	SO_2	NO_2	CO
		(dBA)	*(mg/m^3)*	*(mg/m^3)*	*(mg/m^3)*	*(mg/m^3)*
1	K1	52,7	0,175	0,056	0,044	2,87
2	K2	40	0,132	0,046	0,032	2,41
3	K3	61,7	0,264	0,083	0,068	4,76
QCVN26:2010/BTNMT		**70**	-	-	-	-
QCVN05:2013/BTNMT		-	**0,3**	**0,3**	**0,2**	**30**
Note on location:						
K1:		At the existing 125 MVA transformer, coordinates X=1.096.498;Y=643.144				
K2:		In front of the operation house, coordinates X = 1.096.470, Y = 643.182				
K3:		At substation gate coordinates X = 1.096.418, Y = 643.035				

Source: EIA report for the substation prepared by Center of Environment and Energy, 2014

3. Topography, Geology and Soils

28. Topographical features of Tra Vinh Province are typical of coastal plains, influenced by the interference between rivers and the sea. The region is formed by the low-lying, flat terrain mixed with sand dunes. The common elevation level of the province varies from 0.1 - 1m which accounts for 66% of the total natural area. Generally the terrain is favorable for agricultural production of gravity irrigation and not prone to flooding. According to PECC3 soil in the subproject area is divided into 6 layers (Table 9).

Table 8.Geographic features surveyed at Tra Vinh substation site.

Layer	Depth(m)	Volumetric mass γ (T/m^3)	Adhesive force (T/m^2)	Angle of internal friction φ (degree)	Density Δ
Filling material	0.2-1.5	1.800	0.20	20.00	2.60
Very soft, grey sandy clay	5.0	1.587	0.80	4.42	2.65
Very soft, yellowish grey sandy	6.0	1.612	1.20	3.32	2.65
Very soft, grey sandy clay	6.0-15	1.601	0.70	9.87	2.65

29. The survey conducted by PECC3 determined the substation is located in an area with seismic level of 6 MSK, repeating cycle $T_l \leq 200$ years, the probability of seismic event $P \geq 0.1$ over a period of 20 years. To the bottom of stratigraphic borehole (15m) there are 4 layers: filling material layer, SM, CL and CH. The load capacity of the area is very weak and therefore appropriate measures were taken for enforcement of the foundation, including the specific site where the 2nd transformer is going to be installed.

30. Six major groups of soil are discovered in the province of Tra Vinh, including (Figure 3):

Sand dunes: occupying 7.55% of the natural area, not very fertile but suitable for vegetables and diverse land use.

Saline soil: occupying about 25.17% of the total natural area, of which about 24.5% is of high salinity, is used for aquaculture and mangroveforestry. The remaining area is used for rice cultivation;

Alkaline soil: accounting for 17.63% of the total, currently used for forestry and aquaculture purposes; A majority of the area is slightly alkaline (deep alkaline layer) which can be used for agricultural purposes, but with limited diversification of crops.

Alluvial soil: accounting for 19.45% of the total area of the province, distributed along Tien River and Hau River, abundantly watered, very suitable for numerous crops and land use purposes.

Anthropogenic soil: occupying approximately 19.64% of the total natural area, including residential land and special land use; the remaining area is used for perennial crops, mainly fruits and coconut.

Coastal accretion: Occupying approximately 2.27% of the natural area, resulted from the process of sedimentation in the estuary.

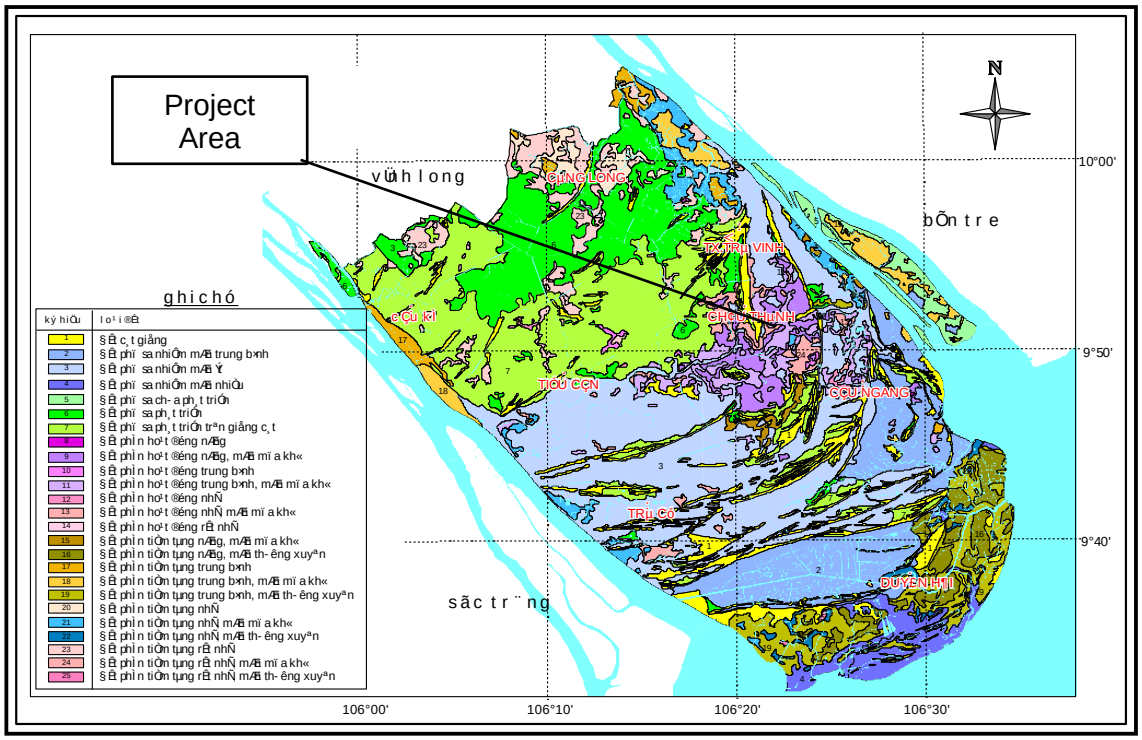
4. Surface water / groundwater resources

31. The hydrology of Tra Vinh Province is complex as it is surrounded by HauGiang River, Co Chien River and the sea. The two rivers, with total length of 578km, are the main source of freshwater for the area which is then distributed through a large system of canals.

32. Tra Vinhis not affected by upstream flooding from Mekong River as in some provinces in Mekong Delta but there has been localized flooding in lowland sub-regionsthat last for 3-5 months a year. Flooding occurs due to intense rainfall in a short period of time (3 -5 days) plus the rising river water (water from upstream and the high tide).The substation site is located amid rice fields and small canals and not prone to localized flooding.

33. Five underground aquifers are found in Tra Vinh Province and Chau Thanh Province siting the project area.Upper groundwater (middle and upper Pleistocene) aquifers are salinized (salt water intrusion from canals), while the water in the middle 3 layers (Pliocene) is more abundant and of better quality. In general, shallow groundwater at depths below 100 m beneath the sand dunes, is supplied mainly from accumulated rainwater. Groundwater at depths deeper than 100 m is pretty rich. A recent increase of crop farming and aquaculture activities led to severe shortage of groundwater in Tra Vinh.

Figure 3.Soil types in Tra Vinh province



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6. Water quality

37. Data on surface water in Tra Vinh is rather poor compared to other localities in the region. Water quality is monitored at 10 urban and rural stationsin the province (Table 10). Overall, the quality of supply water is acceptable except for biological parameters according to a monitoring survey in 2005. As stated by the 2010 Tra Vinh Land use Master Plan, the local water pollution is caused by domestic wastewater, wastewater from aquaculture farming and processing facilities, overuse of fertilizers and pesticides, and industrial wastewater. The most polluting source for surface water in Tra Vinh is domestic wastewater with Coliform parameter that is 2 times over the limits set by QCVN 14:2008/BTNMT.

Table 9.Surface water quality at 10 stations in Tra Vinh, March 2005

Parameter	Unit	Sampling location									
		I	II	III	IV	V	VI	VII	VIII	IX	X
PH	-	7.9	6.8	7.2	7.0	7.0	7.9	7.2	6.5	7.9	8.0
COD	mg/l	30	24	40	22	20	20	18	22	15	25
BOD_5	mg/l	11	8	8	7	6	7	8	7	5	8
SS	mg/l	165	62	31	13	7	86	205	62	70	163
$N\text{-}NO_3$	mg/l	0.5	0.21	0.44	0.69	0.29	0.49	0.69	0.49	0.22	0.38
$N\text{-}NH_4$	mg/l	0.03	0.02	0.4	0.22	0.13	0.03	0.03	0.05	0.05	0.06
∑Coli	1000 MPN/100	240	400	3.9	12	46	46	46	46	46	240
Pb	mg/l	0.03	0.01	0.02	0.05	0.02	0.04	0.01	0.01	0.03	0.07
∑Nitrogen	mg/l	1.3	0.8	1.0	1.7	0.9	1.1	1.5	4.0	1.3	0.9

I: Long Binh Bridge,Tra VinhCity;II:BenGia, Long Huu,Tra VinhCity;III:La Bang, Don Chau, Tra Cu Dist.;IV:Tap Son, Tra Cu Dist.;V:Tam Phuong, Chau ThanhDist.;VI:Tieu Can Bridge,Tieu Can Dist.;VII:My Hue Bridge, Cang Long Dist.; VIII:CauNgangMarket;IX: LocRiver,Chau ThanhDist.;X:CauKe Market.
Source: Tra Vinh Center for Rural Water and Sanitation, 2010.

38. A survey of wastewater from the Tra Vinh substation was conducted in October 2014 (Table 11.) Wastewater at the discharge gate to the irrigation canal in front of the substation was sampled. The analysis showed that the sampled parameters in domestic wastewater treated in the substation's septic tanks are within the limits allowed by column B - National technical regulations for domestic wastewater QCVN 14:2008/ BTNMT.

Table 10.Surface wastewater quality at Tra Vinh, 2014

Parameter	Unit	Result	QCVN14:2008/BTNMT, Colum B
pH	-	6.28	**5– 9**
total suspended solid(TSS)	mg/l	45	**100**
COD	mg/l	15	**-**
BOD_5	mg/l	29	**50**
Nitrate	mg/l	3.74	**50**
Phosphate	mg/l	0.38	**10**
Coliform	MPN/ml	2.700	**5.000**

Source: Tra Vinh EIA report, October 2014

7. Groundwater quality

39. Currently there are no official databases to assess groundwater quality in Tra Vinh. Limited information on groundwater quality is gathered from individual studies which are not up-to-date, for example, those from Tra Vinh Provincial Center for Rural Environment and Sanitation and Can Tho University. The studies proved that for the period from 2005-2009, insignificant changes in groundwater quality are seen and almost all parameters samples are within the Viet Nam standard on groundwater, except for Coliform contamination.

