

Environmental Monitoring Report

Semi-Annual Report (August - December 2013)
February 2014

VIE: Ho Chi Minh City-LongThanh-Dau Giay Expressway

Packages 7, 8 and 9

Prepared by the Consortium of Nippon Koei Co., Ltd and TEDI South for the Vietnam Expressway Corporation, the Ministry of Transport of Vietnam, and the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 1 February 2014)

Currency unit	–	dong (D)
D1.00	=	\$0.00004753
\$1.00	=	D21,040

NOTE

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

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**THE SOCIALIST REPUBLIC OF VIET NAM
MINISTRY OF TRANSPORT
VIETNAM EXPRESSWAY CORPORATION**

**HOCHIMINH – LONG THANH –DAU GIAY EXPRESSWAY
PROJECT MANAGEMENT UNIT (HLD EPMU)**



**NORTH-SOUTH EXPRESSWAY CONSTRUCTION PROJECT
HO CHI MINH CITY – DAU GIAY SECTION (CS)**

LOAN NO. VNXV-1



**SEMI-ANNUAL ENVIRONMENTAL SUPERVISION REPORT
PACKAGES 7, 8 AND 9**

(August 2013 – December 2013)

FEBRUARY 2014

**Consortium of
Nippon Koei Co., Ltd
TEDI South**

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1. INTRODUCTION

1.1. *Report purpose*

In the surrounding area of Ho Chi Minh City (HCMC), the traffic volume has long been over the capacity of road. It is foreseen that the demand of traffic in HCMC and Dong Nai area where industrial development has been recently significant with the planned development of industrial zones and the international airport will increase significantly. The Government of Vietnam (GOV) has decided to construct the HCMC – Long Thanh - Dau Giay Expressway (HLD Expressway) with the assistance from Asian Development Bank (ADB) and Japan Bank for International Cooperation (JBIC), which was currently named as Japan International Cooperation Agency (JICA) by integrating with previous JICA. The express way was divided into two portions such as HCMC – Long Thanh funded by JICA and Long Thanh - Dau Giay funded by ADB.

Ho Chi Minh –Long Thanh –Dau Giay Expressway crosses thinly population density areas such as agricultural land and some high population density areas. EIA has been implemented for environmental and social consideration according to the Vietnamese environmental law and regulations and JBIC and ADB guidelines for Environmental and Social Considerations and Regulations.

Implementation of Environmental Management Plan (EMP) during construction and post-construction stages is necessary for sustainable development as well as to ensure the environmental protection in the road construction project.

The main purpose of the environmental supervision report (August 2013 – December 2013) is to summarize the environmental supervision activities by Contractors and Construction Supervision Consultants (CS Consultants) during the period of August 2013 –December 2013 to support VEC to prepare environmental supervision reports to JICA (previous JBIC), ADB as well as to prepare them to other agencies.

The main objectives of this environmental supervision report are follows;

- Grasp the general environmental condition
- Identify the environmental impacts during the construction period and propose mitigation measures
- Summarize the result of environment inspection during construction period.

- Implementation of environmental monitoring in pre-construction and during construction stages.

1.2. Project Implementation Progress and Change in Project Scope

Packages 7, 8 and 9 have been proceed for the commencement date for each package as follows:

- Package 7 and 8: the commencement date of packages No.7 and No.8 is on 27th February 2013 and construction period is 24 months for each package.
- Package 9: the commencement date of this package is on 02nd April 2013 and construction period is 24 months.

Environmental management plan was submitted by the Contractor and they were approved. The site batching plan, site laboratories, casting yard...were completed and stable in operation.

The Contractors have been conducted sign the contract with environmental monitoring sub-contractor. The initial environmental monitoring was carried out in April 2013.

And environmental monitoring was carried out for the initial monitoring by the CS Consultant in March 2013.

1.2.1. Implementation Progress

The construction progress of each package as of December 2013 is described as follows

I. Package 7:

- ***Preparation of MS and SD:*** Submission of MS and SD is satisfied with construction progress.
- ***Equipment mobilization:*** Mobilization of personnel and equipment is satisfied with construction progress.
- ***Site clearing and grubbing:*** Contractor has completed the site clearing and grubbing
- ***Construction of temporary service road:*** Completed 85.56% of work quantity
- ***Excavation and disposal of topsoil; off site:*** Completed 100% (An Phu intersection)
- ***Prefabricated Vertical Drains (PVD) of An Phu intersection, RampB1:*** Completed 41,111m in December;

- ***VCM on Thruway:*** Completed 4,552.00 m² in December;
- ***Bored pile on Land and in river of Muong Kenh Bridge:*** Completed 06 piles in December;
- ***Construction of pile cap, pier column of Muong Kenh Bridge***
 - + Construction of 04 pile caps of P7; P12.
 - + Construction of 03 pier columns of P7; P12.
 - + Construction of 03 Headstocks of P5 and P11.
- ***Manufacturing of Super-T girder:*** Completed 05 nos in December;
- ***Launching of Super-T girder:*** Completed 20 nos in December
- ***Precast concrete pile (30x30 cm):***
 - + Manufacturing 5,075.00m of the Muong Kenh and Ba Dai Bridge in December;
 - + Driving 5,338.00 lm of the Muong Kenh and Ba Dai Bridge in December;

II. Package 8:

a. *Temporary works*

- ✓ Temporary road:
 - In this month the Contractor had pumped sand for temporary road at section from Km2+000 to Km2+450.
 - Up to now the temporary road was completed a half section from Km3+000 to Km4+000.
- ✓ Batching plant: Batching plant is completed and in operation.
- ✓ Site laboratory: Site laboratory is in the stage of operation.
- ✓ Site office: Site office is in operation.

b. *Site clearance and top soil removal*

- ✓ Thruway: completed
- ✓ Ramp way:
 - Ramp X1, Y1: construction completed
 - Ramp X2: completed excavating and replacing soil
 - Remaining ramps include Y2, Y3 and DXH ramp: the Contractor yet to have schedule

c. *Backfilling and Working Platform Filling:* The Contractor completed pumping sand at the following sections:

- ✓ Thruway: completed.
- ✓ Ramp way: completed X1 and Y1 ramp way
- ✓ Accumulated quantity reaching 91,104 m³ nearly equivalent to 100%

d. PVD installation:

