Initial Environmental Examination

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VIE: Basic Infrastructure for Inclusive Growth in the Northeastern Provinces Sector Project-Upgrading and Improvement of the Provincial Road 211 Tra Linh and Trung Khanh Districts, Cao Bang Province

Prepared by Planning and Investment Department of Cao Bang province for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 27 April 2017)

Currency unit	–	Viet Nam Dong (D)
D1.00	=	$0.000044
$1.00	=	Đ 22,730

ABBREVIATIONS

ADB	–	Asian Development Bank
CPC	–	Commune People's Committee
CSC	–	Construction Supervision Consultant
DARD	–	Department of Agriculture and Rural Development
DONRE	–	Department of Natural Resources and Environment
DOT	–	Department of Transportation
DPC	–	District People's Committee
DPI	–	Department of Planning and Investment
ECT		Emergency Control Team
EIAR	–	Environmental Impact Assessment Report
EMP	–	Environmental Management Plan
EPP	–	Environmental Protection Plan
ESO	–	Environmental Safeguards Staff
ESS	–	Environmental Safeguard Specialist
IEE	–	Initial Environmental Examination
IPM	–	Integrated Pest Management
LEP	–	Law on Environmental Protection
MONRE	–	Ministry of Natural Resources and Environment
MPI	–	Ministry of Planning and Investment
MPN	–	Most Probable Number of viable cells of a pathogen - a measure of water quality
PMU	–	Project Management Unit
PPC	–	Provincial People's Committee
PPE	–	Personal Protective Equipment
PPTA	–	Project Preparatory Technical Assistant
ROW	–	Right of Way
SPS	–	Safeguard Policy Statement

SST	–	Subproject Support Teams
The PPTA	–	The Project Preparatory Technical Assistant Consultants
The Project	–	Basic Infrastructure for Inclusive Growth Sector Project in Northeast Provinces
The Subproject	–	Upgrading and Improving Provincial Road 211 (Tra Linh - Trung Khanh), Cao Bang Province
TTF	–	Trade and Transport Facilitation
UXO	–	Unexploded ordnance

WEIGHTS AND MEASURES

Km^2 (square kilometer)	–	unit of length
m^3 (cubic meter)	–	A measure of volume

Note:

(i) In this report, "$" refers to US dollars.

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I. EXECUTIVE SUMMARY

1. The proposed Basic Infrastructure for Inclusive Growth in the Northeastern Provinces Sector Project (BIIG 1) will invest in the recently completed Four Northeastern Provinces (FNEP) Overall Development Plan (2015). The development plan responds to the Government of Vietnam's strategy of targeting the investment into poorer provinces and regions. The use of a sub-regional approach seeks to build the interrelationship between provinces as one of the foundations for accelerating growth in the more remote regions. As such the plan targets investment into outputs that build areas of comparative advantage in a manner that increases the competitiveness of economic activity in the sub-region. The expected impact is to improve socio-economic wellbeing of local communities through the improved financial returns and through lower costs of accessing public health services, education, water supply and markets.

2. The project has four outputs being (i) FNEP road network connectivity improved, (ii) rural water supply improved, (iii) ARVCs in Lang Son improved, and (iv) decentralized public asset management processes implemented.

A. Subproject Summary

3. The subproject is entitled "Upgrading and improving Provincial Road 211 (Tra Linh - Trung Khanh), Cao Bang Province" and is a representative subproject for Output 1 of BIIG 1: Improved FNEP Road Network Connectivity. The route travels through Trung Khanh and Tra Linh district, Cao Bang province with the total length of 28 km. The start point: at Km 0+00 is the junction with National Road 34 (NH34) in the vicinity of Hung Quoc town, Tra Linh district and the end point, at Km 28+00 is at the junction with Provincial Road 206 (TL206) in the vicinity of Trung Khanh town.

4. The works will bring the road to the standard of Category IV Mountain road as classified in Vietnamese national standards TCVN (Tiêu chuẩn Việt Nam) 4054. The subproject will follow the existing alignment, with the exception of a new alignment to cross a river and bypassing the village of Bac Vong and a bypass at Ban Ngan village, Quang Trung commune, Tra Linh district. The main specifications are:

- Road base width: 7.5m;
- Road surface width: 5.5m;
- Road shoulder: 2 x 1.0m;
- Hard shoulder width: 2 x 0.5m;
- Road surface structure: Bituminous concrete

5. Civil works will include a new bridge crossing over the Bac Vong River (Km16+950), in the territory of Ban Sat village, Quang Trung commune, Tra Linh district and two replacement bridges. The bridge span will be made of pre-stressed concrete, 8m in widths with a design parameters determined by the traffic loading appropriate standards[1]. The bridge will be constructed 100m downstream from the current existing crossing, a spillway to avoid a residential area.

[1] AASHTO HL-93 Loading, Live Load Model and Vietnamese Technical Standards - 272TCN-05

Table 1 – Number of bridges along the subproject road

No.	Location	Bridge type	Length (m)	Width (m)	Status
1	Km1+600	Slab bridge	6.5	3.0	Built from 2002, it is now degrading but the major parts are still functioning well. The bridge is acceptable with the current road grade and the small truck traffic.
2	Km14+200	Slab bridge	5.3	5.0	Built from 2002, it is now degrading but the major parts are still functioning well. The bridge is acceptable with the current road grade and the small truck traffic.
3	Km16+950	Composite Overspill	9.4	4.0	The drift is now degrading and the surface is usually overwhelmed in the flood season

B. Environment impacts and mitigation

6. The Project is categorized as B on environmental issues during the Project Concept note, which identified few potential significantly adverse impacts, of which none are irreversible.

7. This IEE has been prepared to screen and assess impacts and formulate mitigation measures in an Environmental Management Plan (EMP) covering the three phases of subproject implementation including the design, pre-construction; construction and operation phases and to set out institutional arrangements to ensure that the subproject EMP will be implemented.

8. The most significant concern is the potential negative impact on the Bo That water source (Km12+8) and Bo That protection forest[2] (from Km 12+5 - Km 13) of the subproject road from encroachment during construction and effects of noise, dust and fumes on fauna in the forest. These risks will be mitigated by prohibiting construction camps, bitumen heating facilities, depots or material storage sites from being located in or near the forest, minimization of heavy machinery in the vicinity of the forest, prohibiting the use of fuel wood for construction activities or for cooking and water heating in worker's camps and prohibiting the contractor or contractor's employees from hunting or collecting fuel wood or any other forest product from the forest and from buying wood sourced from the forest. During the construction phase, construction activities and waste water from worker camps could impact on the water quality of the Bo That water source and impact on local people in Ngan village, Quang Trung commune, Tra Linh district which is 500m downstream from the water source. The completion of the road will also provide better access to Bo That protection forest; potentially creating favorable conditions for illegal wood logging, forestry product exploitation, and hunting. To minimize the

[2] Bo That Protection Forest is classified as natural environmental protection forest in accordance to Decision No.17/2015/QD-TTg, issuing the Management mechanism of the Protection forest. Information provided by the Agricultural staff of Tra Linh district and Land Administrative staff of Quang Trung commune, Tra Linh district.

impact, (i) construction activities shall be confined to the existing road foundation; (ii) worker camps are not be allowed to be located in or immediately adjacent to the forest and water source area; (iii) the contractor shall not store construction materials in or adjacent to the forest or water source area; (iv) no materials for any use whatsoever may be sourced from the forest and (iv) workers shall be prohibited from cutting trees for firewood, or from hunting or extraction of any forest products.

9. In the design and preconstruction phases, the potential issues that have been identified are (i) land acquisition and resettlement; (ii) disturbance of unexploded ordnance. To minimize the impact on income and disturbance of local people's lives, the PMU will check and review the Land acquisition and resettlement process before construction starts to ensure that all affected households have received compensation adequately in accordance with the current provincial market and ADB's Safeguard Policy has been implemented.

10. The potential negative impacts in the construction phase have been identified as

(i) Impact from route selection at section through Ban Ngan village, Quang Trung commune, Tra Linh district; (ii) Encroachment of Bo That protection forest in Quang Trung commune; (iii) impact on utilities (public infrastructure); (iv) impacts of excavation and material extraction; (v) impacts from temporary materials stockpiles; (vi) generation of surplus soil; (vii) generation of construction waste and domestic waste; (viii) impact from bitumen heating and concrete mixing plant; (ix) dust, noise and vibration from construction machinery; (x) land slide, soil erosion and runoff; (xi) impact on crossing streams or bridge construction locations; (xii) social issues associated with the presence of temporary non-local workers; (xiii) safety risks to workers and also to local public; and (xiv) impact on local traffic.

11. The proposed mitigation measures for these impacts in the construction phase

(i) Construct 400-meter bypass road to avoid the narrow road section through Ban Ngan village, Quang Trung commune, Tra Linh district; (ii) prohibit cutting of trees for firewood and for use in the subproject and also construction camps, concrete mixing plants, material storage sites from being located in the forest area; (iii) contact all relevant local authorities for facilities and local people to plan any re-provisioning of power, water supply, and telecommunication systems; (iv) procure materials only from Cao Bang DONRE authorized quarries and borrow sites and update the list of quarries and borrow pits monthly and report to PMU; (v) stockpile topsoil for later use and fence and re-contour borrow pits after use; temporary stockpiles shall not be located in productive land and forested areas; (vi) surplus material to be distributed to local people for use in landscaping/forming building platforms and shall only be disposed to areas approved by local authorities; (vii) areas suitable for disposal to be agreed with CPCs and Cao Bang DONRE checked and recorded by the CSC, ESS/PMU and monitored; (viii) locate mixing plant, bitumen heating off road and (whenever practicable) at least 500 m from nearest sensitive receivers (residential areas, schools, clinics, etc.) and streams and install and maintain dust suppression equipment; (ix) restrict works to daylight hours within 500 m of residential settlements and local clinics, (x) powered mechanical equipment and vehicle emissions to meet national TCVN/QCVN standards; (xi) establish vegetation and erosion protection immediately after completion of works in each stretch/ sector, (xii) check weather forecasts and minimize work in wet weather; (xii) cofferdams, silt fences, sediment barriers or other devices will be used as appropriate based on the design to prevent migration of silt during excavation and boring operations within streams; (xiv) hire and train as many local workers as practicable; provide adequate housing for all workers at the construction camps and establish clean canteen/eating and cooking areas; (xv) workers shall be provided with appropriate personal protective equipment (PPE), and receive regular scheduled briefings on health and

safety issues related to their activities as well as on proper use of PPE and fencing on all hazardous sites such as excavation sites, borrow pits and sides of temporary bridges; (xvi) communicate to the public through local officials regarding the scope and schedule of construction, as well as certain construction activities causing disruptions or access restrictions.

12. In the operation phase, the potential negative impact has been identified as relating to (i) impact from dust and noise arising from increasing of traffic density; (ii) favorable conditions for transportation of goods and people movement and also likely to increase the vehicle speeds. Project traffic will increase to moderate flows moderate and are unlikely to signiicantly worsen community safety issues. To minimize the negative impacts, Cao Bang Department of Transportation (DOT), the responsible agency for subproject management in the operation phase, will cooperate with Cao Bang DONRE, Tra Linh and Trung Khanh DPCs, 6 town and commune CPCs to maintain the road periodically and collaborate with traffic police to control speed and vehicle load on the road, especially at sensitive areas along the road such as kindergartens, medical clinics and residential areas etc. A road safety and awareness campaign is required for people working and living along the road.

13. The PPTA Consultant has also identified key stakeholders and conducted public consultations from provincial to commune level with a focus on the affected people's views. The main concerns identified were (i) safety risks, and risks to public hygiene from improper handling and transportation of construction materials and of waste (ii) adequacy of construction quality and standard, as a high frequency of trucks travel on the road, (iii) road safety issues at the sections that go through residential areas, (iv) increased runoff from the road due to a wider road surface and (v) traffic jams near the town center and schools. All of these concerns are addressed in the EMP (See Table 9 – 10 for more details).

14. An EMP has been prepared under this IEE to detail responsibilities of relevant stakeholders on mitigation measures to be implemented during construction and operation phases of the subproject.

C. Institutional arrangements

15. Cao Bang DPI has established an Official Development Assistance (ODA) Project Management Unit (PMU) and assigned relevant staff to support the preparation of the subproject in the PPTA period. One member of the PMU has been assigned as the Environmental Safeguards Officer (ESO). Two staff, including the ESO, have been participating in a training course on "Fundamental Safeguard and Gender Safeguard Policy Statement (SPS) of ADB" under TA8902-VIE: Capacity Building for Project Management Unit Professionalization - organized by ADB in August 2016. The ESS will organize training for relevant PMU staff, CSC staff, communities, contractors; in EMP implementation and provide support for the establishment and operation of the subproject environment management system in the construction phase. The ESS will also support PMU's capacity building by reviewing and evaluating the capacity for environmental protection of the PMU and Cao Bang Department of Transportation (DOT) – subproject management organization in the operation phase.

16. To ensure that environmental protection and mitigation measures are included in the civil works contracts, the EMP will be included in the bidding documents and civil works contracts. Any omission of environmental management costs will create high risks for implementing mitigation measures during the construction phase due to lack of resources and

capacity, thus the environmental protection cost and responsibilities need to be involved from the beginning. Bid documents will also specify that contractors shall engage capable and trained staff to take responsibility for the environmental management and safety issues at the working level and to monitor the effectiveness and review mitigation measures as the subproject proceeds.

D. Conclusion

17. The IEE concludes that the feasibility study of the subproject combined with available information is sufficient to identify the scope of potential environmental impacts and formulate mitigation measures for the subproject. Providing that significant changes to the subproject description do not occur at the detailed design phase, and that new sensitive environmental, or cultural resources are not encountered, further detailed environmental impact assessment (EIA) is not required. In case of any change in the subproject design, the ESS will update EMP before detail design finalization.

II. BACKGROUND

A. Objectives of the Project

1. The Basic Infrastructure for Inclusive Growth in the Northeastern Provinces Sector Project

18. The subproject objectives will be achieved through investment in construction and improvement of basic infrastructure, including improve and expand the transport corridors among regions and sub-regions to ensure these corridors actually become the economic corridors, increase infrastructure linkage including the subproject - upgrading provincial road 211 (Tra Linh - Trung Khanh) Km 0+00 - Km 28 to IV class road for mountainous area.

19. The subproject is initially categorized as 'B' for environmental safeguards, and this IEE is required according to the ADB Safeguards Policy Statement (SPS) of 2009. The objectives and scope of this IEE are to (i) assess the existing environmental conditions in the vicinity of the subproject road; (ii) identify potential environmental impacts from the proposed road improvement works; (iii) evaluate and determine the significance of the impacts; (iv) develop an environmental management plan (EMP) detailing mitigation measures, monitoring activities, reporting requirements, institutional responsibilities and cost estimates to address adverse environmental impacts; and (v) carry out public consultations to document any issues/ concerns that stakeholders may have on the subproject and to ensure that such concerns are addressed in the subproject design and mitigation measures.

III. POLICY AND LEGAL FRAMEWORK

20. The subproject shall comply with requirements of ADB SPS 2009 and the GOV's Guidelines on Implementation of the Law on Environmental Protection 2014. Decree No. 18/2015/ND-CP has detailed information on strategic environmental assessment, environmental impact assessment and environmental protection plans. However certain activities commonly associated with infrastructure subprojects such as quarry operations, extraction of gravel, etc., will also require permission from the relevant provincial level authorities. The construction of bridges and spillways, which will be constructed or upgraded by the subproject, are all in small scale and will not be required for separate environmental impact assessment.

A. ADB SPS Requirements

21. The ADB safeguard policy statement (SPS) 2009 imposes safeguard requirements for all its funded projects. The SPS 2009 clarifies the rationale, scope and contents of environmental assessment. It emphasizes environmental and social sustainability in progress of economic growth and poverty reduction in Asia and the Pacific, with the following aims:

- Avoid adverse impacts of projects on the environment and affected people, where possible;
- Minimize/mitigate and/or compensate for adverse impacts on environment and affected people when avoidance is not possible; and
- Help borrowers/clients to strengthen their safeguard systems and develop the capacity to manage environmental and social risks

22. For environmental safeguards, the subproject is initially categorized as 'B'. A subproject, which would be classified as category, A on environmental safeguards would be ineligible as a BIIG I subproject.

B. Legal and Administrative Framework for Environmental Protection in Vietnam

23. The subproject has to comply with the environmental legal framework of Vietnam, which is outlined in this section. The main components of the framework, if not, the more applicable ones are shown here.

1. Laws

- Law No. 55/2014/QH13 of 23 June 2014 by the National Assembly on environment protection
- Law No. 17/2012/QH13 of 21 June 2012 by the National Assembly on water resources
- Law No. 20/2008/QH12 of 13 November 2008 by the National Assembly on Biodiversity Conservation
- Law No. 68/2006/QH11 of 29 June 2006 by the National Assembly on standards and technical regulations
- Law No. 29/2004/QH11 of 03 December 2004 by the National Assembly on forest protection and development

2. Decrees and Regulations

- Decree No. 18/2015/ND-CP dated February 14, 2015 on environmental protection planning, strategic environmental assessment, environmental impact assessment and environmental protection plans.
- Circular No. 27/2015/TT-BTNMT dated May 29, 2015 on strategic environmental assessment, environmental impact assessment and environmental protection plans.
- Circular No. 36/2015/TT-BTNMT of 30 June 2015 by the Ministry of Natural Resources and Environment stipulating hazardous waste management
- Decision 07/2012/QD-TTg dated February 08, 2012 of the Prime Minister promulgating some regulations on intensified enforcement of forest protection
- Decision 186/2006/QD-TTg dated August 14, 2006 of the Prime Minister promulgating the Regulation on forest management
- Decree 09/2006/ND-CP dated 16th January, 2006 of the Government on forest fire prevention and control
- National Technical Regulations on air and noise quality
    - QCVN 05: 2013/BTNMT on ambient air quality
    - QCVN 26: 2010/BTNMT on noise
    - QCVN 27: 2010/BTNMT on vibration
- National Technical Regulations on water quality
    - QCVN 01: 2009/BYT on drinking water quality
    - QCVN 02: 2009/BYT on domestic water quality
    - QCVN 08: 2008/BTNMT on surface water quality
    - QCVN 09: 2008/BTNMT on underground water quality
    - QCVN 14: 2008/BTNMT on domestic wastewater

3. Other legislation applicable to the subproject are the following:

- Law No. 27/2001/QH10 of 29 June 2001 by the National Assembly on fire prevention and fighting
- Law No. 40/2013/QH13 of 22 November 2013 by the National Assembly on amending and adding a number of articles of the Law No. 27/2001/QH10 of 29 June 2001 on fire prevention and fighting
- Decision No. 3733/2002/QD-BYT of 10 October 2002 by the Ministry of Health promulgating 21 labor hygiene standards, 5 principles and 7 labor hygiene measurements
- Law No. 50/2014/QH13 of 18 June 2014 by the National Assembly on construction
- Circular No. 22/2010/TT-BXD of 03 December 2010 by the Ministry of Construction on labor safety in work construction
- Law No. 10/2012/QH13 of 18 June 2012 by the National Assembly on labor code.

IV. DESCRIPTION OF THE SUBPROJECT

A. Subproject Location

24. The upgraded road connects two district centers of Tra Linh and Trung Khanh, both of which lie on the border with China. It connects with provincial roads TL206 and TL213 and improves access to two tourism sites, the Ban Gioc waterfall resort and the Nguom Ngao cave site. Other significant sites in the vicinity include the Gioc Dau spiritual tourism base, Ho Thang Hen tourism base (Tra Linh district), Pac Bo historical relics, the Soc Giang border gate (Ha Quang district) and Ha Giang province. The location of the subproject road is shown in Figure 1. The subproject will (i) facilitate cross-border trade through auxiliary gates, (ii) promote the development of tourism through the east west linkages of two major attractions in Cao Bang reducing travel times substantially, and (iii) assist residents and businesses along and adjacent to the road, to participate in businesses and trade further afield (currently impeded by the standard of PR211).

