

Environmental Assessment Document

Initial Environmental Examination (Update)
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VIE: Additional Financing Second Northern Greater Mekong Subregion Transport Network Improvement Project

Prepared by the Ministry of Transport for the Asian Development Bank
This is an update of the IEE dated August 2010 available on:
<http://www.adb.org/projects/documents/second-northern-greater-mekong-subregion-transport-network-improvement-project-1> .

CURRENCY EQUIVALENTS

(as of 1 October 2015)

Currency unit	–	dong (VND)
VND1.00	=	\$0.000044
\$1.00	=	VND22,478

NOTE

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

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ABBREVIATIONS

ADB	–	Asian Development Bank
BOD	–	biological oxygen demand
DO	–	dissolved oxygen
EARF	–	Environmental Assessment and Review Framework
EIA	–	Environmental Impact Assessment
EMP	–	environmental management plan
EPAR	–	Ethnic and Poverty Assessment Report
GOV	–	Government of Viet Nam
HIV	–	human immunodeficiency virus
IEE	–	Initial Environmental Examination
NGO	–	non-governmental organization
MMP	–	Materials Management Plan
MONRE	–	Ministry of Natural Resources and Environment
MOT	–	Ministry of Transport
DD	–	Design and Supervision Consultant
PMU1	–	Project Management Unit 1, Ministry of Transport
PPE	–	Personal Protective Equipment
QL217	–	National Road QL217 & improvements
REA	–	rapid environmental assessment
RP	–	Resettlement Plan
SPS	–	ADB's Safeguard Policy Statement (2009)
SR	–	sensitive receiver
TA	–	Technical Assistance
TCVN/QCVN	–	National Technical Standards
TOR	–	Terms of Reference
TSD	–	Technical and Scientific Division (in PMU1)
TSP	–	total suspended particulate
TSS	–	total suspended solids
TOR	–	terms of reference
TTMP	–	temporary traffic management plan
VRA	–	Viet Nam Road Administration

WEIGHTS AND MEASURES

dB(A)	decibel (A-weighted)
masl	meter above sea level
km	kilometre
km/h	kilometre per hour
m	meter
m ³	cubic meter

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Location of Project Roads



I. EXECUTIVE SUMMARY

A. Overview

1. The Government of the Socialist Republic of Viet Nam (GOV) has requested the Asian Development Bank (ADB) to provide financing to facilitate investments to support the upgrading of roads proposed in the technical assistance Preparing the Second Northern Greater Mekong Subregion Transport Network Improvement Project TA 6478 - REG (The Project). The Project proposes a comprehensive program to upgrade, rehabilitate and maintain the road QL217 in Viet Nam, linking across the border to Lao PDR, and provide upgrading for some adjacent rural roads in the network. The executing agency (EA) for the Project in Viet Nam is the Ministry of Transport (MOT); the implementing agency will be Project Management Unit 1 (PMU1) of MOT.
2. The proposed road works includes upgrading and rehabilitating QL217 which extends from QL1 to the QL15 (Dong Tam Intersection). The road passes through a number of significant towns namely Vinh Loc, Cam Thuy, Ba Thuoc and Canh Nang and also crosses a number of highways, namely QL45, Ho Chi Minh Highway and QL15A. The existing road is typically narrow with a paved surface width of 5 meters for the 104 kilometers, through to Canh Nang. The exceptions are through some towns where the paved surfaces are as wide as 14 metres. Shoulders are typically less than 1 meter. The road is located in flat and some rolling terrain for the first 104 kilometers and on mountainous terrain until Km 195.
3. Improvement of QL217 has been categorized by ADB as environment category B, under its Safeguard Policy Statement 2009 (SPS)¹, and requires an initial environmental examination (IEE) to ensure that the potential adverse environmental impacts of improving QL217 are appropriately. An IEE had been prepared for the entire QL 217, from Km0 to Km 195 in 2010.
4. Phase 1 of the Project is being implemented, and consists of (i) the upgrading of road QL 217 from Km104 to Km195; (ii) construction of West Cam Thuy Bypass and East Cam Thuy Bypass and (iii) detailed design of Eo Le Bridge (km 38, L= 800m) and Ba Thuoc Bridge (km 104-km107, L = 2,8km) (Figure 2).
5. Based on the fact that the road condition got worse from Km 0 to Km 104+700 and the demand for improved traffic flow in QL 217 is increasing rapidly, GOV has requested additional financing for this section. ADB and MOT have agreed to continue with upgrading, rehabilitating and maintaining the section from km 59+900 to Km104+475 (junction with Route 15), for Phase 2 of the project to complete part of the Northeastern economic corridor for the Greater Mekong Subregion (GMS) Economic Cooperation Program. The scope of Phase 2 is: (i) carrying out improvements to approximately 45km of QL217 from km 59+900 to Km104+475; (ii) create a new flyover in Ha Trung; and (iii) improve the operations and maintenance of QL217.
6. This IEE is a supplement to the 2010 IEE focusing on section from km 59+900 to Km104+475 of road QL217 including a flyover bridge at Km 0. Starting point of Project is Km 0 interchange with NH1A (Km301+500 – NH1A) and North-South railway, Ha Trung District, Thanh Hoa Province. Ending point is Km 104+900 at Dong Tam Intersection, Ba Thuoc District, Thanh Hoa Province. It is based mainly on secondary sources of information, field reconnaissance surveys and public consultation undertaken specifically for this study.
7. The objectives of this IEE are to (i) assess the existing environmental conditions in the proposed Phase 2 sections; (ii) identify potential environmental impacts from the proposed road improvement works, flyover and bypasses; (iii) evaluate and determine the significance of the impacts; (iv) propose appropriate mitigation measures that can be

¹ ADB Safeguard Policy Statement 2009, Manila.

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incorporated into the proposed activities to minimize adverse impacts in an Environmental Management Plan (EMP); (v) ensure that residual impact if there is any, is acceptable and (vi) propose a monitoring program for the Project activities.

8. This IEE is submitted to ADB by the PMU1 and will be disclosed to the public through the ADB website and to the public in Viet Nam by PMU1. Before the loan is processed by ADB, the IEE will also be disclosed by PMU1 to Ministry of Natural Resources and Environment (MONRE) and provincial Department of Natural Resources and Environment (DONRE) and to the local authorities in Thanh Hoa province for review and identification of additional environmental assessment and environmental permits that may be required.

A separate environmental assessment and review framework (EARF) has been prepared and disclosed in 2010. The EARF provides guidance to the executing agency (EA) to ensure that QL217 project components shall conform to the provisions of the ADB's Safeguard Policy Statement 2009 (SPS). The EARF also applies to Project components, defined or modified at a later stage, to ensure all environmental impacts are appropriately addressed and mitigated to acceptable levels.

B. Policy, Legal and Administrative Framework

9. The Project complies with requirements of ADB SPS 2009 and the Government's Guidelines on Implementation of Law on Environmental Protection 2014 No. 52/2014/QH13 dated June 23, 2014 of the National Assembly of the Socialist Republic of Viet Nam on environmental protection, which comes into effect since 01/01/2015.

Additionally, certain activities commonly associated with infrastructure projects such as quarry operations, extraction of gravel or discharge of waste water will also require permission from the relevant provincial level authorities. PMU will submit the IEE to DONRE and disclose the scale and scope of the Project to the environmental authorities in due course. Also, PMU1 will review the IEE and EMP at the detailed design stage in the light of any future developments and forward revised documents to ADB.

C. Description of the Project

10. Phase 2 of the Project aims to improve the section from Km 59+900 (end of Cam Thuy West Bypass) to km104+475 (junction with Route 15), including the construction of a flyover bridge in Ha Trung (Km 0 interchange with NH1A (Km301+500 – NH1A) and North-South railway), Thanh Hoa Province).

Starting point from Km 59+900 at the intersection with Cam Thuy Bypass the road goes straight passing through residential areas in Cam Binh. It basically follows the old road through the districts of Cam Thuy and Ba Thuoc. The road ends at km104+475 at Dong Tam town, Ba Thuoc district at the intersection with QL15A. Total length is approximate 45 km. Generally the road follows the old road, improved bending a position to ensure high standards mountain road ($R_{min} = 125m$). Some sections of the road go through densely populated areas and town centers, towns and some running through residential areas that experience flooding.

A new flyover and interchange are proposed starting at Km 0 intersection with NH1A (Km301+500 – NH1A) and North-South railway, Ha Trung District, Thanh Hoa Province to reinforce traffic safety and decrease traffic congestion. The flyover is planned to have length of 372.0m ensuring railway clearance of 6.55m with structure of pre-stressing reinforced concrete Super T girder. Reinforced concrete abutments are put on bored piles. Length of the bridge approach is 1.00 Km. The direction of the interchange around the residential area of Ha Ninh commune and crossing NH1A is being designed to minimize impact to the environment and the community.

11. The rehabilitation and upgrading of road will involve some alterations to the width by <1m to 5m on the road to improve road geometry within the RoW of 25m either side of the centerline. The bypasses will be constructed on land yet to be acquired that is mostly

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agricultural fields. There will be a need for limited resettlement and the resettlement plans will be accomplished by the Provincial Peoples Committee of Thanh Hoa (PPCTH) who will also carry out the required social interventions.

12. When the road is widened, there will be a need to excavate significant spoil but there may be limited opportunities to use this material as fill. Therefore spoil disposal will be a significant issue that needs to be considered. Other construction impacts would be of a scale typical for a road upgrading project.

13. Bridges will be improved to accommodate vehicles up to 32 tonnes (as per Viet Nam road standards) and constructed as permanent concrete and steel structures. PMU1 will engage a detailed design consultant/project supervision consultant (PDCV/PSCV) and there will be a conventional ICB bidding to secure contractors for upgrading and/or reconstruction of the road.

D. Description of the Environment

14. The project site (Km 59 +900 – Km 104+475) is located at Thanh Hoa Province, where the climate is subtropical and the area is subject to heavy rainfall between April and October. The roads are fairly flat from the origin to Km 72 and then undulating with some steeper sections through the westerly hill terrain, especially after Km 90. The minimum altitude of QL217 is 150masl in the east and the maximum 500masl near Nam Meo. In the surrounding zone, people live at altitudes up to about 800masl. During rainy periods surface water on the road runs to side drains and across to the adjacent fields and canals and in the hills via crossing drainage structures and culverts.

15. The biological environment is dominated by agriculture. After Km70, the road is far from areas protected for the natural habitats for rare or endangered species. The Pu Luong Nature Reserve area is near Canh Nang and the buffer zone is over 5 km from road QL217 at its nearest point. There are no forests used for large timber extraction in any of the areas which are directly accessible from Km 59+900 – Km 104+475. The nearby production forests provide timber, vines and bamboo for the local population to construct dwellings and for craft work. Cattle are kept along on Km 59 +900 – Km 104+475 and other animals and birds are typical of those that tolerate disturbance by human settlement. There are a few large trees that will need to be avoided in the detailed designs but if cut, compensatory tree planting will take place. Moreover, it is important that appropriate permits should be secured from relevant government agencies before tree cutting is carried out.

16. Thanh Hoa is developing socially and has an improving economy and there are many industrial factories, commercial enterprises and many home craft enterprises. Traditional shop houses are located at intervals all along the road Km 59+900 – Km 104+475, and a ribbon of residential and commercial development is continuous throughout the settlement areas and towns. The land around Km 5 +900 – Km 104+475 is used for rice cultivation and large wet-paddy areas are found in most of the areas between the settlements on Km 59 +900 – Km 104+475. Rain-fed rice paddies and cultivation of vegetable and cash crops, in some cases based on shifting cultivation, are more common in the hilly areas to the west of Km70. There are factories along Km59+900–Km104+475, requiring the institutional arrangements to control pollution.

17. There were no sites of cultural significance found close to Km 59+900–Km104+475. The Ho King's Palace compound is about 300m south of the QL217 near km 30 north of Vinh Loc. The Km59+900–Km104+475 has already been realigned to pass away from this cultural relic. There are schools, hospitals, temples, chapels and churches within sight of Km59+900–Km104+475 in some nearby villages and there are graves near the road. All will be set back from where the road works are currently planned to take place.

18. Average mean temperature within the QL217 road project area is predicted to rise by 1.5°C. And maximum absolute temperature is predicted to be more than 42°C. Since the temperature of the region plain in Thanh Hoa province tends to be higher than that in the mountain, then the fly-over at Km 0 and the section from Km 0 - Km 90 will be

affected by high temperature more than other sections from Km 90 - Km 104.475 of QL217.

E. Anticipated Environmental Impacts and Mitigation Measures

19. The potential environmental impacts will require mitigation measures to minimize the impacts in the design, construction and operational phases. The main issues relate to planning design of road structures and drainage and control construction impacts such as spoil and waste disposal, traffic interruption, noise and dust during construction. In most places, the existing road corridor (RoW of 25m wide) either side of the centreline, is ample for the proposed rehabilitation works. There should only be moderate disturbance to the surrounding areas from the construction impacts when the environmental management plan is implemented fully.

20. In the detailed design and preconstruction phases, MOT retains suitably qualified environmental officer(s) in the Technology and Science Division (TSD) of PMU1 and with the assistance of the PDCV/PSCV undertake environmental management and training in preparation to: (i) disclose the final QL217 design to DONRE and ADB; (ii) check that the Project site works boundaries correspond with those disclosed in this IEE; (iii) prepare tender documents to include the updated Environmental Management Plan (EMP) to ensure that the contractor(s) and sub-contractor(s) implement the mitigation measures indicated in the EMP and comply with all environmental safeguard requirements; (iv) ensure environmentally responsible procurement and the acceptability of sufficient borrow sites for rock based materials agreed with DONRE prior to bidding; (v) plan spoil and waste disposal (vi) plan to preserve and avoid road side trees and compensate for trees that will be removed; (vii) confirm hydrological and drainage impacts of the Project and ensure detailed bridge and culvert designs take account of a 100-year return rain storm event; (viii) plan to minimize disturbance of vehicular traffic and pedestrians during construction; (ix) take additional baseline water quality, air and noise samples before construction commences as necessary. Before civil works for Phase 1 started, baseline environmental quality sampling (air, water, noise, soil, etc.) were conducted and the detailed location and measurements are shown in Table V.1, Table V.2 and Table V.4.; (x) plan worker and public safety; (xi) plan for the contractor to engage capable staff to be responsible for the environmental management at the working level and (xii) require the contractor(s) to submit a Contractor's Environmental Management Plan (CEMP) prior to start of construction work. The CEMP will be based on the project EMP of this IEE, including all the mitigation measures indicated therein, an EMP implementation monitoring program and a description of the grievance redress mechanism (GRM) for addressing complaints. The Project Management Unit (PMU1) will also make a reassurance check with the responsible authority that there is no potential threat from unexploded ordinance (UXO) before works commence.

21. Construction impacts will mainly be from works to reconstruct the road base, renewing culverts across streams, providing better crossing drains in embankments and repairing road embankment base courses, and surfacing works. The location for construction works will be >20m from the nearest residential sensitive receivers (SRs) that are outside the RoW and in principle this should allow ample buffer distance to attenuate many potential nuisances.

22. The Contractor(s) will be required to produce and commit to implementing a Contractor's Environmental Management Plan (CEMP) that corresponds to the construction phase mitigation proposed in the EMP including but not limited to several management plans for: (i) waste management and spoil disposal; (ii) temporary drainage; (iii) temporary traffic management; (iv) materials management; (v) erosion control and site runoff, (vi) noise and dust control; reconnection of utilities; and (vi) worker and public safety. The CEMP will be based on the EMP presented in this IEE; updated as necessary in response to the detailed designs. The CEMP should include an Environmental Monitoring Checklist that will be used during regular site inspections. The Contractor(s) will need support from environmental consultants to prepare the CEMP

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and submit it for approval to PMU1 and ADB before the start of civil works. The PMU and Project Supervision Consultant (PSCV) will ensure that the Contractor(s) trains all staff as necessary to implement the construction mitigation measures in the CEMP and monitors the implementation of mitigation measures. PMU and PSCV will provide technical assistance as necessary. Unsuitable soil, spoil and construction waste will be disposed on sites that will be approved by DONRE as agreed with local authorities and disposal will be monitored. Waste will not be burned. The acceptability of the borrow sites for fill materials will be agreed with DONRE prior to signing of contracts. Building materials will be obtained from sites approved by DONRE using local sources as practicable to minimize transportation and stockpiling of building materials. Noise and dust will be controlled at source and no work will be carried out during the night. The Temporary Traffic Management plan (TTMP) will be developed and agreed with local authorities reviewed by PMU1 (PSCV/PMU1) and if found appropriate, approved. Resources from the Contractor(s) and PMU1 (PSCV/PMU1) will be provided as per the plan before construction commences. A worker and public safety plan, particularly for pedestrians and children, will be properly resourced before construction commences and a qualified safety officer will be identified by the Contractor(s) before construction commences. Facilities for workers and public safety, construction site offices and worker camps will be regulated in line with the labour codes of Viet Nam. Complaints will be monitored, investigated and addressed promptly through the GRM. Mitigation measures will be revised and the CEMP will be updated as necessary if unexpected impacts occur.

23. The operation of the improved section of Km59+900–Km104+475 should have little effect on the surrounding environment and the introduction of the wider asphalt pavement can be expected to reduce air pollution from disturbed dust. The improvement of the road will be within the existing corridor or on bypasses keeping vehicles away from sensitive receivers such as residences, commercial premises and schools that are set back from the road. Gaseous and particulate emissions from the expected traffic flows will be dispersed and there will be more traffic increasing noise. The upgrading is likely to increase the vehicle speed but additional future traffic should be moderate and unlikely to create many community safety problems. It is expected that monitoring and awareness campaigns by the road safety authority will be included in the operational phase and overall the condition of the road facilities will be enhanced and driving conditions should improve. Routine safety measures, signage and road markings will be introduced to reduce driving risk and will be verified at detailed design stage.

F. Information Disclosure, Consultation and Participation

24. The stakeholder consultation process has disseminated information in advance in Jan and Feb 2015 on the upgrading works and the expected impacts and the proposed mitigation measures. The process also gathered information on relevant concerns of the community so as to address these in the project implementation stages.

25. The results indicated the main environmental concerns were interference with transportation on QL217, construction noise and dust. Other responses mainly concerned the wish for further consultation between the local people and the Project authorities as well as concern that compensation for land to be acquired by Provincial People's Committee of Thanh Hoa (PPCTH) should be fair. The environmental concerns can all be controlled and minimized by thorough implementation of the CEMP.

G. Grievance Redress Mechanism (GRM)

26. Existing arrangements for redress of grievances are through complaints to the Ward Committees, (the lowest government level) up to the District level and then through the PPCTH and back to PMU1.

27. Through a Grievance Redress Committee (GRC), PMU1 shall promptly address affected people's concerns, complaints, and grievances about the Project's environmental performance at no costs to the complainant and without retribution. The GRC, which shall be established by PMU1 before commencement of site works, shall be

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chaired by PMU and shall have members from the contractor, ward and district committees, DONRE, local NGO, and women's organization. Grievances can be filed in writing or verbally with any member of the GRC. The committee will have 15 days to respond with a resolution. If unsatisfied with the decision, the existence of the GRC shall not impede the complainant's access to the Government's judicial or administrative remedies.

28. PMU1 shall make public the existence of this grievance redress mechanism through public awareness campaigns. PMU shall also set-up a hotline for complaints and the hotline shall be publicized through the media and numbers placed on the notice boards outside the site and suggestion/complaints boxes be placed outside the construction camps and yards.

29. PMU1 have recruited environmental and social safeguard staffs under the Technology and Science Division that is concurrently designated as the Grievance Facilitation Unit (GFU) to deal with complaints, disputes or questions about the Project on a day to day basis and maintain a database at the working level.

H. Environmental Management Plan

30. The institutional requirements and responsibilities for various stakeholders including PMU1, Project Detailed Design Consultant (PDCV) Project Supervision Consultant (PSCV) and contractor(s) have been identified. This IEE including the EMP should be used as a basis for an environmental compliance program. The EMP was developed by close reference to best practices and in line with ADB's SPS 2009. The environmental assessment and EMP will be reviewed by the PDCV at the detailed design stage and the ADB-approved EMP that includes the monitoring program will be included in bidding documents. A suite of mitigation measures has been proposed and the IEE concludes that the impacts will be manageable if the mitigation measures spelled out in the EMP are implemented thoroughly. The EMP will be updated by the design consultants at the detailed design stage. The updated EMP, conditions of environmental clearance from DONRE and any subsequent licenses and approvals from local authorities will comprise the environmental requirements for the Contractor(s) in the compliance program. The requirements of the IEE and the EMP will be included in the contracts and the Contractor(s) will be required to produce a method statement in the form of a Contractor's Environmental Management Plan (CEMP) before construction works commence by fine tuning the construction mitigation measures proposed in the ADB-approved EMP. The effective implementation of the design stage mitigation in the EMP and the construction stage mitigation in the CEMP will be audited by PMU1/TSD and ADB as part of the loan conditions. The main monitoring for the CEMP will be done by the ESO assisted by the Project Supervision Consultant based on thorough implementation of all the mitigation measures by the Contractor(s). If this is done effectively the impacts can be controlled well within acceptable limits. The disposal of spoil and supply of filling and building materials should also be monitored.

I. Conclusion and Recommendations

31. This IEE is a supplement/update to the IEE which was carried out in 2010 when the QL217 upgrading work was at the initial stage of design during the Loan 2703-VIE. In 2010, IEE had been prepared for the entire QL 217, from Km0 to Km 195 in 2010 (IEE Phase 1). This supplement focuses on the rehabilitation, upgrading and maintenance of QL 217 from Km 59.9 (end of Cam Thuy West Bypass) to Km 104.475 (junction with Route QL15, Dong Tam Intersection, Ba Thuoc District, Thanh Hoa Province), including the construction of a flyover bridge in Km 0 that intersect with NH1A.

32. Secondary data and preliminary observations were used to assess the scale of environmental impacts and public consultation and site reconnaissance were carried out in order complete the environmental assessments in a comprehensive manner and recommend suitable mitigation measures.

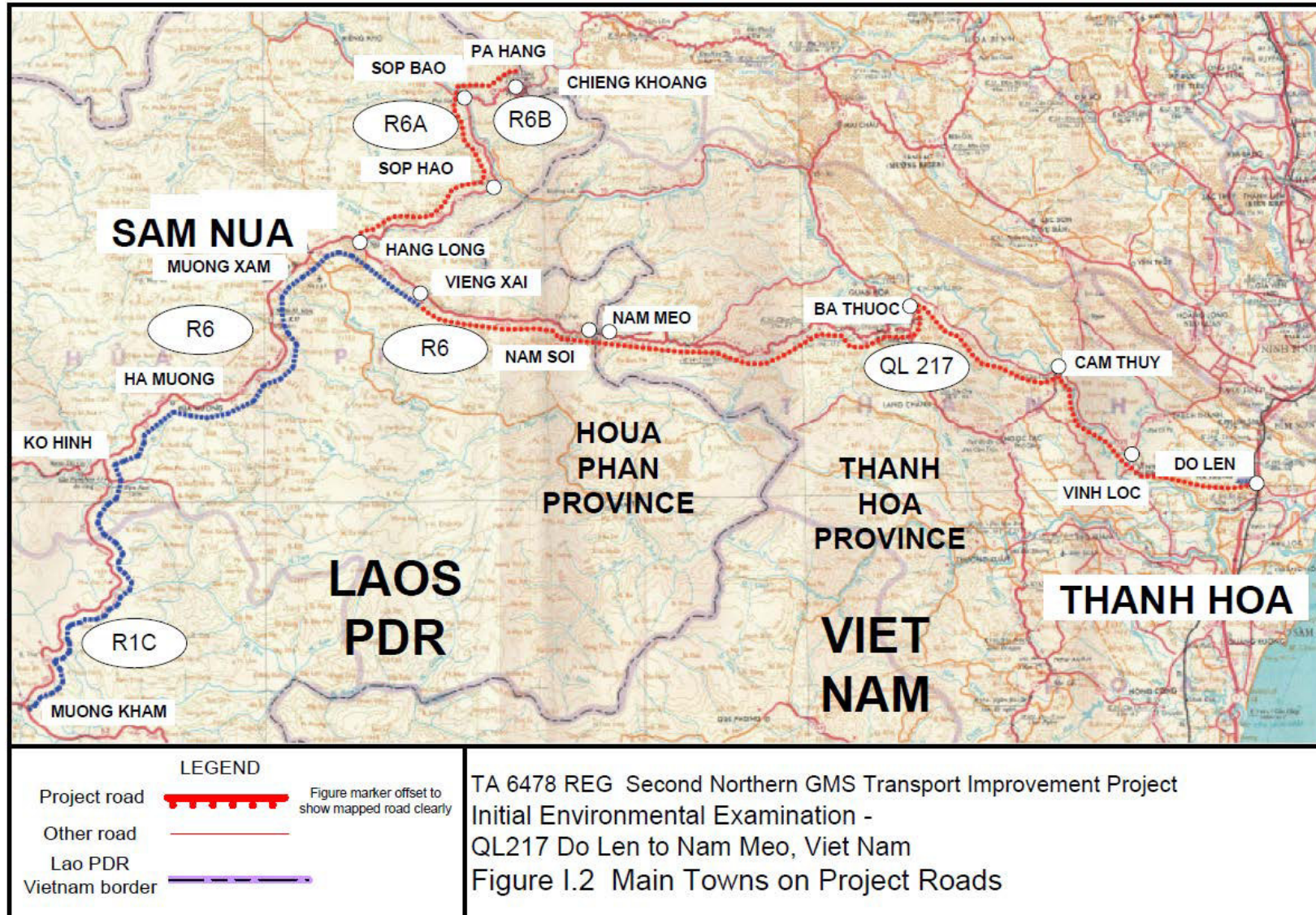
Initial Environmental Examination of Km 59 +900 – Km 104+475 and Flyover Bridge NH1A

33. The IEE shows that impacts from construction and operation will be manageable and no insurmountable impacts are predicted. The environmental assessment and EMP will be reviewed by the PDCV at the detailed design stage and the ADB-approved EMP that includes the monitoring program, will be included in bidding documents. In the event that design details change the locations or scope of the proposed works the environmental assessment and EMP shall be reviewed and revised accordingly by the PDCV. The updated EMP will be included in the bid documents for Phase 2 and is updated by the contractor in the CEMP. If construction mitigation measures are implemented to their full extent, the impacts will be controllable and acceptable.

34. The negative environmental impacts from the Project will mostly take place during the construction stage. The construction impacts will be predicted and managed and with appropriate mitigation few residual impacts are likely. Additional human and financial resources will be required to improve environmental capability in PMU1 and to progress and achieve necessary statutory compliance and monitoring of implementation of the updated EMP and CEMP.

35. The responsibilities for the implementation of mitigation measures and the parties responsible will be clearly defined in contracts and the implementation by various parties will be checked and monitored by the PMU1 and PDCV/PSCV including implementation of additional mitigation measures to address unexpected environmental impacts.

Figure I.1- Location of Main Towns on QL217



II. POLICY AND LEGAL FRAMEWORK

A Environmental Regulatory Compliance

36. The environmental regulations of GOV for environmental assessment rules are set out in the Guidelines on Implementation of Law on Environmental Protection (Law on Environmental Protection 2014 No. 52/2014/QH13 dated June 23, 2014 of the National Assembly of the Socialist Republic of Viet Nam on environmental protection, which comes into effect since 01/01/2015) that requires environmental assessment (in the form of an EIA) for listed projects. MONRE has delegated powers to DONRE to approve the environmental assessment for provincial projects and MONRE will receive a copy of the environmental assessment before construction commences. A copy of the approved environmental assessment in the form of an IEE will be submitted to ADB in accordance with the SPS. Certain activities commonly associated with road improvement such as quarry operations, extraction of gravel or discharge of waste water will also require permission from the relevant provincial level authorities. Therefore MOT/PMU1 will submit the IEE to DONRE and the Thanh Hoa Provincial Environmental Protection Service in the province to disclose the scale and scope of the project to the environmental authorities. Viet Nam laws, main decrees and statutory instruments relevant to this IEE are as follows:

- i) Decree 18/2015/ND-CP of the Government of the Socialist Republic of Vietnam dated 14 Feb 2015 providing strategic environmental assessment, environmental impact assessment and environmental protection commitment
- ii) Vietnamese Environmental Protection Law, amended in 2014, approved by the National Assembly No. 52/2014/QH13 dated June 23, 2014, validity from 01/01/2015.
- iii) Governmental Decree No. 81/2006/ND/CP dated 09/08/2006 of the Government On instruction for fines for breach of Environmental Protection Law's implementation.
- iv) Vietnamese standards on environment protection (QCVN) from 1995 to present (2015).
- v) Government Decree N0.121/2004/ND-CP dated 12/05/2004 providing the regulations on settlement of violations on environmental protection (in replacement of the Decree No 26/CP dated 26/04/1996).
- vi) Decree No. 29/2011/ND-CP of April 18, 2011, providing strategic environmental assessment, environmental impact assessment and environmental protection commitment.
- vii) Circular No. 26/2011/TT-BTNMT detailing a number of articles of the Government's Decree No. 29/2011/NĐ-CP.
- viii) Decree No 35/2014/ND-CP of 29 April, 2014 amended a number of articles of Decree No. 29/2011/ND-CP of April 18, 2011 of the Government, providing strategic environmental assessment, environmental impact assessment and environmental protection commitment.
- ix) Circular No. 21/2012/TT-BTNMT of 19 December, 2012, provides for the guarantee assurance and the qualify control in environmental monitoring.
- x) Circular No. 32/2013/TT-BTNMT dated 25 October, 2013, promulgation National Technical Regulations on environment.

37. Moreover, other latest Government Standards and National Technical Regulations on environment pollution and protection in accordance with Law on Environmental protection will be referred to during the environmental management of the project. For instance :

Initial Environmental Examination of Km 59 +900 – Km 104+475 and Flyover Bridge NH1A

- i) Standards and National Technical Regulations for Ambient Air Quality
- ii) Standards for Noise and Vibration
- iii) Standards and National Technical Regulations for Surface Water Quality
- iv) Standards and National Technical Regulations for Solid Waste
- v) Standards and National Technical Regulations for Solid Quality

38. Pollution standards prescribed for the protection of the environment are described in the Law on Environmental Protection (and the QCVN standards as amended). The following standards will be referred to monitoring ambient environment of the project:

- i) QCVN 08:2008/BTNMT for Surface Water Quality
- ii) QCVN 14: 2008/BTNMT for Domestic Wastewater
- iii) QCVN 4:2008/BTNMT for Discharge of Wastewater
- iv) QCVN 24:2009/BTNM for Industrial Wastewater
- v) QCVN 40: 2011/BTNMT for Industrial Wastewater
- vi) QCVN 05: 2013/BTNMT for Ambient Air Quality
- vii) QCVN 06:2009/BTNMT for Hazardous Substances in Ambient Air
- viii) QCVN 26: 2010/BTNMT for Noise
- ix) QCVN 27: 2010/BTNMT for Vibration
- x) QCVN 19:2009/BTNMT for Industrial Emission of Inorganic Substance & Dust
- xi) QCVN 03:2008/BTNMT for the limits of Heavy Metals in the Soild.
- xii) QCVN 07:2009/BTNMT for Hazardous Waste Thresholds
- xiii) QCVN 36:2010/BTNMT for Drilling Fluids and Drilling Cutting

39. Certain project activities commonly associated with road improvement such as quarry operations, extraction of gravel or discharge of waste water also require licenses that are issued at the provincial level by DONRE and Provincial Peoples Committee offices (PPC) depending on the duration and scale of those activities. PPC offices are the authorities to decide on the permit requirements at the provincial level.

40. In Viet Nam the environmental assessment process is established but the rules, regulations, procedure and processes for environmental impact assessment of development activities and guidelines on environmental management are being reviewed under the latest Government Decrees. PMU will review the IEE and EMP at the detailed design stage in the light of the latest Government Decrees and forward revised documents to DONRE and ADB.

B International Conventions

41. Vietnam is a party to several international conventions that are relevant to environmental management (Table II.1). None of the conventions has any direct or specific relevance for this IEE as the Project does not encounter any areas of environmental sensitivity covered by the conventions.