- ✓ Thruway: 100% PVD work at thruway completed
- ✓ Ramp way: completed the remaining of ramp X1 section KM0+000 to Km0+200) and the Contractor is yet to construct Ramp Y1 section from Km0+420 to Km0+600 in this month
- ✓ Accumulated quantity reaching 719,994 linear meter (Over the total of 746,914 linear meter) equivalent to 96%.

e. VCM Application:

- ✓ Km2+000 to Km2+495, Km2+740 to Km3+001, Km3+435 to Km3+815, Km3+939 to Km4+011: the sand pumping for surcharge and VCM application on progress.
- ✓ Km2+495 to Km2+740: the Contractor carried out trial VCM application and got satisfying pressure. Preparation for surcharge sand pumping on progress
- ✓ Ramp way Km0+020 to Km0+200: the Contractor is carrying out the trial VCM
- ✓ Accumulated quantity reaching 63,716m² equivalent to 95%

f. Surcharge work: Sand filling for surcharge work carried out for following sections:

- ✓ Km3+936 to Km4+011 : 4,236m³ pumped
- ✓ Km3+636 to Km3+815 : 5,500 m³ pumped
- ✓ Km3+426 to Km3+636 : 7000 m³ pumped
- ✓ Km2+740 to Km3+000 : 7,500 m³ pumped
- ✓ Km2+248 to Km2+495 : 10,500 m³ pumped
- ✓ Km2+000 to Km2+248: 9,500 m³ pumped
- ✓ Monthly achievement is 44,236m³ and accumulated quantity is 88,800 m³ equivalent to 45%

g. Sub-structure:

- ✓ Bored pile:
 - Do Xuan Hop Flyover:
 - Bored pile is constructed at A1, P1, P2, P3 and P15A. Accumulated quantity is 170 piles equivalent to 84%
 - Ba Hien Bridge:
 - Completed 66 over the total of 66 piles.

✓ Sub-structure Work:

- Do Xuan Hop Flyover:
 - + Completed 03 pile caps: P10L, P10R, A2L
 - + Completed pier column P9R, P11L, P11R, wing wall A2L
 - + Finished installing rebar cage at P10L, P10R
 - + Completed headstock P12L, P12R, P13R
- Ba Hien Bridge:
 - + Completed pile cap P1L
 - + Completed pier column P1L

h. Superstructure:

- ✓ Do Xuan Hop Flyover: completed 45 hollow slab girders in this month, accumulated quantity is 136, equivalent to 31 %
- ✓ Ba Hien Bridge: completed 16 girders in this month, accumulated quantity is 25 girders, equivalent to 50 %

i. Approach Slab:

- ✓ RC pile fabrication: fabricated 9,0017 linear meter in this month, accumulated quantity reaching 23,420 linear meter, equivalent to 89% completion
- ✓ RC pile driving:
 - Completed the 1st stage of RC pile driving for approach slab before abutment A1 – Ba Hien Bridge, equivalent to 43% over the total quantity
 - Finish driving 3,000 linear meters for approach slab before abutment A2 – Ba Hien Bridge. Accumulated quantity is 4,100 linear meter, equivalent to 48%

III. Package 9:

a. Temporary works

- ✓ Temporary road: Constructing temporary road for construction work.
- ✓ Batching plant: Operated cement concrete batching plant
- ✓ Site laboratory

Site laboratory is operating with all approved equipment. Site laboratory is carrying out these following tests:

- + Concrete mix design and sample compressing
- + Soil tests and compaction

+ Reinforcement.

b. Site Clearance

Contractor was carrying out the site clearing for area which already hand over to the Contractor.

c. Earth work and Soft Soil Improvement.

The contractor is carrying out the construction of ramp A1; D1; B2, A2, C1, B1-A2, Excavation: (Up now: 75.942m³), Backfill: (Up now: 66667 m³); Capping layer K98: 600 (up now: 3318m³), Sub-Base: 4864 m³ (Up now: 5585m³), Base 5326 m³ (up now: 5326 m³). ATB: 11488 m² (up now 11488 m²)

Bridge substructure

- In this month, Contractor mobilized 8 constructions team for bored pile construction and completed 71 piles. Quantity up to now: 540 piles.
- Contractor mobilized 8 construction team for pier construction and completed 12 pile cap (up now: 76 nos), 11 pier column (up now: 71 nos) 5 headstock (up now: 49 nos)

d. Bridge superstructure

In this month, Contractor fabricated 45 Super T girders (up now: 214 nos). Launching Super T: 80 nos, up now: 197 nos.

1.2.2. Scope of project

Ho Chi Minh City – Long Thanh – Dau Giay Section is of great importance under North – South Expressway Construction Project. The Project, which goes through districts 2 and 9 under Ho Chi Minh City and Long Thanh, Nhon Trach, Cam My and Thong Nhat Districts under Dong Nai Province.

Total length of the project is 54.98 km including 4 lanes (phase 1) with starting point at An Phu Interchange at District 2 under Ho Chi Minh City (Km0+000) and ending point at Interchange with National Highway 1A at Dau Giay under Dong Nai Province (km54+984), which belongs the center line of North – South expressway.

The Project section is divided into 9 civil works packages (1a, 1b, 2, 3, 5, 6, 7, 8 and 9) and one ITS work Package (4) by which Package 7 with total length 2Km, Package 8 with total length 2Km and Package 9 is interchange with Ring road No.2 under Ho Chi Minh City. Specifically as follows:

- Package 7 has beginning point at Km0+000 and ending point at Km2+000, with total length 2Km, and 02 bridges. Design speed 80Km/h
- The Package 8 has starting point at Km2+00, district 2 and ending point at Km4+00 district 9, Ho Chi Minh City, with 2Km length. Designed speed is 80 km/h according to Vietnamese Standard TCXDVN 104-2007, HL93 design loading.
- Package 9 includes Ring Road 2 Interchange Km 4+514 (excluding main road Interchange expressway). 8 Ramps with design speed 40 Km/h (except Ramp A1; D1 with design speed 60 Km/h).