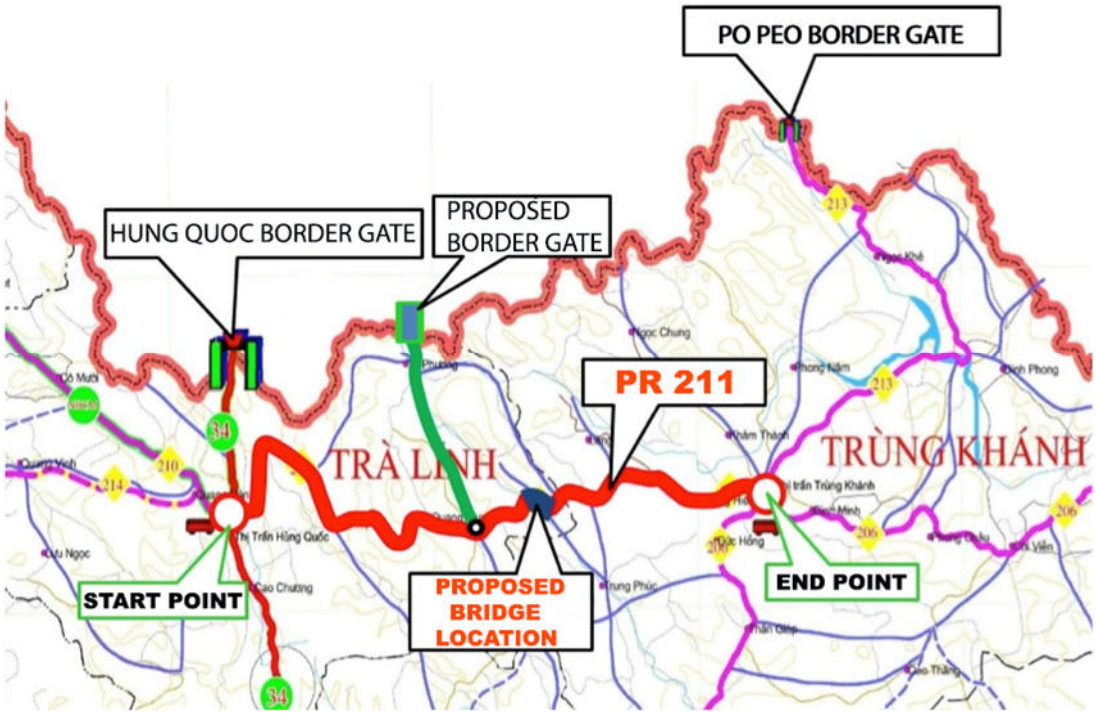

Figure 1: Map of the subproject road

Figure 2 – General Map of Cao Bang and Subproject Location

Part 1


Lăng Yên
Lang Yen CPC
Road to Lang Yen commune
Lang Hieu Primary School and Kindergarten
Lang Hieu Secondary School
Proposed location for borrow pits
Planned disposal site
Lang Hieu Kindergarten - underconstruction
Ban Chien hamlet
Keo Tam Quarry - closed
Lang Hieu Medical Clinic
Bo Gia quarry - closed
Ban Chien Quarry
Lang Hieu CPC
Sac Ha village
Protection forest on top of the mountain
Continous Education Center
Phia Phu Pond
TRAN temple
Trung Khanh High School
Dinh Van quarry
Road to Ly Van Border Gate
Pine forest
Borrow pit
Trung Khanh General Hospital
Water supply plant
Dumping site
Town Medical Clinic
Ecological lake - Ban Da
Road to Ban Gioc Waterfall
TL 206
Road to Quang Yen Town
Image © 2016 DigitalGlobe
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Image © 2016 CNES / Astrium
US Dept of State Geographer
Google earth

Part 2

B. Subproject scope

25. The subproject road is situated in small karst mountain terrain. It passes scattered cultivation on flatter land while intact forest on steep land on the karst mountains. The subproject starts and ends at the crowded residential areas of Hung Quoc town, Tra Linh district and Trung Khanh town, Trung Khanh district. It also runs through some crowded residential areas of Xuan Noi, Quang Trung and Lang Hieu communes of Tra Linh and Trung Khanh districts.

26. The section between Km12+5 to Km 13 runs adjacent to the Bo That protection forest, whose function is partly to protect the Bo That water source (Km12+8) - the main water supply and irrigation sources for people in Ban Ngan village, Quang Trung commune, Tra Linh district.

27. The subproject road crosses the Bac Vong River at Km16+950. This river originates in China, running through Tri Phuong, Quang Trung communes, Tra Linh district before flow through Trung Phuc, Thong Hoe and Than Giap communes, Trung Khanh district then continuing to Ha Lang district.

28. The subproject will follow the existing alignment, with the exception of a new alignment of 200m to cross a river and bypassing the village of Bac Vong town.[3].

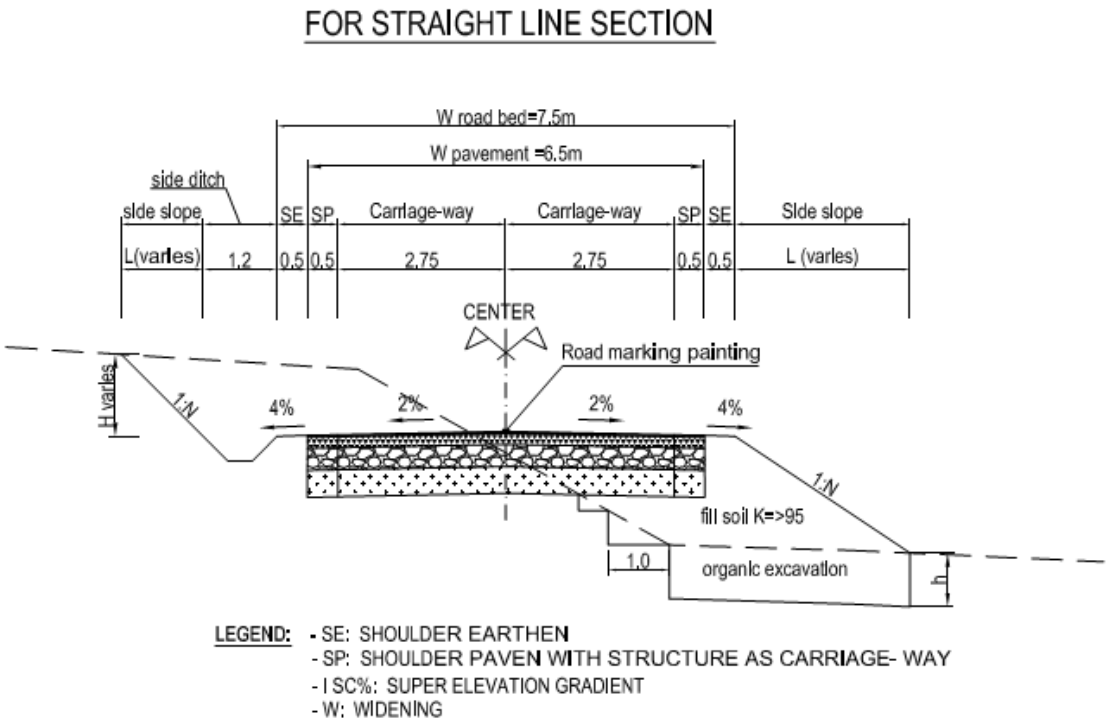
29. Construction along the alignment will require construction of a bridge over the Bac Vong River on south-western boundaries in Ban Sat village, Quang Trung commune, Tra Linh district.

- The bridge is designed with pre-stressed concrete and K=8m width, HL93 design load.

- The location of the new bridge will be 100m downstream from the spillway to enable the clearance of residential area.

[3] The total road length of 28km, including bypass road section through the village from Km11 + 850 to km12 + 250 with 400m of Ban Ngan village, Quang Trung commune, Tra Linh district. The section of the bridge head over Bac Vong bridge, not going through the old road from Km16+600 to Km16 + 800 with 200 meters long of Ban Sat village, Quang Trung commune, Tra Linh District.

Figure 3: Typical Cross Section for straight-line section design of PR211



C. Construction Material Sources

30. In accordance with the list of quarries and sand mines provided by Cao Bang MONRE, potential stone sources are (i) Lung Mo quarry, operated by Khoa Cuong private company in Cao Chuong commune, Tra Linh district about 1.6 km from the start point of the subproject. This quarry has a total capacity of 40,000m^3 and the annual exploitation capacity of 5,000m^3; (ii) Coc Cang quarry operated by Du Trong Dai One Member Limited Company in Hung Quoc town, Tra Linh district, about 500m from Km2+840 of the subproject road. The annual exploitation capacity of the quarry is 10,000m^3; (iii) Keo Thin Lan quarry and construction material operated by Dinh Van private company in Lang Hieu commune, Trung Khanh district about 300m from Km26+520 of the subproject road. The total capacity of the quarry is 105,000m^3 and the annual exploitation capacity of 15,000m^3 [4] while estimated volume of stone using for the subproject road construction is about 84,398 m^3.

31. Potential filling soil sources are (i) Sac Ha borrow pit, located near Km 16+500 in Sac Ha village, Quang Trung commune, Tra Linh district. This is the low hill areas and currently managed by Quang Trung CPC. Estimated capacity of the borrow pit is 600,000 m^3; (ii) Cho Mo town borrow pit, located near Km 13+500 to Km 13+850 in Cho Mo town, Quang Trung commune, Tra Linh district. This is the low hill areas and currently managed by Quang Trung CPC. Estimated capacity of the borrow pit is 348,000 m^3. Estimated volume of excavated soil from construction activities of the subproject is about 168,569 m^3 of which 40,344 m^3 is disable soil (surplus soil) that could not be reused as filling soil. Estimated volume of filling soil for embankment is about 144,397 m^3.

[4] List of quarries in Tra Linh and Trung Khanh districts provided by Mineral and Mining Division, Cao Bang DONRE

D. Land Acquisition

32. According to Resettlement and Ethnic Minority Development Plan, there are 362 households will be affected by the implementation of the subproject of which 5 households must be relocated and number of households with affected assets are 290. In these 362 affected households, there are 7 seriously affected households (households that lost more than 10% of the total area of cultivated land and residential part and relocate or rebuilt houses on the remaining land). The total affected area is 34,756 m^2 of which 5,148 m^2 is production forest.

33. In the plan, the subproject will be constructed in 24 months with the estimated budget in Table 2 below:

Table 2 – Estimated budget of the subproject

No	Cost Items	Unit	before tax costs	VAT	After tax costs (VND)	After tax costs (USD)
I	Civil Works Cost		178,769,197,674	17,876,919,767	196,646,117,441	8,798,484
2	Project Management Cost	1.30%	2,331,329,107	233,132,911	2,564,462,018	114,741
3	Construction Investment Consultancy Cost		11,749,578,242	1,174,957,824	12,924,536,066	578,279
-	*Project Investment Survey Cost*	Temporarily estimated	2,727,272,727	272,727,273	3,000,000,000	134,228
-	*Design Survey Cost*	Temporarily estimated	4,545,454,545	454,545,455	5,000,000,000	223,714
-	*Project Investment Cost*	*0.21%*	*379,884,545*	*37,988,455*	*417,873,000*	18,697
-	*Environmental Impact Assessment Cost*	Temporarily estimated	181,818,182	18,181,818	200,000,000	8,949
-	*Shop Drawings Design Cost*	*0.81%*	*1,447,494,194*	*144,749,419*	*1,592,243,613*	71,241
-	*Shop Drawings Design Verification Cost*	*0.06%*	*102,255,981*	*10,225,598*	*112,481,579*	5,033
-	*Construction Works Cost Estimates Verification Cost*	*0.05%*	*97,607,982*	*9,760,798*	*107,368,780*	4,804

No	Cost Items	Unit	before tax costs	VAT	After tax costs (VND)	After tax costs (USD)
-	*Bidding Documents Preparation Cost*		50,000,000	5,000,000	55,000,000	2,461
-	*Bidding Documents Evaluation Cost*		50,000,000	5,000,000	55,000,000	2,461
-	*Expression of Interest & Prequalificati on Bidding Documents Evaluation Costs*		30,000,000	3,000,000	33,000,000	1,477
-	*Bidding Document & Request for Proposal Evaluation Costs*		50,000,000	5,000,000	55,000,000	2,461
-	*Contractor Selection Results Evaluation Cost*		50,000,000	5,000,000	55,000,000	2,461
-	*Cost of the consultant Committee to resolve Contractors' Requests*		*35,753,840*	*3,575,384*	*39,329,224*	1,760
-	*Construction Supervision Cost*	*1.12%*	*2,002,036,245*	*200,203,625*	*2,202,239,870*	98,534
4	**Other Costs**		**11,319,232,909**	**1,131,923,291**	**12,451,156,200**	**557,099**
-	General Costs		*7,150,767,907*	*715,076,791*	*7,865,844,698*	351,939
-	Design Verification Cost	*0.03%*	*49,136,781*	*4,913,678*	*54,050,459*	2,418
-	Construction Investment project appraisal cost	*0.03%*	*78,338,567*	*7,833,857*	*86,172,424*	3,856
-	Construction Works Evaluation & Approval Cost	*0.31%*	*432,558,847*	43,255,885	*475,814,732*	21,289
-	Independent	*0.46%*	*1,300,842,250*	*130,084,225*	*1,430,926,475*	64,024

No	Cost Items	Unit	before tax costs	VAT	After tax costs (VND)	After tax costs (USD)
	audit cost					
-	Construction insurance cost	*1.03%*	*1,841,322,736*	*184,132,274*	*2,025,455,010*	90,624
-	Project Investment supervision and evaluation Cost	*20.00%*	*466,265,821*	*46,626,582*	*512,892,403*	22,948
5	**Land Acquisition and Resettlement Costs**	**Temporarily estimated**	**16,739,507,915**	**1,673,950,792**	**18,413,458,707**	**823,868**
6	**Contingency**	**16.00%**	**35,345,415,335**	**3,534,541,534**	**38,879,956,869**	**1,739,595**
Total (1+2+3+4+5+6)					**281,879,687,300**	**12,612,067**

[a] Comprises $8,021,830 for road construction and $776,650 for construction of bridges and structures

V. DESCRIPTION OF THE ENVIRONMENT

A. Physical Environment

1. Topography, Geology, and Soils

34. Cao Bang has a complex topography with an average elevation of 300m above Mean Sea Level, gradually going down from North to South and from West to East. The highest point is the summit of Phia Oac Mountain in Nguyen Binh district with a height of 1,931m above MSL. The topography of Cao Bang is divided in three main types: (i) geosynclinal depression in the central area of the province; (ii) hills formed from sedimentary deposits; and (iii) limestone karst. The karst area runs from the North, along the Vietnam - China border line to the South East part of the province. It is concentrated in Ha Quang, Tra Linh, Trung Khanh, Thong Nong, Ha Lang, Quang Uyen and Phuc Hoa districts. The subproject area is largely located inside this karst area in Trung Khanh and Tra Linh districts. Terrain in this karst area of the province is steep, with 75% on slopes steeper than 25 degrees.[5]

35. The soil of Cao Bang is divided in 3 main groups, with 24 types in total. These are group high mountain soils, found over 900m above MSL; flat-valley soils hill soils with a typical yellow-red color. The predominant type in the subproject area is the hill soils.

36. The hill soil group is developed on low hill, or corrugated terrain. It features accumulated with iron and aluminum compounds which result in the typical yellow-red color. Soil derived from basic and ultrabasic igneous parent rock and makes up around 47% of the total, while that derived from metamorphic rock such as gneiss makes up around 30%. [6]

2. Weather, natural disaster and climate change

37. Cao Bang has a tropical monsoon climate with two separated seasons in the year: a hot season with plentiful rainfall lasting from April to October and a cold season with less rain from November to March. The annual average temperature varies from 19.8^0C to 21.6^0C. In the summer months, the average temperature varies from 25^0C to 28^0C while in the winter months it varies between 14^0C to 18^0C. The average number of hours of sunshine in a year is 1300 - 1400, which is not distributed evenly of the year.

38. The annual average rainfall is from 1,450 to 1,600mm. The rainfall in the rainy season (hot season) makes up 70-80% of the total for the year. The driest period is between December to March each year. Rainfall patterns vary over the province, with the highest rainfall in Ha Quang district, reaching 1,637mm per year while Thach An and Bao Lac districts have the lowest rainfall at 1,000 - 1,300mm averaged over the year. The average humidity is 84-85%, reaching 88-89% in July and 80-82% in December.

39. There are two main wind directions: Northeast winds predominate between December to April each year and a Southeast prevailing wind blows from May to November. Whirlwinds or tornados sometimes occur on a local scale.[7]

40. The average temperature of Cao Bang has a rising trend of 0.42^0C every 10 years. Summers are starting to last longer and more extreme hot days, with temperatures greater than

[5] Status of Environment report (SOE) of Cao Bang province 2015
[6] Cao Bang Electronic Portal - http://dukhach.caobang.gov.vn
[7] Status of Environment (SOE) of Cao Bang province 2015

40^0C, are becoming more frequent. Winters are becoming shorter and later, while the extreme cold period is longer. Rain is irregular and the frequency of heavy rain is higher, concentrated in the rainy season, leading to flash flooding and landslides in mountainous area[8].

41. The main weather related risks in the project area are hail, extreme cold, drought and prolonged inundation. Periods of extreme cold impact on cultivation activities cause an increase in livestock deaths in the winter. Serious hail events were reported in Trung Khanh district in 2014. For example, more than 70% of household roofs in Lang Hieu commune were broken by hail and 100% households in Lang Yen reported that has their cultivated areas had been damaged by hail.[9]

3. Hydrology

42. Cao Bang is situated upstream of several rivers under two main river systems: the Red River and the Ta Giang River (China). There are nearly 1200 rivers or streams that are more than 2 km in length. In Cao Bang area, the total combined length of rivers and streams is 3,175 km and the density is 0.47 km/km^2. The Bac Vong is one of the main rivers flowing through the province. The rivers and streams of Cao Bang flow through steep terrain and waterfall are common, within the Quay Son and Gam River systems.

43. The Bac Vong River crosses the subproject road at Km16+950. The river starts in China; flows through Tra Linh and Trung Khanh and Phuc Hoa districts then back to China through Ta Lung town. The Bac Vong River has a catchment area of 815km^2. The flow yield is 23.81 l/s/km^2; water capacity is 19.41 m^3/s and total capacity (W) is 612.04*10^6 m^3 [10]

4. Surface and ground water

Surface water resources

44. The surface water quality in the rivers, streams, ponds and lakes of Cao Bang province has become degraded recently, especially at the river section in Cao Bang city or where mining of mineral ore takes place. The Total suspended solids (TSS), chemical oxygen demand (COD) and biological oxygen demand (BOD_5) parameters are all higher than the allowed levels. In the subproject area, the Bac Vong River has COD and BOD parameters higher than the levels allowed in the appropriate QCVN standards[11][12].

Groundwater resources

45. Several studies have been conducted on groundwater quality and reserves in Cao Bang province. In the subproject area, groundwater sources in Hung Quoc town and Xuan Noi commune yield up to 7,443 m^3/day and the potential exploitation capacity (ie the level at which the source can be exploited without depleting the water source) of the Bac Vong River basin is 77,998 m^3/day. Except Hung Quoc and Trung Khanh towns, stream water is still the main water source for local people in the subproject area. Hung Quoc town uses stream water for water supply while Trung Khanh town uses groundwater. According to the groundwater-monitoring

[8] Cao Bang Action Plan on Climate Change for 2011-2020 period
[9] Information provided by Deputy Chairman and Land Administrative staff of Trung Khanh, Lang Hieu and Lang Yen CPC
[10] Cao Bang Action Plan on Climate Change for 2011-2020 period
[11] QCVN 08MT: 2015/BTNMT National Technical Regulation on Surface Water Quality
[12] SOE of Cao Bang province 2015

program of the Environmental Monitoring Center of Cao Bang DONRE, all water quality parameters of the water supply source for Trung Khanh town, except Coliform, are within permissible levels of QCVN[13]. The coliform concentration of the sample (tested on September 9, 2014) is up to 30 while the allowed level under QCVN 09:2015 is only 3 MPN/100ml.[14]

5. Air quality and noise

46. In comparison to the QCVN standards[15], the levels of Carbon monoxide (CO), Nitrogen dioxide (NO_2), Sulfur dioxide (SO_2) and Total Suspended Particles (TSP) in town centers of the districts are nearly all within permissible limits. Their variation from 2011 to 2014 is also minor. The air quality in the province is still good. Only in Tra Linh town, the average TSP value is nearly 800 µg/m^3 while the allowed level is only 300 µg/m^3.

47. In general, noise levels within the province are within the allowed levels of QCVN[16] with noise level of production, construction, trade and service activities are not higher than 70 dBA daytime (from 6 am to 21h) and 55 dBA (from 21h to 6 am). Only in some crowed areas, along trafficed roads, noise levels sometimes reach 5-8dBA higher than the allowed level.[17]

B. Biological Environment

1. Forestry

48. Cao Bang has several natural types including closed temperate evergreen forest on high mountain areas; closed subtropical evergreen mixed broadleaf forest and coniferous forest at medium elevations; closed moist tropical evergreen broadleaf forest at low elevations and bamboo forests, Forests near the subproject area are the limestone mountain - karst type.

49. The karst ecosystem occupies a large area in Ha Lang, Trung Khanh, Quang Yen, Phuc Hoa, Tra Linh, Ha Quang and Thong Nong districts with a total area of 152,767 ha, making up 22.79% of the total forested area of Cao Bang. Surveys showed that there are 478 flora species under 72 families; 56 mammal species; 274 bird species; 48 reptile species; and 10 amphibians species[18].

50. Cao Bang has many high value plant species such as Yellow camphor (*Cinnamomum parthenoxylon*), Indian mahogany (*Chukiasia tabularis*) and Madhuca (*Madhuca pasquieri*). However, these species are mainly located in Phia Oac Natural Reserve and Cao Vit Gibbon Nature Reserve, 45 km and 6 km as the crow flies from the subproject road respectively. Despite the presence of the Bo That protection forest (a forest area designated for protection by the district administration), lies adjacent to the road for a length of 500m in Ban Ngan village, Quang Trung commune, there are no known communities of plant species listed in the Vietnam Red Book in the subproject area[19].

[13] QCVN 09: 2015-MT/BTNMT National Technical Regulation on Ground Water Quality
[14] SOE of Cao Bang province 2015
[15] QCVN 05: 2013/BTNMT National Technical Regulation on Ambient Air Quality
[16] QCVN 26:2010/BTNMT National Technical Regulation on Noise
[17] SOE of Cao Bang province 2015
[18] SOE of Cao Bang province 2015
[19] **Dang Huy Huynh, Nguyen Huu Thang**, 2013**.** Study on Diversity of Species Composition in the Protected Area Phia Oac - Phia Den, Nguyen Binh district, Cao Ban Province. The 5th National Conference on Ecology and Biological Resources

51. Cao Bang has 30 endangered mammal species, 11 endangered bird species and some other endangered amphibians and fish species such as the Chinese pangolin, hairy-footed flying squirrel, forest musk deer and Elongated tortoise. However no endangered species that listed in the Vietnam Redbook appear in the subproject area (karst area with low hill and mountain)[20].