Table II.1- International Conventions to which Vietnam is a Party (environmental)

Convention Title	Convention date	Viet Nam participation
Convention on Wetlands of International Importance Especially as Waterfowl Habitat (RAMSAR)	1971	20 September 1988
Protocol to Amend the Convention on Wetlands of International Importance Especially as Waterfowl Habitat, Paris.	1982	
Convention Concerning the Protection of the World Cultural and Natural Heritage	1972	19 October 1987
Convention on International Trade in Endangered Species Wild Fauna and Flora	1973	20 January 1994
UN Environmental Modification Convention (ENMOD)	1977	26 August 1980
Montreal Protocol on Substances that Deplete the Ozone Layer	1987	26 January 1994
London Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, London.	1990	
Copenhagen Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, Copenhagen.	1992	
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	1995	13 March 1995
United Nations Framework Convention on Climate Change	1992	16 November 1994
Convention on Biological Diversity	1992	16 November 1994

III. DESCRIPTION OF THE PROJECT

A. Background

42. The standards and conditions of many of the roads in Viet Nam are inadequate to meet rapidly growing demand for efficient travel. This situation limits national development and economic growth. The existing road infrastructure therefore needs to be improved, upgraded and maintained on a regular basis.

43. The existing condition of Km 59 +900 – Km 104+475 ranges from 'poor' to 'normal' condition. The sealed and earthen shoulders are also in poor condition. There are deep ruts and crumbling surface coatings owing to movement of heavy loaded vehicles and little maintenance. The slabs of the bridges have wide holes in places which are repaired improperly from time to time. The culverts also are in poor condition.

44. Procurement will be using project detailed design consultant engineers (PDCV) who will be responsible for detailed design and to undertake the project construction supervision consultancy (PSCV). PMU 1 engaged the PDCV/PSCV For purposes of this IEE, there is a conventional ICB bidding to secure contractors for upgrading and/or reconstruction of the road.

B. Existing Road

45. The existing road starts at the Ho Chi Minh Highway approximately 1 kilometer south of the bridge over the Ma river. The road is located in flat and some rolling terrain for the 104 kilometers. It is fairly flat from the origin to Km72 and then undulating with some steeper sections through the hilly westerly hill terrain especially after Km 90. After Km 92 the road enters the town Ba Thuoc and intersects with NH15 at Thiet Ong (Km104.9 to Km107.2). The road passes through a number of significant parts of Thanh Hoa Province. For example, Project road goes through the residential areas of centers of Cam Thuy, Ba Thuoc and Canh Nang district.

46. In section Km 59+900 - Km104+475 there are 29 curves with radius less than 125 metres – some less than 60 meters. Road gradients control speed in most instances. The section between Km 0 and Km 105 was upgraded between 2001 and 2004 and consists of a 5 metre seal on a 6.5/7 meters road formation. The pavement is macadam and is surfaced with DBST except for a number of sections through towns where the pavements are asphalt and concrete. The existing road is typically narrow with a paved surface width of 5 meters for the 104 kilometers, through to Canh Nang. The exceptions are through some towns where the paved surfaces are as wide as 14 meters. Shoulders are typically less than 1 meter.

47. The major portion of the traffic on this highway consists of motor bikes, trucks and public motor vehicles with some trucks carrying people and goods in and out of the area. Traffic flows counted in 2014 resulted in more than 2000 vehicles per day, comparing to 1800 vehicles per day in 2008. Average travel speeds are typically less than 80 kilometers per hour and settlements, slow traffic and pedestrians have a significant impact on average speeds for the 104 kilometers, reducing them down to 40 to 50 km/h.

48. The route runs along the Ma river so it is affected by river water level. Some sections experience flooding in the rainy season. For example, in the historic floods in 2007 on section Km59 + 900 - Km104 + 475 have some sections flooded with the deepest submerged depth to 2.81m. At the water level H4% affected by the Ma River, a total of 8 sections with length L = 7.38Km (Table III.1) are flooded.

TABLE III.1 Sections Affected by Ma River and the Flood 2007

No	Station		Length (m)	Location and depth of flooding		Height of flooding H _{max} 2007	High water levels H4%
	Km...	Km...		Location flooding	Depth of flooding		
1	Km61+000	Km61+250	250	Km61+120	1.22	24.46	23.83
2	Km61+500	Km65+000	3500	Km62+300	1.75	25.87	25.16
3	Km70+800	Km72+900	2100	Km72+300	2.81	30.30	29.66
4	Km92+000	Km92+150	150	Km92+100	1.56	45.28	43.73
5	Km92+500	Km93+080	580	Km92+633	2.48	45.71	44.16
6	Km95+700	Km96+000	300	Km95+870	2.00	47.00	45.45
7	Km96+250	Km96+750	500	Km96+273	1.86	46.97	45.50
8	Km99+600	Km101+050	1450	Km100+200	2.00	50.76	50.35
	Total		7380				

Source: Road Engineering Report, Appendix 1.

C Proposed upgrading

49. Km 59+900 – Km 104+475 requires rehabilitation and upgrading that will involve some alterations to the width by 1m to 5m in some places to improve road geometry. In most places the existing road corridor (RoW of 25m wide) either side of the centreline, is ample for the proposed rehabilitation works. The works will therefore take place within the existing road corridor and no significant impacts are expected outside the road corridor. However to get a better road geometry some resettlement and minor land acquisition may be involved in some locations, subject to detailed design. The proposed geometric design standard and widening is shown in Table III.2.

50. The road works include widening of the existing road formation and will involve preparatory works such as vegetation and top soil clearing, scarifying and compaction of the foundations for the widened portion and deep scarification and compacting of the existing road embankment. This will be followed by full width pavement layer construction. Based on the expected traffic levels, the analysis indicated that the project roads would need to be widened to 9 meter formation with 2 x 3.0 meter paved traffic lanes, sealed shoulders of 1.0 meters and gravel shoulders of 0.5 meters (Viet Nam Class 3 Mountainous Rural Standard). Existing pavements are constructed of 20 to 30 cm thick macadam.

51. The Song Ma River is near Km 59 +900 – Km 104+475 at a few locations and this river overflows periodically in some places for several days every year. Specific locations or sections of road are flooded for periods of a few hours to a few days (Km 61 to 63; Km 70 to 73; and Km 92 to 96). Professional judgment suggests that in these areas the road will need to be raised and drainage incorporated into the pavement structure.

52. All the project works have been developed in accordance with the relevant Viet Nam road standards except that pavement layers (except for the asphalt layer) are to be constructed full width and that a significant portion of the shoulders are to be sealed (Table III.2).

Table III.2- Geometric Design Standard Adopted for Km 59 +900 – Km 104+475

Section	Km 59 – Km104		
Parameter	Standard	Unit	VN3 Mo R
Current Formation Width			
(approx. by observation) #		M	7.0 to 8.0
Proposed additional width[@]			
			1.0 to 2.0
Design speed		Km/h	40
Number of lanes		No.	2
Formation width		M	9.0
Traffic lane width		M	3.00
Outer shoulder width		M	1.00
Inner shoulder width		M	0.50-
Maximum longitudinal gradient		%	7
Median to be applied over 4-lane		M	-
Minimum horizontal curvature		M	60
Minimum radii of vertical curves: crest		M	700
Minimum radii of vertical curves: sag		M	450
Pavement Structure Surface			AC 7 cm

Source: Ministry of Transport (Vietnamese Standard TCVN 4054) and Consultants. Mo = Mountainous, R = Rural, * = (Wider through Do Len Town, # Final Report TA 6478, @ = i.e. widening by 5m is 2.5m each side. AC = asphalt concrete.

D Proposed bypasses

53. In Phase 1, the East and West Cam Thuy bypasses have been completed already. For Phase 2, Project Consultants and provincial and district authorities have proposed the potential bypasses such as Cam Binh, Dien Trung, and Canh Nang (Table III.3). The proposed alignments are intended to divert traffic away from town streets by rerouting the QL 217 across agricultural land. Consultations are ongoing during the detailed design phase to finalize the location of the proposed bypasses. Regardless of the final location of the bypasses, mitigation measures that will address environmental impacts are included in this IEE.

Table III.3- Possible Town Bypasses

No	Location	Length
1	Cam Binh	3.9 km (Km59+900 to Km63+800)
2	Pho Vac/ Suoi Ca Than	2.4 km (Km70+100 to Km72+500)
3	Dien Trung	0.9 km (Km79+900 to Km80+800)
4	Canh Nang	3.8 km (Km92+000 to Km95+800)

Source: Road Engineering Report, Appendix 1.

E Proposed bridge improvements

54. There are 29 bridges and box-culverts that require improvements to accommodate vehicles up to 32 tons as required by the Viet Nam road standards. As observed during site visits, water channels crossed by the bridges are either small streams and do not appear as productive fish habitats. The consultants have recommended that the bridges will be constructed as permanent concrete and steel structures. Details of conditions, assessments and recommendations of bridges and box-culverts are shown in Table III.4 and Table III.5.

Table III.4 - Condition of the Bridges and Box-Culverts

No	Name	Location	Condition of the Bridges and Box-culverts
1	Rung Lim 1	Km59+979.	No railing.
2	Rung Lim 2	Km60+120.	No railing.
3	Rung Lim 3	Km60+480.	No railing.
4	Rung Lim 4	Km60+502.	Superstructure is damaged 1. Abutment is damaged 3. No railing
5	Cam Binh	Km60+873.	Superstructure and abutment are damaged 1. Flooded 1.2m
6	Lang Xam	Km61+534.	Superstructure and abutment are damaged 1
7	None	Km61+793.	Superstructure is damaged 1
8	Dat	Km62+090.	Flooded 1.75m
9	Cam Binh 2	Km63+530.	Superstructure is damaged 1. No railing
10	Khuoi Gao	Km64+772.	Superstructure is damaged 1. No railing
11	Lang To	Km66+603.	NP
12	Hon Chon	Km68+790.	NP
13	Lang Chen	Km69+960.	No railing.
14	Vac 1	Km70+860.	No railing. Flooded 1.3m
15	Vac 2	Km71+186.	No railing. Flooded 1.4m
16	Chieng Tram	Km72+315.	Flooded 2.8m
17	Cam Thanh	Km73+340.	NP
18	Bong	Km74+031.	No railing.
19	Tra Nua	Km74+368.	Expansion joint is damaged 3.
20	Hon Ngang	Km75+210.	The parapet position is too low.
21	None	Km76+224.	No railing
22	None	Km81+285.	No railing
23	Dai Lan	Km82+227.	Superstructure is damaged 4. Abutment is damaged 1, weak railing
24	Hon La	Km91+304.	Expansion joint is damaged 3.
25	None	Km92+115.	Superstructure is damaged 1. No railing
26	Mun	Km92+700.	Flooded 2.2m
27	La Han	Km95+865.	No railing. Flooded 2.0m
28	None	Km100+465.	Buried culvert
29	Hon Nga	Km104+000.	Superstructure is damaged 4. Abutment is damaged 2. No railing

Legend: NP-No problem/damaged, Condition rate: 1-slight damaged, no need repair, 2-Minor damaged, repair if convenient. 3-damaged, required repair soon, 4-severe damaged, required repair immediately.

Source: Appendix 2. Bridge Engineering Report

Table III.5 - Assessment of the Bridges and Recommendations

NO	Name	Location	Assessment	Recommendation
1	Rung Lim 1	Km59+979.	Bridge width is lacked	Build new on bypass
2	Rung Lim 2	Km60+120.	Bridge width is lacked	Build new on bypass
3	Rung Lim 3	Km60+480.	Bridge width is lacked	Build new on bypass
4	Rung Lim 4	Km60+502.	Bridge width and rails are lacked.	Not require on bypass
5	Cam Binh	Km60+873.	Bridge width and rails are lacked.	Build new on bypass
6	Lang Xam	Km61+534.	Bridge width and rails are lacked.	Build new on bypass
7	None	Km61+793.	Bridge width is lacked.	Build new on bypass
8	Dat	Km62+090.	Bridge width is lacked.	Build new on bypass
9	Cam Binh 2	Km63+530.	Bridge width and rail are lacked.	Build new on bypass
10	Khuoi Gao	Km64+772.	Bridge width and rail are lacked.	Widening (7.6m)
11	Lang To	Km66+603.	Bridge width is lacked.	Keep as existing
12	Hon Chon	Km68+790.	Bridge width is lacked.	Keep as existing
13	Lang Chen	Km69+960.	Bridge width and rail are lacked.	Keep as existing
14	Vac 1	Km70+860.	Bridge width and rail are lacked.	Build new on bypass
15	Vac 2	Km71+186.	Bridge width and rail are lacked.	Build new on bypass
16	Chieng Tram	Km72+315.	Bridge width is lacked.	Build new on bypass
17	Cam Thanh	Km73+340.	Bridge width is lacked.	Keep as existing
18	Bong	Km74+031.	Bridge width and rail are lacked.	Keep as existing
19	Tra Nua	Km74+368.	Bridge width is lacked.	Keep as existing
20	Hon Ngang	Km75+210.	Bridge width is lacked.	Widening (7.4m)
21	None	Km76+224.	Box-culvert length and railing are lacked.	Build new on bypass
22	None	Km81+285.	Bridge width and rail are lacked.	Keep as existing
23	Dai Lan	Km82+227.	Same position	Build new
24	Hon La	Km91+304.	Repair expansion joint. Carriage width is lacked	Keep as existing
25	None	Km92+115.	Bridge width and railing are lacked.	Build new on bypass
26	Mun	Km92+700.	Bridge width is lacked.	Not require on bypass
27	La Han	Km95+865.	Bridge width is lacked.	Not require on bypass
28	None	Km100+465.	Bridge width is lacked.	Extension (6.1m)
29	Hon Nga	Km104+000.	Offset	Build new

Source: Appendix 2. Bridge Engineering Report

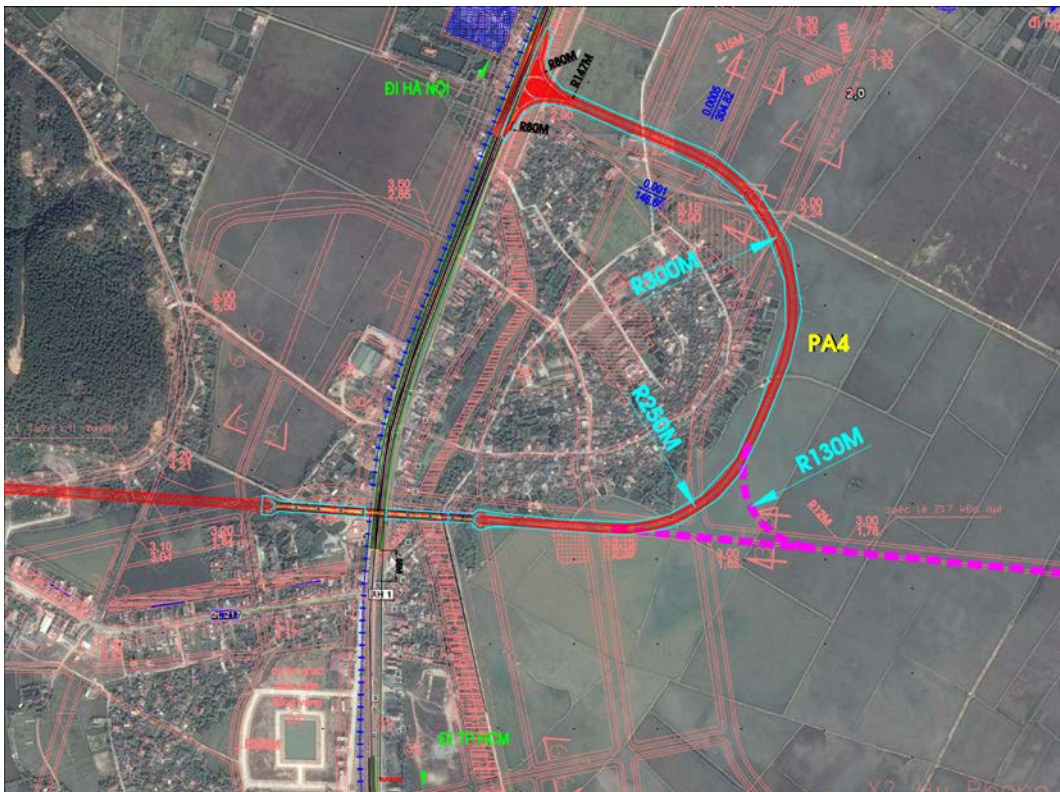
F Proposed Flyover/Interchange

55. A new Flyover Bridge is proposed starting at Km 0 interchange with NH1A (Km301+500) and North-South railway, Ha Trung District, Thanh Hoa Province; and will end at Km 59+900 at Cam Thuy Intersection, Thanh Hoa Province. This is the place where an interchange will be constructed including approach road and Flyover Bridge to reinforce traffic safety and decrease traffic congestion.

56. The Flyover Bridge is planned to have trumpet shape, radius $R=250\text{m}$, and the length of 372.0m ensuring railway clearance of 6.55m with structure of pre-stressing reinforced concrete Super T girder, with diagram for $39.1 + 7 \times 40 + 39.1\text{m}$. Reinforced concrete abutments are put on bored piles. Length of Approach Bridge is 1.00 Km.

57. The Flyover is in the North vicinity of the Do Len river which is a tributary of the Song Ma. It is 2 km far from the Do Len river. It is designed with a height $H = 1.75\text{m}$ beam master. The direction of the Flyover is around the residential area of Ha Ninh commune and crosses NH1A where no residences are on the left; therefore, impacts from the construction will be reduced considerably.

Figure III.1- Proposed Flyover Interchange with NH1A and North-South Railway



IV. DESCRIPTION OF ENVIRONMENT

A Physical Environment

1. *Meteorology and Climate*

58. The climate in Thanh Hoa in general and the Road Km 59+900 – Km 104+475 in particular are subtropical and influenced by the annual south west monsoon. There are two seasons. Dry season starts from November and lasts until March. The rainy season is between April and October. During the dry season no rain may fall for several months and it is cooler. The yearly average temperature is about 27°C with a maximum of 39°C. The rainfall varies and the yearly average precipitation is 1,500-2,500mm.

2. *Topography, Geology and Soil*

59. The topography of Thanh Hoa is largely below 300masl in the east with mountainous areas in the west, with elevations above 500masl typically characterized by steep terrain, narrow river valleys, and lower agricultural potential. The alluvial plains and river terraces cover about 60% of the land area served by QL217; mostly in the east. The hills and steeper landscape extends across most of the west of Thanh Hoa Province beyond Km 90 on QL217 with the most mountainous area west of Ba Thuoc after Km 107.

60. The Thanh Hoa area is tectonically active and northern parts of Vietnam have encountered major earthquakes. Cam Thuy was subject to a moderate earthquake in 2005 but the seismic activity was not significant. There is no record of recent volcanic activity in the mountains. The steep slopes, with moderately thin soil layers are prone to erosion when vegetation is removed and soils are exposed to rainfall and surface water flows. Thus, water quality in the mountain streams and rivers can be rapidly degraded when soils are eroded and flushed out, resulting in increased turbidity that reduces water quality for aquatic life and domestic and livestock consumption. Heavy rainfall is responsible for deteriorated sections of national and rural roads. However soil type should have very little bearing on the implementation of the works.

3. *Surface and Groundwater*

61. The mountainous area of Thanh Hoa Province provides the catchment for the Song Ma river system and QL217 runs alongside the Song Ma at a distance of about 50m for most of the way from Cam Thuy to Quan Son.

62. The rivers and streams are an important resource to the people in the project area. River flows are highest from April to October. Most of the streams and creeks discharge all year round carrying high sediment loads, depositing large quantities of gravels and sands in the lower reaches. During the wet season several stretches and some of the bridges and culverts are regularly inundated, cutting off roads and villages. Sections of road that are flooded for periods of a few hours to a few days are by observation as follows: Km 61 to 63; Km 70 to 73; and Km 92 to 96. The area provides some aquatic resources for subsistence and trade, as well as water for crop irrigation.

63. There are many factories along the length of the road and there many new other factories under construction and in development near the Song Ma that may affect the water quality. Thus, there are institutional arrangements to control pollution in future.

4. *Air Quality*

64. Air quality monitoring was not undertaken and no air quality measurements were available from the local Thanh Hoa environmental authorities. However the gaseous

pollutants carbon monoxide, sulphur dioxide, and nitrogen dioxide from traffic appear to be well dispersed in the open terrain and there is potentially adequate dispersion in the wide main streets of the towns. Air quality appears to be generally acceptable. Dust arises as traffic passes over unsealed shoulders of roads in many places.

65. The areas near the towns such as Do Len (at the origin of QL217) and Ba Thuoc have more potential sources of atmospheric pollution. These areas are more polluted due to significant town development as well as emissions from a few industrial establishments. There are several quarries within a few km in the surrounding district and a few small scale brick kilns located within sight of the road. The other source of air pollution is dust arising from ground or soil disturbance. The Vietnamese National Technical Regulations QCVN 05:2013/BTNMT and TCVN 5937 2005 will be used for the assessment.

5. Noise

66. Noise from vehicles is not a concern in the areas around QL217 at present as traffic is confined to occasional vehicles. There is no criterion for road traffic noise in Viet Nam, therefore the World Bank criteria will be applied. The national standards (TCVN 5949-1998) applies an ambient standards of Leq 60dB(A) for residential areas and Leq50 dB(A) for schools and hospitals. The national standards (QCVN 26:2010) apply the allowable limits for special areas (schools, hospitals, kindergarten, churches, temples, etc.) with 55 dB from 6 am to 9 pm and 45 dB from 9 pm to 6 am. The allowable limit for normal areas (residential district, houses, hotels, offices, etc.) is 70dB from 6 am to 9 pm and 55 dB from 9 pm to 6 am. The World Bank criterion for sensitive receivers such as residential school and hospital areas is Leq 55 dB(A) or background +3dB(A) where background exceeds the criterion. In fact, at Km 78, background noise ranged from Leq 50.4 dB(A) to Leq 67.8 dB(A) with traffic and Leq 35.9 dB(A) to Leq 45.1 dB(A) without traffic. At Km103, noise ranged from Leq 54.0 dB(A) to Leq 71.1 dB(A) with traffic. In the hillier areas further west there is little traffic and the noise levels are similar or less than at Km 78. Therefore in the settlements and towns where traffic runs throughout the day both the World Bank and Vietnamese criteria are potentially exceeded at times by the existing noise therefore a criterion of background +3dB(A) will be applied in the assessment. The Vietnamese criterion of Leq 50 dB(A) can be used at noise sensitive receptors if background is below Leq 50 dB(A)1hour in daytime or Leq 40 dB(A)1hour in nighttime (away from developed areas). However it is noted that there is a general presumption that there will be no night time work except in exceptional circumstances.

B Biological Environment

1. Agriculture

67. Much of the land around QL217 from Km 0 up to Km70 is used for wet-paddy cultivation due to the area's flat terrain. Large wet-paddy areas are found in many of the project areas between the settlements. Rain-fed rice fields are also common in the hillier areas. Besides paddy rice cultivation, a number of vegetable and cash crops are produced on a more commercial basis. In some cases, these are produced based on shifting cultivation in the mountainous areas to the west. These crops include soya beans, cassava, green beans, peanuts, sesame, corn, and a variety of fruit trees. A variety of vegetables are grown such as cabbage, cucumbers, tomatoes, lettuce, chilly eggplant, and pumpkin.

68. The human impact on the vegetation is most pronounced in the areas where grasslands and farmland have been created by numerous cycles of forest clearance for agriculture. In the hills there is some evidence of reversion to fallow and gradual regrowth of some trees. But most of the areas near the road up to Km 70 are paddy

fields. From this point west there is a mixture of settlements, short grassland, crop fields and isolated groups of trees and bamboo within the RoW. Forests are further away from the road.

2. Forestry

69. Consultations with the local forestry officers in Ba Thuoc confirmed that all the land outside settlements for 25m either side of the QL217 centreline is declared as the RoW. This is reduced to 13m in some of the hill towns. There is no National Park or Nature Reserve near Km 59+900 – Km 104+475 and none of the land in the RoW is production forest or protected forest. The land adjacent to the RoW is production forest in some areas. Trees within production forest areas with land use title can be cut and will probably go for local use but if trees are to be cut for the upgrading of the road, there will be a need for the forest authority to mark them first.

70. The local forestry officers in Ba Thuoc could not provide any information on the location or species composition of the nearest production forest or protected forests. No other records of the species composition or the boundaries of the forests could be identified but the local officials indicated that much of the standing crop is bamboo and other small trees and shrubs. They identified planted species of bamboo, acacia, pine, cajuput, linh and cedrela were most common around Km 59+900 – Km 104+475

71. The indications are that the production forests are degraded and not that densely vegetated with mature trees but mainly small-diameter trees, bamboos and shrubs. Local officials indicated that timber and bamboo is often used for paper making and it can be cut with permission from the forest authority that marks the trees and areas of bamboo for cutting. The forest authority is notified before sale. Sale of trees and bamboo is taxed. The nearest timber mill is at Km103 (Ba Thuoc).

72. Land use titles in production forests are issued by the district Department of Environment and Natural Resources. There is a formal management plan in Ba Thuoc, approved by the provincial forest authority and the Ministry of Agriculture and Rural Development. No crops are allowed in the forest land but in special cases nitrogen fixing crops such as legumes and soybeans will be allowed to enrich the soil.

3. Fauna and Flora

73. Based on consultations with forestry and environmental authorities in Ba Thuoc districts, there are no rare, threatened or endangered species of terrestrial and aquatic flora and fauna in the impact zone of the Project. The Km 59+900 – Km 104+475 road is not near areas protected for the natural habitats for rare or endangered species. The Pu Luong Nature Reserve area is the nearest and its buffer zone is over 5km from QL217 at its nearest point north of Canh Nang (Figure IV.4). Pu Luong Reserve Management Board has strict rules and visitors must comply with environmental regulations. Based on observation from the road from Canh Nang going into the Reserve it seems that trees in some hills have already been cleared, at least at the southern end of the Pu Luong Nature Reserve.

74. Along the proposed Km 59+900 – Km 104+475, there are appreciable areas of forest visible in between the areas cleared for agriculture but there are no undisturbed forests near the road. There are no forests used for large timber extraction in any of the areas which are directly accessible from the road. The nearby forests provide timber, vines and bamboo for the local population to construct dwellings and for craft work.

75. During field surveys there was evidence of some small scale extraction of timber near Km 59+900 – Km 104+475 but large scale timber extraction was not observed. Timber extraction is taking place for local small-scale/saw-mill production of timber for local construction purposes and large trunks and lumber were observed being taken

away on an open lorry from near Canh Nang. Large lumber was also observed near the road in several places. There is a lumber mill at Km103. Local forestry authorities control extraction of lumber.

C Social and Cultural Environment

1. Human Issues and Life Quality

76. Thanh Hoa Province is located in the North Central area of Viet Nam and is the second largest province (29,168 km²). It stretches from the coast in the east to the northwest where it shares a border with Laos PDR. Thanh Hoa has a diverse land topography including relatively high mountains, hills, midland, flooded rice areas (even lower than the sea level), alluvial ground, sand dunes, coastal rice fields and the near-shore and offshore islands. About 70% of the province is mountainous terrain that is in the remoter western regions near the Lao PDR border.

77. According to Decision 529/QĐ-LĐTBXH of Ministry of Labour-Invalids and Social Affairs dated 06/05/2014 (on approving the result of survey, revision on poor household and near poor household in 2013), Thanh Hoa population was 3.4 million in 2009 with 305 persons/km² and 89% people are living in rural areas. Thanh Hoa is one of the poorest provinces in Viet Nam, with the number of poor households higher than most of the country (121.849 poverty households). Thanh Hoa has a lower per capita income than most of the country. The mountainous areas are home to over one million ethnic minority people. The coastal areas are the key economic focus where the provincial capital, a deep-sea port, Nghi Son Special Economic Zone, the coastal resort of Sam Son, and various other historical and cultural attractions are located.

78. Report on the socio-economic situation in 2014 (Report 158/ BC-People's Committee of December 25, 2014 of the People's Committee of Thanh Hoa province) stated that the economic growth rate is estimated at 11.6%, exceeding the targets (11.5%) and higher than two years ago (in 2012 reached 10.3%, 11.2% in 2013). Structure of economic sectors in GDP shift in the right direction: the share of agriculture, forestry and fisheries accounted for 18.8%, down 0.9%; industry - construction 40.9%, up 0.9%; accounted for 40.3% service, equivalent over the same period. GDP per capita is estimated at \$ 1,365, exceeding the target set (\$ 1,320). However, per capita income is lower than the other provinces in the country. In 2014, there are 7 Districts of Thanh Hoa (Lang Chanh, Thuong Xuan, Quan Hoa, Quan Son, Muong Lat, Nhu Xuan, Ba Thuoc) in the list of the poorest districts in the country.

79. The province with its significant natural resources has strong potential for regional socioeconomic development, and Thanh Hoa City (population about 300,000), 160 km south of Hanoi along QL1 and connected on the west to the Lao PDR via Road 217, is strategically positioned as a potential regional hub. In the Greater Mekong Sub-region, Thanh Hoa is part of the East–West Transport Corridor with a new axis going into the north-eastern part of Lao PDR2.

80. The national highway in Km 59+900 – Km 104+475 runs through a few districts in Thanh Hoa province and is the lifeline of the residents, especially in Cam Thuy and Ba Thuoc districts. These districts are more mountainous and this is where the ethnic minorities live. Poverty is widespread here mostly because of low literacy, lack of awareness, higher dependency on agriculture, and lack of good connectivity. Improvement of the road will lead to social and economic benefits to the residents and the impacts will be transfused into the remote rural areas by improving the rural roads.

² ADB. 2007. Technical Assistance Report, Thanh Hoa City Comprehensive Socioeconomic Development Project, October 2007

A detailed description of the socioeconomic environment of the study area is given in the Ethnic and Poverty Assessment Report for the project.

2. Cultural and historical sites, schools and housing

81. There were no sites of cultural significance found close to Km 59+900 – Km 104+475 . The nearest is Ho King’s Palace compound just north of Vinh Loc. The existing QL217 has already been realigned to pass away from this cultural relic. The REA for the Project identified Ho King’s Palace as an archaeological palace site of ruins within about 200m of QL217 at Vien Tien. The palace site is actually a little over 300m from QL217 at its nearest point. This is the same culturally sensitive site as identified in the REA and it is outside the area for survey (covering up to 100m from QL217 and bypasses) and outside the corridor of impact for the Project. There are temples, chapels and churches in some villages nearby QL217 and there are graves placed along the road but all are more than 10m from where the rehabilitation works would need to take place and outside the corridor of impact for the Project.

82. Schools are located in proximity to the Km 59+900 – Km 104+475 in many locations. The noise sensitive facades of the school buildings are generally set well back from the QL217 road by more than 30m (Table IV.1). Although the perimeter of some schools is within 10 meters of road construction, these areas are separated by concrete fences or walls that isolate schoolchildren from construction works. Furthermore, a set of safety measures such as school zone warning signs, road markings and speed limit signs, and speed humps on both approaches to the school, will be implemented.