Table 11.Groundwater quality in rural and urban areas of Tra Vinh Province

Parameter	Unit	Sampling locations						
		I	II	III	IV	V	VI	VII
PH	-	8.1	8.1	8.1	7.5	8.3	7.4	7.3
COD	mg/l	5	7	5	6	5	9	6
BOD5	mg/l	2	3	2	3	2	4	3
Rigidness	MgCaCO3/l	192	237	256	295	200	302	230
N-NO3	mg/l	0.4	0.82	1.3	1.2	2.9	1.4	0.84
N-NH4	mg/l	0.9	1.08	1.6	5.13	2.18	8.12	2.84

Parameter	Unit	Sampling locations						
		I	II	III	IV	V	VI	VII
∑Coli	MPN/100 ml	460	43	64	2400	23	1100	4
Al	mg/l	0.09	0.08	0.05	0.08	0.62	1.01	0.92
∑ Fe	mg/l	0.16	0.693	0.795	0.85	2.43	0.062	0.473

I: *Well in Tap Son Commune, Tra Cu Dist.;****II:*** *Well in Tieu Can Market;****III:****Well in HieuTuCommune,Tieu Can Dist.;****IV:****Well in PhongThanhCommune,CauKeDist.;****V:****Well in CauKeMarket;****VI:*** *Well in Phuong ThanhCommune,Cang Long Dist.;****VII:****Tap water in Tra Vinh Department of Environment and Natural Resources.*
Source**:** Tra Vinh Provincial Center for Rural Environment and Sanitation and Can Tho University, 2005, 2009.

40. According to the Tra Vinh Department of EnvironmentandNatural Resources, the province has about 85,000 drilled wells and over 4,700 dug wells. Of which more than 1,600 wells are damaged and create risks of salinization and pollution of groundwater. The top aquifer has been salinized and unsuitable for drinking purpose.

B. Biological Environment

1. Vegetation and Land Use

41. In Chau Thanh District of Tra Vinh province, the natural forest area in the district is 42.66 ha, concentrated in Long Hoa Commune 37.33 ha and 5.33 ha in Hung My Commune. The coastal protection forest area is 135.7 ha that represents mangrove forests of *Sonneratiapagatpat, Avicenniagerminans*and mangrove palms. The terrestrial fauna and aquatic species are very few both in number and variety. Forest regeneration is fostered in the alluvial areas in estuaries for environment protection and erosion control (Table 13).

42. The farming area accounts for 77.4% of the total land area in Chau Thanh District, non-farm land and unused land are 22.5% and 0.1% respectively. In Luong Hoa Commune where the substation is sited, the vegetation is characterized by agricultural crops, mostly rice fields and garden fruits such as pomelo, mango etc. There is no forest in the commune.

Table 12.Land use in Chau Thanh District in 2012

Administrative unit	Total (ha)	2012 (ha)		
		Farm land	Non-farm land	Unused land
Total	**34.338,71**	**26.591,52**	**7.710,95**	**36,24**
Chau Thanh Town	348,77	242,69	106,08	-
Da Loc Commune	3.651,30	3.236,48	413,61	1,21
My Chanh Commune	2.666,54	2.380,9	276,29	9,35

Administrative unit	Total (ha)	2012 (ha)		
		Farm land	Non-farm land	Unused land
Thanh My Commune	2.144,32	1.937,13	207,16	0,03
Luong Hoa Commune	**2.295,89**	**2.066,4**	**219,38**	**10,11**
Luong Hoa A Commune	2.314,82	2.036,03	276,40	2,39
Song Loc Commune	3.453,32	3.120,82	332,43	0,26
NguyetHoa Commune	1.180,76	997,78	181,61	1,37
HoaThuan Commune	1.397,06	1.078,31	315,36	3,39
Hoa Loi Commune	1.559,31	1.397,56	197,24	4,51
Phuoc Hao Commune	2.326,63	2.040,56	285,94	0,13
Hung My Commune	2.793,72	1.723,05	1.070,12	0,55
Hoa Minh Commune	3.622,41	2.049,03	1.570,90	2,48
Long Hoa Commune	4.543,67	2.284,78	2.258,43	0,46

Source: 2012 Chau Thanh District Statistical Yearbook.

2. Wildlife

43. Tra Vinh is known for its mangrove habitats; the most famous is Duyen Hai mangrove forest reserve. In an area of 650 ha, it is home to 64 species of plants belonging to 57 genera, 31 families and animals. The Tra Vinh substation is 65km from the reserve and therefore environmental impacts are very improbable. There are also no rare or extinct animals reported in the subproject area.

3. Conservation Areas

44. There are no conservation areas within the proximity of the substation.

C. Socio-economic condition

1. Population

45. Chau Thanh district is relatively populous in the province. According to 2012 statistics, the population of Chau Thanh district is 137,403 people with a density of 400 people /km^2 (provincial density: 425 people/km^2).

46. The population is distributed unevenly, often concentrated in the town, and along the main roads. The highest population is concentrated in the town of Chau Thanh with 1784 persons/$km^2$with the lowest density of 199 people/km^2 in Long Hoa commune. Among the communes, Luong Hoa has the average population and density (Table 14).

47. Sixty five percent of Chau Thanh District population areKinh people, approximately 34% are Khmer and other ethnic minority groups account for 1%.

Table 13.Population distribution insubproject area

Commune and town	Natural area (km^2)	Avg. population (person)	Population density (person/km^2)
Total	**343,39**	**137.403**	**400**
Chau Thanh Town	3,49	13.359	1.784
Da Loc Commune	36,50	10.801	366
My Chanh Commune	26,67	7.654	405
Thanh My Commune	21,44	10.400	357
Luong Hoa Commune	**22,96**	**9.236**	**453**
Luong Hoa A Commune	23,15	12.223	399
Song Loc Commune	34,53	6.353	354
NguyetHoa Commune	11,81	11.692	538
HoaThuan Commune	13,97	9.705	837
Hoa Loi Commune	15,99	10.262	607
Phuoc Hao Commune	23,27	8.493	441
Hung My Commune	27,94	11.336	304
Hoa Minh Commune	36,22	9.042	313
Long Hoa Commune	45,44	6.226	199

Source: Chau Thanh District Statistical Yearbook 2012.

2. Local Economy

48. Chau Thanh district is typical of agricultural economy. Most people live on farming; the poverty rate in the district is still high, concentrated mainly in communes with such as Da Loc, Hoa Loi, Luong Hoa A, Long Hoa Commune and Phuoc Hao. The district poverty incidence has decreasing over the last 5 years at the average rate of 2.1% per year.

49. The farming sector in Luong Hoa Commune accounts for 31% of the communal economy and is quite diverse. This sector is based on 3,742.7ha for both annual and perennial crops that include rice, vegetables, mushroom, coconut, fruits, cocoa etc. In 2014 the number of livestock raised in the Commune was 506,484, of which 6,864 were pigs, 3670 cows, 7 buffalos and 495,943 chickens or ducks. The aquaculture sub-sector grows by 16% compared to 2013 with estimated yield of 4495 tons of shrimp, snake-head mullets, and catfish.

50. Luong Hoa's industryconsists of small industry and handicraft. Presently, there are 59 units for industry-handicraft production of plastic weaved buckets and textile. The output of industry-handicraft production reached 90billion VND in 2014.

51. Commerce and services are growing but at very small scale. There are 181units and households performing commercial businesses who employ more than 400 labourers. The revenue from commerce and service activities is estimated at 61.34 billion VND, growing by 21.60% year-to-year.

3. Social Infrastructure

a. Public Health and Sanitation.

52. Currently, there are 12 district health centers and polyclinics in Tra Vinh. Clinics exist at each communes/town.

53. According to data from the Center for HIV/AIDS in Tra Vinh province, in 2013 the province has detected 1,825 cases of HIV infection (1042 infected, 714 dead); Tra Vinh city has the highest number of HIV infections with 346 cases (18.9%), Cang Long with 221 cases (12.1%), Tra Cu with 217 cases (11.9%), Chau Thanh with 212 cases (11.6%), Duyen Hai district with 86 cases (4.7%); and 37 cases of unknown address (2.0%). Accordingly, 104 of 105 communes, wards and towns in the province have detected HIV cases.

54. The Luong Hoa Commune Clinic was completed in 2014 to provide basic and primary healthcare to the local people in the subproject site. Universal vaccination applies to 100% of under 5 year old children. More severe patients will be easily transferred to district and city hospitals within 1-2hrs with the improved system of roads.

55. Eighty five percent of communal households have sanitary toilets and 90% have access to clean water (2856 households). Domestic waste is disposed of at home, normally using landfill holes, as there is no concentrated waste treatment facility in Luong Hoa Commune. Waste generated in offices and markets are collected and handled at the Commune's landfill by a collective environmental unit.

b. Education

56. The education system in Chau Thanh district covers from kindergarten level to high school. All communes and town achieved universal secondary and high school education. Currently, the district has 54 schools at all levels, 830 classes with 23,297 students. The schooling rate to kindergarten at age of 5 years reaches 99.1%; that of 6 years old children to elementary school reaches 99.84%.

c. Communications:

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

d. Water and electricity:

58. The subproject area does not have tap-water system, main water source supplying people's life is underground water at drilled wells and dug wells. Along with 500 kV transmission lines and the 220kV substation, there are several power development projects for communes with difficulties in the area, e.g. Central Highland phase 2 etc. As of 2014, 95% of commune households have access to electricity. However, due to unstable power supply, power outage is frequent in dry season lowering the ability to serve for production and business.

4. Infrastructure for transportation

59. Infrastructure development for transportation is being constantly improved which has increased the standard of living and access to services. The road network is reasonably well developed throughout the subproject area. A network of provincial, district, commune and village roads also serve the area. Tra Vinh is traversed by 3 main highways no.53, 54 and 60 with approximate length of 250 kilometers, connecting to Ho Chi Minh City and the Mekong Delta; 5 provincial roads of approximately 180 km long. Traffic in the subproject area in Chau Thanh District is convenient with many important roads such as National Highway 54 to Tra Vinh City. Most of roads in the subproject area are concreted which is convenient to traffic movement of cars, buses, and tipper trucks. The inland waterway system is also convenient for heavy transportation and agricultural cargos.

5. Cultural and Heritage Sites

60. In Tra Vinh, there are 17 cultural and historical sites that are recognized at national and provincial level. The nationally recognized sites include Ho Chi Minh temple, Ba Om Pond tourist spot, Ang Pagoda, Phuoc Minh Cung Pagoda, Gia Linh Tu Pagoda, Luu Cu 2 archeological site, Con Tau wharf, ApSoc Pagoda, Bo Luy-Ao Nam and Bodhisalaraja-Kom Pong Pagoda. The provincial level sites consist of Phuoc My Tu relics, revolutionary Bao Mon Pagoda, Long Thanh Pagoda, Ta Rom Pagoda, An My village house, Ba Tram village house, TraKhup Pagoda. Many of those sites are related to Khmer cultural and religious traditions.

61. The IEE with PECC3 investigated all possible sensitive receptors in a range of 5km from the Tra Vinh substation. It is found that no such sites are within 500m of the substation, therefore no impacts from the subproject are incurred. The table below presents all environmental sensitive receptors around the concerned site.