2. Agriculture

52. Main agricultural crops in Tra Linh and Trung Khanh include rice, maize, cassava , fruit trees including tangerine, grapefruit; cash crops like sugarcane and star anise. Most agriculture is for subsistence, especially with wet rice and maize. Tra Linh district is known for quality of tangerine, while Trung Khanh is known for chestnut. Livestock rearing is the most important source of livelihood. Key animals are cow, buffalo, horse, goat and poultry. According to the annual report on SEDP 2015, agricultural gross output value was VND 307.3 and 346 billion, of which 80% and 90% from crops and livestocks in in Tra Linh and Trung Khanh district respectively.

C. Socio-economic Condition and Infrustructure \

1. Population and Ethnic Composition

53. The total population in the two townships and four target communes is 15,814 people of 3,971 households in 68 villages but the direct beneficiaries[21] of the subproject only account for 35% of the total population and are estimated to be 5,433 people in 25 villages out of 68 villages within four communes and two townships. Consistent with the overall population, the representation ethnic minority account for 97.6% of direct beneficiaries. Table 3 below presents population and ethnicity composition in project area.

54. Table 4 presents the poverty incidence in the target communes/townships. The data indicates large disparities in the poverty rate between Kinh people and ethnic minorities in each of the target communes/ townships. The poverty rate remains higher and more concentrated among ethnic minority groups. One hundred percent of the poor in the five out of six target communes and townships are ethnic minorities. Three out of six communes and townships are P135 communes including Xuan Noi, Quang Trung (Tra Linh district) and Lang Yen commune of Trung Khanh district.

[20] Information provided by staff of Cao Bang Environmental Protection Agency and via public consultation meeting in Hung Quoc, Trung Khanh, Quang Trung, Lang Yen and Lang Hieu commune/towns.

[21] Direct beneficiary is defined as people/households who live in the villages located along the proposed upgraded road. Other villages in communes may access the road through feeder road/track are defined as indirect beneficiaries

Table 3 – Population and Ethnicity in subproject area

	Whole commune							Beneficiary area						
	Hung Quoc Town	Xuan Noi Com.	Quang Trung Com.	Lang Yen Com.	Lang Hieu Com.	Trung Khanh Town	Total	Hung Quoc Town	Xuan Noi Com.	Quang Trung Com.	Lang Yen Com.	Lang Hieu Com.	Trung Khanh Town	Total
Number of Villages	17	11	10	7	8	15	68	3	5	6	1	8	2	25
Population (person)	4554	1568	1846	1290	1951	4605	15814	1004	834	1287	127	1654	527	5433
Number of Households	1163	390	426	291	450	1251	3971	254	210	297	28	431	143	1363
By ethnic group														0
Kinh	62	0	1	0	0	63	126	20	0	1	0	0	11	32
Tay	743	253	379	78	347	925	2725	137	110	250	28	359	93	977
Nung	354	137	46	213	103	262	1115	97	100	46	0	72	39	354
Other	4					1	5	0						0

Source: Annual report of Hung Quoc and Trung Khanh Township, Xuan Noi, Quang Trung, Lang Yen and Lang Hieu commune People's Committees, 2016

Table 4 – Poverty incidence in target townships/ communes, 2016

	Poverty rate (%)		
	As whole	Kinh people	Ethnic minority
Tra Linh district	*40.81*	*4.15*	*95.85*
Hung Quoc Township	20.8	0	100
Xuan Noi commune	51.16	0	100
Quang Trung commune	46.1	0	100
Trung Khanh district	*42.53*	*1.08*	*98.92*
Trung Khanh Township	4.87	6.6	93.4
Lang Hieu commune	28.77	0	100
Lang Yen commune	57.99	0	100

Source: Data collection from target communes/townships, 2016

2. Economic development and income

55. Apart from Trung Khanh Township, agricultural land occupies range 12.5% to 28% of the total land area in five communes and township, agriculture production is still the dominant income source in these communes and townships. Main crops are paddy, maize, cassava, and soybean. Livestock is considered as one of main income sources of the Target Township and commune. Forestry occupies over from 60% to 80% of total land area in these communes/townships and is still of minor importance economically because almost area is protection forest according to annual reports.

Table 5 – Gross output value in subproject area (VND million)

Indicators	Unit	Trung Khanh	Tra Linh
Gross output value	VND million	939,929	362,732

From Industry	VND million	278,254	5,774
From Agriculture	VND million	409,295	351,324
From Services	VND million	252,380	5,634

3. Social services

56. There is one general hospital, three regional clinics located in each district; 10 and 20 health care stations – one in each commune of Tra Linh and Trung Khanh district respectively. In 2015 the rate of malnourished children under 5 years old in whole province was 20.4% however the situation for the two subproject districts is better than the Provincial level at 17.1% and 14.1% for Tra Linh and Trung Khanh district respectively[22].

57. According to Tra Linh Statistic Year Book 2015 and annual reports of communes/townships, each commune/ township has a healthcare station with one medicine doctor and four nurses and midwives, one kindergarten, one primary school and one secondary school. The subproject communes are all connected to the national grid although the more remote villages some households do not have access because of the distance from the grid.

4. Education and Public Health

58. Kinder garten, primary school and secondary school facilities are available at commune level but high school is only located in district centers or in inter-commune locations where students from adjacent communes can access. There are 2 and 3 high schools in Tra Linh and Trung Khanh district respectively. Table 6 shows the school enrolment rate at age from 6 to 14 years old of two subproject districts.

Table 6 – School enrolment rates, 2015 (%)

	School enrolment rate at school aged from 6 to 14 years old	
	At primary school	At secondary school
Whole province	95	93
Tra Linh district	96.2	95.8
Trung Khanh district	100	98

Source: Cao Bang Statistic Yearbook 2015 and annual reports on SEDP 2015 of Tra Linh and Trung Khanh district

5. Social indicators

59. Percentage of household access electricity and percentage of malnourished children under 5 years old are show in Table 7 below.

Table 7 – Some social indicators

Indicators	**Hung Quoc Township**	**Xuan Noi commune**	**Quang Trung commune**	**Lang Yen commune**	**Lang Hieu commune**	**Trung Khanh township**

[22] The rate at provincial level was in 2014 according to the Cao Bang Statistic Yearbook 2015. The rate of two districts was in 2015 according to district annual report on SEDP 2015.

Percentage of household access electricity	100	99	100	100	100	100
Percentage of malnourished children under 5 years old	14.14	18.3	15.9	14.3	14.7	7.9

6. HIV and human trafficking

60. Overall, 93.78% of respondents (PPTA Social survey) had heard about HIV/AIDS with more women, 95.45%, as compared to 92.4% of women. For those that had some knowledge of HIV/AIDS, the main sources of information were television (92.12%) and health workers (70.54%). People had also received information from radio (34.4%), poster (21.58%) and from relatives or friends with 17.43%. Human trafficking has also not been recorded in the subproject area.

7. Unexploded Ordinance

61. In the farthest region of Northern Viet Nam, ordnance used by combatants during conflict that took place between 1962 and 1976, and also from border conflict with China, which went on into the 1980s. Unexploded ordnance (UXO) includes bombs dropped from aircraft, booby traps and land mines, all of which are indiscriminate and all of which result in concealment of the ordinance, defying the assessment of risks to a reliable level. Information on the extent and location of UXO is sparse at any level.

62. UXO devices are encountered when ploughing fields, searching for scrap metal and even by children playing. Within the subproject area, relatively higher risks occur at land close to the border, particularly with China. In recent years, UXO related accidents have occurred in areas near the Chinese border Information on the level of risk in any subproject area includes that available from local officials and residents, and records of incidents in the area, which are maintained by the Government agency, the Technology Centre for Bomb and Mine Disposal, under the Ministry of Defense. Risk assessment may also be based on the existing use of land to be used under the subproject, and the level of disturbance necessary in implementing the subproject: if land is already subject to foot and vehicle traffic, and disturbance such as plowing and excavations, is likely to be relatively safe. However UXO risks are always present to some degree when excavation is to take place.

D. Archaeological, Historical and Cultural Treasures

63. There are several archaeological sites that have been discovered in Cao Bang province, especially artifacts from Stone Age such as the Nguom Vai archaeological site in Can Yen commune, Thong Nong district; the Nguom Boc site in Nam Tuan commune, Hoa An district; and the Nguom Cang site in Dam Thuy commune, Trung Khanh district, outside the subproject area. In case excavations lead to the discovery of artifacts, procedures for addressing chance finds of antiques and artifacts will be set up for the construction phase.

E. Key Environmental Features

64. ***Physical environmental features:*** The subproject route runs through narrow valleys between low hills and Karst mountains and scattered cultivated areas of rice and corn. Bo That protection forest adjoins the road from Km12+500 to Km13, also the site of an important water

source for Ban Ngan village, Quang Trung commune, Tra Linh district. The road crosses the Bac Vong River at Km16+950.

65. ***Social environmental features:*** The road starts and ends at two town centers, Hung Quoc, Tra Linh district and Trung Khanh, Trung Khanh district. It goes through the residential areas of Xuan Noi, Quang Trung, Lang Yen and Lang Hieu communes, which include, schools, kindergartens and medical clinics. Quang Trung has the longest section of the road with nearly 10km running in its territory while Trung Khanh town has the shortest, of 1km. The Quang Trung market center and cattle market of Tra Linh district are also located at the roadside.

VI. ANTICIPATED ENVIRONMENTAL IMPACT AND MITIGATION MEASURES

66. This section discusses the potential environmental impacts of the subproject and identifies mitigation measures to minimize the impacts in all design, construction and operation phases of the subproject.

67. Activities during the construction phase will be mainly confined to the existing road footprint. The main physical issues relate to impacts such as vegetation clearance, earthworks, erosion control, obtaining rock based construction materials, spoil disposal, and disposal of other waste. The effects of these activities are examined.

68. Subproject implementation will impact on the lives of local people, especially those who live along the subproject road. There are several crowded residential areas along the subproject road, namely Hung Quoc town, Tra Linh town and Quang Trung commune.

69. The potential environmental impacts as well as the mitigation measures associated with the pre-construction, construction and operational phases are assessed below. The criteria for assessment are in line with ADB's Safeguard Policy Statement 2009 and the Government of Viet Nam standards based on the Environmental Protection Law (2014). Where government standards or guidelines have some kind of conflict with the ADB SPS, the ADB SPS will be applied as the policy for the subproject implementation. The EMP is presented below including mitigation measures and monitoring plan. Where government standards or guidelines conflict with the ADB SPS, the ADB SPS will be applied as the policy for the subproject implementation. The EMP is presented below including mitigation measures and monitoring plan for the implementation of the subproject road.

**A. Potention Impacts and Mittiation Measures in Pre-Construction Phase **

1. Land acquisition and resettlement

70. **Impacts:** The impact is mainly on several residential areas along the road namely Hung Quoc town; Xuan Noi commune center; Lung Lan, Ban Ngan, Quang Trung commune center, Sac Ha villages of Quang Trung commune; Ban Chien village, Lang Yen commune; Lang Hieu commune center and Trung Khanh town. Among 362 affected households, there are 7 seriously affected households (households that lost more than 10% of the total area of cultivated land or whose homes will be demolished or moved). In total there will be 34,756 m^2 of affected land, 15,397 m^2 is public land and only 2,731 m^2 is private residential land. The area of land used for annual crop is 7,327 m^2 and for trees is 4,137 m^2.

71. **Mitigation measures:** During the feasibility study phase, resettlement and land acquisition impacts have been identified and a Resettlement and Ethnic Minority Development Plan has been prepared. As there is only 7 households adversely affected by construction of the subproject, the REMDP will be updated and validated, and will provide for compensation and support of affected households, especially the 7 seriously affected households, as appropriate before construction starts. Arrangements will be made for regular monitoring and to record and redress grievances.

2. Disturbance of unexploded mine and bomb (UXO)

72. **Impacts:** Along the subproject road, there is some possibility that UXO remains from previous conflict. The risk should be verified by consultations with local residents to find out if there is knowledge of fighting in the area in recent decades.

73. **Mitigation measures**: The PMU will conduct consultations with roadside residents to determine any history of conflict in the area that may have resulted in items UXO being left in the area. The PMU will also verify with the Cao Bang Provincial Military Commanders to check whether the area along the subproject route has been checked for in the past. If a risk is identified following consultation, an authorized UXO clearing contractor will be engaged to undertake UXO detection and clearing along the subproject road. The PMU must ensure that the construction contractors shall only commence site works after the UXO clearing contractor has certified that the subproject areas as safe.

**B. Potention Impacts and Mittiation Measures in Construction Phase **

1. Route selection

74. **Impacts**: The proposed subproject involves upgrading 28km of road in 6 communes/town in 2 districts. As it goes through several residential areas, especially the narrow section through Ban Ngan village, Quang Trung commune, Tra Linh district where houses were constructed close to the roadsides, the impact intensity of dust, noise, vibration and traffic safety on local people living in this area will be multiplied. The risk of traffic accidents and movement difficulties will increase for local people and other people who travel on the subproject road.

75. **Mitigation measures:** Considering the crowed situation of the residential area in Ban Ngan village, Quang Trung commune, a bypass road section through the village from Km11 + 850 to km12 + 250 with 400m of Ban Ngan village, Quang Trung commune, Tra Linh district has been put in the subproject design. This bypass section will go through an area cultivated with

rice, on the right side of the existing road and close to the base of the mountain. All the affected land area has been calculated and proposed for compensation as stated in the resettlement and compensation report of the subproject. In line with ADB policy on environmentally responsible procurement, a new environmental assessment report will be undertaken for submission to ADB if there are any changes to subproject design that would result to environmental impacts or risks that are not within the scope of the current IEE.

2. Impact on flora and fauna along the road

76. **Impacts:** Construction work will involve some removal of trees along the route, mainly fruit trees and other small trees cultivated by people who live along the road. The construction activities will create noise, vibration that may disturb wild animals living in the forest area next to the road. Workers could hunt wild animals and cut down trees in the forest for fuel wood. These risks occur particularly in the vicinity of the Bo That forest. This is a minor impact and will take place over 24 months of construction time. The number of trees that will be cut down as part of the works will be small and the area of forest adjoining the road runs for only 500m, so the impact is not large.

77. **Mitigation measures:** Trees cultivated by local residents that will be removed, will be compensated under the provisions of the REMDP. To reduce the impact on further trees and vegetation, the Tra Linh Forest Ranger and DARD offices of Tra Linh and Trung Khanh districts will be informed about the construction time and schedule, scope of works as well as location of worker camps and material storage sites. No construction camps, bitumen heating facilities, depots or material storage sites will to be located in or near forested areas. Use of heavy machinery in the vicinity of the Bo That forest will be minimized. The contractor will not use or permit the use of fuel wood for construction activities or for cooking and water heating in worker's camps. The contractor will prohibit staff from hunting or collecting fuel wood or any other forest product from nearby forests and will not buy or use wood from illegal sources. The PMU assisted by the ESS and CSC will strictly supervise and monitor the protection of trees and other vegetation.

3. Impact on Utilities

78. **Impacts:** Relocation of some low-voltage electricity poles, water supply pipes, wastewater pipes or signage maybe necessary and some type of signboards along the current route. The potential impact is minor as it is only likely to occur at sites where minor realignment is to be done. Impacts will be brief, and will occur only over the 24-month construction period. In accordance to the compensation and resettlement data, there are four 0.4kv electric poles must be relocated with 250m electric line will be replaced.

79. **Mitigation measures:** Provision will be made in the contract for relocation as required, and to co-ordinate the relocation of services with Trung Khanh and Tra Linh Electric Operation Stations under Cao Bang Electric Power Company. Before construction starts, the PMU will work with these companies and the 6 CPCs to develop and implement plans to relocate the utilities and other affected structures and avoid or minimize service interruptions. The relocaiton plan shall specify roles and responsibilities for relocation, the timing and relocation location sites. If any facilities are accidentally damaged during construction period, the damage should be reported to CSC and PMU as well as the owner of the facilities before repair at the contractor’s expense.

4. Impacts of materials excavation and extraction

80. **Impacts:**. Three commercial quarries, listed as authorized by the Mineral and Mining Division, Cao Bang DONRE and two soil pits have been identified to meet the materials needs for the project. excavation works and the extraction of materials at the quarries and borrow pits may result in the release of soil and silt, which may also be released from materials stockpiles along the road, blocking nearby streams and potentially affecting water quality in the surrounding water bodies. The impact is minor as the main work is upgrading the road surface and the excavation and extraction construction material volume is not large. The estimated volume of stone using for the subproject road construction is about 84,398 m^3 and the estimated volume of filling soil for embankment is about 144,397 m^3, of which 127,813 m^3 could be reused from the excavated soil.

81. **Mitigation measures:** To prevent the release of silt into waterways, the contractors will use of silt fences around excavation sites, quarries and borrow pits; On completion of extraction work, quarries and borrow pits will be closed, rendered safe and improved as agreed with landowners as soon as possible upon exploitation complete, including landscaping and planting works as appropriate.

5. Impacts of the temporary material stockpiles

82. **Impacts:** About 7 main temporary material stockpiles will be located along 28 km road construction site. Fine material like sand and soil could generate dust in the dry conditions; and the material could be discharged into surrounding water bodies in wet conditions. Stockpiles placed at the roadside could make impede movement along the road and cause danger by constricting the road width and reducing visibility.

83. **Mitigation measures:** To minimize the impact, the contractor will work with local authorities in advance to identify acceptable locations for the temporary stockpiles. The proposed locations are around the proposed area for surplus soil dumping at Km2+700; Km4+000; Km10+400; Km14+900; Km18+900 and Km20+400. Stockpiles of material prone to dust generation (fine material like sand) will not be located within 50m of schools, medical clinics or other public infrastructures such as pumps and wells and should be covered with tarpaulin when not in use and at the end of the working day to enclose dust. In the case of large stockpiles (more than 25 m^3) of crushed materials, they should be enclosed with side barriers and also cover with tarpaulin when not in use. Especially, temporary storage areas must not be located in section from Km12+500 to Km13 and must be covered with canvas and fenced with signboard to avoid passing people.

6. Generation of surplus soil

84. **Impacts:** Soil from excavation activities, which could not be reused as fill soil, could have significant impacts such as soil erosion when placed on slopes, as well as release of silt.

85. **Mitigation measures:** Where surplus material is acceptable for use as fill, it will be graded and placed in fill sites for construction. Other surplus material will be made available to local people for uses such as the construction of level areas for recreation or building platforms. The CPCs will organize the distribution of surplus soil. Any remaining surplus material could be deposited at locations agreed with CPCs of the 6 commune/town. 6 CPCs will organize the distribution of surplus soil for local people who wish to use it.

86. For any remaining surplus material not used as fill or distributed to local people, the following list of potential disposal sites is presented to guide Contractors. The contractors should work with local authorities to identify satisfactory dumping and disposal sites before construction starts.

Table 8 – List of proposed locations for surplus soil disposal[23]

No.	Location	Managed by	Estimated volume (m^3)
1	Left side Km2+700	Hung Quoc town PC, Tra Linh district	360,000
2	Left side Km4+000	Xuan Noi CPC, Tra Linh district	350,000
3	Right side Km10+400	Quang Trung CPC, Tra Linh district	60,000
4	Left side Km14+900	Quang Trung CPC, Tra Linh district	200,000
5	Left side Km18+900	Lang Hieu CPC, Trung Khanh district	75,000
6	Left side Km20+400	Lang Hieu CPC, Trung Khanh district	49,000

7. Generation of construction waste

87. **Impacts:** Solid waste that will be generated from construction mainly includes waste from workers' camps, debris, and packaging of materials and equipment including bitumen drums, oil containers, crates and cardboard. Some may be contaminated with hazardous or semi hazardous substances. Domestic waste from workers camps may include organic waste, as well as plastic and other packaging and semi toxic items such as used batteries. Other waste will be generated at workshops, storage sites, refueling sites and depots. This is an average impact, as the construction sites, workshops and depots will be at various locations along the 28 km length of the subproject road including residential areas. At these towns there are no engineered landfill facilities and the towns have been listed as seriously polluted areas in accordance to DONRE's Pollution control report 2015. Uncontrolled waste disposal could further reduce the water, ambient air and soil quality and heavily impacts on local people in the subproject area.

88. **Mitigation measures:** Contractors will be required to (i) reuse construction waste such as cement bag cover, metal tools where possible and (ii) install rubbish bins at work sites and in worker's camps to allow efficient collection of waste and transport the solid waste to a disposal site approved by the CSC.

8. Impact from bitumen heating activities and asphalt concrete mixing plant

89. ***Description:*** The operation of asphalt concrete mixing plant will generate noise and dust and paved works will generate gas and odor from the bitumen heating and noise from the compaction machines. Although the emissions from powered mechanical equipment and asphalt concrete mixing will be rapidly dispersed in the open terrain they will need to be sited carefully to avoid complaints. The impact will happen at the construction sites along the subproject road and

[23] This list has been discussed and initially agreed with the CPCs of Hung Quoc, Xuan Noi, Quang Trung, Lang Yen, Lang Hieu and Trung Khanh CPCs. Details are showed in Geological survey report for PR211 by the PPTA

affect on local people living in the surrounding areas. Bitumen heating construction could create a risk of forest fire, if fuel wood in open fires is used for bitumen heating.

90. **Mitigation measures:** To minimize the negative impact, the contractors should ensure that bitumen heating take place at least 500 m away from residential areas (namely Hung Quoc town; Xuan Noi commune center; Lung Lan, Ban Ngan, Quang Trung commune center, Sac Ha villages of Quang Trung commune; Ban Chien village, Lang Yen commune; Lang Hieu commune center and Trung Khanh town) and especially the Bo That protection forest in Quang Trung commune, PMU and CSC will responsible to monitor this mitigation measure during the 24-month of construction phase.