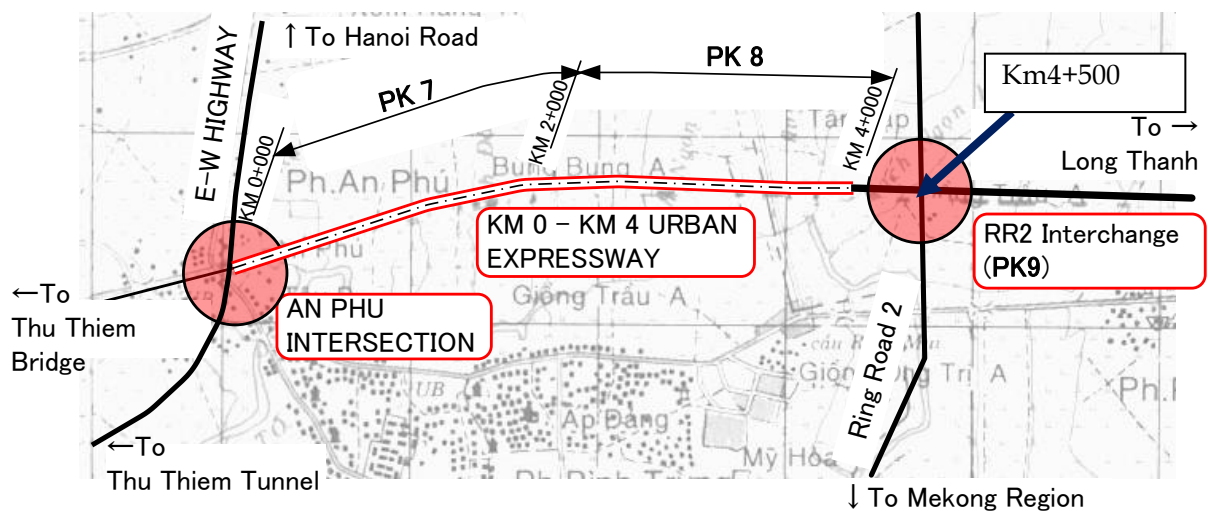


Figure 1. Packages 7, 8 and 9 locations

2. INCORPORATION OF ENVIRONMENTAL REQUIREMENTS INTO PROJECT CONTRACTUAL ARRANGEMENTS

Environmental requirements were incorporated into Volume 3. General Specification of contract document. Which requires the construction contractors comply with environmental regulations and protection as summarized below:

- The Contractor shall submit an Environmental Management Plan detailing how he intends to comply with applicable local laws and regulations concerning protection of the environment and the attached specification for environmental monitoring.
- The contractor shall implement environmental monitoring program which shall be implemented in two phases: prior to the start of construction and during construction. The first phase is required to provide baseline data on environmental quality in the Project area, in particular for houses adjacent to

areas of the works. Monitoring programs in the construction phase are required to collect data and evaluate the impact of the Project and the effectiveness of the Contractor's mitigation measures.

- The Contractor shall strictly comply with Vietnamese Laws and Standards regarding the environment on all works associated with the Contract.
- The Contractor shall be responsible for implementing and managing mitigation measures during the construction of the Works. The recommended mitigation measures including measure for air quality, noise and vibration, water environment, waste management, impacts on traffic.

Implementation arrangement of EMP

The EMP including the explanation of baseline condition at pre-construction and potential impacts and mitigation measures at construction stage and operation stage

EMP has been prepared to monitor the environmental impacts and implement the appropriate mitigation measures during construction and operation stages as required in the EIA. The frameworks of management are described in the following figure.

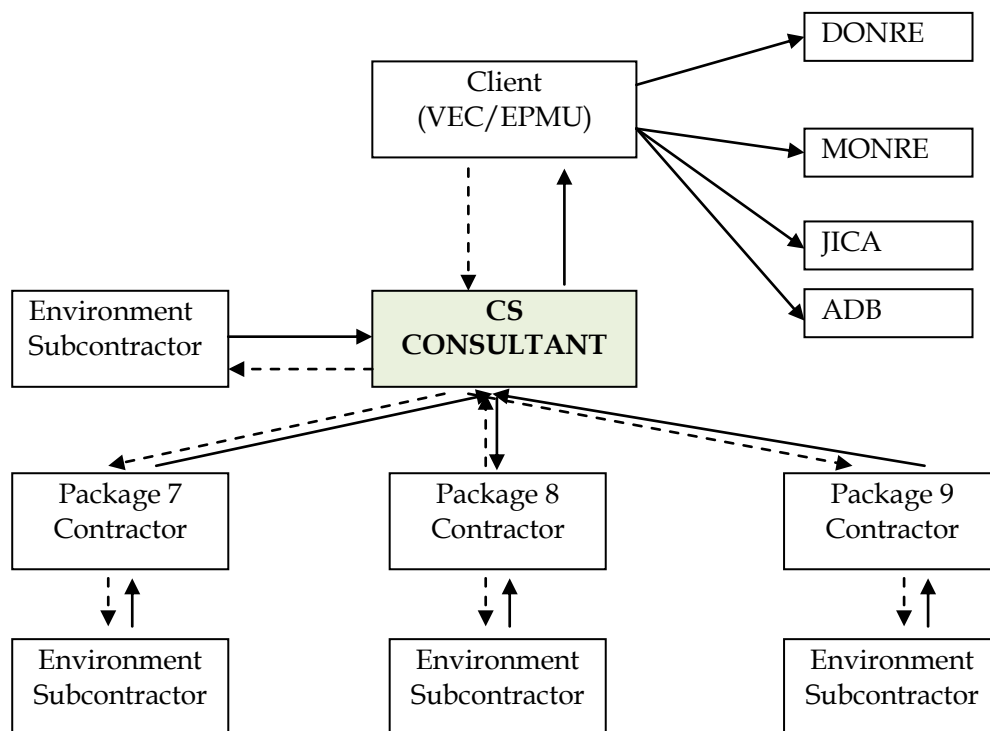


Figure 2. Framework of organizations regarding environmental management

3. SUMMARY OF ENVIRONMENTAL MITIGATIONS AND COMPLIANCE WITH EMP

No.	Mitigation Measures	Compliance Attained	Comment on Reasons for Non-Compliance	Corrective actions taken
I.	Over-all	Good		
	Prepare and implement a site-specific EMP			
II.	Air quality			
2.1	Construction activities			
	<ul style="list-style-type: none"> - No burning of debris or other materials will occur on the site. - For material transportation: prevent dust by covering and wetting loads, limiting the speed for vehicles transporting construction materials, and watering roads and other open areas regularly. - Construction walls will be provided in all locations where strong winds could blow dust and debris. In residential areas, such as An Phu build 3m high fences with fiberboards and iron sheets to minimize dust and noise. - Stockpiles of sand and aggregate greater than 20 cubic meters for use in concrete manufacture shall be enclosed on three sides, with walls extending above the pile and two (2) meters beyond the front of the piles. Locations should be indicated by the accompanying site plan(s). - Effective water sprays shall be used during the 			