Table 14.Environmental Sensitive Receptorsaround the Substation

Substation	Name of receptors	Distance from the substation
220kV Tra Vinh substation	Ba Om Pond	1.5 km
	Bo Luy-Ao Nam	1 km
	Lo Gach Pagoda	2 km
	Communal People's Committee Office	3 km
	Primary school	2.5 km

	Secondary school	2.5 km
	Communal clinic	3 km
	Tuberculosis hospital	600m

Source: IEE consultant and PECC3 team, 2015

6. UXO Clearance

62. After decades of war UXO remains a significant issue in Vietnam. However, the risk of UXO accidents is zero since clearing of UXO has been conducted before the construction of the substation since 2008. The ground within the boundary of the substation for instalment of the 2nd transformer has been prepared; therefore additional UXO clearance is not necessary.

7. Subproject affected people

63. No people will be affected by the installation of the 2nd transformer and related construction activities in the substation.

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8. Additional features of 220 kV Tra Vinh Substation

64. The site of the substation and location of new transformer are shown in the Figure5.

Figure 4.Views of 220 kV Tra Vinh substation site

Fig 4a: Gate of substation

	Fig 4b: Existing Transformer
	Fig 4c: Location for newtransformer

	Fig 4d: Rice fields adjacent to substation
	Fig 4e: Wastewater discharge to irrigation canal

V. INFORMATION DISCLOSURE AND PUBLIC CONSULTATION

A. Information disclosure

65. Formal disclosure to affected persons and stakeholders of information on the 220 kV Tra Vinh substation that occurred during the IEE is meant to form the beginning of continued

information disclosure and stakeholder involvement as the subproject is implemented. As part of the stakeholder communication strategy regular information exchange meetings with stakeholders are strongly encouraged throughout implementation of the subproject.

66. The IEE must be easily available to the stakeholders contacted during examination in written and verbal forms in local language of Vietnamese. At a minimum the Executive Summary of the IEE should be translated to local language and distributed to all APs. The IEE should be available on the NPT and SPMB websites, and at the subproject site. Similarly, all subproject reporting with specific reference to stakeholder consultation minutes, environmental monitoring, and reports on EMP implementation released by the EA/IA should be available at the same offices and websites. The IEE will be available on the ADB website as well as EMP reporting that is prepared by the EA/IA after implementation begins.

B. Public Consultation

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

1. Identification of Stakeholders

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

- Mass organizations such as Women's Union, and Farmers Union which provided information for the design of the various subproject interventions, and which might participate in implementation of measures and interventions;

- Affected households and businesses living along the transmission line and near the substation site who may be directly and/or adversely affected, and who have an interest in the identification and implementation of measures to avoid or minimize negative impacts; and

- Other institutions or individuals with a vested interest in the outcomes and/or impacts of the subproject including (i) PPC, (ii) DPC; (iii) Project EA, (iv) PECC3, and (v) commune leaders.

2. Public consultation meeting

69. A writing consultation with local People's Committee and Commission was previously held by the Vietnamese EIA team (PECC3) in October 2014. A follow up direct community consultation meeting was held by the IEE consultant to discuss the location and impact of the substation for both environmental and social aspects. The meeting is convened in Luong Hoa Commune, Chau Thanh District of Tra Vinh Province on 20th of March 2015. The public meeting consisted of the following two component procedures.

1. The engineering consultant introduced the subproject including the substation location, design and communes and wards; and

2. The environmental consultant presentedADB's environmental policy, safety regulations in the Vietnam power sector, anticipated environmental impacts and respective mitigation measures (to be developed in IEE), the grievance redress mechanism for environmental and resettlement problems.

During the meeting people raised their questions and comments on the environmental issues. The PECC3 consultant and IEE national consultant answered and explained all questions to the participants. While some locals directed their concerns to the proposed component of the subproject, a larger number of the concerns were related to the adverse impacts from operation of the existing substation. These impacts are presented in the following table.

70. The participants of the public consultation meeting included Commune leaders, representatives of mass organization such as Women Union and affected people. A total of 15 people were consulted (Appendix B).

3. Results of Public consultations

71. Comments from communal authorities arecollected by PECC3 consultation in writing. The main comments of communal authorities are as follows:

- Agreement with the environmental impacts of the project addressed in the locality.

- Agreement with the solutions and measures to mitigate environmental impacts of the project.

- The project owner should ensure all mitigation measures during the construction phase are implemented.

- The operator of the substation should strictly follow regulations during the upgrading and operation of the substation

The summary of comments/questions from local authorities/people and answers of consultants are summarized in Table 16. Subsequent formal consultations are not required by an IEE. However, required input from stakeholders and response from project owners will occur through the Grievance Redress Mechanism (see below).

Table 15.Summary of concerns and issues with subproject

Location and time	Comments/questions local people	Answers of consultants	Response of Project
Luong Hoa Commune, Chau Thanh District, Tra Vinh Province March20, 2015	Construction activities must comply with the schedule in order to avoid negative influence on living conditions and farming activities of local people.	A detailed EMP is prepared to ensure that the Contractor of the subproject will avoid and prevent any potential impacts on the local environment and social life.	The EMP prescribes preparation and distribution of complete construction schedule to affected community in order to minimize disturbance.
	Wastewater discharge from the existing substation floods surrounding rice fields and damages the productivity.	Though the raised matter is not directly related to proposed component of the project, it is highly appropriate for further investigation for the future operation of the substation. If these concerns are founded the local people are encouraged to file their complaint to the local authority.[4]	While existing wastewater management is outside the scope of subproject, the EMP does prescribe the requirement for wastewater management as part of operation of the new transformer.
	Concerns about the effects of electromagnetic fields on the health of the people. Furthermore, the psychological effects are also apparent when the lands around the substation cannot be tradable.	Technical analysis confirms that there is no such effect on people health especially the substation site is completely fenced and far away from residential areas. Dealing with psychological effects is beyond the Project Owner and Operator's responsibility and capability.	In addition to the IEE the EMP also provides the results of recent extension review of EMF of the WHO which indicates health effects of EF are inconclusive.
	Lighting from the substation impeded the normal growth of rice crops	See the above response to the wastewater. The Project Owner will clarify with the operator to have adequate corrective actions.[5]	While outside the scope of the subproject the EMP specifies the requirement to direct boundary lighting of substation inward and down towards the ground.

[4] A field visit to the substation site was made immediately by the IEE consultant and the locals following the consultation meeting. A blockage of the drainage ditch from the substation to the adjacent irrigation canal was identified. The IEE consultant recommended the Operator to clear the blockage as soon as possible.
[5] The operator has recently adjusted the lighting direction inwards so that nearby rice fields will no longer be harmed.

Location and time	Comments/questions local people	Answers of consultants	Response of Project
Conclusion	Luong Hoa Commune People's Committee (CPC) and local people agree with the installation of the 2nd transformer in 220 kV Tra Vinh substation. Impacts from the current operation of the substation on local people should be handled in due time. Project Owner and the Contractor will implement the EMP to minimize potential adverse impacts of the proposed subproject		

VI. POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION

72. 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 structure is carried forward to the environmental management plan for the subproject (see section IX).

A. Subproject Benefits

73. The single comprehensive benefit of the subproject is the provision of needed additional electrical power to Tra Vinh district and throughout Tra Vinhprovince while reducing power outages or brownouts.

B. Pre-construction Phase

74. There are no negative impacts during pre-construction. No resettlement or land acquisition will be required because transformer will be installed inside substation.

75. The subproject EMP will need to be reviewedto ensure that the EMP fully addresses the final schedule activities for the installation the new transformer.The key impact management measures to be implemented during the pre-construction phase are:

- Completion of detailed activities of the transformerinstallation including scheduling equipment delivery along the access road; and
- Updating and initiation of the brief subproject EMP.

C. Construction Phase

76. The potential environmental impacts of the new transformer are restricted to: 1)use of the access road for transformer equipment delivery, risk of increased traffic accidents and dust and noise production; and 2) potential worker accidents during transformer installation.

Mitigation measures

77. Construction management measures to mitigate the potential the above common impacts associated with the installation of the transformer areitemized below. The mitigation measures are detailed in the subproject EMP.

- Regular use of wetting agents should be employed at substation site, and along thebusy access road.
- All equipment delivery and construction vehicles, and gas powered equipment should be maintained in proper working order to minimize emissions, and not operated at night if possible to minimize noise.
- Speed limits should be posted and adhered to by construction vehicles.
- Local workers should be used as much as possible to prevent or minimize influx of migrant workers, and incidence of social disease and community unrest.
- Dedicated fuel storage areas must be established away from public areas and marked clearly.

- To minimize the risk of public and worker injury appropriate GoV regulations on Occupational, Safety, and Community Health must be applied[6], or the IFC/World Bank Environment, Health, and Safety Guidelines (2007) for Power Distribution that govern the safe and orderly operation of civil works should be followed.
- Aggregates (e.g., sand, gravel, rock) that are transported by truck should be covered.
- Prolonged use of temporary storage piles of file should be avoided, or covered, or wetted regularly to prevent dust and erosion.
- Storage of bulk fuel should be on covered concrete pads away from the public and worker camp. Fuel storage areas and tanks must be clearly marked, protected and lighted. Contractors should be required to have an emergency plan to handle fuel and oil spillage

D. Operation Phase

78. The potential impacts of the operational transformerare restricted to worker safety, and possible spills of hazardous waste such as transformer oils. These potential impacts are addressed by existing worker safety directives and guidelines of M/DoLISA, and operation regulations for substations (e.g., Table 1).

E. Climate Change

79. There have been numerous recent reports and summaries, e.g.,[7],[8],[9], of climate change scenarios for Viet Nam based on the most recent climate change projections of the different Global Circulation Models (GCM). The fact sheet for Viet Nam[10] compiled by the MONRE of Viet Nam summarizes projected climate change for Viet Nam as follows.

80. By 2100 average annual air temperature in the country is expected to increase by 2.3 C^{o} with the frequency of heat waves increasing by 100-180%, and cold surges decreasing by 20-40%. Total rainfall, and extreme rainfall events is expected to increase everywhere in the country with particular increases occurring in the mountainous northern areas. However, rainfall is expected to decrease during dry season. By 2100 mean sea level is expected to increase 1.0 m.

Climate Risk and Vulnerability[11]

81. The sensitivity of the 220 kV Tra Vinh substation subproject to climate change is considered lowas determined by the initial rapid environmental assessment of the subproject (Appendix A). The substation siteis well drained which will not expose it to increased flooding from increased frequency and severity of rainfall events. Integral to the transformer installation is elevation of the substationwhich makes the facility resilient to potential increases in the flooding of the adjacent canal that connects to the Mekong delta.

[6] e.g. Circular No: 22/2010/TT-BXD, date issued: 03rd December 2010.
[7] ADB (2013). Viet Nam and Climate Change Assessment and Impacts, 31 pgs + Appendices
[8] MONRE, 2009. Climate Change and Sea Level Rise Scenarios, 15 pgs + Appendices
[9] UNEP, 2010. Assessment of Capacity Gaps and Needs of Southeast Asian Countries Addressing Impacts, Vulnerabilities, and Adaption to Climate Variability and Climate Change, 215 pgs + references
[10] MONRE 2010, Climate Change Fact Sheet for Viet Nam
[11] ADB (2014) Climate Proofing ADB Investment in the Transport Sector: Initial Experience, 88 pgs + Appendices

1. Contribution to Global Climate Change

82. Consideration of climate change includes measures to reduce the contribution of the subprojects to greenhouse gas production. Effort through design will be taken to reduce the carbon footprint of the project by ensuring for example that speed limits along upgraded roads are established and subsequently enforced, vehicles that use the access road are maintained in good working order, and all lighting installed at the subproject component sites use light bulbs that are energy efficient.