9. Impact from noise, dust and vibration generated by the construction activities

91. **Impacts:** Earthworks and rock crushing activities will be the main sources of dust. Construction machines and vehicles will generate gaseous emissions (NOx SOx, CO, CO_2, etc.) when they are in operation. These gaseous emissions and dust could cause health problems for residents who live near the construction site and along the transportation route, especially at the sensitive points such as schools, kindergartens, markets, commune centers, medical clinics. Wild animals in the Bo That protection forest and some birds and reptiles in some nearby forested areas. The Karst Mountains could also be affected by noise, vibration and dust and emissions from the construction activities. The impact is considered as average as the subproject road goes through several residential areas.

92. **Mitigation measures:** Similar to the mitigation measure for impact from bitumen heating and asphalt concrete mixing plant, the contractors should not locate any noisy machines, or large materials storage sites near or within Bo That protection forest and residential areas. Depots where plant are operated should be located at least 50m away from these sensitive points. The contractors will work with 6 CPCs, with the representative of ESS and PMU, to identify areas for depots will also include a materials transportation plan in the Contractors Environmental Management Plan. PMU and CSC will responsible to monitor these mitigation measures.

10. Landslide, soil erosion and runoff

93. **Impacts:** Roadside erosion and runoff could happen during rain, at the roadside and at borrow areas. Erosion and runoff could impact on the small rice fields of local people along the road. Landslides could happen in sections with high slopes adjoining the road, especially when the vegetation cover is cleared likes Km13+800, near Bac Vong River; Km16+400 at Ban Chien mountain in Lang Yen commune, near the border with Quang Trung communes; Km19+900 at Keo Tam quarry, Lang Hieu commune. Landslides will damage the road and block movement and release silt into nearby water bodies.

94. **Mitigation measures:** To minimize the negative impacts during the 24-month construction period, contractors will confine activity at hazard prone sites to the dry season and take all reasonable precautions to minimize the release of silt into the ream, and avoid release of any chemical or human waste contaminants into the water.

11. Impact on crossing streams or bridge construction locations

95. **Impacts:** Careless construction and poor handling of materials at bridge sites can cause blockages and release of silt to rivers and streams. Runoff water during its rain could bring waste and soil into Bac Vong River, cross subproject road at Km14+200. That could lead to siltation and reduce the water quality and affect downstream user at Trung Phuc, Than Hoe and Thong Giap communes of Trung Khanh district as the local people are still using water from the river as one source of domestic water supply.

96. **Mitigation measures:** To minimize the negative impact, the contractors should transport excavated material to use as fill, distribute to local users or take to approved disposal sites immediately. Silt fences and sediment barriers or other devices will be used as appropriate at bridge construction sites.

12. Impact by the influx of construction workers

97. ***I*mpacts*:*** About 100 workers will be mobilized discontinuously in 24-month construction phase. The influx of construction workers can cause (i) a burden on local public services like electricity and water supply (ii) risk of transmission of diseases to the subproject area (iii) conditions for great spread of diseases such as sore eyes, cholera, flu and respiratory problems (iv) risk of social problems such as gambling, drug addiction, prostitution, and violence. The impacts would be on both workers and on the communities near the construction sites in residential.

98. **Mitigation measures*:*** (i) Careful siting of workers' camps and facilities as agreed by local communities and approved by the PMU that the camps should be located in areas with sufficient drainage to avoid water logging and formation of breeding sites for mosquitoes and flies (ii) Registration of workers with local police while resident in the subproject area (iii) workers' camps and other depots should be maintained to ensure that site drainage continues to be effective (iv) workers should have health checks before start work in the subproject and should be trained for living and working behavior before joining the sites (v) engaging local people including for unskilled or semi stkilled tasks to the extent that they are able and willing to undertake them. Local people in the residential area of the 6 subproject communes/towns will benefit from the subproject construction.

13. Safety of local people and construction workers

99. **Impacts:** Works and the public are at risk of accidents associated with construction, particularly excavations, and operations involving heavy machinery. Material transport and construction activities on the existing road may create the risk of traffic safety and affect houses and other structures on roadsides, particularly on the sensitive receivers such as Hung Quoc primary school, Hung Quoc high school and secondary school, the cattle market of Tra Linh district, Xuan Noi medical clinic, Xuan Noi secondary school, Xuan Noi primary school, Quang Trung primary and secondary school, general clinic of Tra Linh district, Quang Trung kindergarten, Quang Trung market, Lang Hieu medical clinic, Trung Khanh continuous education center, Trung Khanh kindergarten, Trung Khanh primary and secondary school.

100. **Mitigation measures:** The contractors will (i) conduct training for workers on safety, including roles and responsibilities, safe site practices and environmental hygiene (ii) institute site and camp rules such as wearing proper safety apparel such as safety boots, helmets, protective clothes, gloves and ear protection, (iii) ensure vehicle and plant operators are trained

and licensed (iv) ensure all excavation sites are fenced with sign boards and perimeter markers and (v) allocate responsibility to supervisor staff to ensure that all safety rules are followed by all staff at all times. The project will take note of opinions and complaints from local people and authorities on safety.

14. Impact on local traffic

101. **Impacts:** Construction activities on the Subproject road are likely to cause hindrance in traffic flow if not mitigated properly especially when there is no other option for travelling. There are several schools and kindergartens located along the road. Children and pupils will have difficulty getting to schools, especially for pupils in Ban Chien village, Lang Yen commune, as they need to travel 5 km to reach their school in Quang Trung commune. The general clinic of Tra Linh district is also located in Quang Trung commune, about 14 km from the start point of the road at Hung Quoc town, the center of Tra Linh district. The cattle market of Tra Linh district is located along the subproject road, about 1 km from the start point. It will make difficulties for people to reach general clinic and cattle market during the construction phase. The road runs along the narrow valleys and there is only one junction to Tri Phuong and Trung Phuc communes. Local people and people from other areas who travel on the subproject road will be affected during 24 months construction period.

102. **Mitigation measures:** To minimize the disturbance to local people, the contractor will prepare and submit to the CSC a construction transport plan indicating the timing of vehicle journeys to avoid peak traffic hours, parking areas and any temporary access roads to be used. The contractor will also coordinate with local traffic authorities to implement appropriate traffic diversion schemes to avoid inconvenience due to subproject operations to road users and schedule transport of material to avoid congestion, setup clear traffic signal boards and traffic advisory signs at the start and end point of the road, at the junction to Tri Phuong and Trung Phuc communes and at the sensitive locations likes schools, kindergartens, medical clinics and markets. The contractor will also install bold diversion signs that would be clearly visible even at night and provide flag persons to warn of dangerous conditions. A traffic officer will be designated for each construction site.

C. Potention Impacts and Mittiation Measures in Operation Phase

1. Impact from dust and noise arising from increasing of traffic density and traffic safety

103. **Impacts:** The improved road surface will create a safer running course and reduce dust emission from traffic as well as noise, though these benefits will be reduced as traffic density and driving speeds increase. Noise, dust and vibration could have negative impact on the local people living along the subproject road, especially the sensitive points such as schools, kindergartens, commune centers, markets and medical clinics. Increased driving speeds could also affect community safety issues.

104. **Mitigation measures:** The enforcement of speed limits and / loading limit by police and DOT help reduce safety risks and noise nuisance. Installation of traffic calming measures such as speed humps in high risk areas. Regular maintenance will be necessary to ensure that the pavement, road markings and road signage does not deteriorate.

2. Favorable conditions for transportation of goods and people movement

105. **Impacts:** The paved road will reduce journey times and vehicle operating costs. The completion of the Bac Vong bridge will enable the road to be used even during high water conditions. The road will support economic activity and enable access to markets and services for local people.

VII. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

106. The objectives of the stakeholder consultation process that took place during subproject preparation was to disseminate information on the subproject and its expected impact, long-term as well as short-term, among primary and secondary stakeholders, and to gather information on relevant issues so that the feedback received could be used to address these issues at early stages of subproject design. Another important objective was to determine the extent of the concerns amongst the community, to address these in the subproject implementation and to suggest appropriate mitigation measures.

A. Public Consultation Preparation

107. Stakeholders are people, groups, or institutions that may be affected by, can significantly influence, or are important to the achievement of the stated purpose of a proposed intervention. The stakeholders consulted for the construction of the PR211 included representatives from Cao Bang DPI, DONRE, and DARD. Consultation has also been implemented with representatives from 6 CPCs in Tra Linh and Trung Khanh districts. Among 55 people have been consulted, 17 are women, make up 30.9%. Consultations took place in September 2016.

B. Information Dissemination During Public Consultation

108. Providing information through local authority offices will provide a conduit for the improvement of the subproject implementation to better serve the stakeholders. Public consultation can also assist in:

i) Harnessing cooperation from informed people to help local authorities reconfirm the extent of local permits and licenses that will be required at a later stage;
ii) Obtaining cooperation from informed residents and groups which to avoid cost and time in dealing with complaints;
iii) Identifying local infrastructure subprojects or other local initiatives that will interface with the subproject roads with assistance from informed local authorities;
iv) The collection of relevant information on the current condition of the local environment including aspects of forest and wildlife and conservation.

109. The information disseminated during public consultation included: (i) background of the Project and subproject; (ii) basic information related to ADB and the Government requirement for environmental protection and management; (iii) potential impacts during subproject implementation and mitigation measures; and (iv) the grievance redress mechanism.

C. Use of the Results From Public Consultation

110. The results of the public consultations are recorded in Table 9 and 10 below. In general, all the relevant stakeholders are support the implementation of the subproject. As the subproject is located in a low population density and the main construction work will be to upgrade road surface based on the existing road foundation, no house needs to must be relocated and no major land acquisition will be involved, the local people is totally support the subproject.

Table 9 – Main issues and information from local authorities

Main issues	Information from relevant authorities
Forest in the subproject area	Cao Bang DARD: There is no special forest in the subproject area and its vicinity. There is only some bunch of protection forest on the Karst Mountains along the road and local people have already cultivated in the area around the base of the mountain.
Biodiversity in the subproject area	Cao Bang DONRE: There are 8 nature reserve/ conservation areas in Cao Bang but they are all far from the subproject area. There is no rare or endangered fauna and flora species in the subproject area

Table 10 – Main environmental concerns from public consultation

Concerns expressed	How concerns are addressed in IEE
Hygiene and safety condition in construction phase, especially cattle market area in Hung Quoc town	The ESS will conduct training for workers on safety and environmental hygiene. The Contractor will make rules for the construction camps to encourage environmental protection and avoidance of harmful social effects. All excavation sites will be fenced and sign boards installed. The CSC and PMU will be responsible for supervision activities during construction phase and will arrange timely responses to grievances from local people and authorities
Narrow road at section through Ban Ngan village with houses adjacent to the road.	A 400-meter bypass will be constructed to avoid the crowded residential area with houses adjacent to the road
Pollute Bo That water source at KM12+8	The contractors will store lubricants, oils, paints and other hazardous substances in designated areas with roofs and impervious floors at least 100m from water bodies. Silt fences should be installed in suitable locations to trap soil particles and prevent their entry into water bodies. Materials storage sites should also be covered carefully with canvas and located at least 100m away from water bodies, where the material contains fine particles. PMU and CSC will responsible to monitor these mitigation measures.
Inundation at the current drift in Bac Vong River makes difficulty for travelling in the flood season	A new bridge will be made over the Bac Vong River. The bridge is to be made with pre-stressed concrete, will have a 8m width, and appropriate design load

111. The environmental assessment process under the SPS 2009 requires the disclosure of the IEE. The IEE, including the EMP will be displayed at the PPC Headquarters and on the ADB website. Cao Bang PMU will responsible for IEE translation to Vietnamese and disclosure at Xuan Noi, Quang Trung, Lang Yen, Lang Hieu communes; Hung Quoc, Trung Khanh towns of Tra Linh and Trung Khanh districts.

VIII. GRIEVANCE REDRESS MECHANISM

A. Purpose of the mechanism

112. During the preparation of the subproject, information is disseminated to local people on the scope of the subproject; environmental, social impacts and the grievance redress mechanism. Negative impacts of an environmental or social nature, or resettlement impacts, may occur during the construction and operational phases. Any comments/ suggestions of local people will be solved quickly, transparently in accordance with protected the law, particularly for people affected by the subproject. This grievance redress mechanism is classified by level and responsibilities of involved parties. The GRM will be disclosed with the IEE and other safeguard documents to ensure that potentially affected persons are aware of it and their entitlement to raise complaints. During construction, the Contractor will appoint a member of his staff to act as the focal point, who will liaise with the Community Supervision Board and, if appropriate, the complainant(s) to address and seek solutions to any grievance that relates to the Contractor's actions.

B. Grievance redress process

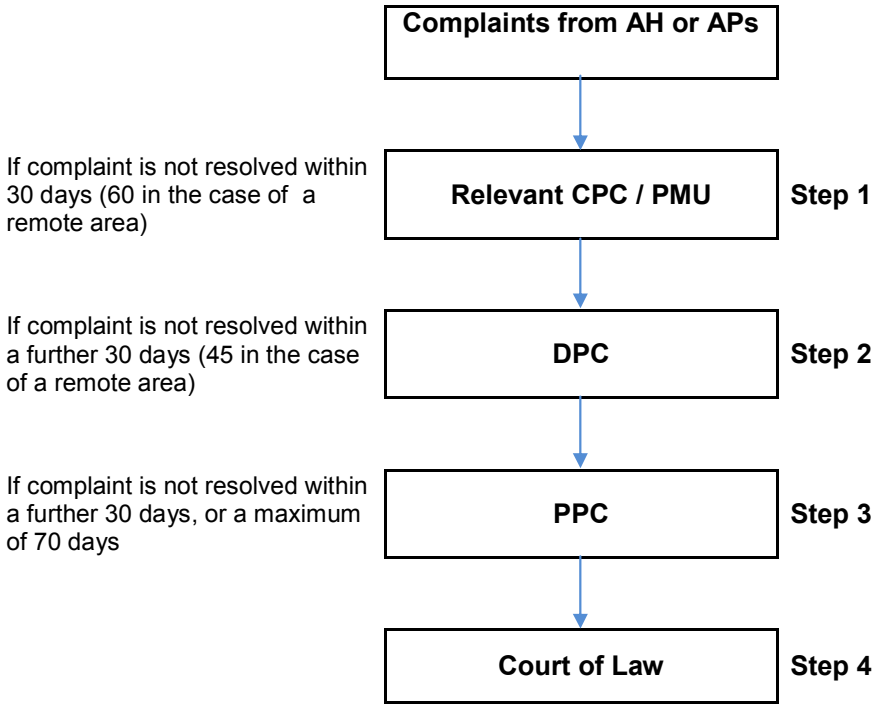
113. There are three steps to address complaints received from stakeholders:

***Stage 1*:** If a household or individual has any complaint he/she can submit a complaint in written or verbal form to the representative of the CPC-community monitoring board (usually the Deputy Chairman of the commune/town). The CPC will work with PMU to solve complaints and a representative PMU will respond in written form to the complainant. The CPC, as a whole body will meet personally with the aggrieved affected household and will have 30 days and a maximum of 60 days after the lodging of the complaint to resolve the complaint, however, depending upon whether it is a complicated case or case comes from a remote area. The CPC secretariat is responsible for documenting and keeping file of all complaints that it handles.

Stage 2: If after 30 days or 45 days (in remote areas) the aggrieved affected household does not hear from the CPC, or if the affected household is not satisfied with the decision taken on his/her complaint, the affected household may bring the case, either in writing, to any member of the DPC. The DPC in turn will have 30 days or a maximum of 70 days after the lodging of the complaint to resolve the case, however, depending on whether the case is complicated or in remote area. The DPC is responsible for documenting and keeping file of all complaints that it handles and will inform the District Resettlement Committee (DRC) of any decision made and the DRC is responsible for supporting DPC to resolve AH's complaint. The DPC must ensure that the complainant is notified of the decision made

Stage 3: If after 30 days or 45 days (in remote area) the aggrieved affected household does not hear from the DPC, or if the affected household is not satisfied with the decision made on his/her complaint, the affected household may bring the case, either in writing, to any member of the PPC. The PPC has 30 days or a maximum of 70 days to resolve the complaint to the satisfaction of all concerned. However, depending if the case is complicated or from a remote area The PPC is responsible for maintaining records of complaints received, action taken and outcomes.

Stage 4: If efforts to resolve disputes using the grievance procedures remain unresolved or unsatisfactory, after a period of thirty days, complainants have the right to bring the case to a Court of law for adjudication. The decision of the Court is binding on all parties.



IX. ENVIRONMENTAL MANAGEMENT PLAN

A. Implementation Arrangements

114. Cao Bang PMU will recruit one Environment Safeguard Specialist (ESS) under the Loan Implementation Consultants (LIC) to support subproject implementation in Cao Bang. The ESS will support the PMU to update the EMP and as well as monitor the compliance of the contractors during construction phase. The ESS will also be responsible for training and capacity building on the implementation of the EMP.

115. The PMU will engage a Construction Supervision Consultant (CSC) for the monitoring and supervision of the subproject in general and for environmental monitoring as well. CSC will ensure that the contractors implement the provisions of the subproject EMP.

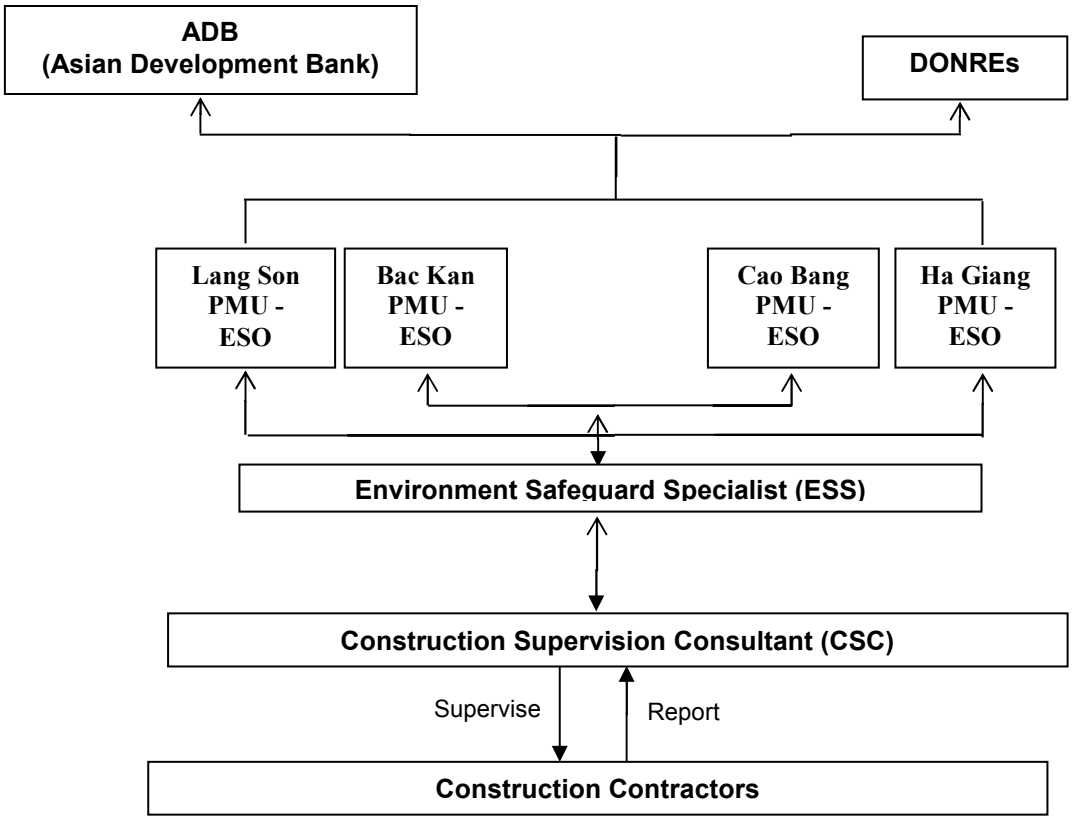
Table 11 – Responsibilities for EMP implementation

Agency	Responsibilities
Cao Bang Project Management Unit under DPI (PMU)	- Ensure that EMP provisions are strictly implemented during various subproject phases (design/pre-construction, construction and operation) to mitigate environmental impacts to acceptable levels. - Undertake monitoring of the implementation of the EMP (mitigation and monitoring measures) with assistance from CSC and ESS. - Ensure that Subproject implementation complies with ADB's environmental policy and safeguards policy statement (SPS 2009) principles and requirements - For subproject duration, commit and retain dedicated staff within PMU as environment and safeguards staff to oversee EMP implementation - Ensure that environmental protection and mitigation measures in the EMP are incorporated in the detailed design. - With the support from ESS, updated EMP to suitable with any changing in subproject scope or any unanticipated impact rise. - Obtain necessary environmental approval(s) from DONRE prior to award of civil works contracts - Include the Subproject updated EMP in the bid and contract documents for civil works - Establish an environmental grievance redress mechanism, as described in the IEE, to receive and facilitate resolution of affected peoples' concerns, complaints, and grievances about the Subproject's environmental performance - With assistance from ESS, prepare semi-annual environmental monitoring reports for submission to ADB - Based on the results of EMP monitoring, identify environmental corrective actions and prepare a corrective action plan, as necessary, for submission to ADB.
Environmental Safeguards Staff (ESO)	- PMU staff support for EMP implementation - Work closely with ESS to daily supervise of EMP implementation and preparation of EMP monitoring report
Environment Safeguard Specialist (ESS)	- Update EMP to make it suitable with the current condition or whenever subproject scope change or any unanticipated impact rise. - Ensure that the environmental protection and mitigation measures identified in the EMP for the design stage has been incorporated in the detail design; - Assist PMU to ensure that all environmental requirements and mitigation measures from the IEE and EMP are incorporated in the bidding documents and contracts. - During detailed design phase carry out baseline data collection on air quality, noise and surface water quality (as specified in the EMP)