No.	Mitigation Measures	Compliance Attained	Comment on Reasons for Non-Compliance	Corrective actions taken
	<p>delivery and handling of all raw sand and aggregate, and other similar materials, when dust is likely to be created and to dampen all stored materials during dry and windy weather.</p> <ul style="list-style-type: none"> - All equipment on the site will be checked at least every week and remodeling necessary to ensure compliance with safety requirements and avoid air pollution. 			
2.2	Measures to reduce air pollution and dust caused by the use of vehicles and machinery			
	<ul style="list-style-type: none"> - All roads within the construction areas of the site shall be watered at least twice each day, and more if necessary to control dust to the satisfaction of the ESO. - Areas within the site where there is a regular movement of vehicles shall have an acceptable hard surface and be kept clear of loose surface material. Locations should be indicated by the accompanying site plan(s). - Ensure that vehicles and machinery are used and maintained properly to meet applicable emission standards. Fuel-efficient vehicles shall be preferred. - All vehicles, while parked on the site, will be required to have their engines turned off. - Any vehicles with an open load carrying area used for moving potentially dust-producing materials shall have properly fitting side and tailboards. - Ensure that employees are trained on the proper use and maintenance of machinery and vehicles. Use dust suppression measures: cover and wet loads, limit the speed for vehicles transporting construction materials, select suitable transport routes and vehicles, and water roads and other open areas regularly. Limit traffic congestion through planning of transportations in coordination with local officials. - Conduct regular site inspections to ensure the use of best practices and report any complaints from local people. - All equipment and machinery on the site will be checked at least weekly and all necessary corrections and or repairs made to ensure compliance with safety and air pollution requirements 	Fair	There are much dust arising from temporary road of Packages 7, 8 and 9 due to constructor's vehicle transfer material to the site.	The Contractor had arranged two workers for each Package in order to clean up the road where arising much dust and water the temporary road regularly
2.3	Mitigation measure by crushing, concrete and asphalt plant operation			
	<ul style="list-style-type: none"> - An air pollution control system shall be installed and shall be operated whenever the plant is in operation. 	Good		

No.	Mitigation Measures	Compliance Attained	Comment on Reasons for Non-Compliance	Corrective actions taken
	<ul style="list-style-type: none"> - Install a three-sided roofed enclosure with a flexible curtain across the entry where dusty materials are being discharged to vehicles from a conveying system at a fixed transfer point. Install exhaust fans for this enclosure and vented to a suitable fabric filter system. - Dry mix batching shall be carried out in a totally enclosed area with exhaust to suitable fabric filters. - The concrete batching plant and crushing plant sites and ancillary areas will be frequently cleaned and watered to minimize any dust emissions. The plants shall not be located within 1000 m of settlements, schools, health facilities and other sensitive sites. 			
III.	Noise and vibration			
	<ul style="list-style-type: none"> - Vehicles and machinery must be used, maintained and equipped so as to avoid unnecessary noise and vibration. - Plants must be located away from sensitive areas and noisy construction work, such as crushing, concrete mixing and batching plan must be done during daylight hours. - Use of machines causing loud noise and vibration (drill, excavator etc.) is prohibited between 23 pm and 5 am. If night-time construction is necessary, the contractor will apply for a permit from local authorities and inform residents about coming works beforehand. - At residential areas, temporary noise walls or boards will be used to minimize noise impacts from construction activities near schools, temples, clinics etc. The contractor will specify the locations and type of temporary noise walls before beginning of construction. - Ensure that local authorities and residents are notified in advance about disturbing activities, such as blasting operations. The effectiveness of mitigation activities will be monitored regularly through noise level measuring. - Be responsible for repairing any damage caused as the result of vibrations generated from or by the use of his equipment, plant, and machinery. - The minimum effective height of the noise barriers should be as such that no part of the noise sources associated with the operation of construction machinery should be visible from the target receptors to be protected. The locations of the temporary noise barriers shall be adjusted where and when necessary taking into 	Good		

No.	Mitigation Measures	Compliance Attained	Comment on Reasons for Non-Compliance	Corrective actions taken
	<p>consideration the locations and type of receptor involved and the machinery intended to be protected. Use of the proposed noise barriers, as other construction site equipment, should take into account standard requirements.</p> <ul style="list-style-type: none"> - A minimum of 4.5 meter wide thoroughfare with not less than 4.5 meter vertical clearance to be maintained at all times for the free passage of fire appliances; - The barrier shall not be located where it prevents access to community facilities, residential areas, and places of work or access routes. - Ensure that the use of noise sources (i.e., aggregate crushers, operators, etc.) will be avoided as much as possible near sensitive receptors. Non-vibratory rollers (for compaction) will be used near sensitive receptors such as schools and cultural resources. - Ensure that all exhaust systems will be maintained in good working order; properly designed engine enclosures and intake silencers will be employed; and regular equipment maintenance will be undertaken. - Ensure that stationary equipment will be placed as far from sensitive land uses as practical; selected to minimize objectionable noise impacts; and provided with shielding mechanisms where possible. 			
IV.	Water quality			
	<ul style="list-style-type: none"> - Wastewater from mixing materials will be drained to a separate collecting system, and processed by sediment traps before release to the public drainage system. - Mud from drilling will be collected and processed to avoid pollution of surface water. - Drilling solutions for performing the abutment will be processed in a closed system, especially for abutments at the riverbed. - Inner-lined drill holes will be used during piling. - Proper drainage systems will be provided at all construction, material exploitation, and storage sites. All existing stream courses and drains within, and adjacent to, the site will be kept safe and free from any debris and any excavated materials arising from the works. Chemicals, sanitary wastewater, spoil, waste oil and concrete agitator washings will not be deposited in the watercourses - The Contractor will ensure that construction 	Good		