VII. ANALYSIS OF ALTERNATIVES

83. No alternative subproject designs or locations were available for the IEE.

VIII. PUBLIC GRIEVANCE REDRESS MECHANISM

A. Type of Grievances

84. Any affected person (AP) can submit a grievance with SPPMB or PTC4 if they believe a practice is having a detrimental impact on the community, the environment, or on their quality of life. Grievances may include:

- Negative impacts on a person or a community (e.g. health and safety issues, nuisances, etc.).
- Dangers to health and safety or the environment.
- Social impacts due to construction activities or impacts on social infrastructure.
- Failure to comply with standards or legal obligations.
- Improper conduct or unethical behavior of Contractor leading to nuisance of affected person(s).

B. Grievance Redress Mechanism

85. A subproject grievance can be defined as an actual or perceived subproject-related problem that gives ground for complaint by an affected person (AP). As a general policy, SPPMB (during construction) and PTC4 (during operation) will work proactively toward preventing grievances through the implementation of impact mitigation measures and community liaison activities that anticipate and address potential issues before they become grievances. Nonetheless, during construction and operation it is possible that unanticipated impacts may occur if the mitigation measures are not properly implemented, or unforeseen issues occur. In order to address complaints, a project grievance redress mechanism (GRM) will be developed in accordance with ADB requirements and Government procedures.

86. The GRM will be established to provide an effective and transparent channel for lodging complaints and for addressing grievances. The GRM will be established prior to the construction of the subproject and will be maintained during operation and maintenance.

87. For complaints received about the construction works, the SPPMB will involve the Contractor. When these are not resolved, any complaint is then facilitated by the SPPMB

through the Environment and Social Unit (ESU) under the Compensation Department. For complaints about substation operation, the PTC4 will act on the complaint. These will be entry points to whom the AP could directly register their complaints. Contact details for the entry point of complaints will be publicly disseminated on information boards at the substation. Mechanisms to contact the point of entry will be through face-to-face meetings, written complaint, telephone conversations, or email.

88. The following are the steps for the GRM (Figure 5):

Step 1: For complaints occurring during the construction phase, affected persons can register the complaint directly to the Contractor and the head of the commune by means of contact information prescribed in the information boards at the substation site. Upon receipt of the complaint, the Contactor is required to record/document all complaints and to coordinate with the complainant immediately and to provide mitigation actions to the complaint within two weeks. The Contractor is required to report complaints received, resolved, and unresolved to the SPPMB through the monthly progress report.

Step 2: If the complainant is not satisfied with the action(s) undertaken by the Contractor, the affected person can inform the head of the commune about the matter, which will document the complaint in the complaints register. The commune head/authority through the Commune People's Committee will then call a meeting of the complainant, SPPMB-Compensation Department and the Contractor to resolve the complaint. After discussion of the possible solutions, the SPPMB monitors the resolution of the complaint. The Contractor shall be required to report any action to the SPPMB in the monthly project progress reports.

Step 3: If the complainant is not satisfied with the action(s) undertaken at the level of Commune People's Committee, the affected person may elevate the case to the district level for resolution.

Step 4: Complaints not resolved at the district level is elevated to the People's Committee at the provincial level for resolution.

Step 5: When the complaint is not resolved at the People's Committee at the provincial level, the complaint is then elevated to the People's Court. The decision of the People's Court becomes the final legal basis for the decision on the complaint.

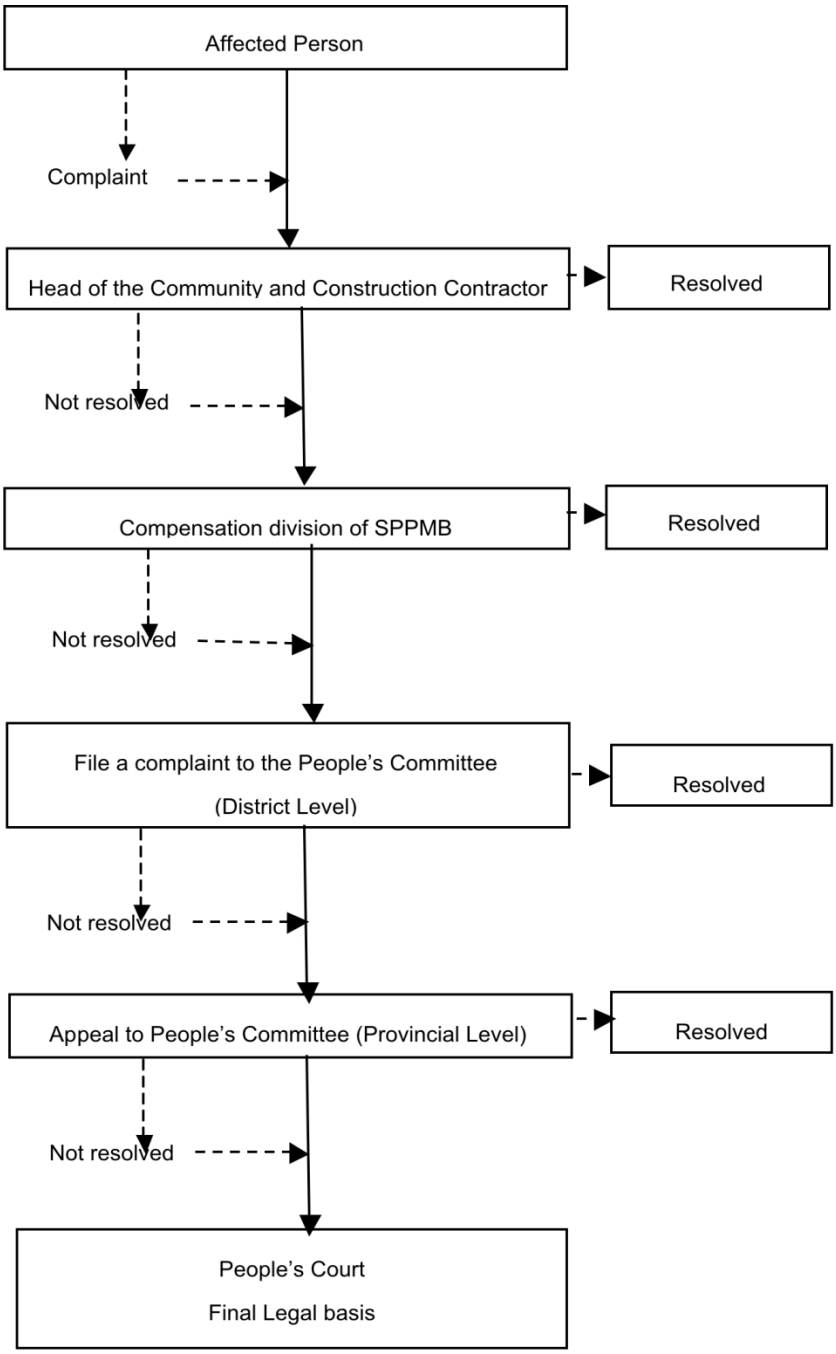
C. Legal Guarantees for Complaints and Grievances

89. Under the regulations in Viet Nam, APs having complaints or grievances will not be responsible for paying any administrative and legal fees in filing their complaints. Any site clearing is not allowed while the resolution of the complaint is still pending.

90. In cases where the AP is illiterate, the AP can ask assistance from one representative of his household who can then write all the complaints and grievances to be submitted to the district level for resolution.

91. Under the law, all meetings to resolve complaints and grievances should be documented and the minutes of meetings should be disclosed and posted at the Commune People's Committee.

Figure 5. The Grievance Redress Mechanism



IX. ENVIRONMENTAL MANAGEMENT PLAN

92. A briefenvironmental management plan (EMP) has been prepared for subproject. The EMP integrates the results of the IEE into a formal plan forthe implementing agency and Contractorto prevent or minimize potential environmental impacts.The EMP addresses the results of the public consultations on the subproject that were convened as part of the IEE. The EMP, *inter alia*, consists of an Impacts Mitigation Plan, a Monitoring Plan, and an Emergency Response Plan, and the institutional responsibilities for the EMP.

A. Institutional Arrangements and Responsibilities

93. At the feasibility stage the primary management framework responsible for the implementation of the EMP for the new transformer at the 220 kV Tra Vinh substation is summarized as follows. The National Power Transmission Corporation (NPT) is the executing agency (EA). The EA takes overall responsibility for implementing the EMP with executive support from the Southern Power Project Management Board (SPPMB) which is the implementing agency (IA) of the subproject. The IA under the direction of the EA implements the subproject and EMP with an assigned environmental and social unit (ESU) whose sole responsibility is to implement the EMP.

94. The ESU oversees and assists the work of the environmental officer (EO) of the construction Contractor who implements the EMP with the CEMP[12]. The day-to-day installation operations including monitoring of waste management and worker safety during theinstallation of the transformer will be the responsibility of the Power Transmission Company 4. A summary of indicative responsibilities for implementation of the EMP is provided below.

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

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

96. The responsibilities of the IA/ESU include:

5. Notify DONRE to verify GoV approvals of subproject are met;
6. Articulation of CEMP requirements in Contractor bid documentswhich included appended EMP;
7. Conductbid evaluations, specifically completeness of CEMP;
8. Undertake day to day management of EMP implementation activities;
9. Ensure compliance with anyenvironmental or social loan covenants and assurances with respect of entire subproject

[12] Contractor Environmental Management Plan prepared by contractor from EMP which is part of bid documents.

10. Lead required follow-up meetings with all affected stakeholders in public consultations;

11. Prepare and submit quarterly reports on EMP implementation to IA/EA;

12. Oversee implementation of CEMP by contractor;

13. Undertake regular construction site inspections to ensure Contractor implements CEMP properly; and

14. Ensure EO of contractor submits monthly reports on construction mitigations and monitoring.

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

15. Implement CEMP for construction phase of subproject; and

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

97. The Department of Natural Resources and Environment (DONRE) is the provincial agency which oversees environmental management of Tra Vinh province. The DONRE with District staff provides direction and support for environmental protection-related matters including application of the Law on Environmental Protection (2014), EIA, and environmental standards.

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

B. Summary of Potential Impacts of Subproject

The potential impacts of the subproject are summarized in Table 17.

Table 16.Summary of potential impacts of subproject

Pre-construction Phase
• None
Construction Phase
• Dust, noise, and reduced and/or blocked public access along access roadcaused by increased truck traffic, disruption of local traffic, increased risk of traffic accidents, damage to existing roads,
Operational Phase
• Risk of worker accidentsassociated with new transformer • Potential spills of hazardous materials such as transformer oil

C. Impact Mitigation Plan

99. The brief impact mitigation measures of the EMP are presented for the three phases of subproject implementation (pre-construction, construction, operation)inTable 18.