	- During detailed design phase, prepare method statement (Waste Management and Spoils Disposal Plan) described in the IEE/EMP. - Implement all mitigation and monitoring measures for various subproject phases specified as ESS's tasks in the EMP - Work with PMU to execute any additional environmental assessment prior to subproject construction as required in the EMP (e.g., preparation of new or supplementary environmental assessment in case of change in alignment that will result to adverse environmental impacts that are not within the scope of the IEE prepared during loan processing, etc.) - Undertake environmental management capacity building activities for PMU as described in the IEE and EMP. - Engage international and national environment specialists to ensure proper implementation of EMP provisions. Through these specialists, the ESS shall: (i) ensure proper and timely implementation of ESS's tasks specified in the EMP, (ii) conduct environmental training as specified in the IEE/EMP for PMU, (iii) conduct workers' orientation on EMP provisions, (iv) undertake regular monitoring of the contractor's environmental performance, as scheduled in the EMP (v) conduct field measurements for surface/ground water quality, dust and noise as required in the EMP, and (v) prepare environmental baseline report and environmental semi-annual environmental monitoring reports , as specified in the EMP, for submission to ADB.
Construction Supervision Consultant (CSC)	- Provide the ESS relevant information as well as full access to the subproject site and all project-related facilities (such as construction yards, workers' camps, borrow and quarry areas, crushing plants, concrete mixing plants, etc.) to monitor contractors' implementation of the subproject EMP, assess environmental impacts resulting from on-going site works and operation related facilities, undertake environmental effects monitoring and orientation of workers on EMP implementation. - Undertake day-to-day subproject supervision to ensure that contractors properly implement the EMP. - Orient workers on EMP implementation, and health and safety procedures - Document and report to PMU on occupational accidents, diseases and incidents - As part of regular progress report submission to PMU, prepare reports on the status of the contractors' implementation of the EMP and health and safety issues - Engage an environmental staff to ensure proper implementation of the above tasks.
Contractors	- Recruit qualified environmental officer to ensure compliance with environmental statutory and contractual obligations and proper implementation of the Subproject EMP - Provide sufficient funding and human resources for proper and timely implementation of required mitigation measures in the EMP - Implement additional environmental mitigation measures, as necessary
Cao Bang Department of Transportation (DOT)	- Responsible for operation and maintenance of Subproject road - Implement EMP monitoring during operation
Cao Bang Department of Natural Resources and Environment (DONRE)	Review and approve environmental assessment reports required by the Government. - Undertake monitoring of the subproject's environmental performance based on their mandate

The organization structure of Environmental Management Plan is showed in the chart below:

Figure 4 – EMP Implementation Organization Chart



B. Environmental Impact Mitigations

116. The anticipated environmental impacts and mitigation measures discussed in the previous section is presented in Table 12. The table also shows responsibilities and timeframe/schedule for implementation of mitigation measures and monitoring.

117. Table 12 shows that most mitigation activities during pre-construction are to be implemented by the ESS while during construction, measures shall be primarily implemented by the contractors. During the operation stage, DOT shall undertake environmental mitigation and monitoring requirements specified in the EMP. To ensure implementation of mitigation measures during construction, the EMP shall be included in the tender and contract documents for civil works. Contractors' conformity with environmental contract procedures and specifications shall be regularly monitored by PMU with assistance from CSC and results shall be reported semi-annually to ADB.

Table 12 - Detailed Environmental Mitigation Plan

		Impact Mitigation				
Environmental Concern	Objective	Proposed Mitigation Measures	Responsible to Implement	Timing	Locations	Mitigation Cost
Design and Pre-construction Phase						
1. Land acquisition and resettlement	Control the impact of land acquisition and resettlement	Monitor the compensation process to ensure it is suitable with the Land Acquisition and Resettlement Report	ESS	Before construction	N/A	Included in the contract with ESS
3. Unexploded Ordnance	Avoid accidents due to any kind of UXO	1. Coordinate with appropriate agencies at the design stage to identify if UXO is a potential threat to works 2. Based on the findings, engage an authorized UXO clearing contractor, as necessary. 3. Ensure that the contractors shall only commence site works after the UXO clearing firm has certified that the subproject areas are already cleared.	ESS	Before bidding	N/A	Included in the contract with ESS
Construction Phase						
1. Route selection	Avoid and minimize intensified construction impact on residential area of Ban Ngan village, Quang Trung commune, Tra Linh district	1. Construct 400-meter bypass road to avoid go through narrow section at Ban Ngan village, Quang Trung commune. 2. Apply all mitigation measures for this bypass as other sections of the subproject road.	CPCs; Contractors	Through out construction phase	At the 400m bypass section	Included in the contract with contractors
2. Impacts to flora and fauna	Avoid and minimize impact to flora and fauna in the subproject area	1. Minimized vegetation covers clearances. 2. All replanting works to utilize locally available non-invasive species. 3. The contractors will not use or permit the use of wood as a fuel for the execution of any part of the works, including but not limited to the heating of bitumen and bitumen mixtures, and to the extent practicable shall ensure that fuels other than wood are used for cooking, and water heating in all camps and living accommodations. 4. Contractors shall not buy or use wood from the illegal sources (that come from the illegal logging) 5. No construction camps, concrete mixing plants, material storage sites are to be	CPCs; Contractors	Through out construction phase	Along the subproject road, especially 500 m go through Bo That protection forest; worker camps area	Included in the contract with contractors

		located along Km12+500 to Km13 - near Bo That protection forest. 6. Contractors will take all precautions necessary to ensure that damage to vegetation is avoided due to fires resulting from execution of the works. The Contractors will immediately suppress the fire, if it occurs, and shall undertake replanting to replace damaged vegetation.				
3. Local facilities	Prevent interruption of services such as electricity and water supply during relocation of the local facilities. Repair damaged access roads.	1. Reconfirm power, water supply, and telecommunications likely to be interrupted by the works. 2. Contact all relevant local authorities for facilities and local people to plan re-provisioning of power, water supply, and telecommunication systems. 3. Facilities shall be relocated and reconnected well ahead of commencement of construction works and contractors shall coordinate with facility company for relocation and reconnection well before works commence. 4. Affected communities shall be properly informed in advance. 5. Reconnection of facilities shall be done at the shortest practicable time before construction commences. 6. Facilities damaged during construction shall be reported to the CSC, PMU and facility authority and repairs arranged immediately. 7. Access roads, agricultural land and other properties damaged during transport of construction materials and other project-related activities shall be reinstated upon completion of construction works at each section	Contractors	Before construction start and through out the construction phase	Along the subproject route	Included in the contract with contractors
4. Materials exploitation and management of quarry, borrow pits and temporary storage area	Minimize impacts from materials extraction, transportation and storage.	1. Prioritize use of Lung Mo, Coc Cang, Keo Thin Lan quarries and Sac Ha, Cho Mo borrow pits and update the list of quarries and borrow pits monthly and report to PMU and minimize impacts on other local resources. 2. Reestablish vegetation cover and trim slopes to an even profile at any closed	Contractors	Though out construction phase	Subproject site, quarries and borrow pit areas	Included in the contract with contractors

		quarries and borrow pits 3. Stockpile topsoil for later use and fence and re-contour borrows pits after use. Topsoil, overburden, and low-quality materials shall be properly removed, stockpiled near the site, and preserved for rehabilitation. 4. During quarry/borrow site operation, provide adequate drainage to avoid accumulation of stagnant water. 5. Ensure borrow pits are left in a tidy state with stable side slopes and proper drainage in order to avoid creation of water bodies favorable for mosquito breeding. 6. Upon completion of extraction activities, quarry and borrow pits shall be dewatered and fences shall be installed, as appropriate, to minimize health and safety risks. 7. To avoid drowning when pits become water filled, measures such as fencing, providing flotation devices such as a buoy tied to a rope, etc. shall be implemented.				
5. Waste and spoil disposal	Control spoils and waste disposal, lubricant and hazardous wastes.	1. Areas suitable for disposal to be agreed with CPCs and Cao Bang DONRE checked and recorded by the CSC, ESS/PMU and monitored 2. Spoil and waste will not be disposed of in streams or other surrounding water bodies, shall only be disposed to areas approved by local authorities as listed in Table 8 of this IEE. 3. Surplus material to be distributed to local people for use in landscaping/ forming building platforms. 4. Spoil disposals shall not cause sedimentation and obstruction of flow of watercourses, damage to agricultural land and densely vegetated areas. 5. Under no circumstances will spoils be dumped into watercourses (rivers, streams, drainage, irrigation canals, etc.) 6. Spoil disposal sites shall be away watercourses and shall be protected from erosion by avoiding formation of steep slopes and grassing.	Contractors	Through out construction phase	Through out construction site, material storage areas, machines and vehicles maintenance area	Included in the contract with contractors

6. Bitumen heating and concrete mixing plant	Avoid air pollution, traffic obstacles and contamination	1. Locate mixing plant, bitumen heating off road and (wherever practicable) at least 500 m from nearest sensitive receivers (residential areas, schools, clinics, etc.) and streams and install and maintain dust suppression equipment. 2. Concrete mixing areas shall be protected against spills and all contaminated soil must be properly handled according to applicable national and local laws and regulation. As a minimum, these areas must be contained, such that any spills can be immediately contained and cleaned up. 3. Prevent soil contamination requiring contractors to instruct and train their workers on storage and handling of materials and chemicals that can potentially cause soil contamination. 4. Recycle debris generated by dismantling of existing pavement subject to the suitability of the material.	Contractors	Through out construction phase	Through out construction site	Included in the contract with contractors
7. Noise, dust and vibration	To minimize negative impacts from noise, dust and vibration during construction period	1. Restrict works to daylight hours within 500 m of residential settlements and local clinics. 2. Powered mechanical equipment and vehicle emissions to meet national TCVN/QCVN standards. All construction equipment and vehicles shall have valid certifications indicating compliance to vehicle emission and noise creation standards. 3. Monitor and investigate complaints; follow the Grievance Redress Mechanism of the project. 4. Keep material storage site moist 5. Tightly cover trucks transporting construction materials (sand, soil, cement, gravel, etc.) to avoid or minimize spills and dust emission. 6. On rainless days undertake watering, at least twice per day, on dusty and exposed areas at construction yards, materials storage sites, construction sites, access roads, quarry areas, borrow sites and other subproject areas where residential sites and other sensitive points such as schools, clinics… are located nearby.	Contractors	Through out construction phase	Through out construction site especially 500 m go through Bo That protection forest	Included in the contract with contractors

		7. Clean up road surfaces after work. 8. To protect buildings and structures from vibration, non-vibrating roller shall be used in construction sites near buildings and structures. 9. Structures, which are damaged due to vibration caused by the construction activities, shall be repaired at the cost of the contractor. 10. Machinery shall be turned off when not in use. 11. Pile driving during to be schedule for daytime if construction site is near sensitive points or approved by DONRE, CPCs and ESS/PMU. 12. Impose speed limits on construction machines and vehicles to minimize dust emission along areas where sensitive pints are located (houses, schools, clinics, pagodas etc.) Speed limits to be imposed by setting up warning signs, instructions to drivers and monitoring of driver behaviour.				
8. Erosion control/ run off	Protect established facilities	1. Establish vegetation and erosion protection immediately after completion of works in each stretch / sector. 2. Stockpile topsoil for immediate replanting after cutting. 3. Minimize damage and excavation of surrounding vegetation during slope formation. 4. Protect the cut slope with planted vegetation, bioengineering or conventional civil engineering structures as soon as practicable after excavation. 5. Include and implement appropriate measures for slope protection, i.e. vegetation cover and stone pitching, as required in the detailed construction drawings. 6. Prevent erosion and protect the excavated slope with temporary or permanent drainage as soon as practicable after cutting. 7. If new erosion occurs accidentally, back fill immediately to restore original contours. 8. Low embankments will be protected from	Contractors	Through out construction phase	Through out construction site and high risk slope as agreed with ESS/PMU	Included in the contract with contractors

		erosion by seeding and planting indigenous grasses that can flourish under local conditions. 10. Payments will be linked to the completion of the works as indicated by the installation of erosion control measures to protect the works to the satisfaction of ESS/PMU.				
9. Streams/ Rivers protection and bridge/culvert construction	Protect Streams/ Rivers and maintain flows	In sections along and near streams and water bodies: 1. Rocks and stones will be disposed or provided to local people and will not be left in streams. 2. Cofferdams, silt fences, sediment barriers or other devices will be used as appropriate based on the design to prevent migration of silt during excavation and boring operations within streams. If cofferdams are used, these will be dewatered and cleaned to prevent siltation by pumping from cofferdams to a settling basin or a containment unit. 3. Other erosion control measures above and covering open surfaces with grasses and creepers to reduce runoff will be implemented as early as possible in construction.	Contractors	Through out construction phase	Bac Vong River crossing point	Included in the contract with contractors
10. Large influx of construction worker	Construction camps and worker camps not to cause any negative impact to surrounding environment (forest area, water bodies, wild animal); control of infectious diseases.	1. Construction and worker camp location and facilities located at least 500m from settlements and agreed with local communities and facilities approved by ESS and managed to minimize impacts. 2. Hire and train as many local workers as possible. 3. Provide adequate housing for all workers at the construction camps and establish clean canteen/eating and cooking areas. 4. Mobile toilets (or at least pit latrines in remote areas) shall be installed and open defecation shall be prohibited and prevented by cleaning lavatories daily and by keeping toilets clean at all times. 5. Provide separate hygienic sanitation facilities/toilets and bathing areas with sufficient water supply for male and female workers. 6. Borrow pits and natural depressions with pre-laid impervious liners will be used to	Contractors	Through out construction phase	Through out construction sites and worker camps	Included in the contract with contractors

		dispose of scarified/scraped asphalt, and then covered with soil. This will check potential groundwater contamination. 7. As much as possible, food shall be provided from farms nearby and bush meat supplies will be banned to discourage poaching. 8. Camp site will be cleaned up to the satisfaction of and local community after use. 9. Solid and liquid waste will be managed in line with WMSDP. 10. All waste materials shall be removed and disposed to disposal sites approved by local authorities 11. Land used for campsites shall be restored to the original condition as far as practicable and the area shall be planted with appropriate trees / shrubs as soon as practicable after it is vacated and cleaned. 12. Register temporary stay for workers with police.				
11. Safety precautions for workers and public safety	Ensure worker safety	1. Provide fire extinguishers and first aid facilities at construction sites, workers' camps and ensure these are readily accessible by workers. 2. Scheduling of regular (e.g., weekly tool box talks) to orient the workers on health and safety issues related to their activities as well as on proper use of personal protective equipment (PPE). 3. Fencing on all excavation, borrow pits and sides of temporary bridges. 4. Workers shall be provided with appropriate PPE such as safety boots, helmets, safety glasses, earplugs, gloves, etc. at no cost to the employee. 5. Where worker exposure to traffic cannot be completely eliminated, protective barriers shall be provided to shield workers from traffic vehicles. 6. Workers shall be provided with reliable supply of potable water. 7. Construction camps shall be provided with adequate drainage to avoid accumulation of stagnant water.	Contractors	Through out construction phase	Through out construction sites	Included in the contract with contractors

		8. Construction camps shall be provided with toilets/sanitation facilities in accordance with local regulations to prevent any hazard to public health or contamination of land, surface or groundwater. These facilities shall be well maintained to allow effective operation. 9. Ensure reversing signals are installed on all construction vehicles. 10. Designate responsibility for maintaining safety measures to a senior member of the Contractor's staff				
12. Traffic Management	Minimize disturbance of traffic	1. Communicate to the public through local officials regarding the scope and schedule of construction, as well as certain construction activities causing disruptions or access restrictions. 2. Coordinate with traffic police of Trung Khanh and Tra Linh districts to implement appropriate traffic diversion schemes to avoid inconvenience due to subproject operations to road users, ensure smooth traffic flow and avoid or minimize accidents, traffic hold ups and congestion 3. Coordinate with traffic police of Trung Khanh and Tra Linh districts to schedule transport of materials to avoid congestion, set up clear traffic signal boards and traffic advisory signs at the roads going in and out the road and bridge construction sites to minimize traffic build-up. 4. Provide safe vehicle and pedestrian access around construction areas. 5. Install bold diversion signs that would be clearly visible even at night and provide flag persons to warn of dangerous conditions. 6. Provide sufficient lighting at night within and in the vicinity of construction sites. 7. Designate traffic officers in construction sites.	Contractors	Through out construction phase	Through out construction sites; at start and end points in Hung Quoc and Trung Khanh towns; Junctions with road to Tri Phuong and Trung Phuc communes.	Included in the contract with contractors
Operation Phase						
1. Generation of noise, vibration and road safety issues from increased traffic	To minimize, noise, vibration and road safety risk	1. Install sign boards, speed limit/ loading limit to prevent dust, noise, vibration and road safety issues from faster vehicles 2. Install traffic calming measures such as	Cao Bang DOT	Through out operation phase	At the start and end point of the road. At the residential	Included in operation and maintenance cost

		speed humps at residential and other areas where there are high risks of accidents to reduce the impact of noise, , vibration and road safety issues.			areas along the road	

C. Environmental monitoring

Environment Compliance Monitoring

118. Table 13 below shows the program for monitoring the compliance on various provisions of the EMP during construction and operation phases. ESS needs to implement a number of measures during detailed design phase (e.g., incorporation of environmental design measures into the detailed design, update EMP, etc.) and this will be confirmed by PMU to ADB. During construction, most of the mitigation the contractors shall implement measures and CSC and ESS shall monitor their environmental performance, in terms of implementation of such measures. The timing or frequency of monitoring is also specified in Table 13. During operation EMP implementation shall be the responsibility of Cao Bang DOT.

119. Prior to implementation of the subproject the IEE and EMP will be updated and amended, as necessary, by ESS after the detailed designs are complete and contracting arrangements are known. Such updating shall be based on reconfirmation and any additional information on the assumptions made at this feasibility stage on location scale and expected conditions of the subproject.

Environmental Effects Monitoring

120. ESS undertakes baseline environmental monitoring for air quality, noise and surface water quality. Sampling will be conducted prior to start of site works at the specified locations. During construction, ESS shall undertake quarterly monitoring of surface water quality and air quality and noise in the same locations sampled during pre-construction. Additional sampling occasions shall be carried out and additional parameters shall be analyzed (as necessary) to validate complaints and/or investigate pollution events caused by the subproject.

Table 13 - Environmental Monitoring Compliance

Performance and Impact Monitoring					
Environmental Concern	Parameter to monitor	Location	Frequency & Verification	Responsible to Monitor	Monitoring Cost
Design and Pre-construction Phase					
1. Land acquisition and resettlement	Compensation documents	N/A	Only one time before the construction commencement	Cao Bang DPI/ DONRE; PMU	Included in the operation budget of PMU
2. Unexploded Ordnance	Checking documents/ certificates	N/A	Once, before construction start	PMU	Included in the operation budget of PMU
Construction Phase					
1. Impacts on flora and fauna	Check of implementation	Along the subproject road, especially 500 m go through Bo That protection forest; worker camps area	Before construction commencement and through out construction phase. Part of daily construction supervision	ESS/ PMU CSC	Included in the operation budget of PMU/ ESS/ CSC
2. Local facilities	Check of implementation	Along the road, near the residential areas	Before construction commencement and through out construction phase. Part of daily construction supervision	ESS/ PMU CSC	Included in the operation budget of PMU/ ESS/ CSC
3. Materials exploitation and management of quarry and borrow pits	Check of implementation	Subproject site, quarries and borrow pit areas	Bi-weekly Part of daily construction supervision	ESS/ PMU CSC	Included in the operation budget of PMU/ ESS/ CSC
4. Waste and spoil disposal	Check of implementation	Through out construction site, material storage areas, machines and vehicles maintenance area	Bi-weekly Part of daily construction supervision	ESS/ PMU CSC	Included in the operation budget of PMU/ ESS/ CSC
5. Concrete mixing plant and bitumen heating	Check of implementation	Through out construction site	Bi-weekly Part of daily construction supervision	ESS/ PMU CSC	Included in the operation budget of PMU/ ESS/ CSC
6. Noise, dust and vibration	Check of implementation	Through out construction site	Bi-weekly and spot checks Part of daily construction supervision	ESS/ PMU	Included in the operation budget of PMU/ ESS CSC

7. Land slide, erosion control/ run off	Check of implementation	Through out construction site and high risk slope as agreed with ESS/PMU (	Bi-weekly Part of daily construction supervision	ESS/ PMU CSC	Included in the operation budget of PMU/ ESS/ CSC
8. Stream protection and bridge/culvert construction	Check of implementation	Through out construction sites, Bac Vong River, material storage sites, temporary waste disposal areas	Bi-weekly Part of daily construction supervision	ESS/ PMU CSC	Included in the operation budget of PMU/ ESS/ CSC
9. Large influx of workers. Construction and worker camps, sanitation and diseases	Check of implementation	Through out construction sites and worker camps	Before establishment of the facilities and through out the construction phase Part of daily construction supervision	ESS/ PMU CSC	Included in the operation budget of PMU/ ESS/ CSC
10. Safety precautions for workers and public safety	Check of implementation. Check compliance to Labor Code of Vietnam and other relevant Decision, Decree and Circular under Government requirements	Through out construction sites	Bi-weekly Part of daily construction supervision	ESS/ PMU CSC	Included in the operation budget of PMU/ ESS/ CSC
11. Traffic Management	Check of implementation	Through out construction sites; at start and end of the road; junctions with road to Tri Phuong and Trung Phuc communes	Bi-weekly Part of daily construction supervision	ESS/ PMU CSC	Included in the operation budget of PMU/ ESS/ CSC
Operation Phase					
1. Dust, noise, vibration	Check of implementation; Ambient air environment, noise level at the road and in the areas which are adjacent to road	At the start and end point of Road 211. At the residential areas along the route	Semi-annual in the first two years	Cao Bang DOT	Included in operation and maintenance cost

Table 14 - Environmental Affects Monitoring

Performance and Impact Monitoring					
Construction Phase					
1. Noise, dust and vibration	Ambient air quality (temperature, moisture, wind direction and speed, PM10, PM2.5, PB, NO_2, SO_2…); Noise level (average noise level, maximum noise level, vehicles frequency…)	10 monitoring points (2 at the start and end point, 1 at each commune center and crowded residential areas)	1 time before construction start and semi-annually during 2 years construction time (5 times in total)	ESS	3000 USD[24]
2. Surface and ground water quality	Surface water quality	3 sampling points at 20m downstream of the crossing river. 1 sampling point in Bo That water source	1 time before construction start and semi-annually during 2 years construction time (5 times in total)	ESS	10,000 USD
	Ground water quality	1 sampling point in Bac Vong River, crossing road at KM16+950	1 time before construction start and semi-annually during 2 years construction time (5 times in total)	ESS	2,000 USD[25]

[24] There is no cost norm for Cao Bang province. Figures have been estimated base on environmental monitoring cost norm of Ha Giang province.
[25] There is no cost norm for Cao Bang province. Figures have been estimated base on environmental monitoring cost norm of Ha Giang.