No.	Mitigation Measures	Compliance Attained	Comment on Reasons for Non-Compliance	Corrective actions taken
	<p>camp and other potential sources of secondary impacts are properly sited and provided with drainage and wastewater facilities.</p> <ul style="list-style-type: none"> - Hygiene bathrooms will be set up at all construction camp sites and septic tanks will be used to treat wastewater. Proper drainage will be provided to avoid creation of stagnant water bodies. - Extraction of sand and gravel in river beds will be prohibited except (i) where there is no technically and economically feasible alternative, and (ii) provided specific mitigation measures are implemented to minimize impacts on river morphology, water quality (e.g. turbidity), and ecosystems (e.g. reduced extraction during fish spawning period). - Equipment and vehicle maintenance area will be provided with adequate drainage facility as well as oil and grease separator to avoid discharge of oil-laden water into the surrounding soil and water courses. - Drainage works will be constructed, maintained, removed and reinstated as necessary and all other precautions taken, as necessary, for the avoidance of damage by flooding and silt washed down from the works. Adequate precautions will be taken to ensure that no spoil or debris of any kind is allowed to be pushed, washed down, fallen or be deposited on land adjacent to the site. Stockpiles will not be located near rivers and streams. Dumping of spoils and obstruction of flows along rivers and streams will be avoided. - Downstream slopes will be stabilized, where warranted, with concrete, rock gabions or walls to avoid erosion. - Prepare emergency response plan in case of fuel and chemical spills 			
V.	Loss of water resources			
	<ul style="list-style-type: none"> - Any source of water (potable or otherwise) for the community, such as wells, ponds or tube wells, accidentally lost will be replaced immediately. - The location and sitting of the replaced source of water will be as per design or as directed by the engineer. In general, there should be only lateral displacement (of the new site from the old); the replacement will be ready prior to demolition/dismantling of the existing source. 	Very good		
VI.	Erosion			

No.	Mitigation Measures	Compliance Attained	Comment on Reasons for Non-Compliance	Corrective actions taken
	<ul style="list-style-type: none"> - Provide temporary or permanent drainage to protect sites susceptible to erosion. - Stabilize downstream slopes on rivers and streams prone to erosion problems. - Protect sensitive surface/erosion prone site with vegetation and replace removed trees to ensure interception of rainwater and deceleration of surface runoff as soon as possible after construction works. - On streams, downstream slopes can be stabilized with concrete, rock gabions or walls as seen necessary. - Careful stockpiling of topsoil in suitable locations to prevent these from being washed away. Specify the erosion protection measures to be used in the site-specific EMP. 	Very good		
VII.	Changes in Hydrological Situation and Irrigation systems			
	<ul style="list-style-type: none"> - Temporary drainage will be established along the expressway to avoid inundation during construction. The contractor shall ensure that activities shall not cause disruption of irrigation into surrounding croplands and that damaged irrigation facilities shall be repaired immediately. - The Contractor shall ensure irrigation channels diverted during the construction phase will be returned to their original status. Where this is not possible, or where channels are irrevocably altered, consultation will be held with landowners to ensure that an adequate redesign is undertaken to ensure that irrigation channels are returned as closely as possible to their former layout. The Contractor will undertake all necessary works to achieve this status, including provision of labor. 	Good		
VIII.	Waste and Spoils disposal			
	<ul style="list-style-type: none"> - Waste from construction activities, including the demolishing of structures before the construction itself begins, must be collected and recycled when possible. - Establish hygienic groups to collect waste from construction camp sites and to ensure the cleanliness of the whole construction area. - Spoils from the works will only be disposed of in selected locations approved by local authorities. - Disposal shall not cause adverse impacts to water and soil quality as well as land use. - The locations of spoils disposal sites will be 	Poor	Contractor of Package 7 and 8 have not collected and disposal at approval area. Garbage is still burn on the site. Sedimentation from the settling tank of batching plant has not been dredged	Sedimentation has been dredged and collect garbage when CS Consultant remind

No.	Mitigation Measures	Compliance Attained	Comment on Reasons for Non-Compliance	Corrective actions taken
	specified by the contractor in the site-specific EMP before the beginning of construction activities.		regularly.	
IX.	Handling of hazardous and toxic materials			
	<ul style="list-style-type: none"> - During the construction, fuels, oil, and other dangerous chemical substances will be transported, stored and handled at the site. If adequate mitigation measures are not used, there is a risk of spills into the surrounding area. The contractor will apply for appropriate permits for the transport and handling of hazardous materials and prepare an emergency and contingency plan for fuel and oil spillage. - The contractor also ensures that employees are trained on handling hazardous materials. - Fuel storage sites will be located away from water bodies on a cement pavement with embankment. A canal leading to an oil and grease separator will be installed to facilitate the capture and removal of spilled oil. - Use and maintain vehicles and machinery properly to avoid accidental spills. 	Good		
X.	Contamination of soil			
	<ul style="list-style-type: none"> - Use good housekeeping practices to avoid any contamination of soil from solid wastes, wastewater and hazardous materials. - All wastes shall be disposed in designated disposal sites approved by local authorities. - Ensure all workers are aware of the importance of careful handling of hazardous and dangerous materials. Prepare emergency plans for accidents. 	Good		
XI.	Loss of vegetation cover			
	<ul style="list-style-type: none"> - Minimize the clearing of vegetation for construction activities and borrow areas. - Re-vegetate embankment slopes and road cuts. - Landscape road verges and plant vegetation to contribute to aesthetic value. - Where roadside trees are lost as a result of construction activities, the Contractor shall replant trees as a ratio of one-to-one. - Where trees cannot be replaced at the roadside due to a lack of roadside space, the Contractor shall consult with affected residents to determine an appropriate alternative planting location and schedule. - The Contractor will be responsible for all works associated with tree planting including maintenance of the trees for a one-year period after planting. 	Very good		