Table 17.Impact Mitigation Plan

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[13] (USD)	Responsibility	
							Supervision	Implementation
Pre-construction Phase								
Finalize activities and scheduling for installation of transformer	No negative environmental impacts	1. Implement efficient and safe transformer installation procedure.	Inside substation, along access road	Before subproject implemented	Once	No marginal cost[14]	IA/ESU	IA/PTC4
Disclosure, and engagement of community	No negative impacts	2. Inform community of transformer installation schedule including increased traffic periods along access road 3. Initiate Grievance Redress Mechanism	For all installation activities.	Beginning of subproject	Quarterly	No marginal cost	IA/ESU	IA/PTC4
Complete bid documents	No negative environmental impact	4. Ensure EMP appended to contractor tender documents which instruct contractors to use EMP to construct their CEMPs, and that CEMPs must be budgeted.	Substation	Before construction	As required	No marginal cost	IA/DONRE	IA/PTC4
Confirm approved construction waste disposal sites	No negative impact	5. Notify DONRE to confirm disposal areas for construction waste. .	Substation	Before construction	As required	No marginal cost	IA/DONRE	IA/PTC4
Capacity development	No negative environmental impact	6. Develop and schedule training plan for IA/ESU/EO to be able to fully implement CEMP, and to manage implementation of mitigation measures by contractors.	Substation	Before construction	As required	No marginal cost	IA/DONRE	ESU

[13] Costs will need to be updated during detailed design phase.
[14] No marginal cost indicates that costs to implement mitigation are to be built into cost estimates of bids of contractors

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[13] (USD)	Responsibility	
							Supervision	Implementation
Construction Phase **Installation of Transformer**								
Training and capacity	Prevent of impacts through education	1. Implement training and awareness plan for IA/ESU//EO and contractors.	IA office, construction sites	Beginning of construction	After each event	No marginal cost	IA	ESU
Implement Noise and dust mitigation subplan	Dust Noise	2. Regularly apply wetting agents to exposed soil and access road. 3. Cover or keep moist all stockpiles of construction aggregates, and all truck-loads of aggregates. 4. As much as possible, restrict working time at substation site between 07:00 and 17:00. 5. Maintain equipment in proper working order 6. Replace unnecessarily noisy vehicles and machinery. 7. Vehicles and machinery to be turned off when not in use. 8. Construct temporary noise barriers around excessively noisy activity areas where possible.	Substation, access road	Fulltime	Monthly	No marginal cost	IA/ESU	contractor
Implement Construction traffic sub-plan	Traffic disruption, accidents, public injury	9. Schedule construction vehicle activity during light traffic periods along access road. . 10. Post speed limits, and create dedicated construction vehicle roads or lanes.	Access road	Fulltime	Monthly	No marginal cost	IA/ESU	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[13] (USD)	Responsibility	
							Supervision	Implementation
		11. Inform community of location of construction traffic areas, and provide them with directions on how to best co-exist with construction vehicles on their roads. 12. Demarcate additional locations where pedestrians can develop road crossings away from construction areas. 13. Increase road and walkway lighting where necessary for safety.						
Implement worker and public safety sub-plan	Public and worker injury, and health	14. Worker and public safety guidelines of MOLISA should be followed. 15. Speed limits suitable for the size and type of construction vehicles, and current traffic patterns should be developed, posted, and enforced on all roads used by construction vehicles. 16. Appropriate safety clothing and footwear should be mandatory for all construction workers. 17. Adequate medical services must be on site or nearby all construction sites. 18. Drinking water must be provided at all construction sites. 19. Sufficient lighting to be used during necessary night work. 20. All construction sites should be examined daily to ensure unsafe conditions are removed.	Substation, access road	Fulltime	Monthly	No marginal cost	IA/ESU	contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[13] (USD)	Responsibility	
							Supervision	Implementation
Operational Phase								
Operation of new substation	Increased risk of worker or public injury	1. Occupational health and safety regulations and guidelines of MOLISA should be applied to operations of substation.	At substation	Fulltime	Biannual	O and M	PTC4	

D. Monitoring Plan

100. The brief environmental monitoring plan for the three phases of subproject implementation is provided in Table 19 which consists of environmental indicators, the sampling locations and frequency, method of data collection, responsible parties, and estimated costs.

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

Performance Monitoring

102. Performance monitoring is required to assess the overall performance of the EMP. A performance monitoring system is normally developed by the EA for the entire 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 20.

E. Reporting

103. Regular reporting on the implementation of mitigation measures and monitoring activities during construction phase. Reporting is the responsibility of IA/ESU and should be conducted in conjunction with regular meetings with stakeholders as part of the continuation of stakeholder communications. The mitigation and monitoring plans (Tables 18-19) summarize proposed timing of reporting.

104. A report on environmental monitoring and implementation of EMP will be prepared quarterly for the EA by the IA/ESU. The IA/ESU report will also be sent to the DONRE and ADB. The reports will table all indicators measured with the monitoring plan of EMP including performance monitoring indicators (Table 20), and will include relevant GoV environmental quality standards. A semi-annual report on the environment monitoring of the subproject must be prepared and submitted to the ADB by the EA for disclosure on the ADB website pursuant to the ADB Public Communications Policy (2011).

Table 18. Environmental monitoring plan for the 220 kV Tra Vinh substation

<table>
<tr><th colspan="8">ENVIRONMENTAL EFFECTS MONITORING</th></tr>
<tr><th rowspan="2">Environmental Indicators</th><th rowspan="2">Location</th><th rowspan="2">Means of Monitoring</th><th rowspan="2">Frequency</th><th rowspan="2">Reporting</th><th colspan="2">Responsibility</th><th rowspan="2">Estimated Cost (USD)</th></tr>
<tr><th>Supervision</th><th>Implementation</th></tr>
<tr><td colspan="8">Pre-construction Phase – Review Baseline Conditions</td></tr>
<tr><td>Qualitative air quality: dust, noise</td><td>At substation and along access road</td><td>Using field and analytical methods approved by DONRE.</td><td>A) One day and one night measurement</td><td>One baseline supplement report before construction phase starts</td><td>IA/ESU</td><td>ESU</td><td>$1,000.</td></tr>
<tr><td colspan="7">Construction – installation of new transformer intoTra Vinh substation</td><td></td></tr>
<tr><td rowspan="4">A) Qualitative air quality: dust, noise

B) Domestic (worker) and construction solid waste inside and outside substation.

C) Public comments and complaints

D) Incidence of worker or public accident or injury</td><td rowspan="4">A) Baseline sites of pre-construction phase.

B) All construction sites and worker camps

C) Using hotline number placed at construction areas

D) At all construction areas</td><td rowspan="4">A – B : Using field and analytical methods approved by DONRE., & visual observation

C Information transferred by telephone hotline number posted at all construction sites.

D) regular reporting by contractors/ESU</td><td rowspan="4">A):
Quarterly during construction periods

Daily visual records

B) Monthly

C) Continuous public input

D) Continuous</td><td rowspan="4">Monthly</td><td colspan="2">A - C:</td></tr>
<tr><td colspan="2">IA/ESU</td><td>A and B: $1,000./yr

C: no marginal cost</td></tr>
<tr><td colspan="2">D) daily observations:</td><td rowspan="2">D: no marginal cost</td></tr>
<tr><td>IA/ESU</td><td>contractor</td></tr>
</table>

ENVIRONMENTAL EFFECTS MONITORING							
Environmental Indicators	**Location**	**Means of Monitoring**	**Frequency**	**Reporting**	**Responsibility**		**Estimated Cost (USD)**
					Supervision	**Implementation**	
Operation of new transformer in Tra Vinh substation							
Incidence of worker accidents, or spills on hazardous materials	At substation and along connector lines	Regular documentation and reporting	Continuous	Quarterly	PTC4		O and M

Table 19.Performance monitoringindicators for Tra Vinhsubproject

Environmental Component	Key Indicator	Performance Objective	Data Source
Pre-construction Phase			
Public Consultation and Disclosure	Affected public and stakeholders	Meetings with public stakeholders contacted during IEE and new stakeholders convened for follow-up consultation and to introduce grievance mechanism	Minutes of meeting, and participants list
EMP	Final EMP	All stakeholders contacted during IEE re-contacted for follow-up consultation	EMP
Bid Documents	Requirements of EMP (CEMP[15])	EMP appended to bidding documents with clear instructions to bidders for CEMP	Bid documents
Training of IA/ESU	Training course(s) and schedule	By end of pre-construction phase, required course(s) that will be delivered are designed and scheduled	Course(s) outline, participants, and schedule
Construction Phase			
Air quality	Visual dust and noise	Levels never exceed pre-construction baseline levels	IA/ESUandcontractor monitoring reports,
Public and worker safety	Frequency of injuries	Adherence to GoV occupational health and Safety regulations[16]	Contractor reports
Traffic	Frequency of disruptions and blocked roadways	Disruptions, stoppages, or detours are managed to absolute minimum.	Public input, contractor reports,
Operation of Tra Vinh substation			
Worker and Public Safety	Frequency of accidents and spills	No increase in pre-construction frequency	PTC4

F. Estimated Cost of EMP

105. The marginal costs for implementing the EMP are primarily for environmental monitoring because the costs for implementing impact mitigation measures are included with the construction costs in Contractor bid documents. The preliminary cost for the implementation of the EMP for the subproject including an estimated environmental training budget for NPT / PPBM is approximately USD $8,000.00which is summarized in Table 21. The environmental costs in Table 21 are primarily for field sampling which include professional per diemsoftechnicians.

[15]Contractor Environmental Management Plan developed from EMP in contractor bidding document
[16] OSH Guidelines provided by MOLISA, *or*IFC World Bank EHS (2007) *for* Electric Power Transmission & Distribution

Table 20.Estimated costs for Environmental Monitoring Plan of EMP

Activity Type	Estimated Cost (USD)
Pre-construction Phase	
Updating Environmental Baseline	
cultural receptors	no cost
environmental quality	$1,000.00
Construction Phase	
environmental quality	$2,000.00
public consultation	no cost
Operation Phase	
environmental quality	no cost
public input	no cost
Training and capacity development of NPT / PPBM / ESU	$5,000.00
Total	**$8,000.00**

106. An estimated budget of USD $5,000.00 is required for training of the EA/IA/ESU on environmental assessment and management, and the implementation of the EMP. The estimated costs of the EMP and training will need to be updated by the IA/ESU during the pre-construction phase.

X. EMERGENCY RESPONSE PLAN

107. The Contractor must develop emergency or incident response procedures during construction and operation phases of the new 220 kV Tra Vinh substation and connector lines 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.

XI. INSTITUTIONAL CAPACITY REVIEW AND NEEDS

108. Currently there is insufficient experience and capacity for environmental assessment and management in SPPMBfor the implementation of the EMP, and to develop future safeguards for the non-core subprojects. The ESU/IA of the subproject will develop and deliver training courses to the IA staff including the EO of the Contractor. The purpose of the course(s) is to strengthen the ability of the project owner including the ESU to oversee implementation of the EMP by construction Contractors, and EMC. Costs for training should be included with costs for implementation of the EMP.

109. Training on the implementation of an EMP should address two thematic areas. The first area should be principles environmental assessment and management focused on the potential

impacts of subproject activities on the natural and social environments. The second area should be environmental safeguard requirements of the ADB and GoV with specific reference to the EMP.