Table IV.1 Schools nearby QL217 within 100m from road axis

Schools South of QL217	Chainage	Schools North of QL217
SCH (15m)	59+000	SCH(25m)
	80+460	SCH(30m)
	80+900	SCH(80m)
	81+400	SCH(30m)
SCH(50m)	91+000	
SCH(50m)	91+090	
	94+100	SCH(25m)
SCH(30m)	95+350	
	97+300	SCH(19m)

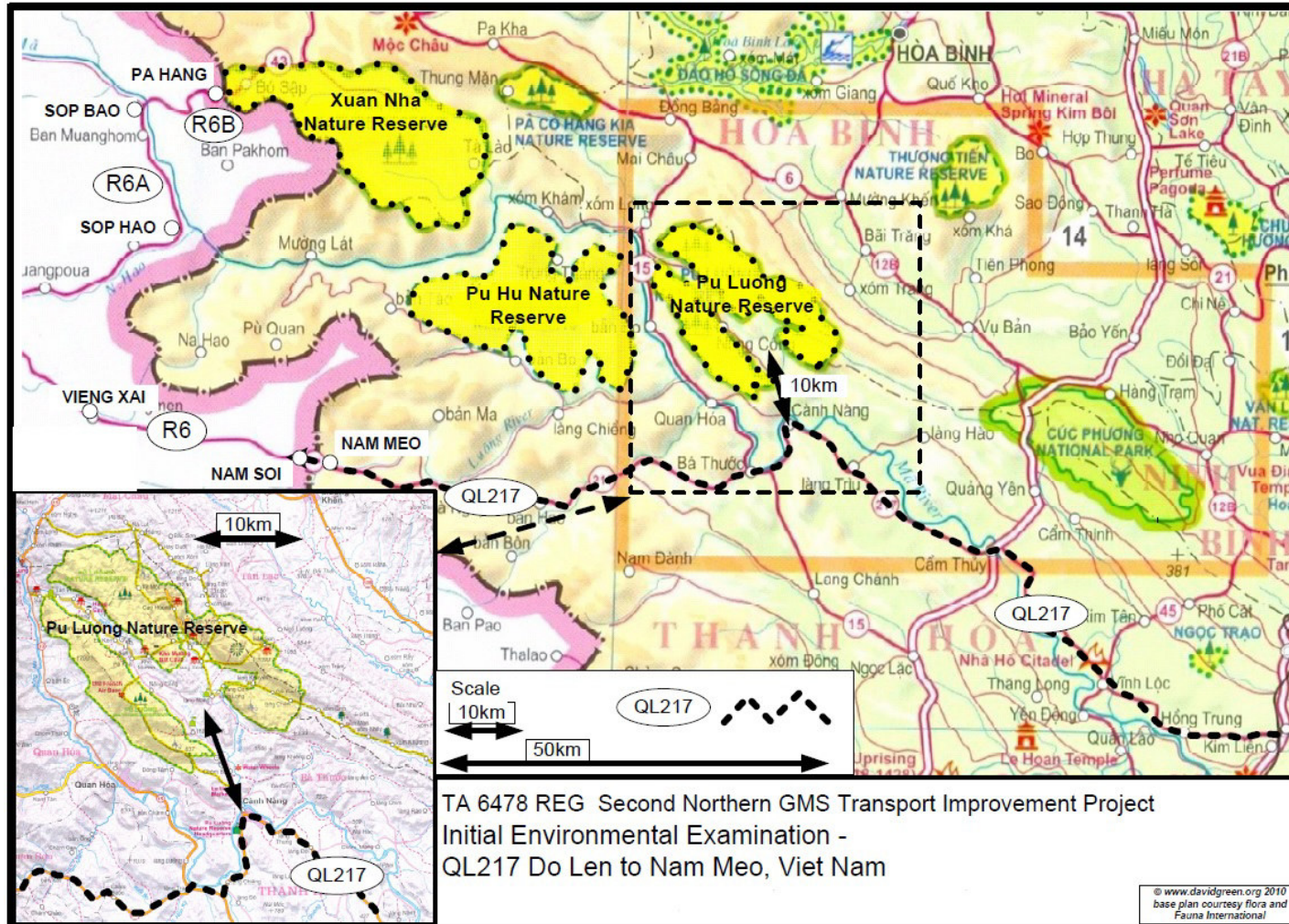
Source: Consultants project surveys. Distance to sensitive facades in parenthesis

83. Traditional shop houses are located at intervals all along the Km 59+900 – Km 104+475 and residential and commercial development is more or less continuous throughout the settlement areas and towns. The RoW is not marked out in detail but the front facades of the houses are generally next to the road (just outside the 25m RoW) with the front fences and walls or temporary structures just a few meters from the existing road edge in many places. Some land acquisition will be required in places and relocation of some properties or resettlement. Land acquisition requirements are in the Resettlement Plan.

3. Power supply

84. Electrical power is supplied throughout the Km 59+900 – Km 104+475 area from the grid. The low voltage distribution network runs on poles adjacent to the road and will need to be protected during the works. Many of these poles and lines may need to be re-provisioned before the upgrading works commence to ensure continuity of power supply.

Figure IV.1 The Nearest Nature Reserves



V. ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

85. This section discusses the potential environmental impacts of the proposed upgrading of QL217 road and bypasses and identifies mitigation measures to minimize the impacts in the design, construction and operational phases; and the main physical issues relate to impacts such as earthworks, erosion control, obtaining rock based construction materials, noise, dust, spoil disposal, disposal of other waste, and water quality. The requirement for blasting will be determined at the detailed design stage. The construction for the civil works will create dust, noise and vibration and the prevention of landslides must be addressed. The main biological issues relate to acquisition of agricultural land, impacts to rivers and removal of occasional trees in the works areas. There is no issue of interference with sites protected for their biodiversity. There will be no interference with protected forests as the works will be within the RoW for QL217. The social and human impacts to village life and impacts to social infrastructure will be of short duration and these have been subject to detailed assessment in the EPAR and RP.

86. The potential environmental impacts in the design, construction and operational phases are assessed below. Where impacts are significant enough to exceed accepted environmental standards, mitigation is proposed in order to reduce residual impact to acceptable levels and achieve the expected outcomes of the project. The criteria for assessment are in line with ADB's SPS, or if the GOV standard is stricter, the national standards and criteria set by GOV. Where GOV has not set a standard or guideline criterion the standards given in World Bank's Environmental Health and Safety Guidelines³ are used. The EMP is presented in Appendix B as a matrix of mitigation measures to prevent or minimize the impacts.

A Design / Pre-Construction Phase

87. The proposed project involves upgrading of a single carriageway existing road. As the existing alignment of the road will be followed, route selection is established but there may be some later adjustment of alignment for the bypasses. There are a number of mitigation measures that will need to be carried out by the project detailed design consultant engineers (PDCV) to avoid and minimize construction and operational environmental impacts. PDCV will be engaged by the PMU. Detailed design will be required to ensure that the upgraded road can cope with flooding from a 100year return storm event. In line with ADB policy on environmentally responsible procurement, opportunities to provide environmental enhancements will also be identified in the detailed design as well as routine matters such as avoiding unnecessary removal of trees and compensatory and enhancement planting. The opportunities for design, construction and operational enhancements have been included in the Environmental Management Plan (EMP). The IEE (together with the EMP) will be updated by the PDCV during the detailed design phase, or a new environmental assessment report will be undertaken for submission to ADB if there are any changes to Project design that would result to environmental impacts or risks that are not within the scope of the current IEE.

1. Design update and project disclosure

88. The PDCV detailed design team in cooperation with PMU1 will update designs to address the requirements below, including, but not necessarily be limited to the following design requirements:

- i) Acquisition of agricultural land will be minimized for temporary facilities (if needed) by selecting preferred locations in detailed designs for construction yards and asphalt plant on barren or marginal land and agree terms with local community.

³ World Bank, *Environmental Health and Safety General Guidelines 2007*, Washington D.C.

- ii) Potential spaces to ensure sufficient disposal space for cut surface spoil materials and to avoid fly-tipping will be identified in advance by the PDCV/PMU and approved by PMU1 and the local community before bidding.
- iii) Arrangements will be made to facilitate the timely production and supply of rock and bitumen based materials for construction and to avoid impacts due to unnecessary stockpiling along Km 59+900 – Km 104+475.
- iv) Extensions and improvements of drainage culverts under embankments for the road will be designed to account for increased rain due to a once in 100 year return storm event and included in detailed designs.
- v) Hydrological and drainage impacts during construction will be minimized by early phasing of replacement of culverts and other infrastructure. Preliminary designs will be included in contracts by the PDCV.
- vi) Disruption to current facilities for water supply will be avoided and facilities will be retained or re-provisioned before construction works commence; provisions will be made to preserve the operation of current facilities for water supply in sufficient quantity in agreement with the local community.
- vii) Disruption to current power supply will be avoided and movement of power lines will be planned well in advance. Power distribution circuitry will be re-provisioned before construction works commence; provisions will be made to preserve the operation of current facilities for power supply in sufficient quantity in agreement with the local power supply company.
- viii) Plans to minimize disturbance of vehicular traffic and pedestrians during construction will be included in the detailed designs. Phasing for construction will retain a passing lane along part of the road during construction in detailed designs programming and avoid community severance.
- ix) Aim to provide enhancements under ADB policy on environmentally responsible procurement and avoid negative impacts due to unnecessary removing of trees.

89. The roads requiring improvement are part of the existing road corridor and although the RoW is wide enough for the upgrading there are some encroachments and there will be some requirement for resettlement. This will probably be needed at a few hundred locations subject to confirmation and these requirements are presented in the Resettlement Plan (RP) report.

90. The final alignment will be disclosed to DONRE and a check will be made at the detailed design stage that the road alignment has been designed as planned. The IEE and EMP will be reviewed, updated by the PMU1/PDCV and resubmitted to ADB and incorporating any recommendations and requirements from the DONRE/MONRE. Prior to preparation of the updated or new environmental assessment report, the proposed Project change shall be screened by ADB for its potential environmental impacts and risks to determine the appropriate extent and type of environmental assessment to be undertaken. During Project implementation either an updated IEE, an updated EMP or a new environmental assessment report shall be submitted to ADB for clearance, if any unanticipated environmental risks and impacts arise. The appropriate document for submission shall be determined by ADB. PMU1 will also prepare to establish the Grievance Redress Mechanism at this stage before site works commence.

2. Project boundaries change near sensitive receivers

91. The residential sensitive receivers (SRs) near the Km 59+900 – Km 104+475 road and the current bypass alignments are set back sufficiently for traffic fumes to be dispersed and road traffic noise will not be sufficient to affect the sensitive receivers. At this stage and given the modest traffic flows it appears that the World Bank criterion of 3dB(A) above background at the sensitive receiver for new noise sensitive developments such as residences, schools, colleges and hospitals could comfortably be achieved. Noise and dust in construction will need to be controlled. The assessment will need to be updated at the detailed design stage when alignment and the relative location of the SRs are known.

92. There are no medical facilities near the Km 59+900 – Km 104+475. The occasional roadside tea and food stalls are also set back from the likely working areas for road rehabilitation. There are many schools along the road but the sensitive facades are also set well back from the road. There could be some as yet unidentifiable refinements to the alignment at the detailed design stage that mean the works must take place over a slightly different area and this IEE and EMP must be updated by PMU1, and then resubmitted for approval of ADB and public disclosure in line with the provisions of ADB SPS 2009 before the changes are implemented.

3. Environmental capacity development and preparing the PMU – TSD to supervise implementation of mitigation measures by Contractor(s)

93. In Phase 2, PMU Technical and Scientific Division (TSD) have recruited Environmental and Safety Officers (ESO) for this project to monitor the implementation of mitigation measures in the EMP. In the long term, it is recommended that a new environmental management unit should be set up to improve this capacity in PMU. PMU will identify one ESO to be trained as environmental specialist by PDCV. The PDCV will engage international environmental specialist (IES) to improve the environmental awareness in PMU and MOT. The IES in PDCV will work closely with the ESO to review the IEE and EMP and incorporate IEE and EMP in bidding documents. The IES will raise awareness and train the ESO and other relevant officers in PMU on (i) the reviewing and updating of environmental assessments and EMPs, (ii) how to make EMPs practicable and incorporate them in bidding documents; (iii) how to increase environmental awareness of contractors and make the contractors implement the mitigation measures in the IEE and EMP; and (iv) proposing corrective actions to address EMP non-compliance and other environment-related concerns. In the construction stage, it is recommended that the IES will be retained by PSCV (or will transfer from PDCV) and work closely with the ESO to monitor and implement the mitigation measures in the IEE and CEMP and prepare and submit semi-annual environmental monitoring reports (SEMR) to PMU and ADB.

4. Management Plans of materials, drainage, traffic, waste and infrastructure

94. The contractor will be primed by including the updated EMP and IEE in the bidding and contract documentation. Prior to bidding, the PDCV will produce a series of draft management plans that the contractor(s) will subsequently be required to update and include in their method statements or Contractor's Environmental Management Plan (CEMP). The broad content of the method statements is included in the construction mitigation section. The CEMP or method statements will demonstrate the manner (location, responsibilities, schedule/ timeframe, budget, etc.) by which the Contractor will implement the mitigation measures specified in the EMP.

95. The following method statements will be drafted by the PDCV in the preconstruction stage for updating by the contractor before construction commences, based on the EMP:

- i) Waste Management and Spoil Disposal Plan (SWMP) for handling, storage, treatment, transport and disposal of solid and liquid wastes, hazardous wastes and excavation spoils.
- ii) Materials Management Plan (MMP) detailing arrangements to be made to facilitate the timely production and supply of construction materials to avoid impacts due to unnecessary stockpiling outside the Project site.
- iii) Drainage Management Plan (DMP) to ensure that construction works will not cause ponding/flooding within the Project site and adjacent areas.
- iv) Erosion Control Plan (ECP) to ensure that construction works will not permit excessive runoff and siltation of adjacent waterways within the Project site, minimize hydrological impacts, flooding and erosion of river banks and adjacent areas and to protect the works under construction.

- v) Tree-cutting and Replanting Plan (TRP) to ensure indiscriminate tree-cutting shall be avoided by clearly defining areas where vegetation removal is necessary based on Project requirements and that replanting shall be done to compensate for lost trees.
- vi) Temporary Transport Management Plan (TTMP) to minimize disturbance of vehicular traffic and pedestrians during construction. Access arrangements for vehicles accessing the Project area will be formulated such that this will avoid community disturbance and severance and will at least retain a passing lane along all roads used during construction.
- vii) Utilities and Irrigation Re-provisioning Plan (UIRP) to minimize interruption to power, water supply telecoms and irrigation system;
- viii) Noise and Dust Control Plan (NDCP) to minimize impacts to sensitive receptors (residential areas, schools, hospitals, etc.) due to construction works, sourcing and transport of construction materials, and other project-related activities.
- ix) Workers and Public Safety Plan (WPSP) to identify interfaces between the works and public and ensure worker and public safety and prevent accidents due to the construction works.

5. Environmentally responsible procurement

96. All the above plans are agreed in advance with PMU1 (PDCV/PMU1) in the project preparation phase and included in contract documentation. The requirements in the contract include full implementation of the EMP. The requirements are included in the draft bidding documents prepared under this project. The contractor is required to engage capable and trained staff or site agents to take responsibility for the environmental management at the working level and to audit the effectiveness of the CEMP and review mitigation measures as the project proceeds. The effective implementation of the CEMP will be audited as part of the loan conditions and the executing agency (MOT) will be prepared for this. In this regard, the PMU1 (the Implementing Agency) also prepares to allow sufficient resources for the PDCV to fulfill the requirements of the law. The international environmental specialist(s) in PDCV will train environmental officer(s) in PMU1 to guide the contractors on the environmental aspects of road construction. This process has begun on other road projects and will be carried forward in this project. Any recent recommendations and initiatives from MONRE/DONRE or other local environmental and forestry authorities will be incorporated, updated and audited in the EMP.

6. Unexploded ordnance (UXO)

97. In order to avoid the risks from unexploded ordnance and avoid accidents, the PDCV on behalf of PMU1 will contact independent and international mines advisory groups and agencies at the design stage to identify if UXO is a potential threat to works in the project area. PDCV will reconfirm if there is a potential threat or if is insignificant before detailed designs are completed and inform PMU in writing one month before work commences.

7. Noise and Air quality baseline monitoring

98. Dust and noise from construction are potentially significant impacts. Noise impacts may be short-lived, although can be very intrusive if not controlled properly. Noise measurement shall follow the methodology specified in TCVN 5949: 1998 (Noise in Public and Residential Areas– Allowable Noise Levels) and shall be measured in dB(A) over a 24-hr period. Measurement will be taken to establish if the World Bank criterion of Leq 55 dB(A) 1-hour is exceeded at the measurement points. If it is exceeded by the existing noise, a criterion of background +3dB(A) will be applied in the monitoring. The criterion of Leq 50 dB(A) can be used where background is below Leq 50 dB(A)1-hour. Works are not expected to be carried out at night but if this is unavoidable for unexpected reasons,

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separate measurements will also be taken before construction commences to establish if the Vietnamese criterion of $Leq\ 40\ dB(A)1\text{-hour}$ is exceeded and the monitoring assessment criteria will be established accordingly. Noise and air quality therefore require measurement as well as implementation of mitigation measures in the EMP. In Phase 1, a baseline for air quality and noise were carried out in 2012 (Table V.1 and Table V.2). In Phase 2, this baseline environmental quality sampling shall be collected and submit to ADB the results before commencement of civil works. The results will be used as the basis of the monitoring of environmental parameters and criteria for the construction phase should be agreed with the contractors and included in the CEMP.

Table V.1- Summary Air Quality

Sample	Location		TSP (mg/m ³)	CO (mg/m ³)	SO ₂ (mg/m ³)	NO ₂ (mg/m ³)
A1	E105050'40,6" N19059'38,6"	Interchange NH 1A, Km 0 +000	0,370	3,492	0,033	0,040
A13	E105044'30,3" N19049'55,2"	Cành Nàng Center	0,211	1,574	0,010	0,018
A15	E105025'16,1" N20015'13,7"	Cắm Thủy Center	0,234	2,597	0,020	0,022
A18	E105050'39,9" N19059'38,0"	Hà Trung Center	0,319	2,334	0,009	0,020
A21	E105012'55,1" N20021'14,7"	Lâm Xa Primary School Km 95+350	0,173	1,951	0,010	0,014
A22	E105028'06,1" N20012'34,6"	High School Cắm Thủy Km59	0,196	1,320	0,002	0,015
QCVN 05:2009			0,30	30,0	0,30	0,20

QCVN 05: 2009/BTNMT: Vietnam National Technical Regulation on Ambient Air Quality.

Source: Environmental Impact Assessment Phase 1 (from PMU1)

Table V.2- Summary Noise Observations

Sample	Location		LAeq (dBA)	LAmix (dBA)	LA ₅₀ (dBA)
N1	E105050'40,6" N19059'38,6"	Interchange NH 1A, Km 0 +000	78,9	86,3	72,0
N13	E105044'30,3" N19049'55,2"	Cành Nàng Center	63,6	72,7	64,8
N15	E105025'16,1" N20015'13,7"	Cắm Thủy Center	64,7	74,5	63,4
N18	E105050'39,9" N19059'38,0"	Hà Trung Center	67,8	80,3	64,7
N22	E105028'06,1" N20012'34,6"	High School Cắm Thủy Km59	65,6	78,3	62,5
QCVN 26:2010/ BTNMT			70	-	-

QCVN 26:2010/BTNMT: Vietnam National Technical Regulation for Noise

Source: Environmental Impact Assessment Phase 1 (from PMU1)

8. Water quality baseline

99. In Phase 2, baseline water quality measurements will be taken (by PDCV/TSD) at three river locations in each district during the two weeks before construction commences. PDCV shall collect water samples 50m before (upstream) and 50m after (downstream) the bridges at mid-width and mid-depth at each of the 72 river crossings along the road alignment to establish a reference baseline. Parameters to be tested are pH, DO, turbidity, temperature, total suspended solids, oil and grease, BOD₅, total coli form and fecal coli form. An industry standard multi-parameter water quality meter could be used for pH, DO, turbidity and temperature. The methodology for sampling and analysis shall be consistent with QCVN 08:2008/BTNMT (National Technical Regulation on Surface Water Quality). Sampling stations shall be GPS referenced and shall be plotted on a map.

100. In Phase 1, water quality monitoring was undertaken (by PDCV/TSD) in rivers/streams in each district stretch of QL217 that form water resources for local communities. Samples were taken on three occasions in the two weeks before construction commences. For rivers that do not mix well, and/or are highly polluted such that it is likely that there will be different DO and TSS values at river bottom than at mid depth, samples shall be collected near river bottom.

101. The analysis cover a range of basic water quality parameters such as pH, dissolved oxygen, suspended solids, turbidity and inorganic chemicals to establish baseline water quality. This analysis is based on some the parameters described for the protection of aquatic life in fresh water in the Water and Water Resources Law (1996 as amended) and QCVN 08:2008 (Table V.3 and Table V.4).

Table V.3 – Maximum allowable concentration of pollutants in surface water

Ref.	Parameter and substance	Unit	Limit value	
			A1	B2
1*	pH value	-	6 ÷ 8,5	5,5 ÷ 9
4*	Dissolved oxygen	Mg/l	≥ 6	≥ 2
5*	Suspended solids (TSS)	Mg/l	20	100
3	COD	Mg/l	< 10	< 50
2*	BOD ₅ (20 ⁰ C)	Mg/l	< 4	< 25
9*	Lead	mg/l	0,02	0,05
12*	Copper	mg/l	0,1	1
13*	Zinc	mg/l	0.5	2
17*	Mercury	mg/l	0,001	0,002
24*	Phenol compounds	Mg/l	0,005	0,02

Source: QCVN 08:2008/BTNMT. N.B. * = recommended parameters for baseline testing.

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Table V.4- Summary Surface Water Quality on Km 59+900- Km 104+475

No	Parameters	Unit	Results (average)										QCVN 08:2008/BTNMT
			W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	
1	T	°C	25,5	23,4	25,6	20,5	20	22	24,4	23,5	24,4	23,4	-
2	pH	-	7,84	7,56	7,54	7,16	7,16	7,6	7,3	6,97	7,56	7,32	5,5 - 9
4	Dissolved Oxygen (DO)	mg/l	4,5	3,2	4,5	3,1	2,5	4,8	3,2	2,4	2,1	2,3	≥ 4
5	Total suspended solids (TSS)	mg/l	85	52	61	55	43	42	67	71	58	77	50
6	Chemical oxygen demand (COD)	mg/l	23	21	27	18	22	19	23	29	20	37	30
7	Biochemical oxygen demand (BOD ₅)	mg/l	17	14	18	15	13	8	17	16	11	18	15
9	Fe	mg/l	0,52	0,32	0,48	0,32	0,31	0,24	0,63	0,72	0,48	0,63	1,5
10	Cu	mg/l	0,15	0,09	0,21	0,23	0,13	0,11	0,17	0,23	0,21	0,16	0,5
11	Zn	mg/l	0,15	0,16	0,13	0,21	0,09	0,13	0,12	0,14	0,21	0,23	1,5
12	Mn	mg/l	0,04	0,01 1	0,00 6	0,05	0,05	0,00 8	0,10	0,08	0,06	0,12	-

QCVN 08:2008/BTNMT Vietnam National Technical Regulation on Surface Water Quality

Source: Environmental Impact Assessment Phase 1 (from PMU1)

102. Other environmental information such as recent rainfall, flood, potential sources of pollution etc will be documented as part of the baseline measurement and will be included in the report. The Table V.5 shows the QCVN standards that will be used for the Project.

Table V.5 – QCVN/TCVN Standards Applicable to the Project

Subject	Standard	Comment
Noise	TCVN 5949: 1998 (Noise in Public and Residential Areas– Allowable Noise Levels)	Leq50dB(A) 1hour schools/hospitals Leq60dB(A) 1hour residential
	Baseline +3dB(A)	Use if TCVN is exceeded by baseline
Air Quality	TCVN 5937: 2005 (Vietnam Ambient Air Quality Standard).	As amended
Water Quality	QCVN 08:2008/BTNMT	As amended
Safety	Labour Code of Viet Nam, Decree 06/CP 1995, Decree / 202 ND-CP OP 2002 and Circular 13/ BYT 24 Oct 1996.	As amended

Source: MONRE Website

9. Enhancements

103. Environmental enhancements have not been a major consideration in the assessment of other projects. However it is noted that it has been common practice in many places to plant trees along highways to provide visual interest in line with best international practice for highway design. Whereas water supply is not likely to be limited along much of the Km 59+900 – Km 104+475 there will be some good opportunity sites for tree planting. These locations may provide a chance to create some local soft landscaping where successful planting of trees and shrubs could be accomplished and should be investigated at the detailed design stage. This practice should be in addition to tree replacement and be encouraged as far as practicable and to foster good will with the local community. Other opportunities for enhancements can be assessed prior to construction and proposed enhancements should be discussed with the local population to identify stewardship of any planting and also to serve as a vehicle for further public consultation at the implementation stage and to assist in public relations.

B Construction Phase

104. The source of the construction impacts from Km 59-900 – Km 104+475 includes (i) excavation and reconstruction of the embankments, (ii) reconstruction of the single carriageway (5.5 to 7m wide) plus hard shoulders; (iii) construction, repair and reconstruction of bridges (iv) ensuring drainage and access near villages and at other key areas is unimpaired by extension of numerous culverts; (v) upgrading road drainage and (vii) installing slope stabilization and bioengineering measures, and landscaping .

105. For the flyover bridge in Km 0, the works of the proposed bridge are mainly focused on (i) arranging the lane for vehicles to stop waiting on NH1 to go into NH217 when the train is passing through; (ii) remove trees and houses to ensure visibility of the intersection; (iii) installing speed limit signs and road marking before the intersection, etc.

1. *Preparation and Implementation of Contractor's Environmental Management Plan (CEMP) and securing permits and licenses*

106. Project construction supervision consultants (PSCV) is engaged by the PMU1 in line with ADB policy on environmentally responsible procurement. The PSCV will train and supervise the contractors to carry forward the environmental mitigation measures and enhancements identified in the detailed designs. On behalf of PMU1 the PSCV will require contractors to prepare updates of the management plans prepared at the design stage and a detailed method statement including a stand-alone Contractor's Environmental Management Plan (CEMP). The CEMP will be the guidebook for monitoring and reporting. This will include as a minimum all the mitigation measure in this IEE and the EMP and any more mitigation measures included in the EMP as a result of the IEE reviewed at the detailed design stage by PDCV. The CEMP will be forwarded to ADB for acceptance prior to the commencement of construction. Contractor(s) and their suppliers shall comply with all statutory requirements for permits from DONRE with regard to use of mechanical equipment, establishment and operation of construction plants such as asphalt plant, concrete batching plant, rock crusher, etc.

2. *Orientation of contractor*

107. The PMU and PSCV shall ensure that the contractor trains all staff to implement the construction mitigation measures in the CEMP that will include all the construction phase mitigation measures included in the Environmental Management Plan (EMP) for this IEE (as reviewed at the detailed design stage). The PSCV will monitor the implementation of mitigation measures by the contractor and if the required measures are not implemented payments will be withheld in accordance with the draft bidding documents for this project. This will include implementation of malaria controls and HIV-AIDS education in line with social plans and the requirements for HIV/AIDS awareness and prevention program to be implemented under the Project These requirements including the EMP, will be included in the Particular Specification for the contract.

3. *Loss of trees and deforestation*

108. The tree-cutting and replanting plan designed by the PDCV will be prepared with the designs and before vegetation clearing is undertaken and updated as part of CEMP. Cut slopes will be designed not to undercut or destabilize adjacent tree lined slopes and clearing of trees will be minimized in the CEMP. The local forestry authority will be informed and will approve cutting and replacement of cut of trees to be undertaken based on the tree cutting and replanting plan and may monitor marking of vegetation that will be removed under its jurisdiction. The plan will be agreed with forest authority prior to commencement of construction. The PSCV will supervise and monitor to check that the contractors do not remove any trees not covered by tree-cutting and replanting plan prior to commencement or during construction unless agreed with the PSCV and forest authority.

109. The PSCV will supervise and monitor to check that the contractors carry forward the mitigation measures and environmental enhancements identified in the CEMP as well as routine matters such as avoiding unnecessary removing of trees and compensatory and enhancement planting.

110. The PSCV will supervise and monitor the prohibition on the use of forest timber for the project and Workers shall be prohibited from cutting trees for firewood.

111. Invasive species shall not be introduced. During replanting/revegetation works, new alien plant species (i.e., species not currently established in the region of the project) shall not be used unless carried out with the existing regulatory framework for such introduction. All replanting and compensatory planting will be planned in full agreement with the local forest authority.

4. Drainage and hydrology

112. The drainage system, irrigation and water resources on surrounding lands could be affected by construction activities as follows: a) local water supplies will need to be tapped to meet campsite and construction requirements, resulting to competition with local use; b) surface and subsurface water resources in the selected sections could be contaminated by fuel and chemical spills, or by solid waste and effluents generated by the kitchens and toilets at construction campsites; c) irrigation channels crossing the work areas may require re-provisioning, (d) natural streams may become silted by borrow material (earth) in the runoff from the construction area, workshops and equipment washing-yards.

113. The contractors will incorporate the following design features into the CEMP after review of the detailed design to minimize alterations in the project corridor's surface drainage patterns as far as possible:

- i) Contractors will review the detailed designs for cross-drainage structures and assess and agree with PMU (PSCV/PMU) if redesign is required or if new structures will be constructed or existing ones will be repaired.
- ii) Contractors will update the Drainage Management Plan as required.
- iii) In areas close to the sensitive receiver (SR), appropriate drains would be constructed so that the outfalls of the surface run-off from the carriageway are diverted away from the SR.
- iv) Measures will also be taken during the construction phase to ensure that storm drains and highway drainage systems are regularly cleared to maintain storm water flow.

5. Utilities and re-provisioning

114. Local water supplies, electrical power supply, telecommunications and irrigation water supply must be maintained during the works. Therefore the need to provide for power supply cables, telecommunication cables, irrigation, or other water supplies during construction needs to be assessed and confirmed by the contractors well before works commence. The contractor will:

- i) Discuss with PSCV and update Utilities and Irrigation Re-provisioning Plan
- ii) Confirm power, water supply, telecommunications and irrigation systems likely to be interrupted by the works and trees to be cut.
- iii) Contact all relevant local authorities for utilities and local village groups to plan re-provisioning of power, water supply, telecommunications and irrigation systems and compensatory planting for trees.
- iv) Relocate and reconnect utilities well ahead of commencement of construction works and coordinate with relevant utility company at the provincial and district levels for relocation and reconnection well before works commence and compensatory planting for trees.
- v) Inform affected communities well in advance of any disruption.
- vi) Arrange reconnection of utilities and irrigation channels in the shortest practicable time before construction commences.
- vii) If utilities are damaged during construction it shall be reported to the PSCL and utility authority and repairs arranged immediately at the contractor's expense.

6. *Materials exploitation and management of quarry and borrow areas*

115. In the detailed design stage the PDCV will produce a Materials Management Plan (MMP) for confirmation in the pre-construction phase and updated in the construction phase (CEMP) by the contractor. The MMP will seek as far as is reasonably practicable to minimize the use of non-renewable resources and rock based materials and also to balance cut and fill requirements and contribute to the minimization of impacts due to extraction of rock based materials. As a first priority, where surplus materials arise from the removal of the existing surfaces, these will be used elsewhere on the project for fill (if suitable) before additional rock, gravel or sand extraction is considered. The TA team has estimated that broadly 10% to 15% may be reusable.

116. The Materials Management Plan will include as a minimum, consideration of the following:

- i) Required materials, potential sources and estimated quantities available.
- ii) Impacts from identified sources and availability.
- iii) Excavated slope material for reuse and recycling methods to be employed.
- iv) Endorsement from DONRE and local groups for use of sources.
- v) Methods of transportation to minimize interference with normal traffic.
- vi) Constraints of regular delivery schedule to reduce stockpiling on site.
- vii) Programme for reuse of slope excavated material for reuse
- viii) Programme for delivery of quarry and borrow materials.
- ix) Discussion of the PSCV/PMU inspection/monitoring role.
- x) Agreement on publicity/public consultation requirements.

117. In the detailed design stage the PDCV will produce a draft mass haul chart for the aggregate and asphalt materials needed for the construction works. The mass haul chart will also be modified by the contractor as part of the CEMP before construction commences to produce a materials management plan (MMP) including mitigation for the extraction of materials, to specify (i) the methods to be employed prior to and during the extraction and transportation of rock based materials for construction, (ii) all other measures to be employed to mitigate nuisances to local residents, and (iii) any additional measures needed (such as compensatory planting when considered necessary, if trees are approved to be removed for gravel extraction or quarries). Contractual clauses will be included to require the contractor(s) to update the draft MMP regularly and report monthly to monitor the production and use of materials. The Contractor will be responsible for updating and the cut and fill estimates in the MMP and reporting to PMU1/TSD. The MMP can then be used to plan for asphalt and aggregates management and to provide an overall balance for asphalt and cut and filled materials and minimize impacts on other local resources outside the road corridor. The Contractor will be responsible to:

- i) Update draft Materials Management Plan from the detailed design phase.
- ii) Balance cut and fill requirements to minimize impacts from extraction of aggregates.
- iii) Prioritize use of existing quarry sites with suitable materials and update the list of quarries and borrow pits monthly in MMP and report to PMU1/TSD and minimize impacts on other local resources.
- iv) Procure materials only from DONRE authorized quarries.