No.	Mitigation Measures	Compliance Attained	Comment on Reasons for Non-Compliance	Corrective actions taken
XII.	Safety			
	<ul style="list-style-type: none"> - Ensure that safety, rescue and industrial health matters are given a high degree of publicity to all persons who are regularly or occasionally on the site. Posters, in both Vietnamese and English, drawing attention to site safety, rescue and industrial health regulation shall be made or obtained from the appropriate sources and shall be displayed prominently in relevant areas of the site. - Basic medical care shall be provided at camp sites. A fully equipped first aid base shall be set up. Arrangements for emergency medical services shall be made to the satisfaction of the ESC and ESO. Workers shall be provided with potable water supply and appropriate protective equipment. Work camps shall be provided with facilities to ensure the safety of workers, e.g., fire-fighting equipment, adequate storage for hazardous materials, and contingency measures in case of accidents. - Borrow pits shall be constructed with proper drainage to prevent the creation of mosquito-breeding sites. Upon completion of extraction activities, the contractor will restore borrow pits through dewatering and installation of fences, as appropriate, to minimize health and safety risks. Borrow pits will be left in a tidy state with stable side slopes and proper drainage in order to avoid creation of stagnant water bodies. - Contractors shall ensure that blasting activities shall not cause damage to lives and properties by making sure that the area is clear, adequately warning people using sirens and other appropriate means, and stopping at a safe distance in case blasting is near the road. - Implement a Safety Training Program consisting of: <ul style="list-style-type: none"> a. Initial Safety Induction Course b. Periodic Safety Training Courses c. Safety Meetings d. Safety Inspections e. (e) Safety Equipment and Clothing 	Poor	Package 8: at 09:45AM on 12th October 2013 at construction site of Ba Hien bridge, one welder was constructing on site, he got electric shock and then die on the way to transfer to District 2 hospital	The Contractor had strictly taken experience in instruction and operation work to Construction Unit about safety and replaced safety engineer. After the fatal accident occurred, Nippon Koei head office, Tokyo immediately dispatched safety manager/Mr. Shisei SAKODA made actual site visit for review, evaluation and recommendation of the safety and environment of the project
XIII.	Traffic conditions and use of waterways			
	<ul style="list-style-type: none"> - Contractor to formulate and implement a traffic management plan minimizing the disturbance caused by construction activities. The plan shall explain the means and methods to be taken for proper and adequate control of traffic during the course of the Works. This plan shall include but not be limited to the traffic control equipment 	Good		

No.	Mitigation Measures	Compliance Attained	Comment on Reasons for Non-Compliance	Corrective actions taken
	<p>the Contractor proposes to use for the Works; traffic control signage including location and sign descriptions; how and when the Contractor proposes to use traffic control flag men; traffic control means during no-working periods; and traffic control means and devices for night and off-hour periods.</p> <ul style="list-style-type: none"> - The contractor shall also ensure implementation of the following measures: that the traffic management plan shall comply with the traffic control provisions with regard to: <ul style="list-style-type: none"> a. General traffic management requirements b. Temporary road works c. Traffic control d. Number of lanes for traffic control e. Half-width construction f. Extraordinary traffic g. Vertical clearance h. Materials for traffic control devices - In order to facilitate traffic through or around the Works, or wherever ordered by the ESC, the Contractor shall erect and maintain at prescribed points on the Works and at the approaches to the Works, traffic signs, lights, flares, barricades, rubber cones with traffic lamps, temporary signaling stations on river and other facilities as necessary or required by the ESC for the proper direction and control of traffic. - As necessary for proper control of traffic or when/ where directed by the ESC, the Contractor shall furnish and station competent flagmen whose sole duties shall consist of directing the movement of traffic through or around the Works. - Furnish and erect, within or in the vicinity of the project area, such warning and guide signs as may be necessary or ordered by the ESC. - In order to minimize disruption to traffic flows the Contractor shall enclose the site with temporary fence to provide a visual barrier between his work and adjacent traffic. The temporary fence shall be two meters high and the movement of men, materials and plant into and out of the barrier area shall be controlled by flagmen - Organize temporary means of access to avoid such short-term negative impacts. Maintain local roads and bridges used by construction vehicles. 			
XIV.	Historic and Cultural Resources			
	- Protect sites of known antiquities, historic and	Good		

No.	Mitigation Measures	Compliance Attained	Comment on Reasons for Non-Compliance	Corrective actions taken
	<p>cultural resources by the placement of suitable fencing and barriers.</p> <ul style="list-style-type: none"> - Not located construction camps within 500 meters from cultural resources. - Adhere to accepted international practice and all applicable historic and cultural preservation requirements of the Government of Vietnam. - In the event of unanticipated discoveries of cultural or historic artifacts (movable or immovable) in the course of the work, the Contractor shall take all necessary measures to protect the findings and shall notify the ESC / ESO and concerned provincial-level and central government level representatives. If continuation of the work would endanger the discovery, work shall be suspended until a solution for preservation of the artifacts is agreed upon. 			
XV.	Utilities			
	<ul style="list-style-type: none"> - Ascertain and take into account, in the method of working, the presence of utility services on and in the vicinity of the site. - Take into account the periods required to locate, access, protect, support and divert all utility services, including any periods of notice required to affect such work in consultation with authorities operating such services. - Assume all responsibility to locate or to confirm the details and location of all utility services on or in the vicinity of the project site. - Exercise the greatest care at all times to avoid damage to or interference with services. - The contractor shall assume responsibility for any damage and/or interference caused by them, their agents, directly or indirectly, arising from actions taken or a failure to take action, and for full restoration of the damage. - Wherever existing ground surfaces are to be disturbed for construction of the works, carry out full and adequate preliminary investigations to locate all services in the area by means of hand-dug trial holes and trenches in combination with electronic and electro-mechanical devices, where appropriate. Each service thus exposed shall be identified. Every service at risk shall be fully exposed and adequately protected and supported in situ or diverted to the satisfaction of the appropriate authority prior to the commencement of such construction. - When working in the vicinity of overhead 			