XII. CONCLUSIONS AND RECOMMENDATION

110. The initial examination of the 220 kV Tra Vinh substation indicates that potential environmental impacts are construction-related impacts and disturbances that can be mitigated and managed.

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

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

XIII. REFERENCES CITED

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APPENDIX A: RAPID ENVIRONMENTAL ASSESSMENT OF SUBPROJECT

Rapid Environmental Assessment Checklist Power Transmission

Country/Project Title: Preparation for Tranche 3 as part of the MFF Power Transmission Investment Program financed by ADB: Second transformer bank for 220 kV TraVinh

Sector / Division: Energy / SEEN

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 (e.g. sensitive or protected areas)?		X	
▪ alteration of surface water hydrology of waterways crossed by roads and resulting in increased sediment in streams affected by increased soil erosion at the construction site?		X	
▪ damage to sensitive coastal/marine habitats by construction of submarine cables?		X	
▪ deterioration of surface water quality due to silt runoff, sanitary wastes from worker-based camps and chemicals used in construction?		X	
▪ increased local air pollution due to rock crushing, cutting and filling?		X	
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?		X	

Screening Questions	Yes	No	Remarks
▪ chemical pollution resulting from chemical clearing of vegetation for construction site?		X	
▪ noise and vibration due to blasting and other civil works?	X		Minimal noise is anticipated during installation of transformer. EMP prescribes noise and dust mitigation plans. There will be no blasting..
▪ dislocation or involuntary resettlement of people?		X	
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		X	
▪ social conflicts relating to inconveniences in living conditions where construction interferes with pre-existing roads?	X		Minor potential impact. The EMP includes mitigation measures for managing traffic caused by construction to prevent of minimize disturbance to regular traffic and local community
▪ hazardous driving conditions where construction interferes with pre-existing roads?	X		As above mitigation measures EMPs exists for managing construction truck traffic to prevent of minimize disturbance to regular traffic and local community
▪ 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	See RP
▪ environmental disturbances associated with the maintenance of lines (e.g. routine control of vegetative height under the lines)?		X	
▪ facilitation of access to protected areas in case corridors traverse protected areas?		X	
▪ disturbances (e.g. 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	
▪ social conflicts if workers from other regions or countries are hired?		X	
▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?		X	
▪ risks to community safety associated with maintenance of lines and related facilities?		X	

Screening Questions	Yes	No	Remarks
▪ community health hazards due to electromagnetic fields, land subsidence, lowered groundwater table, and salinization?		X	Human health effects of EMF have not been established by international medical community (see Appendix of IEE). Land subsidence, lowering of groundwater table and salinization are not expected tooccur .
▪ 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	
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project (e.g., high voltage wires, and transmission towers and lines) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	X		Minimal risks if any. Information campaign will be provided to community prior to and during construction. EMP will have provisions to reduce or mitigate these impacts.

Checklist for Preliminary Climate Risk Screening

Country/Project Title: Preparation of Tranche III of MFF for Power Distribution Development Project: Second transformer bank for 220 kV Tra Vinh substation

Sector: Power Transmission

Subsector: Transmission

Division/Department:SEEN / SERD

Screening Questions		Score	Remarks
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?	0	No
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	0	No.
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	0	

Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	

Result of Initial Screening (Low, Medium, High):Low

Other Comments:n/a

APPENDIX B: MINUTES AND PARTICIPANTS OF PUBLIC CONSULTATIONS

Table 1 Thesummary of public consultation meeting and number of participants

No	Name of subprojects	Location	Date	Participants		
				Male	Female	Total
1	220 kV Tra Vinh Substation	Luong Hoa Commune, Chau Thanh District, Tra Vinh Province	20 March 2015	7	8	15

B.1: PUBLIC CONSULTATION OF LUONG HOA COMMUNE

a.LIST OF PARTICIPANTS

Date (Ngàytháng) : 20 March 2015

Location (địađiểm) : Luong Hoa Commune, Chau Thanh District, Tra Vinh Province

No. TT	Họvàtên (Name)	Nam (M)	Nữ (F)	Chứcvụ (Position)	Cơquan/Địachỉ (Organization/Address)	Chữký (Signature)
1	Tran ThiTrang		X		Ba Se A Hamlet	
2	Tran ThiSuong		X		Ba Se A Hamlet	
3	Thach Sa My		X		Ba Se A Hamlet	
4	Lam Anh Vu		X		Tra De Hamlet	
5	ThachTieuThuong	X			Ba Se A Hamlet	
6	Tran Van Khanh	X			Ba Se A Hamlet	
7	Lam Trom	X			Ba Se A Hamlet	
8	Lam Xay	X			Ba Se A Hamlet	
9	Thach Sa Reme	X			Ba Se A Hamlet	
10	Lam Thi My Le		X		Ba Se A Hamlet	
11	ThachThiThien		X		Ba Se A Hamlet	
12	Kim Suong	X			Ba Se A Hamlet	
13	ThachMui	X		Head	Ba Se A Hamlet	
14	Nguyen Thu Thuy		X	Vice Chairperson	Communal People's Committee	
15	Nguyen ThiThanhThoang		X	Vice Chair person	Communal Women's Union	

b. MINUTES OF MEETINGS AND PHOTOS – LUONG HOA COMMUNE

TA-7742 VIE: Power Transmission Investment Program (MFF)
CHƯƠNG TRÌNH ĐƯỜNG DÂY TRUYỀN TẢI ĐIỆN (MFF)

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

...Lương Hòa..., Ngày...20...tháng...03...năm 2015

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

Tiểu dự án: Lắp MBA thứ 2 TBA 220kV Trà Vinh

Xã Lương Hòa, Huyện Châu Thành, Tỉnh Trà Vinh

1. Thành phần tham dự

- Ông/Bà...Nguyễn Thu Thủy...Chức vụ ...PCT UBND...
- Ông/Bà...Nguyễn Thị Thanh Thảo...Chức vụ ...PCT - Hội phụ nữ
- Ông/Bà...Thạch Mai...Chức vụ ...Trưởng ban nhân dân ấp Bưng
- Ông/Bà...Huỳnh Ngọc Vân...Chức vụ ...PCT - MTTQ...
- Ông/Bà...Huỳnh Văn Tâm...Chức vụ ...Bí thư xã Đoàn
- Ông/Bà...Nguyễn Văn Thanh...Chức vụ ...Trưởng công an xã
- Đại diện những người bị ảnh hưởng: ....người (*chi tiết xem danh sách đính kèm*)

I. Nội dung tham vấn

- ***Tư vấn thiết kế giới thiệu dự án***: Lắp MBA thứ 2 TBA 220kV Trà Vinh trên địa bàn xã.
- ***Tư vấn môi trường trình bày về:*** Chính sách môi trường của ADB; Các quy định về môi trường trong ngành điện của chính phủ Việt Nam; Các tác động về môi trường và các biện pháp giảm thiểu tương ứng (như trong IEE); Cơ chế khiếu nại khi có các vấn đề môi trường xảy ra.

III. Ý kiến thảo luận

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

- Có biện pháp giảm thiểu của hệ thống thoát nước đến ruộng của các hộ xung quanh.
- Đèn chiếu của TBA 220 kV Trà Vinh ảnh hưởng đến phát triển lúa của hộ Lâm Thị Mỹ Lệ.

TA-7742 VIE: Power Transmission Investment Program (MFF)
CHƯƠNG TRÌNH ĐƯỜNG DÂY TRUYỀN TẢI ĐIỆN (MFF)

PUBIC CONSULTATION ON ENVIRONMENT AND SOCIAL/RESETLEMENT

THAM VẤN CỘNG ĐỒNG VỀ MÔI TRƯỜNG
LIST OF PARTICIPANTS
DANH SÁCH NGƯỜI THAM DỰ

Date (Ngày tháng) : 20/3/2015
Location (địa điểm) : UBND xã Hưng Hoà, H. Châu Thành, Tỉnh Trà Vinh

No. TT	Họ và tên (Name)	Nam (M)	Nữ (F)	Chức vụ (Position)	Cơ quan/Địa chỉ (Organization/Address)	Chữ ký (Signature)
1	Trần Thị Trang		✓		BCA,	
2	Trần Thị Sương		✓		BCA,	Sương
3	Thạch Sa Mỹ		✓		BCA, 60	
4	Lâm Anh Vũ		✓		Trà Dê, ĐHA	
5	Thạch Tiểu Thường	✓			39/56	
6	Trần Văn Khánh	✓				
7	Lâm Trân	✓			Ba se 'A'	
8	Lâm Xây	✓				
9	Thạch Sa Rème	✓				
10	Lâm Thị Mỹ Lê		✓			
11	Thạch Thị Thiên		✓			
12	Kim Sương	✓			BaseA, Hưng Hòa	
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						

APPENDIX C: EIA APPROVAL LETTER FOR TRA VINH SUBSTATION

ỦY BAN NHÂN DÂN **TỈNH TRÀ VINH**	**CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM** **Độc lập - Tự do - Hạnh phúc**
Số: 47 /QĐ-UBND	*Trà Vinh, ngày 13 tháng 01 năm 2015*

QUYẾT ĐỊNH
Về việc phê duyệt Báo cáo đánh giá tác động môi trường của Dự án "Lắp máy biến áp thứ 2 Trạm biến áp 220 KV Trà Vinh"

CHỦ TỊCH ỦY BAN NHÂN DÂN TỈNH TRÀ VINH

Căn cứ Luật tổ chức Hội đồng nhân dân và Ủy ban nhân dân ngày 26 tháng 11 năm 2003;

Căn cứ Luật Bảo vệ môi trường ngày 29 tháng 11 năm 2005;

Căn cứ Nghị định số 29/2011/NĐ-CP ngày 18 tháng 4 năm 2011 của Chính phủ quy định về đánh giá môi trường chiến lược, đánh giá tác động môi trường, cam kết bảo vệ môi trường;

Căn cứ Thông tư số 26/2011/TT-BTNMT ngày 18 tháng 7 năm 2011 của Bộ trưởng Bộ Tài nguyên và Môi trường quy định chi tiết một số điều của Nghị định số 29/2011/NĐ-CP ngày 18 tháng 4 năm 2011 của Chính phủ quy định về đánh giá môi trường chiến lược, đánh giá tác động môi trường, cam kết bảo vệ môi trường;

Xét nội dung Báo cáo đánh giá tác động môi trường của Dự án "Lắp máy biến áp thứ 2 Trạm biến áp 220 KV Trà Vinh" đã được bổ sung, chỉnh sửa hoàn chỉnh gửi kèm Công văn số 9360/AMN-ĐB ngày 30 tháng 12 năm 2014 của Ban Quản lý Dự án các công trình Điện miền Nam;

Xét Tờ trình số 03/TTr-STNMT ngày 07 tháng 01 năm 2015 của Giám đốc Sở Tài nguyên và Môi trường về việc đề nghị phê duyệt Báo cáo đánh giá tác động môi trường Dự án "Lắp máy biến áp thứ 2 Trạm biến áp 220 KV Trà Vinh" và Biên bản họp Hội đồng thẩm định báo cáo đánh giá tác động môi trường ngày 02/12/2014,

QUYẾT ĐỊNH:

Điều 1. Phê duyệt Báo cáo đánh giá tác động môi trường của Dự án "Lắp máy biến áp thứ 2 Trạm biến áp 220 KV Trà Vinh" do Ban Quản lý Dự án các công trình Điện miền Nam làm chủ đầu tư với những nội dung chủ yếu như sau:

1. Phạm vi, quy mô và công suất của Dự án:

- Vị trí thực hiện dự án: Dự án thực hiện trong khuôn viên trạm 220 KV Trà Vinh hiện hữu nằm trên Quốc lộ 60 thuộc xã Lương Hòa, huyện Châu Thành, tỉnh Trà Vinh.