D. Reporting

121. PMU will submit the following reports to ADB:

- *Monitoring report for baseline environment:* this report shows the result of baseline environment as implemented by ESS on ambient air quality, surface water quality... This report will be submitted to ADB before the construction start.
- *Environmental monitoring reports:* Environmental monitoring reports will cover the status of EMP implementation in terms of required mitigation measures for different phases of the subproject, results of environmental effects monitoring (air quality, noise and surface water quality), necessary remedial actions to effectively address negative environmental impacts due to subproject implementation, status of environmental capacity building activities as well as documentation of complaints received and corresponding action/resolution. The environmental monitoring reports will be submitted to ADB semi-annually during the construction phase and annually for two years after completion of construction.

Table 15 – Reporting procedures

Project Phase	Type Of Report	Frequency	Responsibility	Submitted To Whom
Construction	**Environmental Performance Report** indicating compliance with EMP and monitoring results at the contractor site	Daily	Construction contractor	CSC
	Subproject EMP Compliance Report indicating compliance with subproject EMP and monitoring results	Quarterly	CSC	PMU
	EMP Compliance Report indicating compliance with subproject EMP and monitoring results	Semi-annually during construction phase	ESS/ PMU	ADB
Operation	**EMP Compliance Report: Operation** indicating compliance with subproject EMP commitments during operation	Annually in the first two years of operation. On-going frequency to be determined based on review after 2 years.	Cao Bang DOT	Cao Bang DONRE

Table 16 – Estimated cost for EMP Implementation (2-year construction/ 4-year in total)

Item	Estimated cost (US$)
Staff Costs	
1. Environment Safeguard Specialist (ESS)	***21,040***
1 National ESS - 6 man-months (intermittent in the 2 years;) – 2000 US$/ man-month	12,000
Per diem for ESS: 48 US$ x 30 days x 6 months	8640
Travelling cost for 2 round trips: 200 US$ x 2 trips	400
EMP Budget	
2. Environmental effects monitoring (implemented by ESS)	***5,500***
Ambient air quality: 10 monitoring locations x 5 times x 60 US$/sample[26]	3,000
Surface water quality: 4 monitoring locations x 5 times x 500 US$/sample[27]	2,000
Ground water quality: 1 monitoring locations x 5 times x 400 US$/sample[28]	500
3. Training/orientation, local transportation, supplies (by ESS)	***3,000***
a) Training/orientation: 1 formal training course for PMU, CSC, Contractors and Cao Bang DOT and other "on the job" training	2,000
b) Local transportation and supplies	1,000
4. Printing Environmental monitoring report by ESS (4 reports)	***600***
Subtotal (2+3+4)	**9,100**
5. Contingency	**455**
Total (1+2+3+4+5)	**9,555**

E. Capacity Building

122. In Viet Nam, the environmental assessment process is established but environmental awareness and capability for implementation of EMP in infrastructure projects of both the executing agency and the implementation agency (PMU) are limited and in development. The safeguards staff of the PMU is usually responsible for many different task and do not have good background on safeguards issues. Usually, the engineer will also be in charge of the environmental monitoring and his/ her capacity is not suitable to check the adequacy of the subproject EMP. The IEEs and EMP are referred to the environmental department in DONRE for approval. During the Project PPTA phase, PPU has been established under Cao Bang DPI with one staff has been assigned as ESO.

123. The most significant challenge is the lack of human and financial resources and necessary infrastructure. To address this constraint, Cao Bang DPI/PMU will designate a full time staff as environmental safeguards officer (ESO) to handle the environmental aspects of the

[26] Due to there is no cost norm for Cao Bang province, figures have been estimated base on environmental monitoring cost norm of Ha Giang province.
[27] Due to there is no cost norm for Cao Bang province, figures have been estimated base on environmental monitoring cost norm of Ha Giang province.
[28] Due to there is no cost norm for Cao Bang province, figures have been estimated base on environmental monitoring cost norm of Ha Giang province.

subproject during implementation stage. The ESO and other relevant staff of PMU will be trained by the Environment Safeguard Specialist (ESS) during subproject implementation as “on the job” training or by formal training courses.

Table 17 – Detail capacity building program

Objective	1. Build capacity and procedures in undertaking systematic environmental assessments in accordance with Government regulations and ADB guidelines 2. Provide training on international best practice on environmental management, monitoring and reporting. 3. Provide guidance on how to effectively incorporate environmental measures into project design and how to incorporate EMP provisions into tender and contract documents.
Tasks/Scope of Work	1. Undertake training needs analyses and review prevailing government regulations and donor guidelines governing the assessment and management of environmental impacts for road development. 2. Review the skills of PMU and Cao Bang DOT staff to establish existing capacity on environmental assessments, environmental monitoring and implementation of mitigation measures for road development project. 3. Prepare the training plan and relevant training materials. 4. Deliver the training, which may be through a combination of hands-on assistance, on-the-job training, and training workshops. 5. Evaluate the effectiveness of the training measuring improvements in attitudes and skills achieved. 6. Modify the training documents/materials as necessary. 7. Hand-over the amended training documents/ material to the project manager for use in the delivery of the training. 8. Prepare report on result of training.
Time frame	Possible within 3 months after construction commencement
Target participant	Staff in PMU and Cao Bang DOT who responsible for environmental management
Staff resources	International and national environmental specialist with at least 15 years experience on environmental management of road projects and must possess relevant post-graduate degree in civil engineering, environmental management and other relevant courses. With working knowledge of safety issues and at least 3 years experience in conducting environmental management training.

X. CONCLUSIONS AND RECOMMENDATIONS

124. This IEE study was carried out in the Technical Assistant for Project Preparation (PPTA) phase. Primary and secondary data were used to assess potential environmental impacts in a comprehensive manner and public consultation and route reconnaissance were carried out in order complete the environmental assessments and recommend suitable mitigation measures. The IEE report provides a picture of potential environmental impacts associated with the upgrading of the subproject road and suitable mitigation measures have been recommended.

125. The implementation of the subproject “Upgrading and Improving Provincial Road 211 (Tra Linh - Trung Khanh), Cao Bang Province” will steadily improve the road quality; make it favorable for transportation between two districts and other area in Cao Bang province. Several actions are required during the detailed design stage to minimize impacts to acceptable levels. The negative environmental impacts from the upgrading works will mostly take place during the construction stage. All of the impacts during construction phase should be very predictable and manageable and with appropriate mitigation and few residual impacts are likely. Additional human and financial resources will be required to improve environmental capability and to progress and achieve necessary statutory compliance and environmental clearance certification for the subproject or associated activities that also require environmental permits under the environmental laws of Viet Nam – LEP 2014.

126. No further or additional impact assessment is considered necessary at this stage. At the implementation stage, PMU through ESS will develop detail EMP to monitor the schedules of mitigation measures and conduct of environmental effects monitoring activities. EMP must be updated to ensure effective environmental monitoring and should be develop follow-monitoring plan as specified in the EMP. With these measures in place, environmental impacts of the subproject should be manageable and will not result in any residual impacts, which are above accepted environmental standards.

XI. APPEDICES

A. Appendix 1: Photos of the subproject road and the vicinity

Starting point in Hung Quoc town, Tra Linh

End point in Trung Khanh town, Trung Khanh

Road section in Xuan Noi commune

Rice field and low karst mountain at road side

Narrow road section through Ban Ngan village

Bo That protection forest Km12+5 to Km13

Bo That water source at KM12+8

Current causeway over Bac Vong River

Landslide near the road in Quang Trung commune

Bad road surface section in Lang Yen commune

Dinh Van quarry in Lang Hieu commune

Sac Ha borrow pit, Quang Trung commune

B. Appendix 2: Source of Reference Information

1. *Cao Bang Status of Environmental Report 2015*
2. *Cao Bang Climate Change Adaptation Plan (2011-2020)*
3. *Report on Pollution control under Environmental Protection Plan in 2015 Cao Bang Environmental Agency*
4. *Environmental Impact Assessment (EIA) Report of Coc Cang Quarry, Hung Quoc town, Tra Linh district.*
5. *The subproject feasibility report*
6. *Poverty and Social assessment report of the subproject*
7. *Inventory of losses report of the subproject*
8. *Resettlement and Ethnic Minority Development Plan of the subproject*

C. Appendix 3: Environmental Mitigation Measures to Include into Bidding Documents

1. Route selection	1. Construct 400-meter bypass road to avoid go through narrow section at Ban Ngan village, Quang Trung commune. 2. Apply all mitigation measures for this bypass as other sections of the subproject road.
2. Impacts to flora and fauna	1. Minimized vegetation covers clearances. 2. All replanting works to utilize locally available non-invasive species. 3. The contractors will not use or permit the use of wood as a fuel for the execution of any part of the works, including but not limited to the heating of bitumen and bitumen mixtures, and to the extent practicable shall ensure that fuels other than wood are used for cooking, and water heating in all camps and living accommodations. 4. Contractors shall not buy or use wood from the illegal sources (that come from the illegal logging) 5. No construction camps, concrete mixing plants, material storage sites are to be located along Km12+500 to Km13 - near Bo That protection forest. 6. Contractors will take all precautions necessary to ensure that damage to vegetation is avoided due to fires resulting from execution of the works. The Contractors will immediately suppress the fire, if it occurs, and shall undertake replanting to replace damaged vegetation.
3. Local facilities	1. Reconfirm power, water supply, and telecommunications likely to be interrupted by the works. 2. Contact all relevant local authorities for facilities and local people to plan re-provisioning of power, water supply, and telecommunication systems. 3. Facilities shall be relocated and reconnected well ahead of commencement of construction works and contractors shall coordinate with facility company for relocation and reconnection well before works commence. 4. Affected communities shall be properly informed in advance. 5. Reconnection of facilities shall be done at the shortest practicable time before construction commences. 6. Facilities damaged during construction shall be reported to the CSC, PMU and facility authority and repairs arranged immediately. 7. Access roads, agricultural land and other properties damaged during transport of construction materials and other project-related activities shall be reinstated upon completion of construction works at each section
4. Materials exploitation and management of quarry, borrow pits and temporary storage area	1. Prioritize use of Lung Mo, Coc Cang, Keo Thin Lan quarries and Sac Ha, Cho Mo borrow pits and update the list of quarries and borrow pits monthly and report to PMU and minimize impacts on other local resources. 2. Reestablish vegetation cover and trim slopes to an even profile at any closed quarries and borrow pits 3. Stockpile topsoil for later use and fence and re-contour borrows pits after use. Topsoil, overburden, and low-quality materials shall be properly removed, stockpiled near the site, and preserved for rehabilitation. 4. During quarry/borrow site operation, provide adequate drainage to avoid accumulation of stagnant water. 5. Ensure borrow pits are left in a tidy state with stable side slopes and proper drainage in order to avoid creation of water bodies favorable for mosquito breeding. 6. Upon completion of extraction activities, quarry and borrow pits shall be dewatered and fences shall be installed, as appropriate, to minimize health and safety risks. 7. To avoid drowning when pits become water filled, measures such as fencing, providing flotation devices such as a buoy tied to a rope, etc. shall be implemented.
5. Waste and spoil disposal	1. Areas suitable for disposal to be agreed with CPCs and Cao Bang DONRE checked and recorded by the CSC, ESS/PMU and monitored 2. Spoil and waste will not be disposed of in streams or other surrounding water bodies, shall only be disposed to areas approved by local authorities as listed in Table 8 of this IEE. 3. Surplus material to be distributed to local people for use in landscaping/ forming building platforms.

	4. Spoil disposals shall not cause sedimentation and obstruction of flow of watercourses, damage to agricultural land and densely vegetated areas. 5. Under no circumstances will spoils be dumped into watercourses (rivers, streams, drainage, irrigation canals, etc.) 6. Spoil disposal sites shall be away watercourses and shall be protected from erosion by avoiding formation of steep slopes and grassing.
6. Bitumen heating and concrete mixing plant	1. Locate mixing plant, bitumen heating off road and (wherever practicable) at least 500 m from nearest sensitive receivers (residential areas, schools, clinics, etc.) and streams and install and maintain dust suppression equipment. 2. Concrete mixing areas shall be protected against spills and all contaminated soil must be properly handled according to applicable national and local laws and regulation. As a minimum, these areas must be contained, such that any spills can be immediately contained and cleaned up. 3. Prevent soil contamination requiring contractors to instruct and train their workers on storage and handling of materials and chemicals that can potentially cause soil contamination. 4. Recycle debris generated by dismantling of existing pavement subject to the suitability of the material.
7. Noise, dust and vibration	1. Restrict works to daylight hours within 500 m of residential settlements and local clinics. 2. Powered mechanical equipment and vehicle emissions to meet national TCVN/QCVN standards. All construction equipment and vehicles shall have valid certifications indicating compliance to vehicle emission and noise creation standards. 3. Monitor and investigate complaints; follow the Grievance Redress Mechanism of the subproject. 4. Keep material storage site moist 5. Tightly cover trucks transporting construction materials (sand, soil, cement, gravel, etc.) to avoid or minimize spills and dust emission. 6. On rainless days undertake watering, at least twice per day, on dusty and exposed areas at construction yards, materials storage sites, construction sites, access roads, quarry areas, borrow sites and other subproject areas where residential sites and other sensitive points such as schools, clinics… are located nearby. 7. Clean up road surfaces after work. 8. To protect buildings and structures from vibration, non-vibrating roller shall be used in construction sites near buildings and structures. 9. Structures, which are damaged due to vibration caused by the construction activities, shall be repaired at the cost of the contractor. 10. Machinery shall be turned off when not in use. 11. Pile driving during to be schedule for daytime if construction site is near sensitive points or approved by DONRE, CPCs and ESS/PMU. 12. Impose speed limits on construction machines and transportation vehicles to minimize dust emission along areas where sensitive pints are located (houses, schools, clinics, pagodas etc.) by setup warning sign, speed limit board and assigned guard staff at the site.
8. Erosion control/ run off	1. Establish vegetation and erosion protection immediately after completion of works in each stretch / sector. 2. Stockpile topsoil for immediate replanting after cutting. 3. Minimize damage and excavation of surrounding vegetation during slope formation. 4. Protect the cut slope with planted vegetation, bioengineering or conventional civil engineering structures as soon as practicable after excavation. 5. Include and implement appropriate measures for slope protection, i.e. vegetation cover and stone pitching, as required in the detailed construction drawings. 6. Prevent erosion and protect the excavated slope with temporary or permanent drainage as soon as practicable after cutting. 7. If new erosion occurs accidentally, back fill immediately to restore original contours. 8. Low embankments will be protected from erosion by seeding and planting indigenous grasses that can flourish under local conditions. 10. Payments will be linked to the completion of the works as indicated by the installation of erosion control measures to protect the works to the satisfaction of ESS/PMU.
9. Streams/ Rivers protection and bridge/culvert	In sections along and near streams and water bodies: 1. Rocks and stones will be disposed or provided to local people and will not be left in streams.

construction	2. Cofferdams, silt fences, sediment barriers or other devices will be used as appropriate based on the design to prevent migration of silt during excavation and boring operations within streams. If cofferdams are used, these will be dewatered and cleaned to prevent siltation by pumping from cofferdams to a settling basin or a containment unit. 3. Other erosion control measures above and covering open surfaces with grasses and creepers to reduce runoff will be implemented as early as possible in construction.
10. Large influx of construction worker	1. Construction and worker camp location and facilities located at least 500m from settlements and agreed with local communities and facilities approved by ESS and managed to minimize impacts. 2. Hire and train as many local workers as possible. 3. Provide adequate housing for all workers at the construction camps and establish clean canteen/eating and cooking areas. 4. Mobile toilets (or at least pit latrines in remote areas) shall be installed and open defecation shall be prohibited and prevented by cleaning lavatories daily and by keeping toilets clean at all times. 5. Provide separate hygienic sanitation facilities/toilets and bathing areas with sufficient water supply for male and female workers. 6. Borrow pits and natural depressions with pre-laid impervious liners will be used to dispose of scarified/scraped asphalt, and then covered with soil. This will check potential groundwater contamination. 7. As much as possible, food shall be provided from farms nearby and bush meat supplies will be banned to discourage poaching. 8. Camp site will be cleaned up to the satisfaction of and local community after use. 9. Solid and liquid waste will be managed in line with WMSDP. 10. All waste materials shall be removed and disposed to disposal sites approved by local authorities 11. Land used for campsites shall be restored to the original condition as far as practicable and the area shall be planted with appropriate trees / shrubs as soon as practicable after it is vacated and cleaned. 12. Register temporary stay for workers with police.
11. Safety precautions for workers and public safety	1. Establish fire prevention tools at the construction site, worker camps and provide first aid facilities that are readily accessible by workers. 2. Scheduling of regular (e.g., weekly tool box talks) to orient the workers on health and safety issues related to their activities as well as on proper use of personal protective equipment (PPE). 3. Fencing on all excavation, borrow pits and sides of temporary bridges. 4. Workers shall be provided with appropriate PPE such as safety boots, helmets, safety glasses, earplugs, gloves, etc. at no cost to the employee. 5. Where worker exposure to traffic cannot be completely eliminated, protective barriers shall be provided to shield workers from traffic vehicles. 6. Workers shall be provided with reliable supply of potable water. 7. Construction camps shall be provided with adequate drainage to avoid accumulation of stagnant water. 8. Construction camps shall be provided with toilets/sanitation facilities in accordance with local regulations to prevent any hazard to public health or contamination of land, surface or groundwater. These facilities shall be well maintained to allow effective operation. 9. Ensure reversing signals are installed on all construction vehicles.
12. Traffic Management	1. Communicate to the public through local officials regarding the scope and schedule of construction, as well as certain construction activities causing disruptions or access restrictions. 2. Coordinate with traffic police of Trung Khanh and Tra Linh districts to implement appropriate traffic diversion schemes to avoid inconvenience due to subproject operations to road users, ensure smooth traffic flow and avoid or minimize accidents, traffic hold ups and congestion 3. Coordinate with traffic police of Trung Khanh and Tra Linh districts to schedule transport of materials to avoid congestion, set up clear traffic signal boards and traffic advisory signs at the roads going in and out the road and bridge construction sites to minimize traffic build-up. 4. Provide safe vehicle and pedestrian access around construction areas.

	5. Install bold diversion signs that would be clearly visible even at night and provide flag persons to warn of dangerous conditions. 6. Provide sufficient lighting at night within and in the vicinity of construction sites. 7. Designate traffic officers in construction sites.

D. Appendix 4: National Technical Regulations of Vietnam

NATIONAL TECHNICAL REGULATION

ON SURFACE WATER QUALITY

1. GENERAL PROVISIONS

1.1. Scope of application

1.1.1. This regulation specifies the limit value of surface water quality parameters.

1.1.2. This regulation applies to assess and control the quality of surface water source, as a basis for the protection and use of water appropriately.

1.2. Explanation of terms

Surface water referred to in this Regulation is water flowing through or stagnate on the ground, streams, canals, ditches, gullies, arroyos, lakes, ponds, swamps, ...

2. TECHNICAL REGULATIONS

Limit values of the surface water quality parameters are specified in Table 1.