No.	Mitigation Measures	Compliance Attained	Comment on Reasons for Non-Compliance	Corrective actions taken
	<p>power cable, ascertain and satisfy safety requirements about the safe clearances to be maintained from the power cables in consultation with the authority operating the power line. Where existing overhead power lines, communications cables or other major utilities require relocation, the Contractor will use the services of specialist enterprises with the necessary skills and technology to carry out the work.</p> <ul style="list-style-type: none"> - The Contractor will consult with local area Departments of Transportation (PDOTs) to determine the proposed schedule for future utilities works on the Project Road. If such works, i.e. cable laying, is proposed in the near future the Contractor should propose an appropriate works schedule to synchronize such activities and reduce potential disruption. 			
XVI.	Social impacts Consultation and Complaints Procedures			
	<ul style="list-style-type: none"> - Provide local community information on upcoming construction related activities and issues related to traffic safety. - Record any complaints received and respond to them promptly. - Co-operate with local authorities to prevent and solve problems related to environmental issues. 	Good		

Note:

1. Very good: mitigations are fully effective
2. Good: mitigations are generally effective
3. Fair: mitigations are partially affective
4. Poor: mitigations are generally ineffective
5. Very poor: mitigations are completely ineffective

4. SUMMARY OF ENVIRONMENTAL MONITORING

Package 2 has been in operation in December 2013. However, the expansion of toll gate has not been completed yet. They are constructing remaining 6 toll gates in addition to 8 gates in operation now. Six toll gates will be expected to complete the end of March 2014. So far, there is not impact on surroundings due to activities of project. Domestic solid waste has been collected and treated by Contractor.

4.1. Environmental Monitoring by CSC

4.1.1. Monitoring program

a. Monitoring Items:

Monitoring items include air quality, noise, vibration, surface water quality, groundwater quality and soil.

b. Environmental reference standards:

The environmental standards to be referred were updated in line with recent Vietnamese regulations from the EMP as follows.

Table 2. Environmental standards

No	Environmental component	Environmental regulation
1	Air quality	QCVN 05:2009/BTNMT - National Technical Regulation on ambient air quality. QCVN 06:2009/BTNMT - National Technical Regulation on hazardous substances in ambient air.
2	Noise	QCVN 26:2010/BTNMT – National technical regulation on noise
3	Vibration	QCVN 27:2010/BTNMT – National technical regulation on vibration
4	Surface water	QCVN 08:2008/BTNMT - National Technical Regulation on surface water quality.
5	Ground water	QCVN 09:2008/BTNMT - National Technical Regulation on groundwater quality.
6	Soil	QCVN 03:2008/BTNMT - National Technical Regulation on soil quality.

c. Monitoring Locations

Monitoring locations of air, noise, vibration, surface water, groundwater and soil are selected for most affected areas during construction and operation stages. The monitoring locations are summarized as following table. Map of sampling location is presented in the Appendix 1.

Table 3. Monitoring locations

No.	Location	Sign for monitoring sample	Package 7	Package 8	Package 9
I.	AIR, NOISE AND VIBRATION				
1	An Phu intersection with HLD expressway	A7	Km0+200	-	-
2	Phu Huu Ward	A8	-	Km3+200	-
3	Ring road No.2 Interchange under Ho Chi Minh City	A9	-	-	Km4+500
II.	SURFACE WATER				
1	Ba Dai canal	SW7-1 SW7-2	Km0+346 (Upstream)	-	-
		SW7-3 SW7-4	Km0+346 (Downstream)	-	-
2	Muong Kenh canal	SW7-5 SW7-6	Km1+150 (Upstream)	-	-
		SW7-7 SW7-8	Km1+150 (Downstream)	-	-
3	Ong Cai river	SW8-1 SW8-2	-	Km3+380 (Upstream)	-
		SW8-3 SW8-4	-	Km3+380 (Downstream)	-
III.	GROUND WATER				
1	An Phu Ward	GW7-1 GW7-2 GW7-3	Km0+200	-	-
2	Residential of Phu Huu Ward	GW8-1 GW8-2 GW8-3	-	Km3+200	-
3	Residential live around Ring road No.2 Interchange under Ho Chi	GW9-1 GW9-2 GW9-3	-	-	Km4+500

	Minh City				
IV.	SOIL				
1	Near Muong Kenh canal	S7-1 S7-2 S7-3	Km1+150	-	-
2	Near Ong Cai river	S8-1 S8-2 S8-3	-	Km3+380	-
3	Resident live around Ring road No.2 Interchange under Ho Chi Minh City	S9-1 S9-2 S9-3	-	-	Km4+500

d. Monitoring Schedule

The environmental monitoring is quarterly carried out during the construction stage and semiannually during the defect liability period of operation stage. The environmental monitoring schedule described in the EMP is summarized as follows.

Table 4. Monitoring schedule

Year	Month	Package 7	Package 8	Package 9
2013	3	X/1 (Initial Survey)	X/1 (Initial Survey)	X/1 (Initial Survey)
	6	X/2	X/2	X/2
	9	X/3	X/3	X/3
	12	X/4	X/4	X/4
2014	3	X/5	X/5	X/5
	6	X/6	X/6	X/6
	9	X/7	X/7	X/7
	12	X/8	X/8	X/8
2015	3			X/9

Year	Month	Package 7	Package 8	Package 9
2016	6	X/9	X/9	
	12	X/10	X/10	X/10
	6	X/11	X/11	X11
	12	X/12	X/12	X/12
2017	4			X/13



: Construction period (PK7, 8 and 9 =24 months)



: Operation period (Defect liability Period=24 months)

X/No : The month when the environmental monitoring will be conducted.

4.1.2. Monitoring Result

a. PACKAGE 7

▪ Monitoring results of Package 7 in September 2013

- *Air quality:* According to the monitored data shows that most of parameters of SO₂, NO₂, CO and dust were monitored at construction site of Package 7 is many times lower than baseline data (monitored 03/2013) and permitted regulations QCVN 05:2009/BTNMT. Except, HC content is higher than baseline data but it is also lower than permitted regulations QCVN 06:2009/BTNMT. This proves that construction activities have not affected the surrounding area environment.
- *Noise level:* From 6:00 to 21:00: noise level is higher than baseline data (monitored 03/2013) but it is lower than the allowable limits of Vietnamese regulations QCVN 26:2010/BTNMT. From 21:00 to 22:00: noise level is lower than baseline data and permitted regulations.
- *Vibration level:* According to the monitored data shows that vibration level monitored during two periods from 6:00 to 21:00 and from 21:00 to 22:00 in September 2013 is lower than baseline data (monitored 03/2013) and permitted regulations QCVN 27:2010/BTNMT.