- v) If the contractor shall operate the quarry site, required environmental permits shall be secured prior to operation of quarry/borrow areas.
- vi) Follow compensatory planting plan if trees have to be removed.
- vii) Stockpile topsoil for later use and fence and re-contour borrow pits after use
- viii) Topsoil, overburden, and low-quality materials shall be properly removed, stockpiled near the site, and preserved for rehabilitation.
- ix) Use quarry with highest ratio between extractive capacity, quality and loss of natural state.
- x) Use quarry sites lying close to the alignment, with a high level of accessibility and with a low hill gradient;
- xi) Do not use quarries in areas of natural woodland or near rivers which provide food and shelters for birds and other animals.
- xii) It is preferable to avoid or reduce the sections of quarry sites located on river bed. If it is not possible to locate quarries out of river beds, quarry sites lying on small rivers and streams shall be avoided.
- xiii) Alluvial terraces or alluvial deposits which lie on the river beds but not covered by water in normal hydrological conditions, are preferred;
- xiv) In quarries in the mountainous or hilly areas, or wherever slopes are important, cut terraces after extraction and implement a drainage system and vegetation cover for rehabilitation.
- xv) 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

7. Spoil Disposal

118. The works will require major cutting to upgrade Km 59-900 – Km 104+475. The requirement for filling materials is expected to be much less than the cut materials and the TA team estimated that only perhaps 10% to 15% can be used near the same area for filling. Therefore there could be a significant surplus of rock and soil based materials as spoil and if disposal is not planned in advance there could be significant environmental impacts due to the improper disposal of these materials.

119. In some locations the use of this immediately available material will minimize the need for additional extraction of rock based materials. The surplus material should be graded and the suitable cut materials directed for reuse as far as possible on the road and subsequently on other road and other local infrastructure projects. This will reduce the need to extract other rock and gravel resources from vulnerable hillsides and river beds. The surplus can then be stockpiled at locations agreed with local authorities for use on other local district projects or other nationally planned infrastructure.

120. The surplus rock and soil based materials for disposal must be controlled to avoid massive potential impacts due improper disposal. A spoil and waste management plan (SWMP) will be required to ensure waste from the road upgrading is managed properly and to reduce, reuse and recycle waste wherever possible. Contractors will initially review the PDCV's options for stockpiling and disposal locations for cut surface materials and reconfirm or propose alternative disposal locations for agreement with PMU1 and local authorities. The Contractor will submit the updated SWMP no later than one month before the commencement of construction including disposal sites identified for agreement by project supervision consultants (PSCV/PMU1) and local authorities. The SWMP will cover all aspects of construction waste disposal. It is preferred that government land is used for

dumping of material. If private land is to be used for the purpose of dumping it shall commence only after written permission from the land owner is checked and recorded by the PSCV/PMU1 and agreeable to DONRE.

121. It is important to emphasize that disposal areas for excess soil and unsuitable material should be identified early in the detailed design. Criteria for selection of disposal areas should comply with EMP requirements. Approximate material balances for cut and fill operations, excess materials for disposal, and capacity of proposed disposal areas should be presented to ensure no material will be left unmanaged. Approval and permits should be secured early before the start of construction to give enough time for securing other locations if some proposed sites may be disapproved or found unsuitable.

122. Moreover, preparation of the spoils disposal plan as well as other environmental management sub-plans must commence immediately after awarding of contract. Material balances should immediately be prepared and potential disposal sites identified for approval by relevant authorities. Disposal sites should conform to the requirements in the EMP.

123. Contractual clauses will be included to require the contractor(s) to update the draft Spoil Disposal Plan (SDP) one month before construction commences to identify all the agreed disposal sites and to balance cut and fill as far as practicable for the duration of the works.

124. Mitigation measures will seek to control the impacts at source in the first place. The PSCV will be responsible to report the update of the cut and fill estimates in conjunction with asphalt and aggregate materials planning (MMP) between the different areas and contractors and advise on overall balancing for cut and fill materials to minimize impacts on local resources (Mitigation measures for cut slopes are covered under erosion control).

125. The Spoil Disposal section of the Spoil and Waste Management Plan (SWMP) will include consideration of the following:

- i) Locations and quantities of spoil arising.
- ii) Agreed locations for disposal / endorsement from DONRE and local groups.
- iii) Methods of transportation to minimize interference with normal traffic.
- iv) Establishment of acceptable working hours and constraints.
- v) Agreement on time scale and programme for disposal and chain of custody.
- vi) Programming issues including the time of year and available resources.
- vii) Discussion of the PSCV/PMU inspection/monitoring role.
- viii) Establishment of complaints management system for duration of the works
- ix) Agreement on publicity/public consultation requirements (advance signing etc.).

126. Mitigation measures will seek to prevent slope collapse and control the impacts at source. The PSCV will be responsible to monitor the progress of cutting slopes and the implementation of mitigation measures, to minimize impacts. The mitigation measures in the Spoil Disposal section of the SWMP will include but not necessarily be limited to:

- I. Spoil will not be disposed of in rivers and streams or other natural drainage path. Spoil disposal sites should be at least 100 m away from water bodies in flat terrain and 50m away from water bodies in hilly/mountainous areas. Suitable slope protection techniques should be applied before and during disposal to ensure that the dumped materials do not erode into the water bodies.

- ii. Spoil will not be disposed of on fragile slopes, flood ways, wetland, farmland, forest, religious or other culturally sensitive areas or areas where a livelihood is derived.
- iii. Surplus spoil will be used where practicable for local repair works to fill eroded gullies and depression areas and degraded land in consultation with local community.
- iv. Spoil disposal will be monitored by PSCV/PMU1 and recorded using a written chain of custody (trip-ticket) system to the designated disposal sites.
- v. Spoil will be disposed of to disused quarries and abandoned borrow pits where practicable.
- vi. Disposed spoil will be spread in 15cm layers and compacted to optimum moisture content, covered with topsoil, landscaped and provided with drainage and vegetation to prevent erosion in line with best practice.

8. General Construction Waste Management

127. Uncontrolled waste disposal operations can cause significant impacts. Mitigation measures will seek to reduce, recycle and reuse waste as far as practicable. The PSCV will be responsible to monitor the contractor's progress of updating the SWMP and the implementation of mitigation measures, to minimize impacts.

128. The General Waste section of the Spoil and Waste Management Plan will include consideration of all matters related to solid and liquid waste disposal including the following:

- i) Expected types of waste and quantities of waste arising.
- ii) Waste reduction, reuse and recycling methods to be employed
- iii) Agreed reuse and recycling options and locations for disposal / endorsement from DONRE and local groups.
- iv) Methods for treatment and disposal of all solid and liquid wastes.
- v) Methods of transportation to minimize interference with normal traffic.
- vi) Establishment of regular disposal schedule and constraints for hazardous waste.
- vii) Programme for disposal of general waste / chain of custody for hazardous waste.
- viii) Discussion of the PSCV/PMU inspection/monitoring role.
- ix) Establishment of complaints management system for duration of the works
- x) Agreement on publicity/public consultation requirements (advance signing etc.).

129. The Contractor's mitigation measures in the waste management plan (WMP) will include but not necessarily be limited to:

- i) Update the draft Waste Management Plan (WMP) in CEMP to cover all aspects of waste storage, disposal and accidental spills all to be approved in writing by the PSCV one month prior to starting works.
- ii) Areas for disposal to be agreed with local authorities and checked and recorded and monitored by the PSCV/PMU1/TSD.
- iii) Waste disposal areas to be rehabilitated, monitored, catalogued, and marked.
- iv) Segregation of wastes shall be observed. Cleared foliage, shrubs and grasses may be given to local farmers for fodder and fuel. Organic (biodegradables) shall be collected and disposed of onsite by composting (no burning on site).
- v) Recyclables shall be recovered and sold to recyclers.

- vi) Residual and hazardous wastes shall be disposed of in disposal sites approved by local authorities.

9. Hazardous substances and hazardous waste disposal

130. Use of hazardous substances such as oils and lubricants operations can cause significant impacts if uncontrolled or if waste is not disposed correctly. Mitigation measures will seek to control access to and the use of hazardous substances such as oils and lubricants and control waste disposal. The PSCV will be responsible to monitor the contractor's progress of updating the Waste Management Plan to include implementation of mitigation measures, to minimize impacts from hazardous substances such as oils and lubricants.

131. The Contractors mitigation measures in the Hazardous Waste section of the Spoil and Waste Management Plan of the CEMP will include but not necessarily be limited to:

- i) Requirements for: safe storage of fuel and bulk materials; from sites in the draft WMP with permit under provincial laws and agreed by TSD and DONRE.
- ii) Hydrocarbon, toxic material (and explosives --- if blasting will be involved) will be stored in adequately protected sites to prevent soil and water contamination.
- iii) Vehicle maintenance and refueling will be confined to areas in construction sites designed to contain spilled lubricants and fuels.
- iv) Fuel depot shall be provided with impervious flooring and bund/containment wall to keep spilled fuel/lubricant within the depot.
- v) Used oil and other toxic and hazardous materials shall be disposed of in an authorized facility off-site.
- vi) Adequate precautions will be taken to prevent oil/lubricant/ hydrocarbon contamination of channel beds.
- vii) Spillage, if any, will be immediately cleared with utmost caution to leave no traces.
- viii) Spillage waste will be disposed at disposal sites approved by local authorities and approved by PSCV.
- ix) All areas intended for storage of hazardous materials will be quarantined and provided with adequate facilities to combat emergency situations and comply with all the applicable statutory stipulation.
- x) The Contractor shall identify named personnel in the CEMP in-charge of these sites and ensure they are properly trained to control access to these areas and entry will be allowed only under authorization.

10. Asphalt hot mix plant, rock crushing and bitumen supply

132. The rock crushing activities will generate noise and dust and pavement works will generate gas and odour from the asphalt hot-mix plant and noise from the compaction of the pavement. Although the emissions from powered mechanical equipment that supply crushed rock and asphalt will be rapidly dispersed in the open terrain they will need to be sited carefully to avoid complaints.

133. In order to maintain the existing air quality of the project area in a condition acceptable to the local population compliance with the following mitigation measures will be needed:

- (i) Cement batching and aggregate mixing plant shall be located as far as possible (at least 500m from settlements and habitation) or as required by MOEST.

- (ii) Any conditions of DONRE permits and local guidelines shall be observed.
- (iii) Dust suppression equipment shall be installed at cement and aggregate mix plants.
- (iv) Areas of construction on the roads as well as the haul road (especially where the works are within 50m of the SRs) shall be maintained damp by watering the construction area.
- (v) Where local roads are used for haulage they shall be kept in serviceable condition and any damage shall be repaired promptly without interference to local travel routes.
- (vi) Storage sites, mixing plants, and asphalt (hot mix) plants will be at least 500m downwind of the nearest human settlements or as required under DONRE permits and guidelines.

134. All hot-mix plants, crushers, and batching plants will be located in agreement with the local town or municipality and installed on a sealed area only after receiving approval from the relevant local authority and DONRE.

135. Due to the locations of the works, fumes from asphalt chemicals are likely to be well dissipated in the open terrain and the TCVN should not be exceeded. However phenol compounds in the bitumen have a very low odour threshold and extremely low concentrations can cause nuisances. These are unlikely to accumulate to toxic levels but the plant for the supply of molten bitumen should be located well away from rivers and streams, schools, health clinics and other sensitive receivers.

136. Bituminous materials will generally be applied using machines supplied from the asphalt plant but if bituminous compounds are to be applied by hand labour methods and melted in heaters, the fuel used shall be kerosene, diesel or gas fuel. Fuel wood shall not be used for heating bitumen, neither will bitumen be used as fuel.

137. Bitumen drums will be stored in a dedicated area, not scattered along the works and any small accidental spills of bitumen or chemicals should be cleaned up immediately. The waste including the top 2cm of any contaminated soil and disposed of as chemical waste to an approved landfill or approved local authority disposal site.

138. Bitumen plant and rock crusher activities (if required) will be controlled (e.g. hot-mix plants should not be located within 500m of any sensitive receiver, river bank or irrigation channel but located at convenient sites nearby but downwind of and at least 500m from sensitive receptors such as schools.

139. It is possible that contamination of soil may occur from oils and chemicals at asphalt/bitumen plant sites, workshop areas, and equipment washing-yards. The contamination may limit the future use of land for agricultural purposes. The following practices will be adopted to minimize the risk of soil contamination:

- i) The contractors will be required to instruct and train their workforce in the storage and handling of materials and chemicals that can potentially cause soil contamination.
- ii) Debris generated by the dismantling of existing pavement will be recycled subject to the suitability of the material.
- iii) Solid waste generated during construction and at campsites will be properly treated and safely disposed of only in demarcated waste disposal sites identified and agreed with PMU and the local community.

11. Noise and Dust

140. Earthworks and rock crushing activities will be the main sources of dust. In many locations there will be sufficient buffer distance between the work corridor and the existing SRs such that no significant impact is expected from the construction works on residential sensitive receivers in terms of noise, vibration, and dust. Also works will not take place at night except in special circumstances justifiable to the PDCV.

141. Although noise and dust were recognized as nuisances by the local population but were also considered acceptable nuisances in view of the good benefits from future improved road conditions. Nevertheless it is good practice to control all dusty materials at source so that nuisances do not occur and visibility on the adjacent road is not impaired and so that road safety can be maintained or improved. Water is available in the study area, but it should be recognized that surplus water may not always be available to suppress dust at many locations in the dry season. Therefore, if it is possible, a general approach is recommended that if works are within 15m of any sensitive receivers, the contractor should install dust barrier between the works at the road edge and the sensitive receivers. The barrier should be easily erectable 2.5m high and designed to retain dust and provide a temporary visual barrier to the works. The materials could be plastic or tarpaulin sheets or alternatively sections of the locally made close woven fences could be used (made by local artisans). Where dust is the major consideration the barrier can take the form of tarpaulins or fences strung between two poles mounted on a concrete base. These can be moved along the road as the work proceeds. PMU1 will strictly monitor these measures to the full to ensure proper and timely implementation of tasks specified.

142. The other mitigation measures will include:

- i) If the surface is dry, water will be sprinkled on the road and exposed surfaces when work is carried out within 50m of residences or roadside food stalls.
- ii) No work will be carried out within 500m of any settlement during the night (2100hrs to 0700hrs). If works have given rise to complaints over dust, it will be addressed through the grievance redress mechanism (GRM). The contractor shall investigate the cause, propose and implement alternative mitigation measures before works recommence and report it in the monthly progress reports.
- iii) All heavy equipment and machinery shall be in full compliance with the national and local regulations (National Technical Regulations QCVN 26: 2010/BTNMT for Noise)
- iv) Fuel-efficient and well-maintained haulage trucks will be employed to minimize exhaust emissions. Smoke belching vehicles and equipment shall not be allowed and shall be removed from the project.
- v) Vehicles transporting soil, sand and other construction materials will be covered with tarpaulin sheets to avoid impact from dust. Speed limits of such vehicles within the works site and on unpaved edge areas of the road will be established and agreed with the PSCV.

142. Experience during project implementation of Phase 1 has shown that these mitigation measures were not followed. So there is a need of controlling and monitoring to ensure that these will be implemented for the additional works and during Phase 2.

143. The need for large stockpiles should be minimized by careful planning of the supply of materials from controlled sources. Stockpiles should not be located within 100m of schools, hospitals or other public amenities such as wells and pumps and should be covered with tarpaulins when not in use and at the end of the working day to enclose dust. If large stockpiles (>25m³) of crushed materials are necessary they should be enclosed with side barriers and also covered when not in use.

144. PSCV shall undertake semi-annual monitoring of TSP and noise at the stations which were sampled during pre-construction phase. Field measurements shall also be carried out, as necessary, to validate complaints.

12. *Blasting and vibration*

145. It is clear from observations and discussions with the project team that blasting will not be the method of choice because most of the surface materials can be removed with powered mechanical equipment (PME). The instability of the local terrain and the likelihood of triggering landslides do not favour blasting.

146. Since blasting is most likely unnecessary, there is no potential acid rock drainage (ARD) issue. According to the geotechnical survey and evidenced by ongoing civil works, there is no indication of ARD in the project site.

147. In the unlikely event that blasting is required in special circumstances, only controlled blasting will be allowed. Blasting will only be carried out in line with the rules set down by DONRE in the prescribed manner and after prior notice to all local residents and the local town authorities. One month prior to the blasting in any area a condition survey including photographs will be made of all residences within 500m of the blast sites. The condition of the residences shall be agreed with the PSCV in case there are any future claims for damage to residences due to the blasting. All blasting shall be carried out in the daytime and at regular intervals after siren warnings. All residents within 500m of the blast sites shall be kept informed of the plans and progress of blasting and residents shall be temporarily evacuated and provided with alternative accommodation if required.

148. No blasting will be allowed at night. Controlled blasting will strictly follow the license requirements from DONRE. Pre-splitting should be undertaken. Where the vibration from blasting is exceeding the maximum permissible level, information from the blasting should be used to modify blasting patterns and calculate a reduced charge for future blasts with the aim of eradicating damage and to minimize damage as far as possible.

13. *Erosion control and runoff*

149. Engineering controls that include erosion protection measures will be designed and installed to control soil erosion both at all the constructed works and in peripheral areas, particularly in borrow areas and along haul tracks. Before construction commences the contractor will update the draft Erosion Control Plan (ECP) produced by the PDCV and implement slope stabilization measures in the detailed designs and maintained during construction to protect the works.

150. The Erosion Control Plan will include consideration of the following:

- i) Climate and rainfall for the area and checking weather forecasts.
- ii) Terrain and typical locations susceptible to erosion and runoff.
- iii) Protection of the works and potential impacts to the environment.
- iv) Erosion control methods to be employed, locations and installation timing.
- v) Limits to stockpiling on sites near waterways and irrigation channels.
- vi) Discussion of the PSCV/PMU inspection/monitoring role.
- vii) Agreement on publicity/public consultation requirements.

151. Mitigation measures for cut slopes will be required of the contractors to prevent slope collapse. These will include but not necessarily be limited to:

- (i) Stockpile topsoil for immediate replanting after cutting.
- (ii) Minimize damage and cutting of surrounding vegetation during slope formation.

- (iii) Protect the cut slope with planted vegetation, bioengineering or conventional civil engineering structures as soon as practicable after cutting.
- (iv) Prevent erosion and protect the cut slope with temporary or permanent drainage as soon as practicable after cutting.
- (v) If new erosion occurs accidentally, back fill immediately to restore original contours.

152. In order to preserve the constructed slopes and other works and embankments from soil erosion and runoff:

- i) Low embankments will be protected from erosion by seeding and planting indigenous grasses that can flourish under local conditions.
- ii) High embankments, i.e. 2m high and above, will be considered for protection by constructing stone pitching or a riprap across the embankment immediately after the works are completed. This practice will also be applied along cross-drainage structures where embankments are more susceptible to erosion by water runoff.
- iii) The contractors will also be required to include appropriate measures for slope protection, i.e. vegetation cover and stone pitching, as required in the detailed construction drawings and implement them accordingly.

153. 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 PSCV/PMU.

14. River protection and bridge repair

154. Careless construction and poor materials control will cause blockage to rivers and stream crossings along study area. Therefore in areas along and near rivers and streams the following will be carried out:

- i) Earth and stones will be properly disposed of so that they do not block rivers and streams, resulting in adverse impact on water quality and flow regime.
- ii) In bridge repair and demolition sites, the bridge structure will not be dropped into the river but alternative means will be used to avoid "dropping the bridge" into rivers/streams. This will be done by "sawing" appropriate sections of the bridge and using cranes to lift these sections away, or alternatively by construction of a platform onto which the bridge could be lowered.
- iii) 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.
- iv) Other erosion control measures including covering open surfaces with grasses and creepers to reduce runoff will be implemented as early as possible in construction.

15. Water Quality

155. If complaints are received about possible contamination of water supply, water samples should be taken, analyzed and compared with the baseline monitoring results in the preconstruction stage. Samples will be taken as soon after the complaint as possible and analyses immediately and again two weeks after the complaint to determine if water quality has been restored. The criteria will be based on the QCVN 08 2008 BTNMT. The following precautionary measures will be undertaken by the contractors:

- i) Lubricants will be stored in dedicated enclosures with a sealed floor >50m from water bodies.
- ii) Solid waste from construction activities will not be thrown in rivers and shall be disposed of as per the WMP and there will be NO BURNING of waste.
- iii) Construction storage/stockpiles shall be provided with bunds to prevent silted run-off.
- iv) Stockpiled materials will be covered to reduce run-off.
- v) Stockpiling or borrow sites will not be allowed within 100m of water body.
- vi) If complaints occur there will be monitoring and investigation of water quality.
- vii) Work in rivers will be scheduled during dry season and work duration shall be as short as possible.
- viii) Bare slopes shall be stabilized immediately after works are completed.
- ix) Stockpile areas and storage areas for hazardous substances shall be located away from water bodies.
- x) Washing of machinery and vehicles in surface waters shall be prohibited.

16. Water Resources

156. Ample water should be available and local water resources could be used because sufficient yield is generally available. Other measures to mitigate the adverse impact on water resources and surface drainage patterns have been incorporated into the other drainage mitigation measures.

157. The contractors will carry out the following measures to mitigate the impact of using local community water resources, where required:

- i) In all areas availability of water will be assessed to evaluate the impact on community resources. Project water will be brought in by tanker as necessary without depleting local village supplies.
- ii) Camps will be located at least 100m away from the nearest local settlement to prevent the contamination of community-owned water resources.
- iii) The contractors will be required to maintain close liaison with local communities to ensure that any potential conflicts related to common resource utilization for project purposes are resolved quickly.
- iv) Guidelines will be established to minimize the wastage of water during construction operations and at campsites.
- v) Avoid and minimize use of river bed for construction materials.
- vi) Confine winning river materials to 20% of river width in any location and away from river banks.
- vii) Reinststate river banks if necessary.
- viii) Reprovision irrigation channels affected by works two weeks before commencement of works to satisfaction of TSD and local community
- ix) All irrigation canals along the alignment shall be clearly marked on the ground to prevent accidental dumping of fill materials into these canals;
- x) In case of obstruction or damage, irrigation ditches and ponds shall be cleaned or repaired immediately.

17. Construction camps and canteen facilities

158. The contractors will adopt good management practices to ensure that fuels and chemicals, raw sewage, wastewater effluent, and construction debris/scarified material are disposed of in controlled conditions to reduce the risk of contamination. The proposed measures include:

- i) Worker camp location and facilities should be >500m from settlements and agreed with local communities and facilities approved by PSCV and TSD and managed to minimize impacts.
- ii) Construction camp will be established in areas with adequate drainage in order to prevent water logging at the camp and formation of breeding sites for mosquitoes in order to facilitate flow of the treated effluents.
- iii) Potable water, clean water for showers, hygienic sanitation facilities/toilets with sufficient water supply, worker canteen/rest area and first aid facilities will be provided. Separate toilets shall be provided for male and female workers.
- iv) Hire and train as many local workers as possible.
- v) Portable lavatories (or at least pit latrines in remote areas) shall be installed and open defecation shall be prohibited and use of lavatories encouraged by cleaning lavatories daily and by keeping lavatory facilities clean at all times.
- vi) Wastewater effluent from contractors' workshops and equipment washing-yards will be passed through gravel/sand beds and all oil/grease contaminants will be removed before discharging it into natural streams. Oil and grease residues shall be stored in drums awaiting disposal in line with the agreed SMWP.
- vii) Predictable wastewater effluent discharges from construction works shall have the necessary permits from DONRE and local authorities before the works commence.
- viii) 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. Options for completely or partially recycling scraped scarified materials will also be taken into account.
- ix) Food shall be provided from farms nearby or imported to the area. Bush meat supplies are banned to discourage poaching. Solid and liquid wastes are managed in line with Waste Management Plan.
- x) Use of guns and hunting equipment by workers will be banned and dismiss workers taking or using green timber or hunting or in possession of wildlife.
- xi) All waste materials shall be removed and disposed to disposal sites approved by local authorities
- xii) Land used for campsites shall be cleaned up and 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.

18. Sanitation and Disease Vectors

159. Potential sanitation and impacts from disease will need to be controlled by maintaining hygienic conditions in the worker camps and implementing the social and health programmes for the Project. The contractor will ensure that:

- i) Measures to prevent malaria shall be implemented (e.g., provision of insecticide treated mosquito nets to workers, installation of proper drainage to avoid formation of stagnant water, etc.).
- ii) Standing water will not be allowed to accumulate in the temporary drainage facilities or along the roadside to reduce breeding areas of mosquitoes.
- iii) Temporary and permanent drainage facilities will be designed to facilitate the rapid removal of surface water from all areas and prevent the accumulation of surface water ponds.
- iv) Malaria controls and HIV-AIDS education will be implemented in line with social plans for the project.
- v) HIV/AIDS awareness and prevention program shall be implemented in line with social plans under the Ethnic and Poverty Assessment Report.

19. Safety Precautions for Workers

160. Worker occupational health and safety is generally governed by the Labour Code of Viet Nam. A Worker and Public Safety Plan will be submitted by the contractor in the CEMP to establish routine safety measures as required by Labour Code of Viet Nam and by good engineering practice as well as to provide first aid facilities.

161. Mitigation measures to be implemented by contractors to ensure health and safety of workers are as follows:

- (i) At least one month before construction commences the Contractor will demonstrate to PMU1 that the safety plan will be properly resourced and a qualified safety officer will be identified by contractor in his bid and the safety plan will be approved by PMU1 and PSCV before construction commences.
- (ii) Conduct of training for all workers on safety and environmental hygiene. The contractor will instruct workers in health and safety matters as required by law and by good engineering practice and provide first aid facilities.
- (iii) The Contractor will instruct and induct all workers in health and safety matters (induction course) and site agents/foremen will follow up with toolbox talks on a weekly basis. Workforce training for all workers starting on site will include safety and environmental hygiene.
- (iv) Fencing on all areas of excavation greater than 1m deep and sides of temporary works shall be observed.
- (v) Workers shall be provided with appropriate personal protective equipment (PPE) such as safety boots, helmets, gloves, protective clothes, breathing mask, goggles, and ear protection at no cost to the workers.
- (vi) Workers who do not wear or use the appropriate PPE should not be allowed to work or allowed entry at the work sites.

162. The contractor will include provisions in the Worker Safety section of the Worker and Public Safety Plan in the CEMP for:

- i) Instruction of all workers in health and safety matters.
- ii) Provision of potable water supply in all work locations.
- iii) Establishment of safety measures as required by law and by good engineering practice and provide first aid facilities.
- iv) Fencing on all excavation, borrow pits and sides of temporary bridges

- v) Providing to all workers appropriate personal protective equipment (PPE) such as safety shoes, hard hats, safety glasses, ear plugs, gloves, etc.
- vi) Scheduling of regular (weekly tool box talks) to orientate the workers on health and safety issues related to their activities as well as on proper use of PPE.
- vii) Where worker exposure to traffic cannot be completely eliminated, protective barriers shall be provided to shield workers from traffic vehicles. Another measure is to install channeling devices, e.g., traffic cones, to delineate the work zone.
- viii) 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.

163. Facilities for workers and public safety, construction site offices and canteen will be regulated in line with the labour codes of Viet Nam. Complaints will be monitored and investigated and mitigation measures will be revised and the CEMP will be updated as necessary if unexpected impacts occur. All measures related to workers' safety and health protection shall be free of charge to workers. The worker occupational health and safety plan to be submitted by the contractor before construction commences can be extended to cover public safety and approved by PMU1 (PSCV/PMU1) in tandem.

20. Public Safety

164. Public safety, particularly of pedestrians and children can be threatened by the excavation of the trenches for side drain construction. Fencing will be installed prior to excavation work commencing on all sides of temporary excavations. The plans will include provisions for site security and guards, trench barriers and covers to holes and any other safety measures as necessary. The contractor will provide warning signs at the periphery of the site warning the public not to enter and define this in the CEMP. The contractor will restrict the speed of project vehicles, control traffic and provide flag men and warning signs at either end of the works where the traveling lanes must be temporarily reduced. The safety measures for the public in the Worker and Public Safety Plan will include:

- i) Barriers (e.g., temporary fence), shall be installed at construction areas to deter pedestrian access to the roadway except at designated crossing points.
- ii) The general public/local residents shall not be allowed in high-risk areas, e.g., excavation sites and areas where heavy equipment is in operation and these sites will have a watchman at the entrance to keep public out.
- iii) Speed restrictions shall be imposed on Project vehicles and equipment traveling within 50m of sensitive receptors (e.g. residential, schools, temples, etc.).
- iv) Upon completion of construction works, borrow areas will be backfilled or fenced.
- v) Provisions for site security, trench barriers and covers to other holes and any other safety measures as necessary.
- vi) Provide warning signs at the periphery of the site warning the public not to enter and define this in the CEMP.
- vii) Strict imposition of speed limits along residential areas and where other sensitive receptors such as schools, hospitals, and other populated areas are located.
- viii) Educate drivers on safe driving practices to minimize accidents and to prevent spill of hazardous substances (fuel and oil) and other construction materials during transport.

165. The contractor will provide information boards near the work sites to inform and instruct the public on how to conduct themselves and to be aware of their surroundings if they must approach the works. The Public Safety section of the Worker and Public Safety Plan will include but not necessarily be limited to the following:

- i) Statement of contractor's safety policy for Workers and Public.
- ii) Legal requirements (e.g. Labour Code of Viet Nam)
- iii) Works safety issues and public safety issues.
- iv) Training the workforce and informing the public on works safety issues.
- v) Establishment and monitoring of acceptable working practices to protect safety.
- vi) Discussion of the PSCV/PMU inspection/monitoring role.
- vii) Establishment of complaints management system for duration of the works
- viii) Agreement on publicity/public consultation requirements.
- ix) Reporting of accidents.

21. Traffic Management

166. Construction activities on the road are likely to cause hindrance in traffic flow if not mitigated properly. A Temporary Traffic Management plan will be developed and submitted by the contractor at least one month before commencement of construction. The main objectives of the plan shall be to maximize the safety of the workforce and the traveling public. The main secondary objective will be to keep traffic flowing as freely as possible. The Temporary Traffic Management Plan will include consideration of the following:

- i) Lane availability and minimizing interference with traffic flows past the works site.
- ii) Establishment of acceptable working hours and constraints.
- iii) Agreement on time scale and establishment of traffic flow/delay requirements.
- iv) Programming issues including the time of year and available resources.
- v) Discussion of the PSCV/PMU inspection/monitoring role.
- vi) Establishment of complaints management system for duration of the works
- vii) Agreement on publicity/public consultation requirements (advanced signboards, etc.).

167. The plan will be reviewed by PMU1 (PSCV/PMU1) and approved, if found appropriate. Resources from contractor and PMU1 (PSCV/PMU1) will be provided as per the plan before construction commences for:

- i) Implementation of construction temporary traffic management plan and awareness program.
- ii) Communication to the public through local officials regarding the scope and schedule of construction, as well as certain construction activities causing disruptions or access restrictions.
- iii) Coordination with local traffic authorities to implement appropriate traffic diversion schemes to avoid inconvenience due to project operations to road users, ensure smooth traffic flow and avoid or minimize accidents, traffic hold ups and congestion.
- iv) Installation of bold diversion signs that would be clearly visible even at night and provide flag persons to warn of dangerous conditions at all times, if necessary.
- v) Designation of traffic officers in construction sites.

22. Archaeological and cultural artifacts

168. Viet Nam has a rich archaeological heritage. Therefore the contractor will take the following precautions to avoid disturbance of any as yet undiscovered archaeologically valuable artifacts:

- i) Site agents will be instructed to keep a watching brief for relics in excavations.
- ii) Should any potential items be located, the PSCV will immediately be contacted and work will be temporarily stopped in that area.
- iii) If the PSCV determines that the item is of potential significance, an officer from the Department of Culture and Information (DCI) will be invited to inspect the site and work will be stopped to allow time for inspection.
- iv) Until DCI has responded to this invitation work will not re-commence in this location until agreement has been reached between DCI and PMU/MOT as to any required mitigation measures, which may include structured excavation.