- Quy mô và công suất:

+ Lắp thêm máy biến áp 220KV-125MVA, nâng công suất trạm từ 1x125MVA lên 2x125MVA.

+ Máy biến áp lực: 225 ± 8x1,25%/115/23KV – 125MVA.

+ Sơ đồ phía 220 KV: Sử dụng sơ đồ hiện hữu, lắp bổ sung thêm 01 ngăn cho máy biến áp thứ 2.

+ Sơ đồ phía 110 KV: Sử dụng sơ đồ hiện hữu, lắp bổ sung thêm 01 ngăn cho máy biến áp thứ 2, 01 ngăn lộ đi Long Đức và đưa vào vận hành 01 ngăn lộ đi Cầu Kè đã lắp đặt thiết bị trong giai đoạn 1.

+ Sơ đồ phía 22 KV: Sử dụng sơ đồ hiện hữu, không bổ sung thêm ngăn lộ.

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

2.1. Có giải pháp đảm bảo an toàn trong giai đoạn vận chuyển, thi công và giai đoạn dự án đi vào vận hành.

2.2. Tổ chức thu gom, vận chuyển và xử lý toàn bộ chất thải rắn thông thường và chất thải nguy hại phát sinh trong quá trình thực hiện dự án theo đúng quy định; tuân thủ nghiêm ngặt các quy định của pháp luật hiện hành về môi trường nước, không khí, tiếng ồn, độ rung và điện từ trong quá trình thi công, vận hành dự án.

2.3. Thực hiện nghiêm túc các biện pháp bảo vệ môi trường, chương trình giám sát môi trường đã được nêu trong báo cáo đánh giá tác động môi trường và lưu giữ số liệu để các cơ quan quản lý nhà nước về bảo vệ môi trường tiến hành kiểm tra.

3. Các điều kiện kèm theo:

3.1. Phối hợp với các cơ quan chức năng quản lý giao thông và chính quyền địa phương để thống nhất kế hoạch thi công đường dây tại những điểm giao cắt với đường bộ; lắp đặt biển báo hoặc có hình thức thông báo kế hoạch phân luồng giao thông đến các chủ phương tiện giao thông trong thời gian kéo dây vượt đường bộ.

3.2. Tuân thủ các quy định pháp luật về điện, phòng chống cháy nổ trong quá trình thi công, vận hành dự án.

Điều 2. Chủ dự án có trách nhiệm sau đây:

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

2. Thực hiện nghiêm túc các yêu cầu về bảo vệ môi trường quy định tại khoản 2, 3 Điều 1 Quyết định này và các trách nhiệm khác theo quy định của pháp luật về bảo vệ môi trường.

Điều 3. Trong quá trình thực hiện nếu Dự án có những thay đổi so với nội dung của Báo cáo đánh giá tác động môi trường và nội dung của Quyết định này, chủ dự án phải có văn bản báo cáo và chỉ được thực hiện những thay đổi sau khi có văn bản chấp thuận của Ủy ban nhân dân tỉnh Trà Vinh.

Điều 4. Quyết định phê duyệt báo cáo đánh giá tác động môi trường của Dự án là căn cứ để quyết định việc đầu tư Dự án; là cơ sở để các cơ quan quản

lý nhà nước có thẩm quyền kiểm tra, thanh tra việc thực hiện công tác bảo vệ môi trường của dự án.

Điều 5. Ủy nhiệm Sở Tài nguyên và Môi trường thực hiện kiểm tra, giám sát việc thực hiện các nội dung bảo vệ môi trường trong báo cáo đánh giá tác động môi trường đã được phê duyệt tại Quyết định này.

Điều 6. Chánh Văn phòng Ủy ban nhân dân tỉnh; Giám đốc các Sở: Tài nguyên và Môi trường, Kế hoạch và Đầu tư, Công thương; Chủ tịch Ủy ban nhân dân huyện Châu Thành, Chủ tịch Ủy ban nhân dân xã Lương Hòa, Thủ trưởng các cơ quan có liên quan và Giám đốc Ban Quản lý Dự án các công trình Điện miền Nam căn cứ quyết định thi hành.

Quyết định này có hiệu lực thi hành kể từ ngày ký./.

Nơi nhận:
- Bộ TN&MT;
- CT, các PCT.UBND tỉnh;
- Như Điều 6;
- PCVP Nguyễn Thanh Tâm;
- Lưu: VT, PNC NN.44bản.

KT. CHỦ TỊCH
PHÓ CHỦ TỊCHTV

Nguyễn Văn Phong

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APPENDIX D: EMERGENCY RESPONSE PLAN

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

i) Emergency Response Team (ERT) of the Contractor as initial responder;
ii) the District fire and police departments, emergency medical service, the Department of Public Health (DPH), collectively referred to as the External Emergency Response Team (EERT), as ultimate responders.

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

Table 21.Roles and Responsibilities in Emergency Incident Response

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

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

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

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

i) Subproject sites;

ii) construction time frame and phasing;
iii) any special construction techniques and equipment that will be used; i
iv) any hazardous materials that will be brought to and stored in the construction premise and details on their applications and handling/management system;
v) the Contractor's Emergency Management Plan
vi) names and contact details of the ERT members

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

i) their comments on the adequacy of the respective Emergency Management Plans
ii) their own assessment of what types, likely magnitude and likely incidence rate of potential hazards are anticipated
iii) the arrangements for coordination and collaboration.

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

i) set up the ERT;
ii) set up all support equipment and facilities in working condition
iii) made arrangements with the EERT;
iv) conducted proper training of ERT members, and encouraged and trained volunteers from the work force; v) conducted orientation to all construction workers on the emergency response procedures and facilities, particularly evacuation procedures, evacuation routes, evacuation assembly points, and self-first response, among others; and vi) conducted drills for different possible situations.

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

Alert Procedures

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

(i) Whoever detects an emergency situation first shall immediately :
- call the attention of other people in the emergency site,
- sound the nearest alarm, and/or
- report/communicate the emergency situation to the ERT.

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

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

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

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

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

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

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

Emergency Response Situations

122. 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 22.Evacuation Procedure

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

Table 23.Response Procedure During Medical Emergency

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

Table 24.Response Procedure in Case of Fire

Procedure	Remarks
▪ Alert a fire situation.	▪ Whoever detects the fire shall immediately: - call the attention of other people in the site, - sound the nearest alarm, and/or - Foreman or any ERT member among the construction sub-group contacts the fire department (in this case it should be agreed on that it is alright for any

Procedure	Remarks
	ERT member in the sub-group to alert the fire department) - report/communicate the emergency situation to the ERTL/Deputy ERTL.
▪ Stop all activities/operations and evacuate.	▪ All (non-ERT) workers/staff sub-contractors, site visitors and concerned public to move out to safe grounds following the evacuation procedure.
▪ Activate ERT to contain fire/control fire from spreading.	▪ Guided by the training they undertook, ERT members assigned to mitigate the fire shall assess their own safety situation first before attempting to control fire spread.
▪ Call the nearest fire and police stations and, if applicable, emergency medical services.	▪ When alerting the EERT, ERTL will give the location, cause of fire, estimated fire alarm rating, any injuries.
▪ Facilitate leading the EERT to the emergency site.	▪ ERTL/Deputy ERTL to instruct: - an ERT member to meet the EERT in the access road or strategic location and lead them to the site. He/she shall hold the orange safety flag to get their attention and lead them to the site. - some ERT members to stop traffic in, and clear, the access road to facilitate passage of the EERT.
▪ ERT to vacate the site as soon as their safety is assessed as in danger.	▪ Follow appropriate evacuation procedure.

APPENDIX E: ENVIRONMENTAL COMPLIANCE AUDIT OF TRA VINH SUBSTATION

ENVIRONMENTAL COMPLIANCE AUDIT

220 kV Tra Vinh Substation, Tra Vinh Province

for present day operations

SUBSTATION INFORMATION

Name and Type of facility: 220 kV Tra Vinh Substation
Name of Operating Power Company: The Western Power Transmission Company under Power Transmission Company No.4
Location: Luong Hoa Commune, Chau Thanh District, Tra VinhProvince
Capacity of substation: 220kV/110kV

Transmitting power to:

- Tra Vinh 110kV Substation via Tra Vinh110kV transmission line
- Duyen Hai110kV Substation via Tra Vinh – Duyen Hai110kV transmission line
- CauKe110kV Substation via Tra Vinh – CauKe 110kV transmission line (not yet constructed)
- Long Duc110kV Substation (planned)

Receiving power from:

- 220 kV Vinh Long Substation via Tra Vinh – Vinh Long 220kV transmission lineDuyen Hai Thermal Power Center via Duyen Hai Thermal Power Plant – 220 kV Tra Vinh transmission line

Estimated population or area serviced by substation: mostly for industrial purposes, number of beneficiary people unidentified.

ENVIRONMENTAL COMPLIANCE CHECKLIST

No.	Item	Yes	No	Remarks
1.	**Maintenance of Equipment**			
1	Is there an oil containment area around transformers?	x		Oil Tank Volume: 120m^3
2	Is equipment maintenance being done frequently? How often?	x		Oil check conducted once a year
3	Is PCB-containing equipment still in the SS or not		x	
4	Is the SS doing the reliability check on the transformer regularly?	x		Done by PTC4 staff
5	When the SS is changing insulating oil of the transformer, is the oil being collected in a	x		The oil will be collected in a container when

No.	Item	Yes	No	Remarks
	container (not to drip on land or discharge into canal)?			changing insulating oil of the transformer
2.	**Waste Management**			
1	Is domestic solid waste collected and disposed at regularly place?	x		
2	Does the SS register for hazardous management license	x		SS has a specified storage for temporary hazardous wastes with clear signage and protective equipment provided
3	Is hazardous waste collected and disposed by regulated organization?	X		
4	Is used oil being managed? And how	x		A specialized team in PTC4 is in charge of managing used oil
5	Are old and used equipment being disposed?How	x		A specialized team in PTC4 is in charge of managing used equipment
6	Has the SS domestic wastewater treatment facilities? Describe	x		The operation of the substation creates 1.7m^3 of wastewater per day. The wastewater is then treated by biological technology in septic tank before discharging into nearby irrigation canal
7	Has the SS the facilities to prevent noise? Describe		x	The transformer is designed to work silently in accordance with international standard IEC-51. Noise measured at the running transformeris52.7dBA lower than the limit of 70dBA required in technical regulation on noise QCVN26:2010/BTN MT
8	Has the SS the facilities to prevent dust? Describe		x	Minimal amount of dust created during operation
3.	**Health and Safety**			
1	Are there safety warning signage within the site	x		
2	Are there safety guidelines?	x		
3	Have safety orientation and trainings been conducted for workers?	x		
4	Are workers wearing personal protective equipment (PPE)	x		

No.	Item	Yes	No	Remarks
5	Does workers be aware on EMF and social diseases	x		
4.	**Permits and license/s to operate**			
1	Is the Environmental Certificate for this SS being obtained		x	Already obtained
2	What kind of permits on environment, fire safety are obtained for this SS	x		
5.	**EMF monitoring conducted**			
	Is the EMF level within the permitted standard?	x		
	Are there measures to prevent the EMF? Describe	x		PPEs are provided to protect workers. Work time is divided into shifts which do not excess 8 hours each and workers will be examined for EMF exposure once a year.
6.	**Air quality monitoring**			
	Is noise level met standard	x		
	Is dust levelmet standard	x		

Air quality at/near Tra Vinh substation including EMF

- Sampling locations: Within the substation
- Date of sampling: October 2, 2014
- Laboratory: Center for Environment and Energy

Table 1: Air Quality at Tra Vinh Substation

Location	Noise(dA)	Pollutant concentration(mg/m^3)			
		Dust	SO_2	NO_2	CO
At the transformer	52.7	0.175	0.056	0.044	2.87
In front of operation house	40	0.132	0.046	0.032	2.41
At the gate of substation	61.7	0.264	0.083	0.068	4.76
QCVN05:2013/ BTNMT	**-**	**0.3**	**0.35**	**0.2**	**30**
QCVN26:2010/ BTNMT	**≤70**	**-**	**-**	**-**	**-**

Notes: the quality of ambient air in the project area is within the allowable standards.