Table 1. Limit values of the surface water quality parameters

No.	Parameters	Unit	Limit values			
			A		B	
			A1	A2	B1	B2
1	pH		6-8,5	6-8,5	5,5-9	5,5-9
2	Dissolved oxygen (DO)	mg/l	≥ 6	≥ 5	≥ 4	≥ 2
3	Total suspended solidss (TSS)	mg/l	20	30	50	100
4	COD	mg/l	10	15	30	50
5	BOD_5 (20^0C)	mg/l	4	6	15	25
6	Ammonium (NH^+_4) (as N)	mg/l	0,1	0,2	0,5	1
7	Clorua Chloride (Cl^-)	mg/l	250	400	600	-
8	Florua Fluoride (F^-)	mg/l	1	1,5	1,5	2
9	Nitrite (NO^-_2) (as N)	mg/l	0,01	0,02	0,04	0,05
10	Nitrate (NO^-_3) (as N)	mg/l	2	5	10	15
11	Phosphate (PO_4^{3-}) (as P)	mg/l	0,1	0,2	0,3	0,5
12	Xianua Cyanide (CN-)	mg/l	0,005	0,01	0,02	0,02
13	Asen (As)	mg/l	0,01	0,02	0,05	0,1
14	Cadimi (Cd)	mg/l	0,005	0,005	0,01	0,01
15	Lead (Pb)	mg/l	0,02	0,02	0,05	0,05
16	Chrom III (Cr^{3+})	mg/l	0,05	0,1	0,5	1
17	Chrom VI (Cr^{6+})	mg/l	0,01	0,02	0,04	0,05

18	Copper (Cu)	mg/l	0,1	0,2	0,5	1
19	Zinc (Zn)	mg/l	0,5	1,0	1,5	2
20	Nickel (Ni)	mg/l	0,1	0,1	0,1	0,1
21	Iron (Fe)	mg/l	0,5	1	1,5	2
22	Mercury (Hg)	mg/l	0,001	0,001	0,001	0,002
23	Surface-active substances	mg/l	0,1	0,2	0,4	0,5
24	Total oil & grease	mg/l	0,01	0,02	0,1	0,3
25	Phenon (Total)	mg/l	0,005	0,005	0,01	0,02
26	Organic chlorine pesticide					
	Aldrin + Dieldrin	µg/l	0,002	0,004	0,008	0,01
	Endrin	µg/l	0,01	0,012	0,014	0,02
	BHC	µg/l	0,05	0,1	0,13	0,015
	DDT	µg/l	0,001	0,002	0,004	0,005
	Endosunfan(Thiodan)	µg/l	0,005	0,01	0,01	0,02
	Lindan	µg/l	0,3	0,35	0,38	0,4
	Chlordane	µg/l	0,01	0,02	0,02	0,03
	Heptachlor	µg/l	0,01	0,02	0,02	0,05
27	Organic phosphorus pesticide					
	Parathion	µg/l	0,1	0,2	0,4	0,5
	Malathion	µg/l	0,1	0,32	0,32	0,4
28	Herbicide					
	2,4D	µg/l	100	200	450	500
	2,4,5T	µg/l	80	100	160	200
	Paraquat	µg/l	900	1200	1800	2000
29	Total radioactivity α	Bq/l	0,1	0,1	0,1	0,1
30	Total radioactivity β	Bq/l	1,0	1,0	1,0	1,0
31	E.coli	MPN/ 100ml	20	50	100	200
32	Coliform	MPN/ 100ml	2500	5000	7500	10000

Note: The classification of surface water to assess and control the quality of water for various purposes of water use:

A1 - Good use for the purpose of domestic water supply and other purposes, such as type A2, B1 and B2.

A2 – Used for the purpose of domestic water supply but applying the appropriate treatment technology; aquatic plant and animal conservation, or purposes of use as type B1 and B2.

B1 - Use for irrigation and drainage purpose or other purposes with similar water quality requirements or other purposes of use such as type B2.

B2 – Water transportation and other purposes with low water quality requirements.

3. METHOD FOR DETERMINATION

3.1. Sampling for surface water quality monitoring conducted under the guidance of national standards:

- TCVN 5992:1995 (ISO 5667-2: 1991) - Water quality - Sampling. Guidance on sampling techniques.

- TCVN 5993:1995 (ISO 5667-3: 1985) - Water quality - Sampling. Guidance on storage and handling of samples.

- TCVN 5994:1995 (ISO 5667-4: 1987) - Water quality - Sampling. Guidance on sampling in natural and artificial lakes and ponds.

- TCVN 5996:1995 (ISO 5667-6: 1990) - Water quality - Sampling. Guidance on sampling in rivers and streams.

3.2. Analytical methods to determine the parameters of surface water quality shall comply with the guidance of the national standards or corresponding analytical standards of international organizations:

-TCVN 6492-1999 (ISO 10523-1994) - Water quality - Determination of pH.

-TCVN 5499-1995. Water quality - Determination of dissolved oxygen - Winkler method.

- TCVN 6625-2000 (ISO 11923-1997) - Determination of suspended solids by filtration through glass-fibre filters

- TCVN 6001-1995 (ISO 5815-1989) - Water quality - Determination of biochemical oxygen demand after 5 days (BOD 5) - Dilution and seeding method.

- TCVN 6491-1999 (ISO 6060-1989) - Water quality - Determination of the chemical oxygen demand.

- TCVN 6494-1999 - Water quality - Determination of ions of fluoride, chloride, nitrite, Orthophotphat, bromide, nitrate and soluble sulphate in liquid ion chromatography.

- TCVN 6194-1996 (ISO 9297-1989) - Water quality - Determination of chloride. The method of titration of nitrate silver with chromate indicator (MO method).

- TCVN 6195-1996 (ISO 10359-1-1992) - Water quality - Determination of fluoride - Electrochemical probe method for potable and lightly polluted water

- TCVN 6178-1996 (ISO 6777-1984) - Water quality - Determination of nitrite. Molecular absorption spectrometric method.

- TCVN 6180-1996 (ISO 7890-3-1988) - Water quality - Spectrometric method using sulfosalicylic acid

- TCVN 5988-1995 (ISO 5664-1984) - Water quality - Determination of ammonium - Distillation and titration method.

- TCVN 6181-1996 (ISO 6703-1-1984) - Water quality - Determination of total cyanide.

- TCVN 6336-1998 (ASTM D 2330-1988) - Test method for Methylene Blue Active Substances

- TCVN 5991-1995 (ISO 5666-3-1984) - Water quality - Determination of total mercury by flameless atomic absorption spectrometry - Method after digestion with bromine

- TCVN 6002-1995 (ISO 6333-1986) - Water quality - Determination of manganese - Formaldoxime spectrometric method

- TCVN 6053-1995 (ISO 9696-1992) - Water quality - Measurement of gross alpha activity in non-saline water - Thick source method

- TCVN 6177-1996 (ISO 6332-1988) - Water quality - Determination of iron - Spectrometric method using 1,10 - phenanthroline

- TCVN 6193-1996 (ISO 8288-1986) - Water quality - Determination of cobalt, nickel, copper, zinc, cadmium and lead - Flame atomic absorption spectrometric methods

- TCVN 6197-1996 (ISO 5961-1994) - Water quality - Determination of cadmium by atomic absorption spectrometry

- TCVN 6222-1996 (ISO 9174-1990) - Water quality. Methods for the determination of total chromium by atomic absorption spectrometry

- TCVN 6626-2000 (ISO 11969-1996) - Water quality - Determination of arsenic - Atomic absorption spectrometric method (hydride technique)

- TCVN 6216-1996 (ISO 6439-1990) - Water quality - Determination of phenol index - 4-Aminoantipyrine spectrometric methods after distillation

- TCVN 5070-1995 - Water quality - Weight method for determination of oil and oil products

- TCVN 6053-1995 (ISO 9696-1992) - Water quality - Measurement of gross alpha activity in non-saline water - Thick source method

- TCVN 6219-1995 (ISO 9697-1992) - Water quality - Measurement of gross beta activity.

- TCVN 6187-1-1996 (ISO 9308-1-1990) - Water quality - Detection and enumeration of coliform organisms, thermotolerant coliform organisms and presumptive Escherichia coli - Part 1: Membrane filtration method

The parameters specified in this Regulation not having national standards guiding the analytical method shall apply the corresponding analytical standards of the international organizations

4. IMPLEMENTATION ORGANIZATION

This Regulation shall apply in substitution for TCVN 5942:1995 - Water quality - surface water quality standards in the List of Vietnamese standards on environment which is mandatorily applied and issued together with Decision No. 35/2002/QD-BKHCNMT dated June 25, 2002 of the Minister of Science, Technology and Environment.

In case the national standards referred in this Regulation amended and supplemented or superseded shall be applied under new documents.

QCVN 09 : 2008/BTNMT

NATIONAL TECHNICAL REGULATION

ON UNDERGROUND WATER QUALITY

Introduction

QCVN 09:2008 / BTNMT was written by the Compilation Board of national technical regulations on water quality, submitted by the General Department of Environment and Legal Department for approval and issued under the Decision No. 16/2008/QD-BTNMT dated December 31, 2008 of the Minister of Natural resources and Environment.

NATIONAL TECHNICAL REGULATION

ON UNDERGROUND WATER QUALITY

1. GENERAL PROVISIONS

1.1. Scope of application

1.1.1. This regulation specifies the limit value of underground water quality parameters.

1.1.2. This regulation applies to assess and control the quality of underground water source, as a basis for the orientation of various purposes of use.

1.2. Explanation of terms

Underground water in this Regulation is the water in the soil and rocks underground.

2. TECHNICAL REGULATIONS

Limit values of the underground water quality parameters are specified in Table 1.

Table 1: Limit values of the underground water quality parameters

No.	Parameters	Unit	Limit values
1	pH	-	5,5 - 8,5
2	Hardness (as CaCO3)	mg/l	500
3	Total solids	mg/l	1500
4	COD ($KMnO_4$)	mg/l	4
5	Ammonium (as N)	mg/l	0,1
6	Chloride (Cl-)	mg/l	250
7	Fluoride (F-)	mg/l	1,0
8	Nitrite (NO^-_2) (as N)	mg/l	1,0
9	Nitrate (NO^-_3) (as N)	mg/l	15
10	Sulgreasee (SO_4^{2-})	mg/l	400
11	Cyanide (CN-)	mg/l	0,01
12	Phenol	mg/l	0,001
13	Asenic (As)	mg/l	0,05

14	Cadimi (Cd) Cadmium (Cd)	mg/l	0,005
15	Lead (Pb)	mg/l	0,01
16	Chromium VI (Cr6 +)	mg/l	0,05
17	Copper (Cu)	mg/l	1,0
18	Zinc (Zn)	mg/l	3,0
19	Manganese (Mn)	mg/l	0,5
20	Mercury (Hg)	mg/l	0,001
21	Iron (Fe)	mg/l	5
22	Selenium (Se)	mg/l	0,01
23	Total radioactivity α	Bq/l	0,1
24	Total radioactivity β	Bq/l	1,0
25	E.Coli	MPN/100ml	Not found
26	Coliform	MPN/100ml	3

3. METHOD FOR DETERMINATION

3.1. Sampling for underground water quality monitoring conducted under the guidance of national standards:

- TCVN 5992:1995 (ISO 5667-2: 1991) - Water quality - Sampling - Guidance on sampling techniques

- TCVN 5993:1995 (ISO 5667-3: 1985) - Water quality -sampling -Guidance on the preservation and handling of samples

- TCVN 6000:1995 (ISO 5667-11: 1992) - Water quality -sampling -Guidance on the sampling of groundwaters

3.2. Analytical methods to determine the parameters of underground water quality shall comply with the guidance of the national standards or corresponding analytical standards of international organizations:

- TCVN 6492-1999 (ISO 10523-1994) - Water quality - Determination of pH

- TCVN 2672-78 – Potable water – Method for determing the general hardness

- TCVN 6178-1996 (ISO 6777-1984) - Water quality -Determination of nitrite - Molecular absorption spectrometric method

- TCVN 6180-1996 (ISO 7890-3-1988) - Water quality - Determination of nitrate - Spectrometric method using sulfosalicylic acid

- TCVN 6200-1996 (ISO 9280-1990) - Water quality - Determination of sulgreasee - Gravimetric method using barium chloride

- TCVN 6181-1996 (ISO 6703-1-1984) Water quality - Determination of total cyanide

- TCVN 5988-1995 (ISO 5664-1984) - Water quality - Determination of ammonium -Distillation and titration method

- TCVN 6194-1996 (ISO 9297-1989) Water quality -Determination of chloride - Silver nitrate titration with chromate indicator (Mohr's method)

- TCVN 6195-1996 (ISO 10359-1-1992) - Water quality - Determination of fluoride - Part 1: Electrochemical probe method for potable and lightly polluted water

- TCVN 6216-1996 (ISO 6439-1990) - Water quality - Determination of phenol index -4-Aminoantipyrine spectrometric methods after distillation

- TCVN 6626-2000 (ISO 11969-1996) - Water quality - Determination of arsenic - Atomic absorption spectrometric method (hydride technique)

- TCVN 6193-1996 (ISO 8288-1986) - Water quality - Determination of cobalt, nickel, copper, zinc, cadmium and lead - Flame atomic absorption spectrometric methods

- TCVN 6197-1996 (ISO 5961-1994) - Water quality - Determination of cadmium by atomic absorption spectrometry

- TCVN 6002-1995 (ISO 6333-1986) - Water quality - Determination of manganese - Formaldoxime spectrometric method

- TCVN 6177-1996 (ISO 6332-1988) - Water quality - Determination of iron - Spectrometric method using 1,10 - phenanthroline

- TCVN 6183-1996 (ISO 9965-1993) -Water quality - Determination of selenium - Atomic absorption spectrometric method (hydride technique)

- TCVN 59910-1995 (ISO 5666-3-1984) Water quality - Determination of total mercury by flameless atomic absorption spectrometry - Method after digestion with bromine

- TCVN 6222-1996 (ISO 9174-1990) - Water quality -Determination of chromium - Atomic absorption spectrometric methods

- TCVN 6187-1-1996 (ISO 9308-1-1990) - Water quality - Detection and enumeration of coliform organisms, thermotolerant coliform organisms and presumptive Escherichia coli - Part 1: Membrane filtration method

The parameters specified in this Regulation not having national standards guiding the analytical method shall apply the corresponding analytical standards of the international organizations

4. IMPLEMENTATION ORGANIZATION

This Regulation shall apply in substitution for TCVN 5944:1995- Water quality - underground water quality standards in the List of Vietnamese standards on environment which is mandatorily applied and issued together with Decision No. 35/2002/QD-BKHCNMT dated June 25, 2002 of the Minister of Science, Technology and Environment.

In case the national standards referred in this Regulation amended and supplemented or superseded shall be applied under new document

QCVN 05:2013/BTNMT

NATIONAL TECHNICAL REGULATIONS ON AMBIENT AIR QUALITY

Introduction

QCVN 05:2013/BTNMT was written by the Compilation Board of national technical regulations on ambient air quality, submitted by the General Department of Environment and Legal Department for approval and issued under the Circular No. 32/2013/TT-BTNMT dated October 25, 2013 of the Minister of Natural resources and Environment.

National Technical Regulation on Ambient Air Quality

1. GENERAL PROVISIONS

1.1. Scope of applications

1.1.1. This Regulation deals with limitations on values of basic factors including sulphur dioxide (SO2), carbon monoxide (CO), dioxide nitrogen (NO2), ozone (O3), total suspended particles (TSP), PM10, PM2.5, particles, and lead (Pb) in ambient air.

1.1.2. This Regulation applies to supervision and assessment of ambient air quality.

1.1.3. This Regulation does not apply to air within manufacturing facilities and indoor air.

1.2. Interpretation of terms

In this Regulation, the terms below are construed as follows:

1.2.1. Total suspended particles (TSP) is total particles with aerodynamic diameter less than or equal to 100 μm.

1.2.2. Particle PM_{10} is total suspended particles with aerodynamic diameter less than or equal to 10 μm.

1.2.3. Particle $PM_{2,5}$ is total suspended particles with aerodynamic diameter less than or equal to 2,5 μm.

1.2.4. Average 1 hour: The arithmetic average of the measured values over a period of 1 hour.

1.2.5. Average 8 hours: The arithmetic average of the measured values over a period of 8 consecutive hours.

1.2.6. Average 24 hours: The arithmetic average of the measured values over a period of 24 consecutive hours (a day).

1.2.7. Annual average: The arithmetic average of the 24-hour average values measured over a period of one year.

2. Technical Reputation

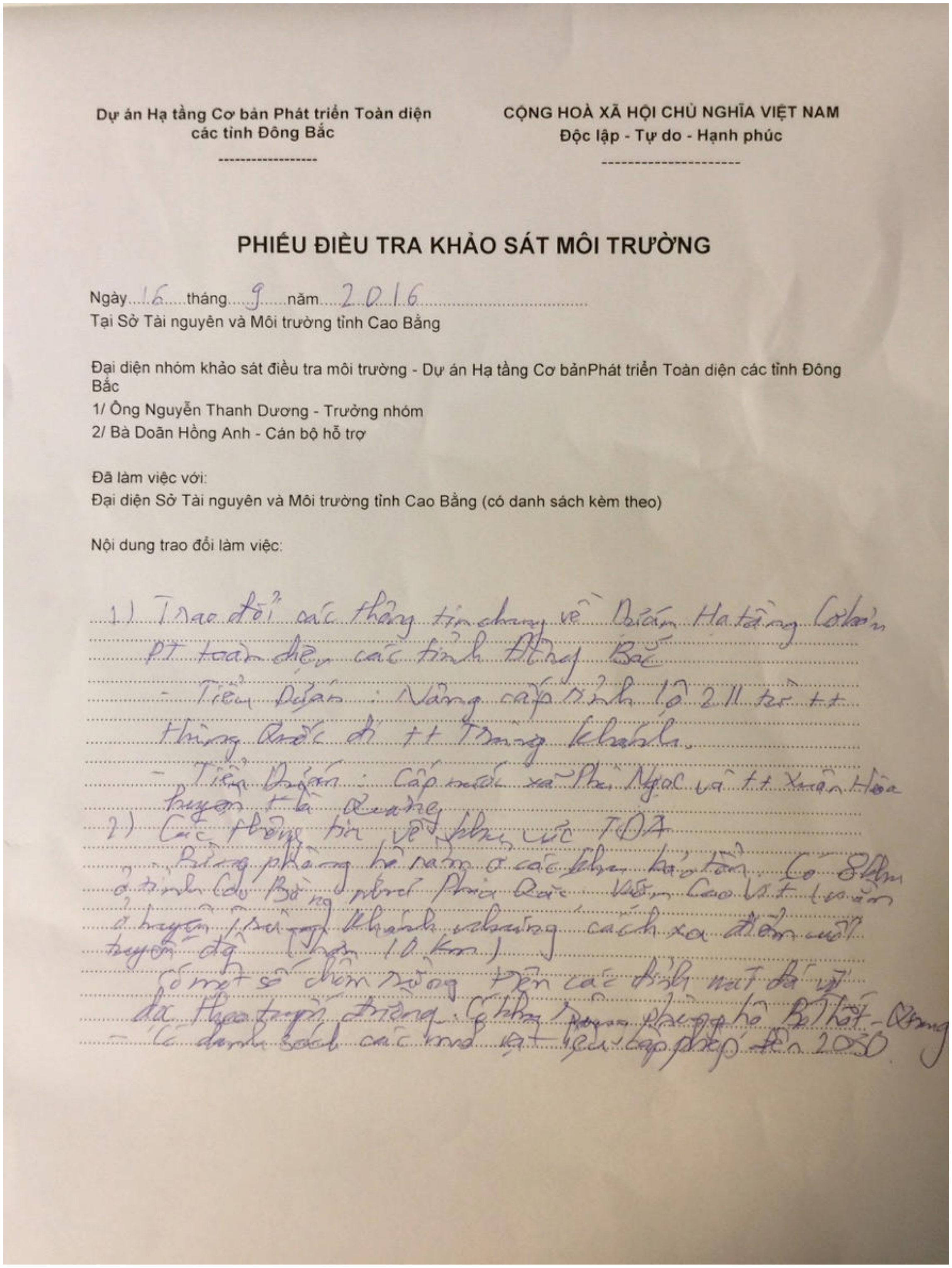
Maximum value of basic parameters of ambient air is specified in Table 1.