23. Enhancements

169. Environmental enhancements such as tree planting near the road will be explored in the detailed designs and included in the updated EMP. Enhancements shall be re-assessed prior to construction and proposed enhancements should be discussed by the contractor with the local population to identify stewardship of any planting and also to serve as a vehicle for further public consultation at the implementation stage and to assist in public relations.

C Operational Phase

170. During the operational phase of the Project the executing agency (EA) will be Viet Nam Roads Administration and the implementing agency will be a Provincial Department of Transport.

171. The improvement of the hard shoulders on Km 59-900 – Km 104+475 and the introduction of the AC surfaced rural roads can be expected to reduce road traffic noise and air pollution from dust. The improvement of the road will be within the existing corridor but could result in increased traffic volume. At this stage it is difficult to see that noise and air quality levels would exceed the assessment criteria hence monitoring will be necessary.

1. Noise

172. The Vietnam National Technical Regulations (QCVN 26:2010) applies the allowable limits for special areas (schools, hospitals, kindergarten, churches, and temples, etc) with 55 dB from 6 am to 9 pm and 45 dB from 9 pm to 6 am. The allowable limit for normal areas (residential district, houses, hotels, offices, etc) is 70 dB from 6 am to 9 pm and 55 dB from 9 pm to 6 am. World Bank sets a criteria of Leq55 dB(A) for residential areas. Noise level around sensitive receivers such as school and hospital is potentially exceeded at most times. At Km 78, background noise ranged from Leq50.4 dB(A) to Leq67.8 dB(A) and at Km 103 noise ranged from Leq54.0 dB(A) to Leq71.1 dB(A). Therefore a criterion of background +3dB(A) will be applied. The main noise source in most areas is traffic noise and in order for the existing background to be exceeded by +3dB(A) the existing traffic would have to be more than doubled. Traffic forecasts indicate that traffic is not expected to double for at least twenty years. Therefore the project is believed to be sustainable in terms of noise. No operational mitigation measures are required based on the current alignments.

2. Gaseous Emissions

173. Vehicle emissions (gaseous) of oxides of nitrogen will be the main air pollution sources during operation. Sensitive receivers are set far enough back from the road to allow adequate dispersion that there will be no significant impacts at the sensitive receivers.

3. Particle Emissions

174. Vehicle emissions (particulate contamination) such as dust and fumes will also be air pollution sources during operation. However, toxic residues from vehicle emissions near the road are unlikely to accumulate or create significant impacts under the local conditions. Dust from the existing road will be reduced due to the better asphalt surface for the new road. Therefore the project is believed to be sustainable in terms of gaseous and particulate emissions and no operational mitigation measures are required.

4. Soil Erosion

175. Soil erosion will be prevented by the comprehensive suite of engineering controls to prevent erosion in the detailed design. A system will be devised and engineered to control erosion and flooding on either side of the embankments in case of heavy rains. Apart from affecting the community lands and resources, this would otherwise cause natural streams and irrigation channels to become silted.

176. Measures will also be taken during the operational phase to ensure that storm drains and highway drainage systems are periodically cleared to maintain clear drainage to allow rapid dispersal of storm water flow. An adequate system of monitoring, reporting and maintenance will be developed.

5. Water Resources

177. Provision is included to monitor water quality impacts after the completion of construction and into the maintenance phase if necessary should complaints about water impacts from the road arise. This is to quantify if the complaints are justified and if there have been significant impacts on water resources based on the criteria in the Water and Water Resources Law (1996 as amended QCVN 5938 2008 BTNMT). These standards will be referred to for water quality monitoring along the improved road.

6. Driving Conditions and Community Safety

178. The rehabilitation and widening of the Km 59-900 – Km 104+475 is likely to increase the vehicle speed on the road. This may be tempered by the increase in traffic volume however, resulting to moderate speeds and unlikely to create many community safety issues. The improvements to the road will be monitored and the road safety authority will be included to monitor in the operational phase and conduct awareness campaigns. Overall the condition of the road facilities will be enhanced and driving conditions should improve. Routine safety measures, signage and road markings should be introduced to reduce driving risk further in accident prone areas and provide enhancements to driving conditions near the road.

D Cumulative Environmental Impact Associated with the Project Locations

179. There should be no significant adverse cumulative impacts expected from the Second Northern Greater Mekong Subregion Transport Network Improvement Project the Second Northern Greater Mekong Subregion Transport Network Improvement Project. Overall the improvement in the road system and Viet Nam will potentially lead to growing traffic, commercial activities, that may indirectly lead to additional pollution. It is not possible to quantify these impacts at this stage. Since the Second Northern Greater Mekong Subregion Transport Network Improvement Project the Second Northern Greater Mekong

Second Northern Greater Mekong Subregion Transport Network Improvement Project (TA 6478-REG)
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Subregion Transport Network Improvement Project will be on existing road QL217 there is not likely to be any significant change to the current pattern of movements caused by road upgrading that could potentially lead to uncontrolled access for exploitation of minerals or forest resources. The statutory provisions under the laws of Vietnam cover pollution control, the forestry protection acts cover exploitation of forest products and there are also laws to protect wildlife in both countries. These laws are established but institutional strengthening is required and improvements in resources are needed to achieve better enforcement to support strategic management of pollution control and resource exploitation in the long term.

VI. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

180. Additional consultations with the project stakeholders were conducted in the first quarter of 2015 to supplement the consultations undertaken for phase 1 of the project in 2010. The objectives of the stakeholder consultation process was to disseminate information on the project 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 project design. Another important objective was to determine the extent of the concerns amongst the community, to address these in the project implementation and to suggest appropriate mitigation measures.

A Identification of Stakeholders

181. 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. For this project stakeholders included the community living in the area, the road users, the business associated with the road and the locally elected representatives and local Government officials.

B Consultation with Stakeholders

182. The main environmental concerns are preventing damage to local surroundings construction impacts, prompt completion of the works and minimization of land acquisition. Increased traffic noise and controlling project workers and sanitation during construction were also concerns. Full and prompt compensation for land acquisition was also raised as a social issue. The stakeholders were informed that this is addressed in the resettlement plan and separate public consultations that tackle social issues were also conducted. Consultations with stakeholders are taken in early 2015 and gathered information on relevant issues so that the feedback received is used to address these issues at early stages of project design. One of the requests from the stakeholders is for the consultations to continue until the alignment is finalized and to regularly update the local people of the project's progress. Additional public consultations have been proposed during the detailed design phase which will commence in 2016.

C Concerns Raised

183. Concerns with respect to road alignment and drainage design and the disturbance or destruction of crops and gardens, private property and community disturbance have been brought to the attention of the project proponent and the relevant parties are well aware of the potential for local disturbance that can result from poorly controlled contractors. Therefore it is important to determine the extent of the concerns amongst the community, to address these in the project implementation and to suggest appropriate mitigation measures. The main issues raised have been when addressed in the environmental management plan, as far as is reasonably practicable at this stage, and a resettlement plan has been prepared to compensate for the financial problems that can reasonably be predicted at this stage. A summary of the results of the public consultations is presented in Table VI.1. More detailed information is provided in Appendix C.

Second Northern Greater Mekong Subregion Transport Network Improvement Project (TA 6478-REG)
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Table VI.1 Summary of Main Environmental Concerns from Public

Concern expressed	How concern is addressed in IEE
Almost unanimous support and desire for the project to commence soon and awareness of potential economic benefits is high.	Harness this support by fostering continuing consultation, ensuring Contractor's proper and timely implementation of EMP provisions by incorporating EMP in tended and contract documents and regular monitoring and prompt resolution of complaints through GRM.
Local transportation affected and local roads will be damaged by construction traffic	Contractor(s) environmental management plan (SEMP) will include temporary traffic management plan (TTMP) including acceptable routes worked out with districts. Damage to roads will be repaired as specified in the EMP.
Damage to forests	Works are in narrow corridor. Checks will be made at detailed design stage. The EMP specifies a suite of mitigation measures to avoid or minimize impacts to flora and fauna.
Construction noise	SEMP will include noise and air quality control plan and construction hours will be limited as worked out with PMU1 and local authority.
Construction dust	SEMP will include noise and air quality control plan and construction hours will be limited.
Scheduling	PMU1 will control Contractor(s) to ensure prompt completion of the works.
Other land should be used.	Not possible to address in the IEE. Land use issues will be dealt with by PPCTH by Law.

VII. GRIEVANCE REDRESS MECHANISM

184. Existing arrangements for redress of grievances for affected persons are through complaints to the village and commune committees up to the district level and then through the PPCTH and back to the agency (e.g. PMU1) that implements a project. This indirect route will remain in place to preserve the usual administrative remedies. There will be a need to set up a more efficient way to deal with complaints and grievances during construction and for this project, Therefore another mechanism will be available to affected persons whereby complaints can also be made direct to the PMU1 (with the usual authorities PPCTH being kept informed).

185. Through a Grievance Redress Committee (GRC), PMU1 shall promptly address affected people's concerns, complaints, and grievances about the Project's environmental performance at no costs to the complainant and without retribution. The GRC, which shall be established by PMU1 before commencement of site works, shall be chaired by PMU1 and shall have members from the contractor, ward and district committees, DONRE, local NGO, and women's organization. Grievances can be filed in writing or verbally with any member of the GRC. The committee will have 15 days to respond with a resolution. If unsatisfied with the decision, the existence of the GRC shall not impede the complainant's access to the Government's judicial or administrative remedies.

186. PMU1 shall make public the existence of this grievance redress mechanism through public awareness campaigns. PMU1 shall also set-up a hotline for complaints and the hotline shall be publicized through the media and numbers placed on the notice boards outside the site and suggestion/complaints boxes be placed outside the construction camps and yards as well as on notice boards outside the Than Hoa provincial offices near QL217. Locally affected people will still be able to express grievances through the ward or district committees and these would be referred to PMU1 through the usual channels in those committees.

187. PMU1/TSD proposed that both an Environment / Safety Safeguard Officer (ESO) and a Social Safeguard Officer (SSO) will be recruited for the QL217 project under the Technology and Science Division of PMU1. The SSO and ESO will each be graduates with backgrounds and experience in the social sciences and environmental management. It is proposed that both an SSO and ESO be concurrently designated as the Grievance Facilitation Unit (GFU) which act for PMU1 and will receive, follow-up and report on a monthly basis all complaints, disputes or questions received about the Project. The SSO and ESO will develop and maintain a database of complaints received related to the Project.

VIII. INSTITUTIONAL REQUIREMENTS AND ENVIRONMENTAL MANAGEMENT PLAN

A Institutional Requirements

188. In Viet Nam the environmental regulations of GOV are derived from the Law on Environmental Protection (2014) and subsequent decrees and regulations. The environmental assessment rules are set out in the Guidelines on Implementation of Law on Environmental Protection 2006 (under Law on Environmental Protection (2014) that requires Environmental Impact Assessment (EIA). DONRE will review the IEE before construction can commence. However certain activities commonly associated with road improvement such as quarry operations, extraction of gravel or discharge of waste water will also require permission from the relevant provincial level authorities.

189. The project owner (MOT/PMU1) is required to obtain approval from the Ministry of Natural Resources and Environment (MONRE) following environmental assessment and public consultation. It has been clarified by MONRE that although the Guidelines on Implementation of Law on Environmental Protection 2006 applies the PMU1 should disclose the scale and scope of the Second Northern Greater Mekong Subregion Transport Network Improvement Project works at the detailed design stage so that DONRE can decide on procedures that need to be completed under the environmental laws in view of the pending developments in environmental assessment procedures in Viet Nam. Therefore MOT/PMU1 will submit the IEE to DONRE to disclose the scale and scope of the projects in due course and obtain approval.

190. Pollution standards for the protection environment are described in the Law on Environmental Protection (2014). These standards will be referred to for water quality noise and dust monitoring during the environmental management of the project (e.g. Table V.2, Table V.2 and Table V.3). Certain associated project activities commonly associated with road improvement such as quarry operations, extraction of gravel or discharge of waste water also require licenses that are issued at the provincial level depending on the duration and scale of those activities. DONRE is the authority to decide on the permit requirements at the provincial level.

B Parties involved in implementing the EMP

191. Overall implementation of the EMP will be PMU1's responsibility. Other parties to be involved in implementing the EMP are as follows:

- i) **Consultants:** responsible for assisting PMU in preparing detailed designs, updating environmental assessments and incorporating IEE and EMP in bidding documents;
- ii) **Contractors:** responsible for implementing and reporting on all measures required to mitigate environmental impacts during construction;
- iii) **Government agencies:** such as DONRE will be responsible for monitoring the implementation of environmental permit conditions related to the road.
- iv) **MOT and PMU Manager:** responsible to ensure that sufficient resources are allocated in advance to allow the appropriate time to process the environmental assessments and to implement all design, construction and operational mitigation measures required to mitigate environmental impacts to acceptable levels.
- v) **PMU1:** PMU of MOT has officers in TSD that are periodically delegated environmental duties. The delegated officers have responsibility to bring environmental issues to the notice of senior management.

192. PMU1 will also:

- i) Ensure that Project implementation complies with ADB's environmental policy and Safeguard Policy Statement 2009 (*SPS*) principles and requirements;
- ii) Engage an environment and safety officer (ESO) and require PDCV/PSCV to employ an IES to ensure that EMP provisions are incorporated in the design, assist PMU in obtaining the environmental approvals from DONRE prior to award of civil works contracts and monitor EMP implementation by contractors;
- iii) Establish an environmental grievance redress mechanism, acceptable to ADB, to receive and facilitate resolution of affected peoples' concerns, complaints, and grievances about the Project's environmental performance;
- iv) Submit semi-annual environmental monitoring reports to ADB;
- v) Ensure that environmental protection and mitigation measures in the EMP are incorporated in the detailed design;
- vi) Ensure that tender documents and civil works contracts include the Project EMP and specify requirement for preparation and implement of construction EMP;
- vii) Review and approve the CEMPs/Method Statements with assistance from the IES in PDCV/PSCV;
- viii) Report to ADB on all aspects of environmental management and monitoring at six month intervals, based on the results of EMP monitoring
- ix) Based on the results of EMP monitoring, identify environmental corrective actions and prepare a corrective action plan, as necessary, for submission to ADB.

193. The requisite ESO staff in TSD/PMU1 should be delegated prior to the commencement of the tendering for the detailed design activities in order to work full time with PDCV to ensure the inclusion of environmental requirements can be translated into contractual works for completion also respond to unexpected circumstances. The PDCV and international environmental specialists (IES) can then train the environmental officers (ESO) in TSD/PMU1 "on the job". The ESO can initially depend on assistance from PDCV as they develop experience.

194. The environmental/safety officer (ESO) in DDC/PSC will:

- i) Work and be trained within TSD / PMU to execute any additional environmental assessment requirements prior to project commencement and during project implementation;
- ii) Work proactively with the IES and project management team(s) in PMU1 and PDCV/PSCV to ensure all environmental requirements and mitigation measures from the environmental assessment and EMP and environmental performance criteria are incorporated in the bidding documents and contracts and monitored accordingly; and
- iii) Work with IES in PDCV/PSCV and develop expertise to work towards assisting contractors, to training contractors and to helping Contractor(s) proactively manage the implementation of the EMP for the Project;
- iv) Conduct at least monthly site inspection on EMP implementation and validate the weekly monitoring report on EMP implementation by the contractors.

195. PMU1 will engage Project Detailed Design Consultants (PDCV) and Project Supervision Consultants (PSCV). The (PDCV/PSCV) will engage/retain the international

environment and safety specialist (IES) to train the ESO and contractors and improve the environmental awareness in TSD/PMU1.

196. The Project Detailed Design Consultant (PDCV) supported by the IES will be responsible to:

- i) Engage an environment and safety specialist (ESS) to ensure that EMP provisions are incorporated in the design and assist PMU1 in obtaining the environmental approvals from DONRE prior to award of civil works contracts;
- ii) Incorporate into the design the environmental protection and mitigation measures identified in the EMP for the design stage;
- iii) Assist PMU in reviewing Contractor environmental credentials and commitment (and draft method statements if any) at the bid stage to ensure that these are consistent with the Project design and EMP and adequately address the potential environmental impacts of the project; and
- iv) Provide training to PMU staff (via IES) on environmental management to build their capacity on environmental assessment and EMP implementation.
- v) Undertake field measurements of surface water quality, dust, and noise levels to establish a baseline as a support to assessment of effective EMP implementation by contractors, validation of complaints or during assessment of pollution events;
- vi) Prepare and submit to ADB and PMU1 a semi-annual environmental monitoring report (SEMR) on EMP implementation that will be disclosed on ADB's website.

197. The IES in PDCV/PSCV will work closely with the ESO to train the ESO to review the IEE and EMP and incorporate them in bidding documents. The ESS will also to train the ESO(s) and other relevant officers in PMU on (i) the reviewing and updating of environmental assessments and EMPs, (ii) how to make EMPs practicable and incorporate them in bidding documents and (iii) how to increase environmental awareness and make the Contractor(s) and the PMU1 become more effective in managing the environmental impacts of all projects. The international environmental specialists (IES) will:

- i) Work within PDCV/PSCV/PMU1 to execute any additional environmental assessment requirements prior to project commencement;
- ii) Provide training for the PDCV/PMU1/ESO (and later PSCV) on environmental management of the Project.
- iii) Work with the project management team(s) in PDCV/PMU1 to ensure all environmental requirements and mitigation measures from the environmental assessment and EMP and environmental performance criteria are incorporated in the bidding documents and contracts; and
- iv) Support the PSCV and work with contractors to train them and to help contractors proactively manage the implementation of the project EMP
- v) Lead in the preparation of the SEMR that will be submitted to ADB and PMU1..

198. The Project Supervision Consultant will be responsible to:

- i) Retain the international environment and safety specialist (IES) to undertake train the ESO to conduct regular monitoring of the Project works and report on behalf of PMU1, based on EMP provisions during the construction phase;
- ii) Assist PMU1 to ensure that the EMP provisions included in the tender documents and civil works contracts are committed to by the contractors (prepare a memorandum of understanding before final selection as necessary);

- iii) Prior to implementation of civil works, assist PMU1 in reviewing the CEMP/Method Statements/Management Plans prepared by Contractor(s) to ensure that these are consistent with the provisions of the Project EMP;
- iv) Assist PMU1 in monitoring the implementation of mitigation measures and the environmental performance of Contractor(s) based on the updated EMP and the CEMPs/Method Statements prepared by Contractor(s);
- v) Undertake semi-annual monitoring of ambient air quality (dust) and noise levels at the stations established during the detailed design phase; and
- vi) Undertake field measurements for impact monitoring of surface water quality, dust, and noise levels to support assessment of effective EMP implementation by contractors, validation of complaints or during assessment of pollution events.
- vii) Report field measurements of surface water quality, dust, and/or noise levels on a monthly basis to PMU for later incorporation in reporting to ADB.

199. To facilitate EMP implementation during construction, the contractors must be prepared during the tendering and pre-construction phase to cooperate with the environmental managers, PMU1, and the local population in the mitigation of impacts. However, experience suggests that contractors may have little impetus or interest in dealing with environmental problems in the absence of performance-related criteria. To remedy this, the EMP including the monitoring plan, are included in the bid documents. The contractor will be required to produce a Contractor's EMP (CEMP), based on the EMP included in this IEE and the bid documents. This will be submitted for approval no later than one month before the start of construction. PSCV will assist the Contractor in preparing the CEMP so that the required environmental mitigation is clearly spelled out. Clearances for payments will include certification from the PSCV as to the effective implementation of the CEMP and completion of mitigation will therefore be linked to payment milestones.

200. Information must be given to the Contractors at the bidding stage and an awareness workshop should be conducted by the PDCV/IES at the bidding stage. Training workshops should be conducted by the PDCV/IES every month for the first four months as the Project gears up. Training workshops should be conducted periodically by the PSCV as every new contractor is engaged and every six months or twice each year, for the first 3 years, to share experience in the implementation of the QL217 and the monitoring report on the implementation of the EMP, to share lessons learned in the implementation and to decide on remedial actions, if unexpected environmental impacts occur.

201. The Contractor(s) will be responsible to:

- i) Recruit qualified Environmental and Safety Agents (ESA) to ensure compliance with environmental statutory and contractual obligations and proper implementation of the CEMP. Prior to start of construction, PMU1 will strictly monitor this Contractor's responsibility to the full to ensure proper and timely implementation of tasks specified.
- ii) Prepare and submit to MOT/PMU a CEMP/Method Statements prior to commencement of civil works;
- iii) Ensure proper implementation of the CEMP through the conduct of weekly monitoring of EMP implementation using a checklist that will be submitted to PSCV and the IES;
- iv) Implement additional environmental mitigation measures, as necessary.

202. The PSCV will coordinate closely with government agencies such as DONRE for monitoring the implementation of all necessary statutory environmental permit conditions including those related to spoil disposal and extraction of filling materials.

C Capacity Building

203. Training workshops should be conducted by the IES two weeks before works commence and refresher courses should be set up every month for the first three months as the Project construction gears up. Training workshops should be conducted periodically by the IES as every new contractor is engaged and every six months or twice each year, for the second and third year, to share experience in the implementation of the works and the monitoring report on the implementation of the EMP, to share lessons learned in the implementation and to decide on remedial actions, if unexpected environmental impacts occur.

E Environmental Monitoring (design stage)

204. This IEE concludes that the construction impacts will be manageable if the mitigation measures are implemented thoroughly. The EMP (Appendix B) is based on the type, extent and duration of the identified environmental impacts. The EMP has been prepared by close reference to best practices and in line with SPS.

205. The effective incorporation of the EMP in the contracts and implementation of the EMP should be audited as part of the loan conditions. PMU1 must work closely with the design engineers to ensure that environmental aspects are incorporated in every stage of construction. The IES of PDCV/PSCV would take the lead and experienced environmental staff will be provided for support to PMU by the PDCV/PSCV from the commencement of the project to train the ESOs in TSD/PMU1 to take on the that responsibility as the Project is rolled out.

206. Prior to implementation of the Project the IEE and EMP will be updated and amended as necessary and reviewed by the IES in PDCV/PSCV after the detailed designs are complete and contracting arrangements are known. Such a review shall be based on reconfirmation and any additional information on the assumptions made at the feasibility stage on location, scale and expected conditions of the Project. Although no major additional impacts would be anticipated based on the information provided to date, the performance and evaluation schedules to be implemented during project construction can be reviewed, updated, and costs estimates can be revised if necessary.

207. Baseline environmental monitoring of water quality, noise and air quality has been proposed after the detailed designs are complete and before construction commences (no later than pre-construction. Field measurements of surface water quality, dust, and noise levels will establish a baseline as a support to assessment of effective EMP implementation by contractors, validation of complaints and pollution events.

F Environmental Monitoring (pre-construction)

208. Implementation of construction of the Project will need to comply with environmental requirements and clearance that has been obtained from DONRE for the whole Project at a provincial level for any statutory environmental assessment or an indication that no further assessment is required. PDCV/PSCV will also need to confirm that Contractor(s) and their suppliers have complied with all statutory requirements for permits from DONRE and provincial authorities. PDCV/PSCV should also check that Contractor(s) have all the necessary valid licenses and permits for use of powered mechanical equipment if necessary and the use of local water supplies (and to construct or operate plant such as for cement batching or asphalt/bitumen (if required) in line with all environmental regulations and permit conditions from provincial authorities. (N.B. local suppliers of cement and

bitumen will be preferred if practicable). Baseline environmental monitoring of water quality, noise and air quality will be undertaken before any construction activity is started.

G Environmental Monitoring (construction stage)

209. The CEMP will be reviewed by the PMU1 assisted by ESO/TSD and the IES in PDCV/PSCV and project management approved before any construction activity is initiated to take account of any subsequent changes and fine tuning of the proposals. The main monitoring for the CEMP should be based on thorough implementation of all the mitigation measures by the contractor. The use of an EMP implementation monitoring checklist that should be included in the CEMP will facilitate this. If EMP implementation is done effectively the impacts can be controlled well within acceptable limits. The disposal of spoil and supply of rock based filling and building materials should be tracked. The access routes by road should also be monitored.

H Environmental Monitoring (operational stage)

210. Operational monitoring of erosion control measures, survival of tree planting will be useful. Water quality monitoring may be necessary if complaints persist into the operational phase. Air quality monitoring will likewise be necessary due to the expected volume of vehicles. Accidents in the vicinity of QL217 should be monitored. Monitoring activities during project operation will focus on erosion control measures, survival of tree planting, complaints, and traffic and accident frequency. Effective monitoring will also facilitate data and performance outcomes to be fed back into the design and operation of the next phases of the road network development.

211. The complete scope of the EMP, including the environmental monitoring program is provided in Appendix B.

J Performance Indicators

212. The key performance indicator will be the successful implementation of the mitigation measures and the EMP. The successful training of TSD/PMU1's ESO by the PMSC's IES and the Contractor's ability to perform the environmental requirements and mitigation measures will also be monitored.

IX. CONCLUSIONS AND RECOMMENDATIONS

213. This IEE update was carried out in 2015. Essentially secondary data were used to assess the 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 potential environmental impacts were assessed in a comprehensive manner. The IEE report provides a picture of potential environmental impacts associated with the upgrading of the road Km 59+900- Km104+475, and suitable mitigation measures have been recommended. The IEE and EMP will be reviewed by the PDCV at the detailed design stage and the EMP will be included in bidding documents. In the event that any design details for the locations or scope of the QL217 are changed the IEE and EMP shall be reviewed and revised accordingly and submitted to ADB for acceptance.

214. The upgrading of QL217 offers a robust option for the enhancement of the existing road network. Several actions are required during the detailed design stage to minimize impacts to acceptable levels. The negative environmental impacts from the rehabilitation will mostly take place during the construction stage. The construction impacts should be very predictable and manageable and with appropriate mitigation 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 road or associated activities that also require environmental assessment and environmental permits under the environmental laws of Viet Nam.

215. The responsibilities for the implementation of mitigation measures and the parties responsible will be clearly defined in contracts and agreements and the implementation by various parties will be checked by the ESO in TSD and monitored by the IES/PDCV for PMU1. The IES/ESO working with PSCV will develop a mechanism to address unexpected environmental impacts in the construction stage. Contractors and PMU1 management must have policies and workable strategies which can be put into practice on site to mitigate the environmental impacts.

216. Whereas most anticipated environmental impacts related to the road will take place during the construction phase, there are no identifiable cumulative impacts during operation. Environmental reporting is recommended to be included in the contractor's monthly progress monitoring reports throughout the construction phase. The implementation of the environmental mitigation measures during the construction period is the responsibility of the contractors and monitored by the PSCV and these requirements will be included in contracts. Environmental performance and the implementation of the EMP should be linked to payment milestones in the contracts.

217. Contractor environmental awareness training will be undertaken by the PSCV and this can assist PMU1 to develop environmental awareness at all levels. It will require sustained effort over several years to achieve proactive management of environmental responsibilities but the Second Northern Greater Mekong Subregion Transport Network Improvement Project and other previous ADB projects have also included provision to consolidate this process and over time so that environmental improvements can accrue in line with good sustainable practice and ADB guidelines. The ESO in the TSD of PMU will be supported in the short term by the IES employed by the PSCV who will be able to liaise with and advise the PMU1 to better utilize the available staff resources to support environmental management. This capability can be used to extend environmental awareness for the contractors in the short term. In the medium to long term PMU1 can strengthen the support their environmental management and dovetail the efforts with the environmental officers in

MOT. At the completion of the Second Northern Greater Mekong Subregion Transport Network Improvement Project the environmental officers in PMU1 are retained in TSD

218. The construction is restricted to the existing road corridor except for the flyover at Km 0. A resettlement plan and resettlement framework have been prepared to establish policies and procedures for payment of compensation to affected people for lost or damage assets. The scope of land acquisition impacts, where they occur, will be limited to the areas of the road where the geometry needs to be adjusted and in these areas there will be some displacement of housing and affected people will experience small losses of crops, trees, fences or other secondary structures.

219. At the detailed design stage, a review will be conducted of the monitoring activities proposed in this IEE and EMP to establish the parameters to be checked during the construction and operation. Impact and compliance monitoring activities will focus on compliance with license conditions, recording implementation of mitigation measures, recording environmental parameters, reviewing contractor environmental performance and proposing remedial actions to address unexpected impacts and complaints.

220. This IEE, including the EMP, will be used as a basis for an environmental compliance program. In addition, any conditions included as part of the environmental compliance from the Government (MONRE/DONRE) will also be included as a basis for the environmental monitoring and compliance program. The implementation of mitigation measures (and other conditions of environmental compliance will be carried out and included in the monthly progress report and the SEMR submitted to ADB during the construction stage. Continued monitoring of selected parameters will be undertaken as necessary during the operation phase.

221. VRA will maintain the road and VRA/PDOT will undertake the appropriate monitoring and operational mitigation measures for maintenance during the lifetime of the road.

222. The IEE report is prepared based on the preliminary designs for rehabilitation and upgrading proposals along the specified routes. At the implementation stage PMU will make arrangements to monitor the schedules of mitigation measures and monitoring programs provided in the IEE report (including Environmental Management Plans and Monitoring Plan). With these measures in place environmental impacts of the Project should be manageable and will not result in any residual impacts which are above accepted environmental standards.