Wastewater in Tra Vinh substation

- Sampling location: At discharging gate after treatment
- Date of sampling: October 2, 2014
- Laboratory: Center for Environment and Energy

Table 2: Waste water quality at Tra Vinh Substation

No	Parameter	Unit	Result	QCVN14:2008/BTNMT,
1	pH	-	6.28	**5– 9**
2	Total suspended solid(TSS)	mg/l	45	**100**
3	COD	mg/l	15	**15**
4	BOD5	mg/l	29	**50**
5	Nitrate	mg/l	3.74	**50**
6	Phosphate	mg/l	0,38	**10**
7	Coliform	MPN/ml	2,700	**5,000**

Notes: All sampled parametersin domestic wastewater treated in the substation's septic tanks are within the limits allowed by column B - National technical regulations for domestic wastewater QCVN 14:2008/ BTNMT.

Corrective Action Plan: not required

CERTIFICATE OF
ENVIRONMENTAL PROTECTION COMMITMENT FOR TRA VINH SUBSTATION

Chau Thanh District People's Committee
No: 14/ GXN-UBND

Socialist Republic of Vietnam
Independence- Freedom –Happiness

Chau Thanh, August 27, 2007

CERTIFICATION
ENVIRONMENTAL PROTECTION COMMITMENT
For The Project: 220 kV Tra Vinh Substation

CHAIRMAN OF CHAU THANH DISTRICT PEOPLE'S COMMITTEE
CERTIFIES

Article 1. On August 23, 2007, the Southern Power Project Management Board as Project Owner submitted Document no.3409/CV-AMN-PDB dated August 23, 2007 to register the Environment

Protection Commitment of 220 kV Tra Vinh Substation to be constructed in Ba Se A Hamlet, Luong Hoa Commune, Chau Thanh District, Tra Vinh Province.

Article 2. The Project Owner is responsible to implement fully and correctly environmental protection contents presented in the Environmental Protection Commitment.

Article 3. The Environmental Protection Commitment of the Project is the basis for Project Investment Decision and for the inspection and examination of environmental protection by authorized state agencies.

Article 4. This Certification takes effect from the date of signing.

Recipients:

- Project Owner
- For internal storing

ON BEHAFT OF DPC CHAIRMAN
VICE CHAIRMAN

Nguyen Van Tien

Signed and Sealed

ỦY BAN NHÂN DÂN
HUYỆN CHÂU THÀNH

Số: 14 /GXN-UBND

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

Châu Thành, ngày 27 tháng 8 năm 2007

GIẤY XÁC NHẬN ĐĂNG KÝ BẢN CAM KẾT BẢO VỆ MÔI TRƯỜNG

Của Dự Án: TRẠM BIẾN ÁP 220KV TRÀ VINH

CHỦ TỊCH ỦY BAN NHÂN NHÂN HUYỆN CHÂU THÀNH

XÁC NHẬN

Điều 1. Ngày 23 tháng 08 năm 2007 Chủ dự án là Ban quản lý dự án các công trình điện miền nam đã có Văn bản số 3409/CV-AMN-PĐB ngày 23 tháng 07 năm 2007 đăng ký bản cam kết bảo vệ môi trường của dự án Trạm biến áp 220KV Trà Vinh đặt tại Ấp Ba Se A - Xã Lương Hòa - Huyện Châu Thành - Tỉnh Trà Vinh.

Điều 2. Chủ dự án có trách nhiệm thực hiện đúng và đầy đủ những nội dung về bảo vệ môi trường nêu trong bản cam kết bảo vệ môi trường.

Điều 3. Bản cam kết bảo vệ môi trường của dự án là cơ sở để các cơ quan quản lý nhà nước về bảo vệ môi trường giám sát, kiểm tra, thanh tra việc thực hiện bảo vệ môi trường của Dự án.

Điều 4. Giấy xác nhận này có giá trị kể từ ngày ký./.

Nơi nhận:
- Chủ dự án;
- Lưu.

Chứng thực bản sao đúng với bản chính
Số chứng thực 25739 Quyển số 4 SCT/BS
Ngày 20 -12- 2012
Chủ Tịch UBND Phường Cầu Kho Q.1

TM. ỦY BAN NHÂN DÂN HUYỆN
KT. CHỦ TỊCH
PHÓ CHỦ TỊCH

Phạm Văn Thêm

Nguyễn Văn Tiễn

APPENDIX F:HEALTH EFFECTS OF ELECTROMAGNETIC RADIATION EMF

123. The popular concern of negative health effects of exposure to electromagnetic fields (EMF) originally arose from exposure to high voltage transmission lines. Today the concern of EMF has spread to exposure to personal electronic sources of EMF such as microwave ovens and cellular phones. The World Health organization (WHO) as part of their mandate for monitoring global human health with specific focus on developing countries recently conducted an extensive review and assessment http://www.who.int/peh-emf/en/ of the validity of the concerns of EMF.

124. Provided below is the recent review and critical summary conducted by WHO of the extensive research on human health and EMF which is reprinted verbatim below. The portion of the research database published in primary is referenced follows the summary.

125. In the area of biological effects and medical applications of non-ionizing radiation approximately 25,000 articles have been published over the past 30 years. Despite the feeling of some people that more research needs to be done, scientific knowledge in this area is now more extensive than for most chemicals. Based on a recent in-depth review of the scientific literature, the WHO concluded that current evidence does not confirm the existence of any health consequences from exposure to low level electromagnetic fields. However, it is believed that some gaps in knowledge about biological effects exist and need further research.

Effects on general health:

126. Some members of the public have attributed a diffuse collection of symptoms to low levels of exposure to electromagnetic fields at home. Reported symptoms include headaches, anxiety, suicide and depression, nausea, fatigue and loss of libido. To date, scientific evidence does not support a link between these symptoms and exposure to electromagnetic fields. At least some of these health problems may be caused by noise or other factors in the environment, or by anxiety related to the presence of new technologies.

Effects on pregnancy outcome

127. Many different sources and exposures to electromagnetic fields in the living and working environment, including computer screens, water beds and electric blankets, radiofrequency welding machines, diathermy equipment and radar, have been evaluated by the WHO and other organizations. The overall weight of evidence shows that exposure to fields at typical environmental levels does not increase the risk of any adverse outcome such as spontaneous abortions, malformations, low birth weight, and congenital diseases. There have been occasional reports of associations between health problems and presumed exposure to electromagnetic fields, such as reports of prematurity and low birth weight in children of workers in the electronics industry, but these have not been regarded by the scientific community as being necessarily caused by the field exposures (as opposed to factors such as exposure to solvents).

Cataracts

128. General eye irritation and cataracts have sometimes been reported in workers exposed to high levels of radiofrequency and microwave radiation, but animal studies do not support the idea that such forms of eye damage can be produced at levels that are not thermally hazardous. There is no evidence that these effects occur at levels experienced by the general public.

Electromagnetic fields and cancer

129. Despite many studies, the evidence for any effect remains highly controversial. However, it is clear that if electromagnetic fields do have an effect on cancer, then any increase in risk will be extremely small. The results to date contain many inconsistencies, but no large increases in risk have been found for any cancer in children or adults.

130. A number of epidemiological studies suggest small increases in risk of childhood leukemia with exposure to low frequency magnetic fields in the home. However, scientists have not generally concluded that these results indicate a cause-effect relation between exposure to the fields and disease (as opposed to artifacts in the study or effects unrelated to field exposure). In part, this conclusion has been reached because animal and laboratory studies fail to demonstrate any reproducible effects that are consistent with the hypothesis that fields cause or promote cancer. Large-scale studies are currently underway in several countries and may help resolve these issues.

Electromagnetic hypersensitivity and depression

131. Some individuals report "hypersensitivity" to electric or magnetic fields. They ask whether aches and pains, headaches, depression, lethargy, sleeping disorders, and even convulsions and epileptic seizures could be associated with electromagnetic field exposure.

132. There is little scientific evidence to support the idea of electromagnetic hypersensitivity. Recent Scandinavian studies found that individuals do not show consistent reactions under properly controlled conditions of electromagnetic field exposure. Nor is there any accepted biological mechanism to explain hypersensitivity. Research on this subject is difficult because many other subjective responses may be involved, apart from direct effects of fields themselves. More studies are continuing on the subject.

The focus of current and future research

133. Much effort is currently being directed towards the study of electromagnetic fields in relation to cancer. Studies in search for possible carcinogenic (cancer-producing) effects of power frequency fields is continuing, although at a reduced level compared to that of the late 1990's.

134. The long-term health effects of mobile telephone usage is another topic of much recent research. No obvious adverse effect of exposure to low level radiofrequency fields has been discovered. However, given public concerns regarding the safety of cellular telephones, further research aims to determine whether any less obvious effects might occur at very low exposure levels.

a. Key emergent points

- A wide range of environmental influences causes biological effects. 'Biological effect' does not equal 'health hazard'. Special research is needed to identify and measure health hazards.
- At low frequencies, external electric and magnetic fields induce small circulating currents within the body. In virtually all ordinary environments, the levels of induced currents inside the body are too small to produce obvious effects.
- The main effect of radiofrequency electromagnetic fields is heating of body tissues.

- There is no doubt that short-term exposure to very high levels of electromagnetic fields can be harmful to health. Current public concern focuses on possible long-term health effects caused by exposure to electromagnetic fields at levels below those required to trigger acute biological responses.
- WHO's International EMF Project was launched to provide scientifically sound and objective answers to public concerns about possible hazards of low level electromagnetic fields.
- Despite extensive research, to date there is no evidence to conclude that exposure to low level electromagnetic fields is harmful to human health.
- The focus of international research is the investigation of possible links between cancer and electromagnetic fields, at power line and radiofrequencies.

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