Table 1: Maximum value of basic parameters of ambient aire

Unit: Micro gram over cubic meter ($\mu g/m^3$)

No.	Paramater	Average 1 hour	Average 8 hours	Average 24 hours	Annual average
1	SO_2	350	-	125	50
2	CO	30.000	10.000	-	-
3	NO_2	200	-	100	40
4	O_3	200	120	-	-
5	Total Suspended Particle (TSP)	300	-	200	100
6	Dust PM_{10}	-	-	150	50
7	Dust $PM_{2,5}$	-	-	50	25
8	Pb	-	-	1,5	0,5
Note: (-) unspecified					

E. Appendix 5: Public consultation - Meeting minutes and List of attendance



Dự án Hạ tầng Cơ bản Phát triển Toàn diện các tỉnh Đông Bắc

CỘNG HOÀ XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập - Tự do - Hạnh phúc

PHIẾU ĐIỀU TRA KHẢO SÁT MÔI TRƯỜNG

Ngày 16 tháng 9 năm 2016

Tại Sở Tài nguyên và Môi trường tỉnh Cao Bằng

Đại diện nhóm khảo sát điều tra môi trường - Dự án Hạ tầng Cơ bảnPhát triển Toàn diện các tỉnh Đông Bắc

1/ Ông Nguyễn Thanh Dương - Trưởng nhóm

2/ Bà Doãn Hồng Anh - Cán bộ hỗ trợ

Đã làm việc với:

Đại diện Sở Tài nguyên và Môi trường tỉnh Cao Bằng (có danh sách kèm theo)

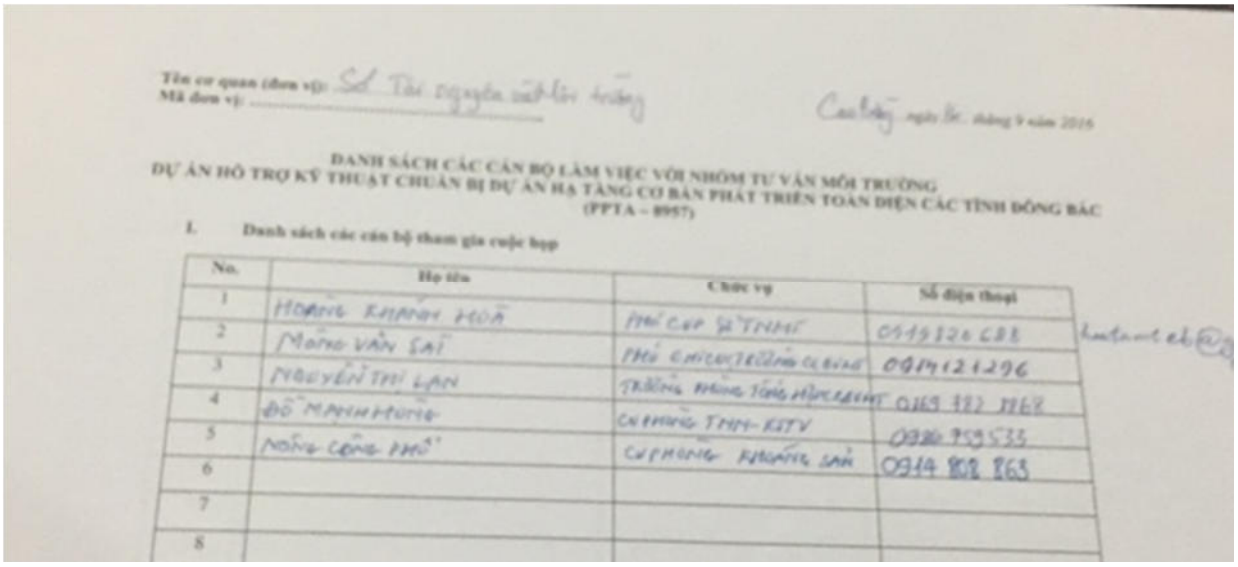
Nội dung trao đổi làm việc:

1) Trao đổi các thông tin chung về Dự án Hạ tầng Cơ bản PT toàn diện các tỉnh Đông Bắc

- Tiểu Dự án: Nâng cấp tỉnh lộ 211 từ tt Thông Nông đi tt Trùng Khánh.
- Tiểu Dự án: Cấp nước xã Phù Ngọc và tt Xuân Hòa huyện Hà Quảng

2) Các thông tin về khu vực TDA

- Rừng phòng hộ nằm ở các khu bảo tồn. Có 8 khu ở tỉnh Cao Bằng như Phia Oắc - Phia Đén, Cao Vít (vượn) ở huyện Trùng Khánh nhưng cách xa điểm cuối tuyến đg (hơn 10 km)
- Có một số chim rừng trên các đỉnh núi đá vôi dọc tuyến đường. Có khu [illegible] phòng hộ Bản Thắt - Quảng [illegible]
- Có danh sách các mỏ vật liệu cấp phép đến 2050.



Tên cơ quan (đơn vị): Sở Tài nguyên và Môi trường
Mã đơn vị: .....

Cao Bằng, ngày 16 tháng 9 năm 2016

DANH SÁCH CÁC CÁN BỘ LÀM VIỆC VỚI NHÓM TƯ VẤN MÔI TRƯỜNG
DỰ ÁN HỖ TRỢ KỸ THUẬT CHUẨN BỊ DỰ ÁN HẠ TẦNG CƠ BẢN PHÁT TRIỂN TOÀN DIỆN CÁC TỈNH ĐÔNG BẮC
(PPTA – 8957)

I. **Danh sách các cán bộ tham gia cuộc họp**

No.	Họ tên	Chức vụ	Số điện thoại
1	HOÀNG KHÁNH HOÀ	PHÓ CHÁNH VĂN PHÒNG	0913926688
2	MÔNG VĂN SÁI	PHÓ GIÁM ĐỐC SỞ TN&MT	0914121296
3	NGUYỄN THỊ LAN	TRƯỞNG PHÒNG TỔNG HỢP KẾ HOẠCH	0169 382 1168
4	ĐỖ MẠNH HƯNG	CV PHÒNG TNMT-KTTV	0986 959535
5	NÔNG CÔNG PHÚ	CV PHÒNG KHOÁNG SẢN	0914 802 863
6			
7			
8			

Dự án Hạ tầng Cơ bản Phát triển Toàn diện các tỉnh Đông Bắc

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

PHIẾU ĐIỀU TRA KHẢO SÁT MÔI TRƯỜNG

Ngày 16 tháng 9 năm 2016

Tại Nông nghiệp và Phát triển Nông thôn tỉnh Cao Bằng

Đại diện nhóm khảo sát điều tra môi trường - Dự án Hạ tầng Cơ bảnPhát triển Toàn diện các tỉnh Đông Bắc

1/ Ông Nguyễn Thanh Dương - Trưởng nhóm

2/ Bà Doãn Hồng Anh - Cán bộ hỗ trợ

Đã làm việc với:

Đại diện Sở Nông nghiệp và Phát triển Nông thôn tỉnh Cao Bằng (có danh sách kèm theo)

Nội dung trao đổi làm việc:

1/ Trao đổi các thông tin chung về DA Hạ tầng Cơ bản PT Toàn diện các tỉnh Đông Bắc
- TDA: Nâng cấp tỉnh lộ 211 Trà Lĩnh - Trùng Khánh
- TDA NSH thị trấn Xuân Hòa + xã Phù Ngọc, Hà Quảng

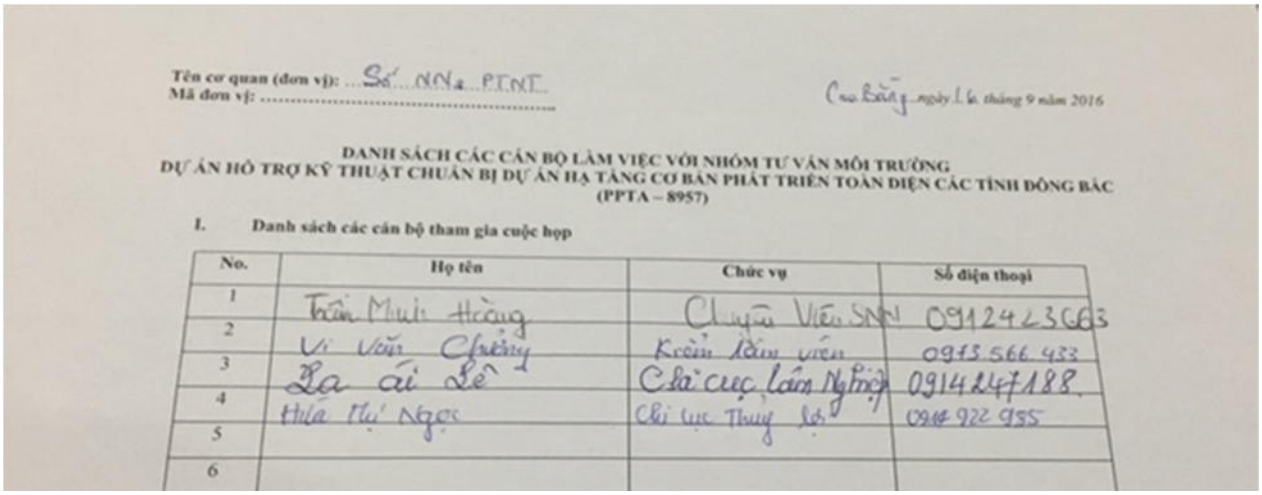
2) Thông tin chung khu vực TDA.

Rừng Cao Bằng phân 3 loại theo Q.định 415 của UBND tỉnh Cao Bằng

TT Hùng Quốc: 13378.8 ha; huyện Trùng Khánh: 25.546,1 ha; Huyện Hà Quảng: 27.034,5 ha; khu Pác Bó: 1385 ha. Ko có diện tích rừng phòng hộ tại khu vực 2 TDA. Rừng chủ yếu phân kết về cho người dân quản lý.

Các huyện có Ban chỉ đạo Quản lý Bảo vệ và PT rừng bao gồm cả kiểm lâm và cán bộ ở xã.

Có file pdf diện tích rừng phòng hộ của 3 huyện.



Tên cơ quan (đơn vị): Sở NN & PTNT
Mã đơn vị: .....

Cao Bằng ngày 16 tháng 9 năm 2016

DANH SÁCH CÁC CÁN BỘ LÀM VIỆC VỚI NHÓM TƯ VẤN MÔI TRƯỜNG
DỰ ÁN HỖ TRỢ KỸ THUẬT CHUẨN BỊ DỰ ÁN HẠ TẦNG CƠ BẢN PHÁT TRIỂN TOÀN DIỆN CÁC TỈNH ĐÔNG BẮC
(PPTA – 8957)

I. Danh sách các cán bộ tham gia cuộc họp

No.	Họ tên	Chức vụ	Số điện thoại
1	Trần Mười Hoàng	Chuyên Viên SNN	0912423663
2	Vi Văn Chường	Kiểm lâm viên	0913.566.433
3	Đa ái Lê	Cán cục Lâm Nghiệp	0914247188.
4	Hứa Thị Ngọc	Chi cục Thuỷ lợi	0947 922 955
5			
6			

Dự án Hạ tầng Cơ bản Phát triển Toàn diện các tỉnh Đông Bắc - PPTA 8957

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

PHIẾU ĐIỀU TRA KHẢO SÁT MÔI TRƯỜNG

Ngày 17 tháng 9 năm 2016
Tại xã TT Hùng Quốc; xã Quang Trung; Lăng Yên huyện Trà Lĩnh; Trùng Khánh tỉnh Cao Bằng

Đại diện nhóm khảo sát điều tra môi trường - Dự án Hạ tầng Cơ bảnPhát triển Toàn diện các tỉnh Đông Bắc

1/ Ông Nguyễn Thanh Dương - Trưởng nhóm

2/ Bà Doãn Hồng Anh - Cán bộ hỗ trợ

Đã làm việc với:

Đại diện chính quyền xã (có danh sách kèm theo)

Nội dung trao đổi làm việc:

- TT Hùng Quốc: cần quan tâm đến chợ thi công, cống qua đường. Đa số ng dân dùng nước giếng khoan. Nhà máy cấp nước quanh định TT Hùng Quốc. Nguồn nước lấy ở suối.
Y/c: Đảm bảo vệ sinh đất đá khi thi công con đg. Đặc biệt khi chợ gia súc đi vào hoạt động (dự kiến đầu năm 2017.
- Xã Quang Trung:
Muốn tăng độ qua cánh đồng, tránh các khu đông dân cư, đặc biệt khu bản Ngần.
- Tránh ảnh hưởng đến nguồn nước Bó Thấy bản Lũng Nặm ngay khu rừng phòng hộ Bó Thấy, cách UBND xã khoảng 1 km.
Khu vực qua sông Bắc Vọng hay bị ngập lụt (khu Bản Sác, Hạ) đg khu này làm tạm thời phải
- Xã Lăng Yên (Trùng Khánh)
- 2 xóm Lũng Giả và Bản Chiếu: học sinh phải sang Lăng Hiếu và Quang Trung học
Cần lưu ý đến bảo đảm tăng cho bà con.

DANH SÁCH CÁC ĐẠI BIỂU THAM VẤN NHẬN TIỀN HỖ TRỢ
DỰ ÁN HỖ TRỢ KỸ THUẬT CHUẨN BỊ DỰ ÁN HẠ TẦNG CƠ BẢN PHÁT TRIỂN TOÀN DIỆN CÁC TỈNH ĐÔNG BẮC (PPTA – 8957)

Cao Bằng, ngày 17 tháng 9 năm 2016

Nhóm Tư vấn môi trường thực hiện khảo sát tại xã TT. Thông Nông huyện ..... tỉnh Cao Bằng

I. Danh sách các đại biểu nhận tiền hỗ trợ

No.	Họ tên	Ký nhận
1	Nông Văn Đô	Đô
2	Nông Thị Khô	Khô
3	Nông Xuân Thanh	Thanh
4	Tô Văn Bạch	Bạch
5	Phạm Hạnh	Hạnh
6	Hoàng Văn Niên	Niên
7	Lê Quang Chiêu	Chiêu
8	Phan Văn Cường	Cường
9	Phan Văn Thắng	Thắng
10	Hoàng Đình Dũng	Dũng
11	Nông Thị Chiến	Chiến
12	Nông Thị Bích	Bích
13	Đàm Thị Bến	Bến
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DANH SÁCH CÁC ĐẠI BIỂU THAM VẤN NHẬN TIỀN HỖ TRỢ
DỰ ÁN HỖ TRỢ KỸ THUẬT CHUẨN BỊ DỰ ÁN HẠ TẦNG CƠ BẢN PHÁT TRIỂN TOÀN DIỆN CÁC TỈNH ĐÔNG BẮC (PPTA – 8957)

……………, ngày……… tháng 9 năm 2016

Nhóm Tư vấn môi trường thực hiện khảo sát tại
Xã……Quang Trung……huyện……Trà Lĩnh……tỉnh……Cao Bằng

I. Danh sách các đại biểu nhận tiền hỗ trợ

No.	Họ tên	Ký nhận
1	Nông cường Quyết	50.000đ Quyết
2	Dương văn Hoà	[illegible]
3	Bế văn Niên	Đản
4	Nông văn Chế	[illegible]
5	Nông văn Lợi	Lợi
6	Triệu Thị Nguyệt	[illegible]
7	Vương Thị Vòng	Vòng
8	Đàm Văn Điềm	Điềm
9	Đàm Văn Hùng	Hùng
10	Đàm thị Việt	Việt
11	Đàm Văn [illegible]	[illegible]
12	Võ quang Dũng	[illegible]
13	Dương Hoàng Đăng	Đăng
14	Đàm Văn Tuấn	Tô
15	Đàm Văn Tô	
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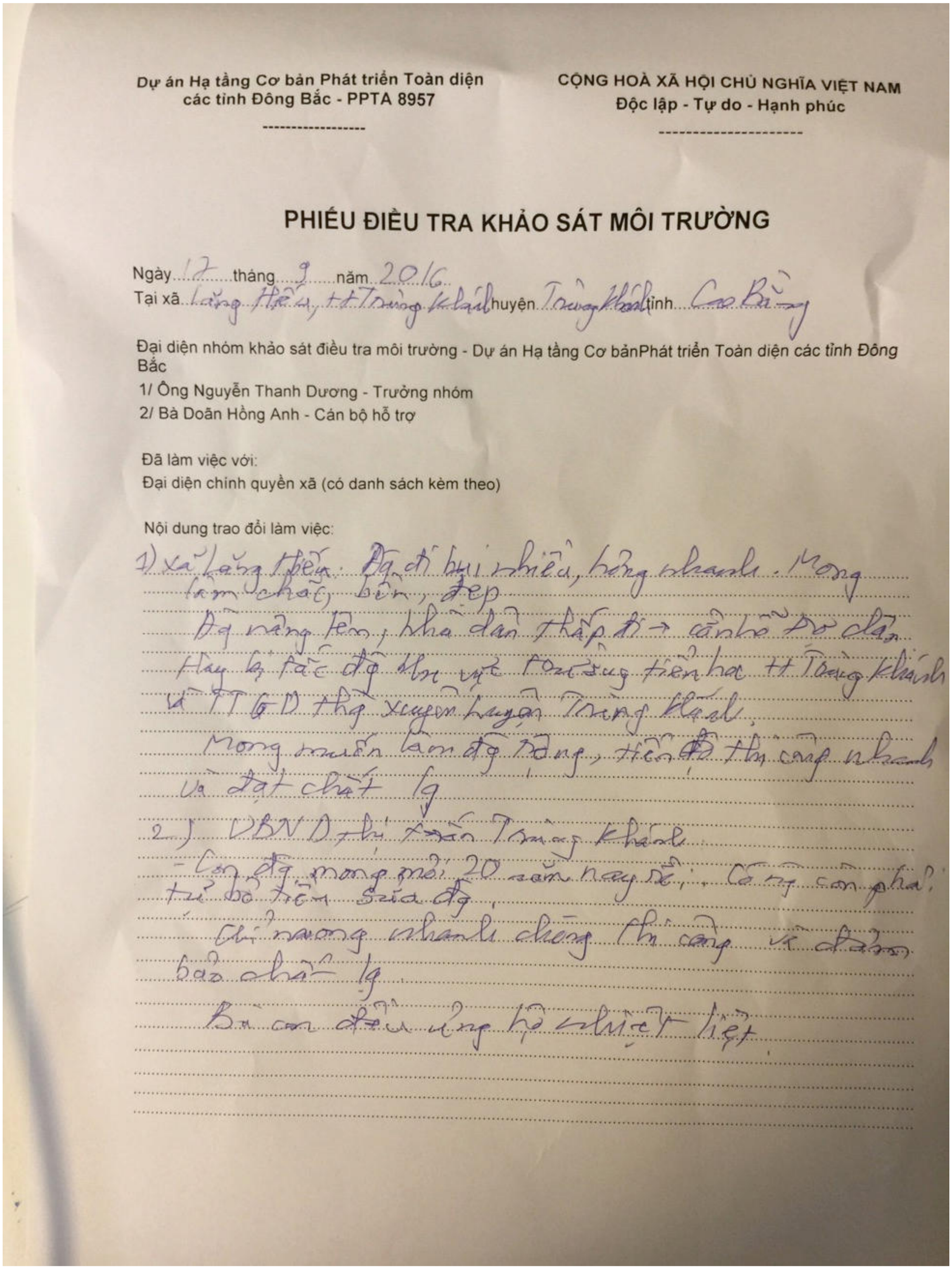

Dự án Hạ tầng Cơ bản Phát triển Toàn diện các tỉnh Đông Bắc - PPTA 8957

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

PHIẾU ĐIỀU TRA KHẢO SÁT MÔI TRƯỜNG

Ngày 17 tháng 9 năm 2016
Tại xã Lăng Hiếu, tt Trùng Khánh huyện Trùng Khánh tỉnh Cao Bằng

Đại diện nhóm khảo sát điều tra môi trường - Dự án Hạ tầng Cơ bảnPhát triển Toàn diện các tỉnh Đông Bắc

1/ Ông Nguyễn Thanh Dương - Trưởng nhóm

2/ Bà Doãn Hồng Anh - Cán bộ hỗ trợ

Đã làm việc với:

Đại diện chính quyền xã (có danh sách kèm theo)

Nội dung trao đổi làm việc:

1) xã Lăng Hiếu: Đg đi bụi nhiều, hỏng nhanh. Mong làm chắc, bền, đẹp

Đg nâng lên, nhà dân thấp đi → cần hỗ trợ dân

Hay bị tắc đg khu vực trường tiểu học tt Trùng Khánh và TTGD thg xuyên huyện Trùng Khánh.

Mong muốn làm đg rộng, tiến độ thi công nhanh và đạt chất lg

2) UBND thị trấn Trùng Khánh

- Con đg mong mỏi 20 năm nay rồi. Có ng còn phải tự bỏ tiền sửa đg.

Chỉ mong nhanh chóng thi công và đảm bảo chất lg

Bà con đều ủng hộ nhiệt liệt

DANH SÁCH CÁC ĐẠI BIỂU THAM VẤN NHẬN TIỀN HỖ TRỢ
DỰ ÁN HỖ TRỢ KỸ THUẬT CHUẨN BỊ DỰ ÁN HẠ TẦNG CƠ BẢN PHÁT TRIỂN TOÀN DIỆN CÁC TỈNH ĐÔNG BẮC (PPTA – 8957)

ngày ..... tháng 9 năm 2016

Nhóm Tư vấn môi trường thực hiện khảo sát tại
Xã Lăng Hiếu huyện Trùng Khánh tỉnh Cao Bằng

I. Danh sách các đại biểu nhận tiền hỗ trợ

No.	Họ tên	Ký nhận
1	Hoàng Thị Tươn	Tươn
2	Nông Thị Bến	Bến
3	Lương Thị	Hồn
4	Sầm Thị Phấn	Phấn
5	Lã Văn Bảo	Bảo
6	Hoàng Văn Lực	Lực
7	Chu Văn Tiệp	Tiệp
8	Bế Văn Minh	Minh
9	Hứa Văn Chương	Chương
10	Nông Văn Cường	Cường
11	Nông Đức Bốn	Bốn
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DANH SÁCH CÁC ĐẠI BIỂU THAM VẤN NHẬN TIỀN HỖ TRỢ
DỰ ÁN HỖ TRỢ KỸ THUẬT CHUẨN BỊ DỰ ÁN HẠ TẦNG CƠ BẢN PHÁT TRIỂN TOÀN DIỆN CÁC TỈNH ĐÔNG BẮC (PPTA – 8957)

……………, ngày……… tháng 9 năm 2016

Nhóm Tư vấn môi trường thực hiện khảo sát tại
xã Tri Trung Khoá huyện……………………………tỉnh Cao Bằng

I. **Danh sách các đại biểu nhận tiền hỗ trợ**

No.	Họ tên	Ký nhận
1	Lý Thế Cường	
2	Lý Văn Sơn	
3	La Tòi Thổ	
4	Ngọc Thị Lan	
5	Lại Thu Thủy	
6	Trần Chí Quý	
7	Ngô Thu Phương	
8	Hoàng Thị Trường	
9	Hoàng Thị Nen	
10	Đoàn Văn Chứng	
11	Hà Thay Quan	
12	Chu Văn Nam	
13	Hoàng Văn On	
14	Hà - Chu	
15	Nông Minh Hưởng	
16		
17		
18		