Appendix A- Selected photographs



QLNH1A with railway



Dong Tam Town



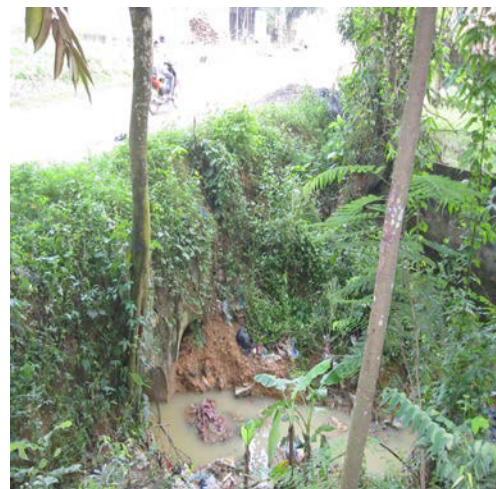
QL217 -A typical embankment



Dong Tam Road









QL217 – A typical bridge



A Dong Tam Culvert is blocked

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 A photograph showing a paved road curving to the right, bordered by a dense forest on the left side.	 A photograph of a busy intersection with a truck, motorcycles, and a building in the background.
<p>Opposite curves at KM99+ 641</p>	<p>NH1A Complex intersection</p>
 A photograph of a road with several potholes, surrounded by trees and utility poles.	 A photograph of a large pothole filled with water on a road surface.
<p>Potholes at Km88+040</p>	<p>Pothole at NH No217 at Interchange NH1</p>
 A photograph of a road with a large pothole, showing a dirt and gravel surface.	 A photograph of a road intersection with a car, a motorcycle, and utility poles.
<p>The pothole at Km104+100</p>	<p>Pavement NH217 at the Interchange with NH1</p>

Appendix B Environmental Management and Monitoring Plan

Environmental Concern	Objective	Impact mitigation					Impact monitoring			
		Proposed Mitigation Measures (MM)	Responsible to Implement MM	Timing to Implement MM	Locations Implement MM	Mitigation Cost	Parameter to monitor	Frequency & Verification	Response. to Monitor	Monitoring Cost
DESIGN & PRE-CONSTRUCTION										
1. Design update and project disclosure	Update designs. Compliance with VIE statutory environmental assessment process. Establishment of Grievance Redress Mechanism (GRM)	<ol style="list-style-type: none"> 1. Secure the services of the Project Design Consultants (PDCV) to update designs to address design requirements. 2. Notify Project to DONRE and identify environmental permits / certificates under statutory environmental assessment process. 3. Implement plan for Grievance Redress Mechanism and inform Than Hoa Province 	PMU1 / TSD	Start of detailed design.	All the study areas.	Cost included in staffing.	Require in PDCV contract. check at DD Revised IEE and EMP submitted Response from DONRE on permits.	Completion detailed design, Once.	DONRE and ADB check	TSD project staffing.
2. Subproject boundaries change.	EMP can control impacts and compliance required for environmental laws.	<ol style="list-style-type: none"> 1. Ensure the road is as described in IEE and RRP with same land acquisition. 2. Design bypasses and QL217 upgrading works within RoW, to avoid graves, cemeteries and other SRs 3. Detailed design alignment to avoid sensitive receivers, loss of vegetation and trees. 4. Detailed design to provide for enhancement where practicable. 5. Make plan for tree replacement with forest and local authorities DFO. 6. Review and update IEE and EMP & include in bidding documents and resubmit in line with ADB SPS 2009. 	PDCV for TSD.	Completion of detailed design.	All the study areas.	Cost included in staffing	Require in PDCV contract. check at DD Complete check on detailed design.	Once, completion of detailed design.	PMU1 and ADB check	Cost met by TSD project staffing
3. Environmental capacity development	Ensure TSD and PMU1 can develop management capacity to implement the EMP so PMU1-TSD to supervise implementation EMP and environmental	<ol style="list-style-type: none"> 1. Deliver revised environmental assessment and EMP. 2. IEEs and EMPs are checked by TSD and included in bidding documents to prepare contractors for environmental responsibilities. 2. Training to TSD (PMU1) on all matters required in IEE; using workshops and on-the-job training techniques and case 	PDCV for TSD	Design output during pre-construction stages. Initiate during run up to construction and continue throughout project	Committed fixed staff in TSD for project duration. Preparation to cover all the road	Cost included in PDCV design fees	Require in PDCV contract. Check at DD. Complete training and check before construction	Completion of detailed design and final bid docs and throughout project duration. Refresher courses quarterly during	PMU1 and ADB check	Cost met by TSD project staffing

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Environmental Concern	Objective	Impact mitigation					Impact monitoring			
		Proposed Mitigation Measures (MM)	Responsible to Implement MM	Timing to Implement MM	Locations Implement MM	Mitigation Cost	Parameter to monitor	Frequency & Verification	Response. to Monitor	Monitoring Cost
	mitigation measures	studies. 4. Capacity building activities. Consolidate environmental specialists in TSD and PMU. 5. Develop strengthening plan for the environmental management by TSD and PMU and retain staff for project duration.						construction.		
4. Plan Spoil and Waste Disposal	Minimize waste; avoid fly-tipping and pollution.	1. Re-use of waste materials & spoil disposal locations included in contracts. 2. PDCV prepares draft WASTE MANAGEMENT PLAN and SPOIL DISPOSAL PLAN as part of updated EMP (update by contractor later).	1 & 2 PDCV for TSD.	1. DD output. 2. Within one month award of contract.	Throughout the road	Cost included in design fees.	Require in PDCV contract. check at DD	Twice, Completion of detailed design and CEMP check	TSD PSCV	1. TSD project staffing. 2. PSCV fees
5. Plan construction materials management	Avoid stockpiling of rock based materials and erosion runoff.	1. Schedule construction materials to avoid stockpiling. 2. Designs to balance cut and fill where possible, and avoid borrow areas in agricultural land. 3. Draft MATERIALS MANAGEMENT PLAN for selected contractor to include in CEMP.	1-3. PDCV/TSD.	1. DD output. 2 & 3. Before bidding.	All the study areas.	1. Cost included in design fees. 2. Contractor fees	Require in PDCV contract. check at DD	Twice, Completion of detailed design and CEMP check.	TSD PSCV	TSD project staffing
6. Drainage and Hydrological Impacts	To minimize hydrological impacts flooding and erosion of river banks.	1. Designs for bridges and culverts sufficient to control flooding with appropriate drainage structures to cater for worst case flow and rainfall from 100 year return storm and to dissipate energy of flow to reduce erosion. 2. Designs for drainage to avoid disposal of outflow on steep slopes >30% and non vegetated areas. Protect slopes below. 3. Draft DRAINAGE MANAGEMENT PLAN for selected contractor to update in CEMP.	PDCV/TSD.	During design agree with local land owners.	Bridges ad causeways ad all areas considered prone to flooding.	Cost included in design	Require in PDCV contract. check at DD	Once, completion of DD.	TSD	TSD project staffing
7. Erosion Control and Flooding	To minimize hydrological impacts, flooding damage to the works and erosion of river banks.	1. Incorporate erosion control and slope stabilization measures in the engineering design such as side ditches and berms, rock lining and slope walls, and provision of vegetation cover on slopes, where appropriate. 2. Temporary drainage works are to be designed based on the historical flood data and flood forecasting.	PDCV for TSD	1. During DD 2. Within one month of signing contract.	Identified n amended EMP and details included in CEMP.	Cost included in design fees.	Require in PDCV contract. check at DD	Twice, Completion of detailed design and CEMP check.	TSD	TSD project staffing

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Environmental Concern	Objective	Impact mitigation					Impact monitoring			
		Proposed Mitigation Measures (MM)	Responsible to Implement MM	Timing to Implement MM	Locations Implement MM	Mitigation Cost	Parameter to monitor	Frequency & Verification	Response to Monitor	Monitoring Cost
		3. Ensure design includes prevention of flooding in adjacent areas during rehabilitation or construction of bridges. 4. Incorporate in the design side drainage structures to divert the stream water at construction sites. 5. Design incorporates sufficient sizes of drains to take design flows. 6. Draft EROSION CONTROL PLAN for selected contractor to update in CEMP.								
8. Traffic Condition	Minimize disturbance of traffic and traffic congestion.	1. Contact all relevant local authorities and local village groups to plan traffic management. 2. Draft TEMPORARY TRAFFIC MANAGEMENT plan for selected contractor to update in CEMP.	PDCV for TSD	During DD	Identified n amended EMP and details included in CEMP.	Cost included in design fees.	Require in PDCV contract. check at DD	Twice, Completion of detailed design and CEMP check.	TSD	TSD project staffing
9. Protect and reprovion irrigation, utilities and trees	Minimize interruption to power, water supply telecoms and irrigation system and tree cutting	1. Identify all power, water supply, telecommunications and irrigation systems likely to be interrupted by the works and trees to be cut. 2. Contact all relevant local authorities for utilities, forestry authority and local village groups to plan reprovioning of power, water supply, telecommunications and irrigation systems and tree replanting. 3. Draft UTILITIES and IRRIGATION REPROVISIONING PLAN and TREE REPLACEMENT PLAN for selected contractor to update in CEMP.	PDCV for TSD.	During DD.	Identified n amended EMP and details included in CEMP.	Cost included in design fees.	Require in PDCV contract. check at DD	Twice, Completion of detailed design and CEMP check.	TSD	TSD project staffing
10 Nose and dust management	Minimize noise and dust	1. Reconfirm all noise and dust sensitive receivers likely to be affected.. 2. Contact local village groups to plan mitigation in advance. 3. Draft NOISE and DUST CONTROL PLAN for selected contractor to update in CEMP.	PDCV for TSD.	During DD.	Identified, amended EMP and details included in CEMP.	Cost included in design fees.	Require in PDCV contract. check at DD	Twice, Completion of detailed design and CEMP check.	TSD	TSD project staffing
11. Environmentally responsible procurement	Opportunity enhance design/avoid pollution.	1. Awareness workshop with candidate contractors before bids are accepted. 2. Include in bid document that Contractor shall engage capable and trained staff or site agent(s) to take responsibility for the environmental management and safety	. PDCV for TSD Contractor	During contractor selection.	Throughout the road	Cost included in design	Complete check on DD.	Once, completion of DD.	TSD	TSD project staffing

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Environmental Concern	Objective	Impact mitigation					Impact monitoring			
		Proposed Mitigation Measures (MM)	Responsible to Implement MM	Timing to Implement MM	Locations Implement MM	Mitigation Cost	Parameter to monitor	Frequency & Verification	Response to Monitor	Monitoring Cost
		issues at the working level and to monitor the effectiveness and review mitigation measures as the project proceeds 3. Non-polluting or enhancing methods. 4. Contractors submit MS of mitigation measures and enhancements with tender with dedicated named staff; environmental and erosion control managers. 5. Recruit qualified staff to oversee implementation of environmental and safety measures specified in the EMP								
12 Unexploded Ordinance	Avoid accidents due to UXO	Contact independent and international mines advisory groups and agencies at the design stage to identify if UXO is a potential threat to works	PDCV for TSD (Contractor to reconfirm before works commence).	1. Prior to contractor selection. 2. Reassurance check before works commence	Throughout the road	Cost included in design	Complete check on DD.	Once, completion of DD.	TSD	TSD project staffing
13 Water quality baseline	Determine preconstruction water quality baseline conditions for performance monitoring.	Conduct water quality analysis two weeks before opening up construction activities within 50m at three bridges in each district. Surveys methods to follow analysis of selected parameters (QCVN 08 2008 BTMNT- see construction mitigation).	PDCV for TSD with support from Independent experienced laboratory.	During the month prior to construction.	Upstream and downstream of all main river crossings.	Cost included in design	Complete check at end of DD.	Once, completion of DD.	TSD	TSD project staffing
14 Noise baseline	Determine preconstruction noise baseline conditions for performance monitoring.	Conduct noise and air quality monitoring and analysis two weeks before opening up construction activities within 50m at all bridges. Surveys methods to follow analysis of selected parameters (Noise TCVN 5949 - 1998 & TSP TCVN 5937: 2005 see construction stage mitigation).	PDCV for TSD with support from Independent experienced laboratory.	During the month prior to construction.	Selected locations near noise sensitive receivers.	Cost included in design	Complete check at end of DD.	Once, completion of DD.	TSD	TSD project staffing
CONSTRUCTION STAGE										
1. Activate management plans and obtain permits / licenses.	Avoid impacts from unplanned activities.	1. PSCV shall conduct contractor environmental awareness training 2. Update and activate management plans for spoil and waste, materials, drainage, erosion control, traffic, utilities, noise and dust control and worker and public safety included in CEMP. 3. Contractor(s) and their suppliers comply with all statutory requirements for permits	PSCV Contractor.	One month before construction	Throughout the road	Cost included in contractors fees	Complete check before construction.	Once, one month before construction.	PSCV for TSD	Cost met by PSCV project staffing

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Environmental Concern	Objective	Impact mitigation					Impact monitoring			
		Proposed Mitigation Measures (MM)	Responsible to Implement MM	Timing to Implement MM	Locations Implement MM	Mitigation Cost	Parameter to monitor	Frequency & Verification	Response to Monitor	Monitoring Cost
		from DONRE with regard to use of mechanical equipment, establishment and operation of construction plants such as concrete batching plant, rock crusher, etc.								
2. Orientation for Contractor, Workers on environmental and social management.	Contractor & workers trained to implement mitigation measures and better implementation of EMP.	1. Contractor / TSD training by PSCV on all aspect of EMP , CEMP and all management issues for waste, noise etc., 2. Contractors clearly separate resources applied to mitigation measures. Tenders identify named staff to supervise management's plans. 3. Implement malaria controls and HIV-AIDS education in line with social plans 4. HIV/AIDS awareness and prevention program shall be implemented under the Project.	PSCV for TSD, Contractor.	1. Induction all contractor management and site agents and above including all TSD and PSCV staff & refresher talks. 2 to 4. Weekly toolbox talks for site staff	1. All site agent staff. Monthly induction and six month refresher courses. 2. On active areas of works sites.	Cost included in contracts for PSCV and Contractor	Complete check before construction.	Monthly during construction.	TSD . PSCV	Cost met by TSD and PSCV project staffing
3. Loss of trees, vegetation & aesthetics	Avoid removing trees and prevent deforestation	1. Tree-cutting and replanting plan will be prepared before vegetation clearing is undertaken as part of CEMP. 2. Monitor and marking of vegetation that will not be removed agreed with forest authority prior to commencement of construction. 3. Cut slopes designed not to undercut or destabilize adjacent tree lined slopes. 4. Forest authority to approve replacement of cut trees to be undertaken based on the tree cutting and replanting plan. 5. Clearing of trees minimized in CEMP. 6. Ensure ban on use of forest timber for fuel is in CEMP and Workers shall be prohibited from cutting trees for firewood. 7. During replanting/revegetation works, new alien plant species (i.e., species not currently established in the country or region of the project) shall not be used unless carried out with the existing regulatory framework for such introduction. Invasive species shall not be introduced into new environments.	. Forest Authority and/or PSCV for TSD to supervise design & marking. Contractor (CEMP) to implement.	One month prior to construction and continue throughout construction	Throughout the road.	Cost included in contracts	Check in CEMP.	Prior to and during construction	PSCV for TSD	Cost met by TSD and PSCV project staffing
4. Drainage and Hydrological	To minimize hydrological	1. Review detailed designs for cross-drainage structures, assess and agree with PMU (PSCV/PMU) if redesign is required	Contractor.	One month before construction	Bridges ad causeways and all	Cost included in	Require in PSCV contract.	Once, completion of	TSD	Cost met by PSCV project

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Environmental Concern	Objective	Impact mitigation					Impact monitoring			
		Proposed Mitigation Measures (MM)	Responsible to Implement MM	Timing to Implement MM	Locations Implement MM	Mitigation Cost	Parameter to monitor	Frequency & Verification	Response. to Monitor	Monitoring Cost
Impacts	impacts flooding and erosion of river banks.	or if new structures would be constructed or existing ones would be repaired. 2. Update DRAINAGE MANAGEMENT PLAN in CEMP. 3. Implement agreed designs for bridges and culverts sufficient to control flooding as designed and to dissipate energy of flow to reduce erosion. 4 Protect or reprovion irrigation channels that cross the works areas. 5. Protect natural streams may become silted by construction runoff, workshops and equipment washing-yards. 6. Minimize alterations in the project corridor's surface drainage patterns as far as possible: 7. Drains to be constructed so that the outfalls of the surface run-off from the carriageway are diverted away from the SRs. 8 Ensure that storm drains and highway drainage systems are periodically cleared to maintain storm water flow during construction.		commences agree with local land owners.	areas considered prone to flooding.	design	check at DD	DD.		staffing
5. Utilities	Prevent interruption of services such as electricity and water during relocation of the utilities line /connections.	1. Update UTILITIES and IRRIGATION REPROVISIONING PLAN 1. Reconfirm power, water supply, telecommunications and irrigation systems likely to be interrupted by the works and trees to be cut. 2. Contact all relevant local authorities for utilities and local village groups to plan reprovisioning of power, water supply, telecommunications and irrigation systems. 3. Utilities shall be relocated and reconnected well ahead of commencement of construction works and contractor shall coordinate with utility company for relocation and reconnection well before works commence. 4. Affected communities shall be properly informed in advance. 5. Reconnection of utilities shall be done at the shortest practicable time before	Contractor.	One month before construction commences agree with local land owners.	All utilities and irrigation facilities are to be considered	Cost included in design	Require in PSCV contract. check at DD	Once, completion of DD.	TSD	Cost met by PSCV and TSD project staffing

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Environmental Concern	Objective	Impact mitigation					Impact monitoring			
		Proposed Mitigation Measures (MM)	Responsible to Implement MM	Timing to Implement MM	Locations Implement MM	Mitigation Cost	Parameter to monitor	Frequency & Verification	Response to Monitor	Monitoring Cost
		<p>construction commences.</p> <p>5. Utilities damaged during construction shall be reported to the PSCV and utility authority and repairs arranged immediately.</p>								
6. Materials exploitation and management of quarry and borrow areas	Minimize impacts from materials extraction, transportation and storage with MMP.	<p>1. Update draft MATERIALS MANAGEMENT PLAN (MMP) in CEMP</p> <p>2. Balance cut and fill requirements to minimization impacts from extraction of aggregates.</p> <p>3. Prioritize use of existing quarry sites with suitable materials and update the list of quarries and borrow pits monthly in MMP and report to PMU1/TSD and minimize impacts on other local resources.</p> <p>4. Procure materials only from DONRE authorized quarries.</p> <p>5. If the contractor shall operate the quarry site, required environmental permits shall be secured prior to operation of quarry/borrow areas.</p> <p>5. Follow compensatory planting plan if trees have to be removed</p> <p>6. Stockpile topsoil for later use and fence and re-contour borrow pits after use. Topsoil, overburden, and low-quality materials shall be properly removed, stockpiled near the site, and preserved for rehabilitation.</p> <p>7. Use quarry with highest ratio between extractive capacity (both in terms of quality) and loss of natural state;</p> <p>8. Use quarry sites lying close to the alignment, with a high level of accessibility and with a low hill gradient;</p> <p>9. Do not use quarries in areas of natural woodland or near rivers which provide food and shelters for birds and other animals.</p> <p>10. It is preferable to avoid or reduce the sections of quarry sites located on river bed. If it is not possible to locate quarries out of river beds, quarry sites lying on small rivers and streams shall be avoided.</p> <p>Alluvial terraces or alluvial deposits which</p>	Contractor	Update MMP monthly	List and map borrow areas and plan storage areas one month prior to start of works.	Cost included in contract	Complete check before construction.	Monthly during construction.	PSCV for TSD.	Cost met by PSCV project staffing

Initial Environmental Examination of Km 59 +900 – Km 104+475 and Flyover Bridge NH1A

Environmental Concern	Objective	Impact mitigation					Impact monitoring			
		Proposed Mitigation Measures (MM)	Responsible to Implement MM	Timing to Implement MM	Locations Implement MM	Mitigation Cost	Parameter to monitor	Frequency & Verification	Response to Monitor	Monitoring Cost
		lie on the river beds but not covered by water in normal hydrological conditions, are preferred; 11. In quarries in the mountainous or hilly areas, or wherever slopes are important, cut terraces after extraction and implement a drainage system and vegetation cover for rehabilitation. 12. 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								
7. Spoil Disposal	Control spoil and construction waste disposal, oily and hazardous wastes.	1. Update Spoil Disposal section in SPOIL & WASTE MANAGEMENT PLAN (SWMP) updated by Contractor one month before construction (in CEMP) to cover all aspects of spoil removal, storage, disposal and monitoring to be approved in writing by PSCV one month prior to starting works. 2. Areas for disposal to be agreed with land owner and DONRE checked and recorded by the PSCV/PMU1 and monitored 3. Spoil disposal areas to be rehabilitated monitored, catalogued, and marked.	Contractor	Audit regularly and update once a month and report quarterly.	Agree site(s) with local community and TSD.	Cost included in contracts	Checks on WMP before and during implementation of construction.	Monthly during construction.	PSCV for TSD	Cost met by PSCV project staffing
8. General Construction Waste Disposal	Reduce, reuse and recycle waste and contamination due to poor waste disposal practices.	1. Update Waste Management section of SWMP, updated by Contractor one month before construction (in CEMP) to cover all aspects of waste storage, disposal and accidental spills to be approved in writing one month prior to starting works. 2. Areas for disposal to be agreed with land owner and DONRE checked and recorded by the PSCV/PMU1 and monitored 3. Waste disposal areas to be rehabilitated monitored, catalogued, and marked. 4. Segregation of wastes shall be observed. Cleared foliage, shrubs and grasses can be given to local farmers for fodder and fuel. Organic (biodegradables) shall be collected and disposed of on site by composting (no burning on site). 4. Recyclables shall be recovered and sold	Contractor	Audit regularly and update once a month and report quarterly PSCV / TSD.	Agree sites with local community and TSD.	Cost included in contracts	Checks on SWMP before and during implementation of construction.	Monthly during construction.	PSCV for TSD	Cost met by PSCV/ TSD project staffing

Initial Environmental Examination of Km 59 +900 – Km 104+475 and Flyover Bridge NH1A

Environmental Concern	Objective	Impact mitigation					Impact monitoring			
		Proposed Mitigation Measures (MM)	Responsible to Implement MM	Timing to Implement MM	Locations Implement MM	Mitigation Cost	Parameter to monitor	Frequency & Verification	Response to Monitor	Monitoring Cost
		to recyclers. 5. Residual and hazardous wastes shall be disposed of in disposal sites approved by local authorities.								
9. Use of hazardous substances and hazardous waste disposal	Minimize contamination due to use and storage of hazardous substances	<p>1. Update Hazardous Waste section of SWMP, one month before construction (in CEMP). Include in CEMP requirements for: safe storage of fuel and bulk materials; from sites with permit under provincial laws and agreed by TSD and DONRE</p> <p>2. Hydrocarbon, toxic material and (explosives --- if blasting will be involved) will be stored in adequately protected sites to prevent soil and water contamination</p> <p>3. Vehicle maintenance and refueling will be confined to areas in construction sites designed to contain spilled lubricants and fuels.</p> <p>4. Fuel depot shall be provided with impervious flooring and bund/containment wall to keep spilled fuel/lubricant within the depot;</p> <p>5. Used oil and other toxic and hazardous materials shall be disposed of in an authorized facility off-site.</p> <p>6. Adequate precautions will be taken to prevent oil/lubricant/ hydrocarbon contamination of channel beds. Spillage, if any, will be immediately cleared with utmost caution to leave no traces.</p> <p>7. Spillage waste will be disposed at disposal sites approved by local authorities and approved by PSCV.</p> <p>8. All areas intended for storage of hazardous materials will be segregated and provided with adequate facilities to combat emergency situations complying with all the applicable statutory requirements.</p> <p>9. The Contractor shall identify named personnel in the CEMP in-charge of these sites and ensure they are properly trained to control access to these areas and entry will be allowed only under authorization.</p>	Contractor	Audit regularly and update once a month and report quarterly.	Agree site(s) with local community and TSD.	Cost included in contracts	Checks on SWMP before and during implementation of construction.	Monthly during construction.	PSCV for TSD	Cost met by PSCV project staffing

Environmental Concern	Objective	Impact mitigation					Impact monitoring			
		Proposed Mitigation Measures (MM)	Responsible to Implement MM	Timing to Implement MM	Locations Implement MM	Mitigation Cost	Parameter to monitor	Frequency & Verification	Response to Monitor	Monitoring Cost
10. Asphalt plant rock crushers, bitumen usage and soil contamination	Avoid air pollution, nuisances, traffic obstacles and contamination	<p>1. Locate asphalt plant, rock crushers and bitumen supply off road and (wherever practicable) at least 500m from nearest sensitive receivers and rivers.</p> <p>2. Locate asphalt plant rock crushers and bitumen supply on sealed surfaces to prevent soil contamination, off road and (wherever practicable at least 500m from nearest sensitive receivers) and install and maintain dust suppression equipment.</p> <p>3. Bitumen should not be used as fuel. Fuel wood not for bitumen heating. Bitumen drums stored in dedicated area not scattered along the Second Northern Greater Mekong Subregion Transport Network Improvement Project road.</p> <p>4. Bitumen will not be allowed to enter either running or dry streambeds and nor will be disposed of in ditches or small waste disposal sites prepared by the contractor.</p> <p>5. Bitumen storage and 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. Any petroleum products used in the preparation of the bitumen mixture must also be carefully managed to avoid spills and contamination of the local water table.</p> <p>6. Fuel wood shall not be used for heating bitumen and bitumen shall be not used as fuel.</p> <p>7. Bitumen drums shall be stored in a dedicated area, not scattered along the works</p> <p>8. All accidental spills of bitumen or chemicals should be cleaned up immediately with the top 2cm of any contaminated soil underneath and</p>	The Contractor observes the rules as redefined in CEMP.	Site staff instructed before works commence.	Throughout the road	Cost included in contracts	Complete check before construction.	Monthly during construction.	PSCV for TSD	Cost met by PSCV project staffing

Second Northern Greater Mekong Subregion Transport Network Improvement Project (TA 6478-REG)

Initial Environmental Examination of Km 59 +900 – Km 104+475 and Flyover Bridge NH1A

Environmental Concern	Objective	Impact mitigation					Impact monitoring			
		Proposed Mitigation Measures (MM)	Responsible to Implement MM	Timing to Implement MM	Locations Implement MM	Mitigation Cost	Parameter to monitor	Frequency & Verification	Response to Monitor	Monitoring Cost
		disposed of as chemical waste to a site approved by the local authority. 9. Prevent soil contamination requiring contractors to instruct and train their workforce on storage and handling of materials and chemicals that can potentially cause soil contamination. 10. Recycle debris generated by dismantling of existing pavement subject to the suitability of the material. 11. Solid waste generated during construction and at campsites to be treated and safely disposed only in demarcated waste disposal sites identified and agreed with PSCV/PMU and the local community.								
11. Noise and dust nuisances	To minimize air impacts effectively and avoid complaints due to the airborne dust.	1. Update the Noise and Dust control plan NDCP before construction (in CEMP). Include requirements for CONTOL NOISE and ALL DUSTY MATERIALS AT SOURCE. 2. Restrict works to daylight hours within 500m of residential settlements and hospitals. 3. PME and Vehicle emissions to meet national TCVN standards. 4. Monitor & investigate complaints; propose alternative mitigation measures. 5. Keep stockpiles moist and cover vehicles to prevent spillage, 6. Clean up road surfaces after work. 7. Ensure regular maintenance of equipment and provision of muffler silencers for all vehicles and equipment. 8. Temporary noise barriers shall be used, as necessary, in sites where sensitive receptors are present, such as residential areas, schools, hospitals, temples, etc. 9. To protect buildings and structures from vibration, non-vibrating roller shall be used in construction sites near buildings and structures. 10. Structures which are damaged due to vibration caused by the Project shall be repaired immediately as directed by PSCV.	Contractor	CEMP agreed before works commence and monitor weekly throughout all construction works	Throughout the road	Cost included in contracts	1. Installation of mitigation measures as per CEMP. 2. Monitoring noise versus TCVN 5949: 1998 3. Monitoring TSP versus TCVN 5937: 2005	1. to 12 regularly during construction. 2, 3, 4 at monthly intervals during construction at active construction sites. 5 to 12 at all times.	PSCV for TSD.	Cost met by PSCV project costs

Initial Environmental Examination of Km 59 +900 – Km 104+475 and Flyover Bridge NH1A

Environmental Concern	Objective	Impact mitigation					Impact monitoring			
		Proposed Mitigation Measures (MM)	Responsible to Implement MM	Timing to Implement MM	Locations Implement MM	Mitigation Cost	Parameter to monitor	Frequency & Verification	Response to Monitor	Monitoring Cost
		11. Machinery shall be turned off when not in use. 12. Pile driving during to be schedule for day time if construction site is near sensitive receptors or approved by DONRE, local authority and PSCV. 12. PSCV shall undertake monitoring of TSP and noise at the locations of justifiable complaints and compare to stations which were sampled during pre-construction phase to validate complaints.								
12. Blasting (if required)	Perform safe blasting and prevent damage and nuisances from blasting	1. PDCV will be reviewed requirements for blasting at the detailed design 2. Contractor to review requirements for blasting in CEMP. 3. Blasting will be carried out as per Vietnamese statutory requirements with notification to DONRE and local police. 4. Blasting plan will be included in CEMP. 5. No blasting will take place without condition survey of the buildings within 500m and permission and monitoring by the PSCV. 6. People living near blasting sites will be informed of blasting times prior to the blasting. 7. Warning sirens will be sounded before blasting. 8. Pre-splitting should be undertaken. 9. Blast blankets will be laid over the blast area to reduce flying rock 10. Where the vibration from blasting is exceeding the maximum permissible level, or damage occurs to local property information from the blasting should be used to modify blasting patterns and calculate a reduced charge for future blasts 11. Blasting will not be undertaken at night. 12. Workers at blasting sites will be trained prior to blast operations and provided with safety equipment and earplugs.	Contractor	Audit regularly and update once a month and report quarterly PSCV / TSD.	Notify sites to all stakeholders including local community and TSD.	Cost included in contracts	Checks on SWMP before and during implementation of construction.	Monthly during construction.	PSCV and TSD	PSCV and TSD project staffing
13. Erosion	Protect established	1. Update the draft Erosion Control Plan (ECP) produced by the PDCV and	Contractor	1 & 2. All times.	All vulnerable slopes agreed	Cost included in	Installed as per DD and	Once, after completion of	PSCV and	Cost met by PSCV / TSD

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Initial Environmental Examination of Km 59 +900 – Km 104+475 and Flyover Bridge NH1A

Environmental Concern	Objective	Impact mitigation					Impact monitoring			
		Proposed Mitigation Measures (MM)	Responsible to Implement MM	Timing to Implement MM	Locations Implement MM	Mitigation Cost	Parameter to monitor	Frequency & Verification	Response. to Monitor	Monitoring Cost
control / run-off	works.	implement slope stabilization measures in the detailed designs and maintained during construction to protect the works. 2. Establish vegetation & erosion protection immediately after completion of works in each stretch / sector. 3. Check weather forecasts and minimize work in wet weather and. 4. Stockpile topsoil for immediate replanting after cutting. 5. Minimize damage and cutting of surrounding vegetation during slope formation. 6. Protect the cut slope with planted vegetation, bioengineering or conventional civil engineering structures as soon as practicable after cutting. 7. Include and implement appropriate measures for slope protection, i.e. vegetation cover and stone pitching, as required in the detailed construction drawings. 8. Prevent erosion and protect the cut slope with temporary or permanent drainage as soon as practicable after cutting. 9. If new erosion occurs accidentally, back fill immediately to restore original contours. 10. Low embankments will be protected from erosion by seeding and planting indigenous grasses that can flourish under local conditions. 11. High embankments, i.e. 2m high and above, will be considered for protection by constructing stone pitching or a riprap across the embankment immediately after the works are completed. This practice will also be applied along cross-drainage structures where embankments are more susceptible to erosion by water runoff. 12. 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		3. Daily with focus in rainy seasons. 5 to 8 at all times	with PSCV.	contracts	check installation after construction.	each stretch.	TSD .	project staffing

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Environmental Concern	Objective	Impact mitigation					Impact monitoring			
		Proposed Mitigation Measures (MM)	Responsible to Implement MM	Timing to Implement MM	Locations Implement MM	Mitigation Cost	Parameter to monitor	Frequency & Verification	Response to Monitor	Monitoring Cost
		PSCV/PMU.								
14. River protection and bridge repair	Protect rivers and maintain river flow	In sections along and near rivers and streams: 1. Rocks and stones will be disposed not to block rivers and streams. 2. In bridge repair and demolition sites, the bridge structure will not be dropped into the river but alternative means will be used to avoid "dropping the bridge" into rivers/streams. This will be done by "sawing" appropriate sections of the bridge and using cranes to lift these sections away or alternatively by construction of a platform onto which the bridge could be lowered. 3. 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. 4. 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.	Contractor	At all times	All rivers and streams with repair and reconstruction works.	Cost included in contracts	Installed as per DD and check installation after construction.	Tree times before, during and after completion of each stretch near the bridge works.	PSCV and TSD	Cost met by PSCV / TSD project staffing
15. Water quality	Prevent water quality impacts due to negligence and ensure unavoidable impacts managed effectively.	1. Store of lubricants, fuels in dedicated enclosures >50 m from water bodies. 2. Dispose solid waste from construction activities (NO BURNING) in line with SWMP in CEMP. 3. Covering materials to reduce run-off. 4. No stockpiling or borrow sites < 50m of water body. 5. Monitor and investigate water quality if complaints occur. 6. Work in rivers will be scheduled during dry season and work duration shall be as short as possible. 7. Immediate stabilization of bare slopes shall be undertaken.	Contractor 1 to 4 & 7 to 12. 5. PSCV for TSD	Timing will depend on the construction timetable and complaints.	1-10 Locations will depend on the construction timetable and complaints. 6. Works within 50m river crossings e.g. bridges. 5. During pollution events or when there are complaints, PSCV shall	Cost included in contracts	1 - 4. Conditions of storage in CEMP. 5. Indicator water quality parameters. Water quality parameters In QCVN 08:2008 selected at pre-	1-4.Continuous 5. 3 baseline samples per location. At bridges T two weeks before construction & bi- weekly during works; and one month after construction.	PSCV for TSD	Cost met by PSCV project staffing

Initial Environmental Examination of Km 59 +900 – Km 104+475 and Flyover Bridge NH1A

Environmental Concern	Objective	Impact mitigation					Impact monitoring			
		Proposed Mitigation Measures (MM)	Responsible to Implement MM	Timing to Implement MM	Locations Implement MM	Mitigation Cost	Parameter to monitor	Frequency & Verification	Response to Monitor	Monitoring Cost
		8. Construction storage/stockpiles shall be provided with bunds to prevent silted run-off. 9. Stockpile areas and storage areas for hazardous substances shall be located away from water bodies. 10. Washing of machinery and vehicles in surface waters shall be prohibited. 11. In response to complaints water quality measurements will be taken (by PSCVL/TSD) 50m before (upstream) and 50m after (downstream) the bridges in line with the methodology used in for baseline sampling and impacts determined by reference to the baseline results.			undertake sampling at the upstream, point of discharge of contaminant and downstream areas of the river(s) of concern.		construction baseline monitoring stage.			
16. Water resources	Reduce damage to river bed and irrigation network.	1. Use water without depleting local village supplies assess water availability and evaluate the impact on community resources. 2. Bring in project water by tanker as necessary. 3. Worker camps will be located >500m from the nearest settlement to prevent the contamination of community-owned water resources. 4. Maintain close liaison with local communities to ensure that any potential conflicts related to common resource utilization for project purposes are resolved quickly. 5. Guidelines will be established to minimize the wastage of water during construction operations and at campsites. 6. Avoid and minimize use of river bed for construction materials. 7. Confine winning river materials to 20% of river width in any location and keep away from river banks. 8. Reinstate river banks if necessary. 9. Re-provision irrigation channels affected by works two weeks before commencement of works to satisfaction of TSD and local community. 10. All irrigation canals along the	Contractor	Timing will depend on the construction timetable.	Locations depend on the DD construction timetable	Cost included in contracts	Indicator water quality parameters. selected after pre-construction baseline monitoring stage.	Continuous	PSCV for TSD	Cost met by PSCV project staffing

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Environmental Concern	Objective	Impact mitigation					Impact monitoring			
		Proposed Mitigation Measures (MM)	Responsible to Implement MM	Timing to Implement MM	Locations Implement MM	Mitigation Cost	Parameter to monitor	Frequency & Verification	Response to Monitor	Monitoring Cost
		alignment shall be clearly marked on the ground to prevent accidental dumping of fill materials into these canals. 11. In case of accidental obstruction or damage, irrigation ditches and ponds shall be cleaned or repaired immediately.								
17. Site Agent / Supervisor /Worker Camp canteen and facilities.	Worker facilities not to cause nuisance or exploit forest of wildlife resources.	1. Worker camp location and facilities located >500m from settlements and agreed with local communities and facilities approved by PSCV and TSD and managed to minimize impacts. 2. Construction camps will be established in areas with adequate natural drainage channels in order to facilitate flow of the treated effluents. 3. Hire and train as many local workers as possible 4. Portable lavatories (or at least pit latrines in remote areas) shall be installed and open defecation shall be discouraged and prevented by cleaning lavatories daily and by keeping lavatory facilities clean at all times. 5. Wastewater effluents from contractors' workshops and equipment washing-yards will be passed through gravel/sand beds and all oil/grease contaminant will be removed before discharging it into natural streams. Oil and grease residues shall be stored in drums awaiting disposal in line with the agreed Waste Management Plan. 6. Predictable wastewater effluent discharges from construction works shall have the necessary permits from DONRE and local authorities before the works commence. 7. 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. 8. Options for completely or partially recycling scraped scarified materials will also be taken into account.	1 to 14. Contractor 1, 3 & 5. PSCV for TSD	Throughout construction. Check and update once a month	Location Map is prepared by the Contractor (CEMP).	Cost included in contracts.	Locations agreed and complete site check before construction. All mitigation in place at all sites and monitor monthly	Once for each location, one month before construction.	PSCV and TSD	Cost met by TSD and PSCV project staffing g

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Environmental Concern	Objective	Impact mitigation					Impact monitoring			
		Proposed Mitigation Measures (MM)	Responsible to Implement MM	Timing to Implement MM	Locations Implement MM	Mitigation Cost	Parameter to monitor	Frequency & Verification	Response to Monitor	Monitoring Cost
		9. Food shall be provided from farms nearby and bush meat supplies will be banned to discourage poaching. 10 Ban use of guns and hunting equipment by workers and dismiss workers taking or using green timber or hunting or in possession of wildlife. 11. Camp site will be cleaned up to the satisfaction of TSD and local community after use. 12. Solid and liquid waste will be managed in line with Waste Management Plan. 13 All waste materials shall be removed and disposed to disposal sites approved by local authorities 14. 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.								
18. Sanitation and Diseases	Control of infectious diseases.	1. Standing water will not be allowed to accumulate in the temporary drainage facilities or along the roadside to discourage mosquitoes. 2. Temporary and permanent drainage facilities will be designed to facilitate the rapid removal of surface water from all areas and prevent the accumulation of surface water ponds. 3. Malaria controls and HIV-AIDS education will be implemented in line with social plans for the project. 4. HIV/AIDS awareness and prevention program shall be implemented in line with social plans under the Project	Contractor	Throughout construction. Check and update once a month	All areas.	Cost included in contracts.	All mitigation in place before construction at all sites and monitor monthly	Before construction and monthly check.	PSCV and TSD	PSCV / TSD project staffing
19. Safety Precautions for the Workers and first aid.	Ensure worker safety.	1. Contractor updates Worker and Public Safety Plan (WPSP) and instructs workers in health and safety matters. 2. Establish safety measures as required by law and by good engineering practice and provide first aid facilities (CEMP). 3. Fencing on all excavation, borrow pits and sides of temporary bridges 4. Workers shall be provided with	1: Before construction 2 to 9: Contractor, with routine checks by PSCV and TSD	Throughout construction	Throughout all R1C, R6, R6A & R6B routes.	Cost included in contracts	Complete check before construction.	Continuous. First check all in CEMP one month before construction.	PSCV and TSD	Cost met by TSD and PSCV project staffing

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Environmental Concern	Objective	Impact mitigation					Impact monitoring			
		Proposed Mitigation Measures (MM)	Responsible to Implement MM	Timing to Implement MM	Locations Implement MM	Mitigation Cost	Parameter to monitor	Frequency & Verification	Response to Monitor	Monitoring Cost
		<p>appropriate personal protective equipment (PPE) such as safety shoes, hard hats, safety glasses, ear plugs, gloves, etc. at no cost to the employee.</p> <p>5. The contractor shall orient workers on health and safety issues related to their activities as well as on the proper use of PPE.</p> <p>6. Where worker exposure to traffic cannot be completely eliminated, protective barriers shall be provided to shield workers from traffic vehicles. Another measure is to install channeling devices (e.g., traffic cones and barrels) to delineate the work zone.</p> <p>7. Workers shall be provided with potable water supply.</p> <p>8. Construction camps shall be provided with adequate drainage to avoid accumulation of stagnant water.</p> <p>9. 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.</p>								
20. Public safety	Prevent accident with public in local community	<p>1. Include in WPSP for barriers (e.g., temporary fence), shall be installed at construction areas to deter pedestrian access to the roadway except at designated crossing points.</p> <p>2. The general public/local residents shall not be allowed in high-risk areas, e.g., excavation sites and areas where heavy equipment is in operation and such sites have a watchman to keep public out.</p> <p>3. Speed restrictions shall be imposed on Project vehicles and equipment when traveling within 50m of sensitive receptors (e.g. residential, schools, temples, etc.).</p> <p>4. Upon completion of construction works, borrow areas will be backfilled or fenced.</p>	Contractor	At all times	Locations identified and agreed by TSD	Cost included in contracts	Complete check before construction.	Once, month before construction.	PSCV and TSD	Cost met by TSD and PSCV project staffing
21. Traffic	Minimize	1. Update and implementation of	Contractor	At all times	Locations	Cost	Complete	Once, month	PSCV and	PSCV and

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Environmental Concern	Objective	Impact mitigation					Impact monitoring			
		Proposed Mitigation Measures (MM)	Responsible to Implement MM	Timing to Implement MM	Locations Implement MM	Mitigation Cost	Parameter to monitor	Frequency & Verification	Response. to Monitor	Monitoring Cost
Conditions	disturbance of traffic and traffic congestion	construction Temporary Traffic Management Plan and awareness program. 2. 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. 3. In coordination with local traffic authorities, implement appropriate traffic diversion schemes to avoid inconvenience due to project operations to road users, ensure smooth traffic flow and avoid or minimize accidents, traffic hold ups and congestion 4. Install bold diversion signs that would be clearly visible even at night and provide flag persons to warn of dangerous conditions. 5. Designate traffic officers in construction sites.			identified and agreed by TSD.	included in contracts	check before construction.	before construction.	TSD	TSD
22. Archaeological and cultural artifacts.	Preservation of chance finds of cultural and archaeological relics. identified during construction	1. Site agents instructed to keep a watching brief for relics 2. Should any potential items be located, the site PSCV will immediately be contacted and work will be temporarily stopped in that area. 3.. If the site supervisor determines that the item is of potential significance, an officer from the Department of Culture and Information (DCI) will be invited to inspect the site and work will be stopped. 4. Until DCI has responded to this invitation work will not re-commence in this location until agreement has been reached between DCI and DOR as to any required mitigation measures, which may include excavation.	Contractor	Throughout construction. Check and report on same day.	All areas.	Cost included in contracts.	Reporting lines confirmed in CEMP in place before construction at all sites and monitor monthly	Before construction and monthly check.	PSCV and TSD	PSCV / TSD project staffing
23 Enhancements	Provide environmental enhancement of the project	Contractor to reconfirm and implement enhancements identified at the detailed design stage and included in the updated EMP.	Contractor	Throughout construction. Check and report in CEMP.	All areas.	Cost included in contracts.	Enhancements confirmed in CEMP before construction	Before construction and monthly check.	PSCV and TSD	PSCV and TSD

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Environmental Concern	Objective	Impact mitigation					Impact monitoring			
		Proposed Mitigation Measures (MM)	Responsible to Implement MM	Timing to Implement MM	Locations Implement MM	Mitigation Cost	Parameter to monitor	Frequency & Verification	Response to Monitor	Monitoring Cost
							at all sites and monitor			
OPERATIONAL STAGRE	(maintenance)	PDOT is implementing agency.								
1. Orientation of maintenance contractors and workers for environmental management.	Ensure maintenance contractors capacity to implement mitigation.	Contractors tenders will be required to identify resources and funds for staff to supervise environmental mitigation carried over from construction.	Contractor management and for PDOT to check quarterly.	Induction for all site agents <u>all PDOT_new</u> staff before work.	All works & Induction periodic site agent staff & refresher course.	Cost included in contracts	Check before first phase maintenance commences	Quarterly. observe and record results.	for PDOT check	Cost met by for PDOT project staffing
2. Soil erosion.	To minimize excessive erosion.	1. Ensure rapid response and thorough maintenance programme. 2. Surveillance and re-vegetation for landslips.	1 & 2. PDOT 2. Maintenance contractor	Throughout maintenance operations	Slopes with protection measures and new wash out.	Cost included in design	Check on DD.	Prior to and during construction	for PDOT check	Cost met by for PDOT project staffing
3. Monitoring Water Quality	Respond to complaints	Monitor indicator water quality parameters .In QCVN 08:2008 selected at pre-construction baseline monitoring stage.	1. PDOT. 2. Local road authority & district peoples authority	During operation.	Throughout all QL217 route and bypasses.	Cost included QL217 route & bypasses monitoring	Throughout operations and maintenance	In response to justifiable complaints.	for PDOT check	Cost met by for PDOT operational costs
4. Monitoring Accidents	Monitor accidents QL217 route and bypasses.	1. QL217 route and bypasses road user and neighbour information/ education and road markings. 2. Establishment of accident review committee in NRA.	1. PDOT. 2. Local road authority & district peoples authority	During operation.	Throughout all QL217 route and bypasses.	Cost included QL217 route & bypasses monitoring	Throughout operations and maintenance	Every six months and report every year.	for PDOT check	Cost met by for PDOT project staffing
5. Tree survival	Ensure survival of trees planted in compensation	Monitoring survival of trees / shrubs and grass in bioengineered slopes (e.g. at landslides, also transplanted / compensatory planting trees).	Forestry offices and PDOT depending on locality of planting	During operation.	Throughout all QL217 route and bypasses.	Cost included QL217 route & bypasses monitoring	First three years of operations and maintenance	Every six months and report every year.	for PDOT check	Cost met by for forestry office and PDOT project staffing

Environmental Monitoring Plan

No.	Environmental Monitoring Tasks ⁴	Implementation Responsibility	Implementation Schedule
1	Design Phase		
1.1	Provide information on the project and its expected impact, long-term as well as short-term; and other information on relevant issues to MONRE/DONRE.	PDCV/PMU through TSD environmental officer	Prior to bidding
1.2	Audit project bidding documents to ensure IEE and EMP included in bids and environmental criteria are included in evaluation.	PDCV/PMU PDCV through TSD environmental officer	Prior to issue of bidding documents.
1.3	Monitor final site selection (alignment) and environmental compliance with EARF selection criteria and EMP.	PDCV/PMU PDCV through TSD environmental officer	Prior to PDCV/PMU approval of detailed designs.
1.4	Monitor the performance of environmental training and briefings and of the environmental awareness of project staff and PDCV/PMU/TSD.	PDCV/PMU PDCV through TSD environmental officer	Ongoing, prior to and during implementation of works.
1.5	Baseline water quality, air quality (TSP) and noise monitoring at locations specified Chapter V and the EMP.	PDCV/PMU PDCV through TSD environmental officer	Sampling will be conducted based on the sampling program specified under Chapter V and the EMP.
2	Construction Phase		
2.1	Training and briefing of contractor's management, site agents with regards to all IEE and EMP requirements.	PDCV/PMU/TSD through environmental officer	First training 1 month prior to commencement of each contract and refresher courses at least at yearly intervals throughout construction period.
2.2	Monitor the performance of environmental training by contractor and briefings and of the environmental awareness of Contractors staff, tool box talks and & refresher courses.	PDCV/PMU/TSD through environmental officer	Ongoing, prior to and during implementation of works and operation.
2.3	Regular (monthly) monitoring and reporting (quarterly) of contractor's compliance with statutory environmental requirements	PDCV/PMU/TSD through environmental officer	Continuous throughout construction period.
2.4	Regular (monthly) monitoring and reporting (quarterly) of contractor's compliance with	PDCV/PMU/TSD through	Continuous throughout

⁴ Monitoring of issues related to compensation of land owners for land acquisition and loss of production, etc. are addressed in the Resettlement Plan.

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No.	Environmental Monitoring Tasks ⁴	Implementation Responsibility	Implementation Schedule
	contractual environmental mitigation measures including EMP.	environmental officer	construction period.
2.5	Regular (monthly) monitoring and reporting (quarterly) of complaints and responses or environmental mitigation measures	PSCV/PMU/TS D through environmental officer	Continuous throughout construction period.
2.6	Monitor adjustments to the EMP for unexpected impacts and the thorough implementation of detailed EMP.	PSCV/PMU/TS D through environmental officer	During all phases of the QL217s
2.7	Commissioning phase monitoring of road maintenance and facilities versus environmental contractual performance criteria. Check ERP compliance.	PSCV/PMU/TS D through environmental officer	At commissioning.
2.8	Water quality, air quality (TSP) and noise monitoring at baseline sampling locations (if applicable) specified in Chapter V and in sampling locations during pre-construction.	PSCV/PMU/TS D through environmental officer	Sampling will be conducted every six months and in response to complaints.
3	Operation and Maintenance Phase		
3.1	Observations during routine maintenance inspections of facilities. Inspections will include monitoring implementation of operational mitigation measures versus environmental criteria specified in EMP for operational impacts.	VRA/PDOT through environmental officer	As per PDCV/PMU inspection schedules
3.2	Post construction monitoring of water quality at any sites where complaints about water quality from works were justified in construction phase.	VRA/PDOT through environmental officer	Monthly up to 3 months after completion of construction or until water quality meets baseline conditions.
3.3	Monitoring survival of trees / shrubs and grass in bioengineered slopes (e.g. at landslides, also transplanted / compensatory planting trees).	District forestry offices and VRA/PDOT through environmental officer	During the first three years after installation or rehabilitation.

Appendix C Summary of Public Consultation

Table B1 - Questions posed to Thanh Hoa officials on the road enlargement project

Number	Question
1	Do you agree on the road upgrading project?
2	Do you approve of the new alignment and road? If the road is widened or the course is changed, will it affect such as any archaeological, religious, cultural or historical sites?
3	In your opinion, what can be environmental problems we should pay attention to?
4	Do you have any suggestions to reduce such environmental impacts?
5	Do you have any other ideas?
6	What kinds of forests do you know in your district about 1 km from the road 217?
7	Are there any preserved areas or national forests around the area of 5km from the road 217?
8	Are any cultural relic or heritage in the area of 100m from the road 217?
9	Are any cultural relic or heritage in the area of 100m from the road 217?
10	Are there any special area 100m far from the road? (military base special protected building, etc.)
11	Are there any meteorological and hydrography observation stations?
12	Are there any quarries/borrow pits in your district about 1km from the road 217? How are the procedures to for exploiting?

Table B2 - Responses from Thanh Hoa officials on the road enlargement project

Response	Respondent's information	1. Agreement	2. Development	3. Approval alignment	4. Environmental problems	5. Suggestions	6. Other ideas	7. Forests	8. Protected areas	9. Cultural relic	10. Protected buildings	11. Measurement stations	12. Quarries and borrow pits
1	<p>Name: Nguyễn Văn Công Province/District: Thanh Hoá Workplace: Department of Trade and Industry Position: Head, Section of Trade and Industry Time: 02pm 3/2009</p>	There is no problem with road widening.	Yes definitely. More cargos from and to Laos and other neighboring countries will be transported in the new road. Less accidents.	If we widen the road, its shoulder may cut in the land of some pagodas. The cemetery for dead soldiers may be affected.	Need to have the environmental impact assessment for the project. Local residents are not so demanding about environmental requirements but district officers should find out methods to reduce bad impacts.	Should address environmental influence and work out the methods to reduce the bad effects.	The road 217 should be far from Vinh Loc town. Upgrade to class III according to the Decision 186	Not much.	Production forestes (cajuput, acacia, eucalyptus) in Vinh Hùng, Vinh Hung Vinh Hoà. Can cut down forests to widen the road but must have compensation	Tran Khat Chan temple, Vinh Thanh commune from km 26 to 27, is next to the road. The church of Ben and Nhan Lo parishes is from the road about 500 – 700m.		There are no such stations in our district.	<p>There are not many mines to exploit. As planned, there are two earth mines (Vinh Hoa, Vinh Hung) 300m from the road. 4 km can be used to execute the work and fill up the road 217.</p> <p>Vinh Minh and Vinh Thinh stone-pits are next to the road.</p> <p>There are 17 businesses which process building stones, mainly</p>

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Re f	Respondent's information	1. Agreement	2. Development	3. Approval alignment	4. Environmental problems	5. Suggestions	6. Other ideas	7. Forests	8. Protected areas	9. Cultural relic	10. Protected buildings	11. Measurement stations	12. Quarries and borrow pits
													private concerns.
	<i>How addressed</i>	Supportive	EMP Monitor accidents	EMP	EMP Capacity b'ldng	EMP	EMP Bypass VL	EMP Check DDS	EMP and RP	EMP Set back	N/A	N/A	Refer to engineers
2	<i>Name:</i> Đinh Quang Trung <i>Province/District:</i> Thanh Hoá <i>Workplace:</i> Dept.Transport <i>Position:</i> Head, Section of Transport Mgmt. <i>Time:</i> 03pm 4/3/2009	Agree, now the road is being used too much. It should be widened for the purpose of development	More agricultural products (maize, rice, beans, peanut...) can be traded. Tourism can be more developed (King Ho Palace, Sacred Fish Stream etc) Na Meo Border gate is open to Laos; the opening of this Border will benefit the people around the Border gate and the whole nation's development.	Agree. There is no problem because the road 217 is far from many cultural buildings	If we widen the road, we have to resettle residents to other places. also lose forests, agricultural land. However, this issue is not so big because the forests here are of little significance.	Should consider preliminarily environmental impacts now to make suggestion to limit such impacts		There is Ha Trung pine forest, km4 – km9 to Cam Thuy km72 – km104. In Ba Thuoc, there are also thin forests with bamboo. There are forests with pine, bamboo, cajuput, linh and cedrela odorata km 114 – Na Meo has hills and forests with bamboo.	Production forests, artificial forests, (cajuput, acacia, eucalyptus) in Vinh Hùng, Vinh Hung Vinh Hoà.	Ho dynasty' rampart is far away from the road. The road is about 1km to the west of it.			There are a lot of rock based and borrow pits being used in Thanh Hoa,
	<i>How addressed</i>	Supportive	Supportive	EMP	EMP Awareness	EMP	N/A	EMP Check DDS.	EMP	EMP Set back 300m	N/A	N/A	EMP Use licensed pits
3	<i>Name:</i> Trần Quang Trọng <i>Province/District:</i> Thanh Hoá <i>Workplace:</i> DONRE <i>Position:</i> Vice Director <i>Time:</i> 1.30pm 9/3/2009	As is the government decision, residents and authorities of the province should follow. From the province's point of view, the proposal of road widening is also the desire of the people and the party of Thanh Hoa province.	Have great benefit for Thanh Hoa people. More convenient transportation with Laos; contributing to the province's development as well as the whole country.	The road should be wider, built for long - lasting . We should invest once and make it up to the national standard. Personally cannot imagine the width of the new road (wide or narrow). Should ask the engineers to propose appropriate size. National forests and reserves are not along the road 217	It is always difficult for land clearing and compensation. The policies are fixed and limited. Many residents are not ready to move away. The widening of the road 217 generally does not affect forests (bamboo, trees for paper production), so the amount of compensation is not too much. When widening the road, we have to level the	I don't study thoroughly the road 217 but I think you should examine carefully environmental impacts .	Invest once with right scale, Should keep people informed to avoid complaints.	We only have newly- planted forests, miscellaneous trees are not many.	In general, there are not many forests, mainly newly- planted ones and miscellaneous trees.	The part of the road was modeled to avoid Ho dynasty's rampart. Lu temple is not affected. King Trinh's palace is also far away from the road.	Mainly Border guard units.	There is Cam Thuy hydrography obervation station, Hoi Xuan hydrography obervation station (supply data to big hydroelectric projects of the province)	There are a lot of rock mountains. The mines to exploit are mainly in Vinh Loc- Ha Trung. People's Committee ≡ The procedure to give permission to exploit is according to general law and the regulations of the State. If the road 217 is widened, there will be some impacts on several stone-pits. However, it is

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Response	Respondent's information	1. Agreement	2. Development	3. Approval alignment	4. Environmental problems	5. Suggestions	6. Other ideas	7. Forests	8. Protected areas	9. Cultural relic	10. Protected buildings	11. Measurement stations	12. Quarries and borrow pits
					mountains so it is easy to cause landslide. Streams may also be blocked during construction, so it may cause flood or water stagnant situations. Land filling is not too much, so it has little influence on the premises or the landscapes around.								temporary. We can get new jobs.
	<i>How addressed</i>	Supportive	Supportive	DDS and EMP	EMP, RP and Erosion control	EMP	EMP GRM	EMP Check at DDS.	EMP	EMP Set back 300m	Note	Note	EMP Use licensed pits
4	<i>Name:</i> Phan Văn Đức <i>Province/District:</i> Thanh Hoá <i>Workplace:</i> Central Commission on Flood Prevention and Mitigation <i>Position:</i> General Officer <i>Time:</i> 12am 3/3/2009	Agree, we want to upgrade the road.	Contributing to local economic development. The local residents can do business with Laos through the border; to develop the economy, exchange goods, increase property price, and develop agriculture and industry. Improve transportation.	No impacts on historical, cultural, religious or archaeological sites. there is Ho Dynasty Palace, where the road once goes through, but now the road is far away from the site.	No effects on the environment because the construction is on the same road with same direction, just to make it a little wider. Along the road, there are some forests with small and newly-planted trees or some places with one side of mountains and one side of streams. People living near the road plant dendrocalamus (luồng – bamboo family), the price is not high enough to have big	I don't know professional knowledge so I don't have any proposal.	The road is still narrow. It's difficult to transport. The improvement and widening of the road is suggested to help people get convenience in trading and traveling.	We only have newly- planted forests. They are of little significance.	Here are only newly- planted forests. The trees are still small. People living along the road plant cajuput but the value is not much.	the road was modeled to bypass King Ho palace.	Near King Trinh's palace. Should pay attention.		

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R e f	Respondent's information	1. Agreement	2. Development	3. Approval alignment	4. Environmental problems	5. Suggestions	6. Other ideas	7. Forests	8. Protected areas	9. Cultural relic	10. Protected buildings	11. Measurement stations	12. Quarries and borrow pits
					economic impact.								
	<i>How addressed</i>	Supportive	Supportive	Noted	EMP Awareness	Noted	Supportive	EMP Check at DDS.	EMP	EMP Set back 300m	EMP Set back 300m	N/A	EMP Use licensed pits
5	<i>Name:</i> Hoàng Huy Bình <i>Province/District:</i> Hà Trung Dist. <i>Workplace:</i> People's District Committee <i>Position:</i> Vice Chairman <i>Time:</i> 4pm 5/3/2009	Many difficulties in implementing the project are expected. Nevertheless this project is very necessary.	Able to build more residential areas. Reduce the risk of traffic accidents.	No impacts on historical, cultural, religious or archaeological sites.	Intersection of the road 217 with highway 1A involves big compensation because many residents will be relocated. There will be environmental pollution. The contractors will cause this problem. This is a national level project and it belongs to central contractors, so it is hard for the district to interfere. People always complain; however, they are able to live well with this matter.	The State and contractors must obey the environmental commitment.	Need to have frontage road for people not cross the road too much. Remodel Ha Linh road turning. Get the turning at km 9 straight. Model to get the interchange of the road 217 and highway 1A to avoid taking away premises, but need to build bridge over the canal. Suggest widening the two-lane road at the area of Ha Trung town, so that residential area can be expanded.	Along the road 217, Thượng Phú (Hà Đông commune) – Thanh Xá (Hà Linh commune), the original road destroyed about 4km pine protective forests. RoW is now marked	Pine forests is along the road 4km, which play the role of protective forests.	There will not be any impacts. The road is near some relics at km1. Long Can pagoda is far from about 500m-province relic; at km3, Ho's royal tomb is away from the road about 500m – national relics; at km4, Thuong Phu village's temple is far away from it 200m – province relic.		There is a hydrography observation station along Ma river and Len river to observe water level. There is not a meteorological observation station. Department of environment sometimes examine and measure water concentration	Ha Trung is rich of minerals which provide materials for constructions and the road building. The earth for road building is from low hills and mountains. Ha Trung has lots of sunken places, so we can sell dug earth to fill up surface of the road.
	<i>How addressed</i>	Note Supportive	Supportive	Noted (check)	EMP GRM Awareness	EMP GRM Awareness	DDS issue. Inform TA	EMP Check at DDS.	Noted EMP Forest >25m	EMP noted Set back 300m	N/A	Noted for DDS	EMP Use licensed pits
6	<i>Name:</i> Nguyễn Xuân Kiều <i>Province/District:</i> Cẩm Thủy <i>Workplace:</i> People's District Committee <i>Position:</i> Vice Head of General Office <i>Time:</i> 10am 6/3/2009	The road 217 has been built for a long time, and upgraded in 2003, but only the asphalt layer was finished. Along the total 37 km of the road	Need for local development is huge. Local people wish to have the road run 2 km away from Cam Phong road and 3 km away from Cam Thuy town to bypass residential areas. If so, the transport will be easier.	There is compensation procedure and loss calculation for people whose land is acquired. People here obey and they are aware of the importance and economic benefits of the road	There are a lot of quarries that are good for road construction. But attention should be paid to rock mining.	Clean water: 60% of dug wells, 10% of drilled wells, the other is water from rivers, streams, ponds and lakes. The quality of water has not tested yet.	The road is very narrow whereas there are a lot of big vehicles. Suggest widening the road large enough. The road 217 is often flooded. In 2007, it was flooded so that 70% of the vehicles could not	The district has experience in land liberating. We always do it carefully, strictly in the right way.	There is Ha Trung pine forest, km4 – km9 to Cam Thuy km72 – km104.	Keo Le pagoda is along the road 217 (Cam Van commune) Chang, Ngoc Chau pagoda (Cam Son commune) is quite far from the old road but next to the new road as planned. Rong pagoda is		There is Cam Thuy hydrography observation station.	There are lots of clay, stone, limestone mines which can be used for road building. The mines along the road 217 are easy to exploit. The mines with stone or clay blocks 0,5 – 1,5km far from the road were used for

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Ref	Respondent's information	1. Agreement	2. Development	3. Approval alignment	4. Environmental problems	5. Suggestions	6. Other ideas	7. Forests	8. Protected areas	9. Cultural relic	10. Protected buildings	11. Measurement stations	12. Quarries and borrow pits	
		across the district, the drain system is concretized. The road is stone-embanked.		improvement. They generally agree but they want the compensation should be appropriate.		Now, this kind of water is in use for construction, including Ho Chi Minh road.	moved. The deepest place was in Cam Binh, 1.4m deep (the usual level is 0,7÷1,2m), which completely separated transportation.			far from the road 217 about 1km on the way to Cam Thach. Contracted Fish Stream (Cam Luong, Cam Thach) is 2km from the road.			building Ho Chi Minh road. Province give permission; district cannot do so but only make suggestion. It is easy to give permission to exploit stone in the right procedure.	
	<i>How addressed</i>	Note Supportive	Noted. Bypasses included	Noted. RP entitlements	EMP licensed quarries only	EMP Baseline monitoring	EMP & DDS improve drainage	EMP Check DDS.	Noted EMP Forest >25m	EMP SR is Set back Check DDS	N/A	Noted for DDS	EMP / DONRE Only licensed pits	
7	<i>Name:</i> Nguyễn Văn Dũng <i>Province/District:</i> Bá Thước <i>Workplace:</i> People's District Committee <i>Position:</i> Head of General Office <i>Time:</i> 08am 6/3/2009	Agree. It will contribute to the development of our province as well as our district.	Enhance knowledge and awareness for minority ethnic people. Help them have access to social services, cultural exchange and do business.	Who issues land-use right is responsible for land acquisition. Forest land is allocated according to the province's decision. Other types of land in the district is allocated according to the district's decision.	Some rare animals will be affected when forests are destroyed for making the road. Loss of agricultural land and houses/buildings.	Any building can cause pollution. The district and people here are all aware of this matter but require diminishing pollution.	Need to have solutions to reduce environmental pollution. Persuade and encourage people as well as compensate appropriately.	There are 3 kinds of forests: deep protective forests, production forests along the road and forests for special purposes but all are outside the RoW	Not in the district but in Phú Lương protected area, Thanh Lam commune, Dũng Cao is away from the road 217 at least 15km. There is no effect. But there are some rare animals like Trachypithecus (voocj). There are no primeval forests, forests for special purposes along the road, mainly with cajuput, acacia but economic efficiency is not high.	No relics.	No.	No fixed observation station. Environment Department sometimes survey.	≠ Spring water and well water is used for executing the work. Stone-pits are along the road (Dien Trung and Thien Dong). They are not very far from the road so it is easy to ship. They have permission to exploit stone. The amounts of stone that were exploited is considerable. ≠ Stone and earth used for building the road is available and easy to be exploited. However, we are considering if it can be used to execute the work or not.	
	<i>How addressed</i>	Supportive-	EPAR Social interventions	Noted. PPC TH to do RP	Forest is avoided	EMP Baseline monitoring	EMP awareness	EMP noted Check DDS.	Noted EMP PA >5km away	Noted Check at DDS	Noted	Noted for DDS	EMP / DONRE Only licensed pits	
8	<i>Name:</i> Mr. Dũng <i>Province/District:</i> Quan Sơn <i>Workplace:</i> People's District Committee <i>Position:</i> Trade and Industry	Should extend the road as wide as possible. It will help our province as well as our district development	Help local residents develop economy. ≠ Quick and convenient transportation. ≠ More trading between Viet Nam and Laos.	The road should be as wide as possible. It will bring more advantages for the local development. There's a cemetery by the	Water is abundant from ground water to surface water. There are a lot of streams along the road.	Mustn't fill up rivers or streams. Không được phép lấp sông suối. Dug earth has to be moved to other places	The road 217 widened has not much influence on land acquisition. It depends on ADB's proposals. Currently, the road is narrow. Suggest widening as much	This area has a lot of forests, including forests along the road 217. If widening, we have to destroy some plantations of					Our district hasn't got any fixed observation stations to. Environment Department sometimes cooperate to	≠ There are a lot of stone-pits and earth mines along the road, about 100m far from the road. It's easy to exploit, mainly by private companies.

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Re f	Respondent's information	1. Agreement	2. Development	3. Approval alignment	4. Environmental problems	5. Suggestions	6. Other ideas	7. Forests	8. Protected areas	9. Cultural relic	10. Protected buildings	11. Measurement stations	12. Quarries and borrow pits
	Section Time: 11am 6/3/2009	There will be better transport and doing business with Laos.		road side. It's difficult for us to move it away.		to avoid environmental pollution and frustrate agricultural production. Ensure to keep the environment clean, unstopped transportation. However, the people here can accept pollution during the construction period.	as possible Suggest making road far away from Quan Son town.	mainly. (Cajuput, acacia...)				do a survey. There have not been any milestones to show premises liberation and traffic safe along the road 217 in the district. There has not been the Circular No.1856 but 70% of the land use rights certificates and 100% of forestry land has been licensed.	
	<i>How addressed</i>	Supportive	EPAR Social interventions	EMP Cemetery avoided.	EMP Baseline monitoring	EMP & spoil disposal plan	EMP.	EMP noted Check DDS.	N/A	N/A	N/A	Noted for DDS	EMP / DONRE Only licensed pits
9	Name: Nguyễn Quang Dũng Sgt. & Lê Hữu Hùng, Lieutenant <i>Province/District: Quan Son</i> <i>Workplace: Na Mèo Border Military Station</i> <i>Position: Chief and Vice Chief</i> Time: 02 pm 8/3/2009	It's good. It enables the development of our social-economic conditions, transport, trading and reduce the risk of traffic accidents. If the public relations are well established, the public will completely support the development of the road. The benefits of the project outweigh the bad impacts.	While Na Meo Border gate is international and there are a great number of tourists, the quality of the road 217 is too bad to meet the needs. Built in 1978, it was a national Border gate. Since 2004, it became the international border gate. People from 60 countries have traveled through Na Meo Border gate.	Laos planned for the economic and social development around the border. Thus, the road widening is completely suitable for the development of the two countries.	Always affects the environment. Forests are assigned to people and companies for management. Thus, when taking the land, think seriously about the compensation. There are 3 units managing the forests: Border guard, people and farms and forests management unit. Thus, when implementing the project, hand in the statement. Then Department of	Environmental issue is still not serious. Now, it is good so there will be not many troubles with this problem. Mainly focus on socio-economic development and foreign investment.	Marketing of the Border tourism is still not good. In addition, the road is in bad conditions. Widening the road help improve local tourism.	We have production forests, artificial forests and protective ones. Border gate station control protective forests along the border belt. All forests are outside the RoW reserve./	Mainly protective forests and Border gate ones. Na Meo Border gate station control 7718ha, mainly new forests. before there was no management so people go hunting and destroy the forests.	There is no big problem. Can be removed with appropriate compensation. If the Border guards encourage, people will follow.	Only Border guards settle down at the Border gate. There is no regular army but local army, district armed forces and militia.	We haven't got any such observation stations.	Can set off mines along the Border but have to get license, equipment and techniques to do it. At km 42, there is a stone-pit which can be exploited to have good-quality stones. Dug earth from the road if not be used will be filled up the sunken places and let people live there.

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R e f	Respondent's information	1. Agreement	2. Development	3. Approval alignment	4. Environmental problems	5. Suggestions	6. Other ideas	7. Forests	8. Protected areas	9. Cultural relic	10. Protected buildings	11. Measurement stations	12. Quarries and borrow pits
					Agriculture and Rural Development will make decision to change the purpose of using forest land into land for protecting Border and making roads.								
	<i>How addressed</i>	Supportive	Supportive	Supportive	EMP noted Check DDS	Noted supportive	Noted supportive	EMP noted Check DDS.	EMP noted Check DDS.	EMP noted Check DDS	Noted for DDS	Noted for DDS	EMP / DONRE Only licensed pits

Table B3 – Questions posed to local people in Thanh Hoa on the road enlargement project

Number	Question
1	<i>Do you agree with the project of expanding the highway?</i>
2	<i>If expanding the road, which historical monuments, cultural monuments, archaeological monuments will it be able to affect?</i>
3	<i>When upgraded, does the road contribute to develop economy of local (traveling, agriculture, industry...)? How it facilitates local traffic?</i>
4	<i>Do you have any idea of the regulations of environment, land, compensation, ground clearing?</i>
5	<i>What are potential environmental problems of this project?</i>
6	<i>Do you have any idea to reduce the effect of environment?</i>
7	<i>Suggestions / other opinions.</i>

Table B4 Responses from local people in Thanh Hoa on the road enlargement project

		1. Agreement	2. Cultural monuments, affected	3. Contribution to local economy	4. Awareness environmental issues	5. Environmental problems	6. How to reduce the effect	7. Suggestions / other opinions.
1	Name: Ngô Thị Kiều Age : Place : Group 3 - Hà Lĩnh commune – Hà Trung Dist Tel:..... Occupation: Position: Farmer	I completely agree with the project of upgrading the Highway.	Not affect any historical monuments, cultural monuments, archaeological monuments.	Yes, easier trading, traffic development, travelling is faster, less accidents.	Like other people in this region, I only know how to protect the environment. and keep it clean . I do not know the land, compensation, clearing ground..	Dust, noise, waste from activities of construction, behaviors of workers.	— Contractors have to show responsibility of area's environment, getting the impacts to minimum	Implement project as quickly as possible.
		Supportive	EMP noted, Check DDS	Supportive	EMP Disclosure	EMP	EMP Awareness	EMP, Check DDS.
2	Name: Nguyễn Chí Thanh Age: 40 Place: Hà Lĩnh commune – Hà Trung Dist Tel: 0975 872 786 Occupation: Position: Nông dân	Yes	I think that don't have affection [not be affected]	Yes	I think that building the roads has to acquire land, clear ground and have to pay money. I am not sure how much money is paid	Smoke, dust, noise pollution.	In the process of building, have watering solution. [water supply?]	
		Supportive	EMP noted, Check DDS	Supportive	EMP - RP	EMP	EMP Awareness	N/A.
3	Name: Nguyễn Thị Cúc Age: 35 Place : Hà Đông commune – Hà Trung Dist Tel: 0373 623 551 Occupation: Home care Position: Home owner	I agree with the project of upgrading the Highway.	It will not affect historical monuments, cultural monuments, archaeological monuments.	Easier transport and travel	At present I don't know.	About environment, I hope environmental pollution is the lowest.		There are two spots where accidents often occur. Suggestion: Bypass them when designing alignment
		Supportive	EMP noted, Check DDS	Supportive	EMP Disclosure	EMP	N/A	EMP, Check DDS.
4	Name: Phạm Thị Thuý Age: 35 Place : Zone 2- Vĩnh Lộc Town Tel:	I am very pleased with the projects of upgrading the highways and, I hope that the project will be started soon.	Throughout the region, it does not affect any historical monuments, cultural monuments, archaeological	Yes	I don't know	Dust, noise, accidents	In the process of building, usually water on the road to reduce dust, collect rubbish, Security ensured	Employ local workers in the projects

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		1. Agreement	2. Cultural monuments, affected	3. Contribution to local economy	4. Awareness environmental issues	5. Environmental problems	6. How to reduce the effect	7. Suggestions / other opinions.
	<i>Occupation:</i> <i>Position: Small shop owner</i>		monuments.					
		Supportive	EMP noted, Check DDS	Supportive	EMP Disclosure	EMP	EMP	EMP, Check DDS.
5	<i>Name: Ngô Anh Tuấn</i> <i>Age: 32</i> <i>Place : Zone 2 - Vinh Lộc</i> <i>Tel: 0988 315 347</i> <i>Occupation:</i> <i>Position: Home owner</i>	Completely agree to upgrade the Highway.	Upgrading it doesn't affect historical monuments, cultural monuments, archaeological monuments.	Yes and our district will much benefit in trading with other districts.	No idea	Loss of forest, loss of agricultural land, loss of ecosystem.	Mimimize the land area to be lost	Adequate compensation price
		Supportive	EMP noted, Check DDS	Supportive	EMP Disclosure	EMP (forestry authority)	EMP / DDS- RP	EMP, RP, Check DDS.
6	<i>Name: Ngô Thị Bà</i> <i>Age: 70</i> <i>Place : Khu 2 - Vinh Lộc Town</i> <i>Tel: 0373 870500</i> <i>Occupation:</i> <i>Position: Home owner</i>	I completely agree with the project of upgrading the Highway. Expanding the road has not only no effect history and culture but also advantages to communicate with Laos.		Speed up local economy development. It is easy for traveling between the districts and the communes.	A little about compensation	No loss of agricultural land. Cause smoke, dust, noise, and waste by construction workers.	Should hire local workers in th project.	Adequate compensation price
		Supportive	N/A	Supportive	EMP Disclosure RP	EMP	EMP / DDS-contract	EMP, RP, Check DDS.
7	<i>Name: Ngô Tam Sơn</i> <i>Age: 55</i> <i>Place : Zone 2 - Vinh Lộc</i> <i>Tel: 0373 870 647</i> <i>Occupation: Small shop owner</i> <i>Position: Home owner</i>	We are in support to upgrading the highway.	Not affect on historical monuments, cultural monuments, archaeological monuments. Conversely it is better for these buildings. .	Yes	I only know that how to keep it clean I don't know much about taking land , paying compensation, and clearing the ground.	The project implementation will cause environmental pollution: dust, noise, waste, construction worker's conditions of life This is the problem that I worry.	Dust, noise...	Information disclosure to the public
		Supportive	EMP noted, Check DDS	Supportive	EMP Disclosure RP	EMP & disclosure GRM	EMP monitoring	EMP, RP, disclosure.
8	<i>Name: Vũ Thị Bích</i> <i>Age: 67</i> <i>Place : Xã Vinh Thành-Vinh Lộc</i> <i>Tel:</i> <i>Occupation:</i> <i>Position: Retired</i>	Expanding the road is very good.	There are no historical monuments, cultural monuments, archaeological monuments along the road	More trading and traveling	D.K. These things are from the State.	I am very concerned about the impact of the construction the project that causes smoke, dust, noise, waste in the region.	Social accountability from contractors; no pollution.	Best planning, best road
		Supportive	EMP noted, Check DDS	Supportive	EMP Disclosure	EMP & disclosure, GRM	EMP train Contractor	EMP, Check DDS.
9	<i>Name: Nguyễn Thị Hà</i> <i>Age: 35</i> <i>Place : Tổ 3 - Thị Trấn Cẩm Thủy</i> <i>Tel: 037 525 777</i> <i>Occupation:</i> <i>Position: Small shop owner</i>	I agree with the project of upgrading the highway.	No historical monuments, cultural monuments, archaeological monuments that are affected.	Yes, more development	I don't know	Reduce environmental pollution to the minimum.	DK	No commend.
		Supportive	EMP noted, Check DDS	Supportive	EMP Disclosure	EMP & disclosure, GRM	EMP Disclosure	N/A
10	<i>Name: Đỗ Huy Hà</i> <i>Age:</i> <i>Place : Xóm Móng Trâu-Thôn Tô Một- Cẩm Bình - Cẩm Thủy</i> <i>Tel: 0376 266 981</i> <i>Occupation:</i> <i>Position: Resident</i>	Agree. I am in support to upgrading the highway	No	Yes	I don't know much about the issue	Smoke, dust, noise, waste.	Everyone, officials, contractors, workers should be careful in implementing project	Quality control in road construction

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		1. Agreement	2. Cultural monuments, affected	3. Contribution to local economy	4. Awareness environmental issues	5. Environmental problems	6. How to reduce the effect	7. Suggestions / other opinions.
		Supportive	EMP noted, Check DDS	Supportive	EMP Disclosure	EMP & disclosure, GRM	EMP train Contractor	EMP, Check DDS.
11	<i>Name: Lê Đình Lâm Age: 43 Place : Phố 1 - Thị trấn Càng Nàng Tel: 0373 880 262 Occupation: Position: Resident</i>	Having the project of expanding is too good. I agree to it very much.	Not affect monuments because there aren't.	Yes. Sacred Fish Stream will be more attractive	I don't know.	I have no comments on this issue.		Keep in mind drainage, ditches, for the road to avoid flooding
		Supportive	EMP noted, Check DDS	Supportive	EMP Disclosure	EMP & disclosure, GRM	N/A	EMP, Check DDS.
12	<i>Name: Lê Thị Hải Age: 42 Place : Zone 2-Thị trấn Càng Nàng Tel: 0977 908 168 Occupation: Position: Resident</i>	Expanding the road, makes more attractive so I also agree.	Only affect houses, not affect historical monuments, cultural monuments, archaeological monuments.	Yes	I don't know exactly. Only know that if the state takes land, there is a compensation for people.	I love forest very much, so I am very concerned about clearing the ground, cutting down trees along the road	Limit to cut trees along the road.	Satisfactory compensation price for affected people
		Supportive	EMP noted, Check DDS	Supportive	EMP Disclosure - RP	EMP forest authorities	EMP train Contractor	EMP, Check DDS.
13	<i>Name: Trần Văn Toàn Age: 42 Place: Zone 3-Thị trấn càng nàng Tel: 0976 946 845 Occupation: Home business Position:</i>	I am very pleased to have the project of upgrading the highway and I agree with it.	NO	Yes	I don't know the issues, only wish people will receive reasonable compensation.	How to maintain a clean environment, fresh air, no smoke dust.	Keep environment clean, decrease dust, noise, rubbish has to be disposed properly	Quality must be ensured
		Supportive	Noted, Check DDS	Supportive	EMP Disclosure – RP	EMP disclosure GRM	EMP train Contractor	EMP, Check DDS.
14	<i>Name: Phạm Thị Ngân Age: 35 Place : 49 –Street 1- Càn Nàng Town Tel: 0373 707 415 Occupation: Position: Resident</i>	Expanding is necessary and very urgent to develop local economy. I agree.	No	Yes	I don't know.	To Ensure environment is green - clean - beautiful. – No smoke, dust, garbage to the local.	Reduce dust, noise, no pollution to water	Put signs where appropriate
		Supportive	Noted, Check DDS	Supportive	EMP Disclosure	EMP disclosure GRM	EMP, train Contractor	EMP, Check DDS.
15	<i>Name: Nguyễn Thị Tú Age: 53 Place : Street 3 - Càng Nàng Town Tel: 0373 880 257 Occupation: Position: Resident</i>	I completely agree with the project of upgrading the Highway.	I am not certain	Yes	Just a little, others told me.	Dust, noise and loss of agricultural land, forest loss.	Don't know	Higher compensation price
		Supportive	Noted, Check DDS	Supportive	EMP Disclosure	EMP forest authority	EMP, disclosure	EMP, Check DDS.
16	<i>Name: Bùi Thị Minh Age: 17 Place : Điện Quang commune - Bá Thước Dist Tel: Occupation: Student Position:</i>	I completely agree.	I don't know where the road will go through so I am not certain of impacts	The road contributes to develop local economy.	I don't understand	Loss forests, agricultural land in the district.	Soil erosion, landslide	Appropriate compensation price
		Supportive	Disclosure, Check DDS	Supportive	EMP Disclosure	EMP disclosure GRM	EMP, DD, training	EMP, Check DDS.
17	<i>Name: Lê Văn Cương Age: 23</i>	☺ I completely agree.	Upgrading the road will help us better understand	The upgraded road will contribute to develop	Not specific	Don't cause to lose our land when the road is built.		Inform people about the project,

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		1. Agreement	2. Cultural monuments, affected	3. Contribution to local economy	4. Awareness environmental issues	5. Environmental problems	6. How to reduce the effect	7. Suggestions / other opinions.
	<i>Place : Điện Trung Commune -Bá Thước Dist Tel : 01686 912 262 Occupation: Position: Resident</i>		history, culture of the districts and other communes.	agriculture and forestry. Locals will live easier; trading is more convenient.				compensation policy
		Supportive	Disclosure, Check DDS	Supportive	EMP Disclosure	EMP disclosure GRM	N/A	EMP, Disclosure DDS.
18	<i>Name: Hoàng Đình Long Age: 40 Place: Điện Quang Commune -Bá Thước Dist Tel: 0373 584 281 Occupation: Shop owner Position: Shop owner</i>	I think that the expanding the road is essential. I completely agree.	No	Upgrading the road contributes to develop local economy. It creates favorable conditions for transport, trading is easy.	I don't know exactly.	I think that the problem is most interested in the project is to ensure the forest area, area of agricultural land and other relics in the province. Especially ensure the clean environment.	Clean environment, adequate sanitary conditions for workers	Construction is fast, quality is ensured.
		Supportive	EMP, Check DDS	Supportive	EMP Disclosure	EMP w.r.t. forest authority	EMP, train Contractor	EMP, Check DDS.
19	<i>Name: Lương Văn Cường Age: 30 Place : Quan Sơn Dist Tel: 01694 830 612 Occupation: Village vice chief Position:</i>	I only agree because of the future for children. Damage to existing buildings is big..	There aren't historical monuments, cultural monuments, archaeological monuments.	Expanding the road will develop local economy and it is convenient for traffic such as transport is easier.	NO	Not much people so environmental issues have no effect people much.	No idea.	Need have a appropriate compensation policy.
		Supportive, EMP	EMP, Check DDS	Supportive	EMP Disclosure	EMP disclosure GRM	EMP, disclosure	EMP, Check DDS.
20	<i>Name: Hà Đình Ngũ Age: Place : Sơn Điện Commune - Quan Sơn District Tel: Occupation: Position: Resident</i>	I really agree with the project to upgrade the highway.	No	Yes, more exchange of goods with lowland areas	Only know that upgrading the road will have involve compensation for people.	A lot of forest land, hill land so getting land again, and cutting down the trees along the road don't affect much.	No idea.	Straighter road, fewer zig-zags
		Supportive	EMP, Check DDS	Supportive	EMP Disclosure	EMP disclosure	EMP disclosure	EMP, Check DDS.
21	<i>Name: Nguyễn Văn Tiến Age: 45 Place : Quan Sơn Town Occupation: Position: Resident</i>	The improvement of the road is very well. It will make local so better, so I will support very much.		Yes	I understand environmental protection and I don't know about taking land back, clearing the ground. The state must have compensation.	Loss of forests, loss of agricultural land, dust, noise, waste, activities of construction workers.	Minimize waste volume	
		Supportive, EMP	N/A	Supportive	EMP Disclosure RP	EMP disclosure GRM	EMP, train contractor	N/A
22	<i>Name: Nguyễn Tiến Hùng Age: 31 Place : Quan Sơn Town Tel: Occupation: Position: Driver</i>	I completely agree. The larger the road is, the more convenient the traveling.	No	Obviously yes	— I don't understand environmental protection. The state must have a compensation policy .	traffic block, dust, smoke, environmental pollution.		— I have no idead.
		Supportive, EMP	EMP, Check DDS	Supportive	EMP Disclosure	EMP disclosure GRM	EMP, DD, training	EMP, Check DDS.

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Initial Environmental Examination of Km 59 +900 – Km 104+475 and Flyover Bridge NH1A

		1. Agreement	2. Cultural monuments, affected	3. Contribution to local economy	4. Awareness environmental issues	5. Environmental problems	6. How to reduce the effect	7. Suggestions / other opinions.
23	Name: Vi Văn Thủy Age: 40 Place : Bản Hẹ- Quan Lưu Commune- Quan Sơn Tel: Occupation: Position: Farmer	Absolutely agree. The larger the road is, the more the drivers like.	No	The impact of traffic is huge for developing local economy. The large road is advantageous for traffic. fewer accidents will occur.	I don't know much.	Loss of land, smoke, dust,		To have appropriate compensation policy for people.
		Supportive	EMP, Check DDS	Supportive	EMP Disclosure	EMP disclosure GRM	N/A	EMP, Check DDS.

Table B5 Public Consultation with affected people near QL217 and bypasses (June 2010)

Respondent's information	Details	Do you agree to road upgrading project?	Do you approve of the new alignment and bypass?	Will the upgraded road contribute to the local development	How will Project benefit / affect your local transport?	Are there any cultural archaeological, religious, or historical sites within 100m from the road?	Are any protected buildings in the area	What will be the environmental problems you expect from the project?	Do you have suggestions to reduce environmental impacts?	Do you have any other comments / suggestions or ideas?
Consultations undertaken during field reconnaissance June 2010										
Vinh Loc South										
Location	Km 27 + 900									
Name:	Occupation / Address									
Tran Thi Hao Ms.	Shop owner, No.85 Cluster 3, Vinh Loc Town	Yes	Not really but must follow Govt's policy	Yes	Bring more vehicles and customers	Dang Pagoda, District's cemetery, Tran Khat Chan Temple	District's People Committee Office, DPC guest house, Hospital	Noisy, dirty	watering	Need fair compensation for land acquired
Location	Km28 + 200									
Name:	Occupation / Address									
Dang Thi Huyen Ms.	Teacher No.27 Cluster 3, Vinh Loc Town	Yes	Yes	Yes	More convenient, less flooding on the current road	As above	DPC Office	Noise, dirt, dropped out construction material	No idea	Make it quick and clean
Location	Km 28 + 000									
Name:	Occupation / Address									
Le Thi Minh, Ms	Police No.89 Cluster 3, Vinh Loc Town	Yes	Yes	Yes	Traffic will be good	Tran Khat Chan Temple Dang Pagoda District's cemetery	District's Hospital	Noisy, dirty	No	The road should be 2 lanes
Location	Km 28+ 200									
Name:	Occupation / Address									
Trinh The Tuan, Mr	Staff of Government No.89 Cluster 3, Vinh Loc Town Km28+ 200	Yes	Yes	Yes	Minimizing traffic flow	Tran Khat Chan Temple Dang Pagoda	District's Hospital	Noisy, dirty	Watering Worker should be in secluded place	Project was long time
Location	Km28+ 200									
Name:	Occupation / Address									
Trinh Thi Nguyet	Housework, No. 21 Vinh Loc, Town	Yes	Yes	Yes	Travel favourably	No	No	Damage existing Road, & cause dust during construction	No suggestion	No suggestion
Location	Km28+200									

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Respondent's information	Details	Do you agree to road upgrading project?	Do you approve of the new alignment and bypass?	Will the upgraded road contribute to the local development	How will Project benefit / affect your local transport?	Are there any cultural archaeological, religious, or historical sites within 100m from the road?	Are any protected buildings in the area	What will be the environmental problems you expect from the project?	Do you have suggestions to reduce environmental impacts?	Do you have any other comments / suggestions or ideas?
Name:	Occupation / Address									
Bui Thi Nhiem	Business. No. 37, Street Area, No. 3, Vinh Loc Town	Yes	No	Yes	Travel favourably	No	No	Machinery will cause Noisy and dusty During construction	Machinery that are in good condition to reduce Harm	No suggestion
Vinh Loc North										
Location	Km 31 + 400									
Name:	Occupation / Address									
Pham Thi Phuong Ms.	Farmer, Cau Mui Village, Vinh Long Commune	Yes	Yes	Yes	More convenient	Thai Binh Temple (small)	Fertilizer factory	Noise, dirt	No idea, maybe watering	Happy with project, no objection
Location	Km 31 + 450									
Name:	Occupation / Address									
Nguyen Manh Hung Mr.	Fuel station owner, Beo Village, Vinh Long Commune	Yes	Yes	Yes, more goods, customers	Very good, lesser impact on the town and Ho King's Palace	No	Telecom Office, Commune Office	Dirt, noise	Stop working in windy, hot days and during lunchtime and nighttime	Make it fast
Location	Km 33 + 400									
Name:	Occupation / Address									
Trinh Van Luong, Mr	Service, Cau Muu, Vinh Long commune	Yes	Yes	Yes	Traveling will be convenient	No	No	Dusty	No	Depending on the State
Location	Km 33 + 400									
Name:	Occupation / Address									
Trinh Van Quang	Farmer, Cau Muu, Vinh Long commune	Yes	Yes	Yes	Traveling will be convenient	No	No	dusty	No	Disordering the life of people Ensure job for affected people
Location	Km 32+500 (QL45)									
Name:	Occupation / Address									
Ngo Ngoc Chuyen (60 YO)	Pensioner, Pho Moi Village, Vinh Tien Commune, Vinh Loc District	Yes	Yes	To develop the locale	To Travel Favourably	No	No	Local environment will be affected harmfully during construction. After construction no Problem	To finish construction work As soon as possible	No suggestion
Location	Km32+600 (QL45)	Yes	Yes	To develop the	It's better for	No	No	Local environment shall be Affected harmfully During construction Time	To find out measures that minimize harm To the people at the Locale	No suggestion
Name:	Occupation / Address			Local	Travel					
Tran Thi Hoa (28)	Housework, Pho Moi Village, Vinh Tien Commune, Vinh Loc District									
Cam Thuy East										
Location	Km 54 + 500									
Name:	Occupation / Address									
Nguyen Thi Hang Ms.	Teacher, Phong Ly Village, Cam Phong	Yes	Yes	Yes	Less accidents, more convenient	Catholic cemetery (Vuon Thanh – Holy Garden) to	No	Noise, dirt, air pollution	No working in windy days	Ensure transport during

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Respondent's information	Details	Do you agree to road upgrading project?	Do you approve of the new alignment and bypass?	Will the upgraded road contribute to the local development	How will Project benefit / affect your local transport?	Are there any cultural archaeological, religious, or historical sites within 100m from the road?	Are any protected buildings in the area	What will be the environmental problems you expect from the project?	Do you have suggestions to reduce environmental impacts?	Do you have any other comments / suggestions or ideas?
	Commune					be affected by the bypass				construction
Location	Km 582+100(HCMH)									
Name:	Occupation / Address									
Nguyen Thi Huong Ms.	Selling gas cookers, Duong Hue Village Cam Phong Commune	Yes	Yes	Yes	More convenient	District memorial for soldiers	Commune People Committee Office	Dirty, noise	Got used to these impacts, no problem	No
Location	Km 54 + 800									
Name:	Occupation / Address									
Nguyen Van Sy, Mr	Farmer, Phong Y Village, Cam Phong Commune	Yes	Yes	Yes	Avoiding accident Avoiding traffic jam	Catholic cemetery	No	Noise, dirty	No	Base bypass on existing road. Avoiding require paddy land.
Location	Km 54 + 800									
Name:	Occupation / Address									
Nguyen Viet Trung, Mr	Farmer, Phong Y Village, Cam Phong Commune	Yes	Yes	Yes	More convenient	District memorial for soldiers	No	Dirty	No	Minimizing require paddy land
Location	Km 54 + 900									
Name:	Occupation / Address									
Nguyen Thi Hue, Ms	Farmer, Nghia dung Village, Cam Phong Commune	Yes	Yes	Yes	Cleaner, no wetting, convenient	Catholic cemetery	No	Noise, dirt	No	Avoid Catholic cemetery Building road should be quick
Location	Km54+800									
Name:	Occupation / Address									
Le Hong Phong (45)	Farmer, Phong Y Village, Cam Phong Commune	Yes	Yes	To develop the locale	Travel favourably	Yes	Yes	No problem because Population density is Low	No suggestion	No suggestion
Location	Km55+200	Yes	Yes	To develop the locale	To travel Favourably	No	No	Dust from materials, From petrol, Noisy from machinery	Local people should find The way to prevent Harm of environment	Implement road project successfully
Name:	Occupation / Address			Local						
Vu Duy Trinh (62)	Farmer, Nghia dung Village, Cam Phong Comm., Cam Thuy Dis.									Coordination between Project and local people
Location	Km55+600	Yes	Yes	To develop the						
Name:	Occupation / Address			Local	To travel Favourably					
Ngo Van Nguyen (49)	Farmer, Farmer, Nghia dung Village, Cam Phong Commune, Cam Thuy District					No	No	Noise, Dust	Improving awareness Of construction workman To minimize harm from, Construction time	No suggestion
Cam Thuy West										
Location	Km 523 + 600 (HCMH)									
Name:	Occupation / Address									
To Thi Phuong Ms.	Farmer, (S = 1200m2), next to substation. Hoang Giang 1 Village,	Yes	Yes	Yes	More easy transportation	No	Power sub-station	Noise, dirt	Don't know	Don't take too much of our land

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Respondent's information	Details	Do you agree to road upgrading project?	Do you approve of the new alignment and bypass?	Will the upgraded road contribute to the local development	How will Project benefit / affect your local transport?	Are there any cultural archaeological, religious, or historical sites within 100m from the road?	Are any protected buildings in the area	What will be the environmental problems you expect from the project?	Do you have suggestions to reduce environmental impacts?	Do you have any other comments / suggestions or ideas?
	Cam Son Comn.									
Location	Km 523+ 460 (HCMH)									
Name:	Occupation / Address									
Le Xuan Loc Mr.	Village Chief, Hoang Giang 1 Village, Cam Son Commune	Yes	Yes	Yes	Better road, more convenient	No	No	Noise, dirt	Working in proper hours	Don't know
Location	Km 62+150									
Name:	Occupation / Address									
Nguyen Thi Tao Ms.	Farmer (S = 1000m2) Sam Village, Cam Binh Comm.mune	Yes	Yes	Yes	More convenient	No	No	Noise, dirt	Don't know	Don't know
Location	Km 62+000									
Name:	Occupation / Address									
Trinh Thi Sau Ms.	Farmer (S = 1000m2) Sam Village, Cam Binh Commune	Yes	Yes	Yes	Less accidents	No	Commune cultural house	Don't know	Don't know	Fair Compensation
Location	Km 523+600 (HCMH)									
Name:	Occupation / Address									
Mai Thi Lien, Ms	Farmer, Go Ca Village, Cam Son Commune	Yes	Yes	Yes	Not muddy, [more] convenient	No	Village's meeting House	No	No	Home will be beside road
Location	Km 523+600 (HCMH)									
Name:	Occupation / Address									
Nguyen Thi Hoa	Farmer, Go Ca Village, Cam Son Commune	Yes	Yes	Yes	More convenient	Village's meeting House	Village's meeting House	Don't know	No	Project should be ASAP
Location	Km 523+600 (HCMH)									
Name:	Occupation / Address									
Nguyen Duc Thuan, Mr	Farmer, Go Ca Village, Cam Son Commune	Yes	Yes	Yes	Traveling will be convenient	No	Village's meeting House	No	No	Road should be constructed quickly
Location	Km 61+800									
Name:	Occupation / Address									
Nguyen Van Tuyen, Mr	Farmer, Sam Village, Cam Binh Commune	Yes	Yes	Yes	Traveling will be convenient	No	No	Dusty	No	No
Location	Km 61+ 700									
Name:	Occupation / Address									
Hoang Van Thang, Mr	Farmer, Sam Village, Cam Binh Commune	Yes	Yes	Yes	Easier in traveling	No	No	Dusty	No	Project should be ASAP
Location	Km 61+ 600									
Name:	Occupation / Address									
Pham Thi Thao, Ms	Farmer, Sam Village, Cam Binh Commune	Yes	Yes	Yes	Traveling is easier	No	No	Dusty	No	Compensation should be applied for things

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Respondent's information	Details	Do you agree to road upgrading project?	Do you approve of the new alignment and bypass?	Will the upgraded road contribute to the local development	How will Project benefit / affect your local transport?	Are there any cultural archaeological, religious, or historical sites within 100m from the road?	Are any protected buildings in the area	What will be the environmental problems you expect from the project?	Do you have suggestions to reduce environmental impacts?	Do you have any other comments / suggestions or ideas?
Location	Km523+600 (HCMH)									
Name:										
Trinh Van Mon (55)	Occupation / Address									
	Farmer and Construction workman, Go Ca Village, Cam Son Commune	Yes	Yes	Yes	To travel favourably	No	No	To cause noise and dust	To co-ordinate between the project side and local Side closely	No comment
Location	Km523+600									
Name:	Hoang Thi Thanh									
	54 years old	Yes	Yes	To develop the locale	To travel favourably	No	No	Noise from construction and workmen activities, Dust from construction, Water source may be affected badly.	It's needed to co-ordinate between the project side And local people side closely to manage the Workman ship of the Project	No comment