-
- *Surface water quality*
 - + Ba Dai Canal: According to the analyzed data at Ba Dai Canal showed that most of parameters meet the allowable limits of QCVN 08:2008/BTNMT Column B1, except Coliform is 1,47 times higher than permitted regulations at samples SW7-2 and SW7-4 during low tide. Other parameters such as: NO₂-, As, Cd, Cr₆₊, Hg, Pb and oils and grease are not detected in all analyzed samples.
 - + Muong Kenh Canal: According to the monitored data at Muong Kenh Canal showed that Coliform is 2,26 times higher than the allowable limits of QCVN 08:2008/BTNMT Column B1 at the sample SW7-6. The others meet regulations.
 - *Ground water quality:* Analyzed results showed that the ground water quality at Project area of Package 7 is quite good. Most of parameters meet the allowable limit of regulations QCVN 09:2008/BTNMT, except Coliform is 2,33 times higher than permitted regulations at sample GW7-3.
 - *Soil quality:* According to the analyzed data showed that soil quality at Project area of Package 7 still no sign of pollution by activities of Project. All parameters meet permitted regulations QCVN 03:2008/BTNMT.
 - [Monitoring results of Package 7 in December 2013](#)
 - *Air quality:* The monitored data in December 2013 shows that dust content and pollutions content in ambient air of project area are lower than baseline data (monitored in March 2013) and they are lower than the allowable limits of QCVN 05:2009/BTNMT and QCVN 06:2009/BTNMT.
 - *Noise level:*
 - + From 6:00 to 21:00: noise level is lower than baseline data (monitored in March 2013) and it is also lower than the allowable limits of QCVN 26:2010/BTNMT several times.
 - + From 21:00 to 22:00: noise level is lower than baseline data but it is 1,09 times higher than permitted regulations of QCVN 26:2010/BTNMT.
 - *Vibration level:*
 - + Vibration regulations of QCVN 27:2010/BTNMT and baseline data (monitored 03/2013) are used for assessing the vibration level at project area.

- + The monitored data shows that vibration level monitored in December 2013 at project area during two periods from 6:00 to 21:00 and from 21:00 to 22:00 are from 1,1 to 1,2 times lower than baseline data and they are from 1,2 to 1,5 times lower than permitted regulations of QCVN 27:2010/BTNMT.
- *Surface water quality*
 - + **Ba Dai Canal:** The analysis results at Ba Dai Canal in December 2013 are shown that most of analyzed parameters meet the allowable limits of QCVN 08:2008/BTNMT Column B1. Other parameters such as: NO₂⁻, As, Cd, Cr⁶⁺, Hg, Pb and oils and grease were not detected in all analyzed samples.
 - + **Muong Kenh Canal:** The analysis results of surface water quality of Muong Kenh Canal in December 2013 are shown that all analyzed parameters meet the allowable limits of QCVN 08:2008/BTNMT Column B1. Other parameters of NO₂⁻, As, Cd, Cr⁶⁺, Hg, Pb and oils and grease were not detected in all analyzed samples.
- *Ground water quality:* Analyzed results shows that the ground water quality at Project area of Package 7 in December 2013 meets the allowable limit of regulations of QCVN 09:2008/BTNMT, except Coliform content at GW7-1 sample is slightly higher than the allowable limits.
- *Soil quality:* The analyzed results shows that soil quality at Project area of Package 7 in December 2013 is still no sign of pollution by activities of Project. All analyzed parameters at three samples meet permitted regulations of QCVN 03:2008/BTNMT. All analyzed samples, Cd and Hg content is not detected.

b. PACKAGE 8

- Monitoring results of Package 8 in September 2013
- *Air quality:* There is no much change in the results of the 3rd monitoring and initial monitoring (monitored 03/2013). Most of parameters are many times lower than permitted regulations QCVN 05:2009/BTNMT, QCVN 06:2009/BTNMT. This proves that environmental issues around Package 8 are still under control.

-
- *Noise level:*
 - + During the period from 6:00 to 21:00: noise level is 1,19 times higher than baseline data (monitored 03/2013), this results show that surrounding areas are more or less impacted by construction activities of project but this noise level is under the permitted regulations QCVN 26:2010/BTNMT.
 - + During the period from 21:00 to 22:00: noise level is higher than baseline data and permitted regulations but not much.
 - *Vibration level:* Vibration level during two periods from 6:00 to 21:00 and from 21:00 to 22:00 is higher than baseline data (monitored 03/2013) but they are under control that means they are lower than permitted regulations QCVN 27:2010/BTNMT.
 - *Surface water quality:* According to the monitored data at Ong Cai River (Ong Cai Bridge) showed that the surface water quality at this area is still quite good, most of parameters meet permitted regulations QCVN 08:2008/BTNMT Column B1, except Coliform is 2 and 3,46 times higher than permitted regulations in two samples SW8-1 and SW8-2 respectively.
 - *Ground water quality:* According to the analysis results of ground water samples collected in residential area of Phu Huu Ward, District 9 near Package 8 showed that pH does not meet permitted regulations QCVN 09:2008/BTNMT. pH is slightly low, they ranged from 5,27 to 5,34. Coliform in two samples GW8-2 and GW8-3 is 3 and 2,33 times higher than permitted regulations respectively. Analyzed results of the remaining parameters meet the allowable limits.
 - *Soil quality:* According to the analysis results are shown that soil quality at this area is not contaminated, most of these parameters meet permitted regulations QCVN 03:2008/BTNMT. Cd and Hg contents are not detected in all analyzed samples.
- [Monitoring results of Package 8 in December 2013](#)
- *Air quality:* The monitored data shows that dust and pollution parameters content at project area in December 2013 are slightly exceed baseline data (monitored in March 2013) but these values are lower than permitted regulations of QCVN 05:2009/BTNMT, QCVN 06:2009/BTNMT several times.

- *Noise level:*

- + During the period from 6:00 to 21:00: noise level was 56,2dBA, this value is slightly higher than baseline data (monitored in March 2013 was 54,6dBA) but it is lower than the allowable limits of QCVN 26:2010/BTNMT (70dBA) several times.
- + During the period from 21:00 to 22:00: noise level was 58,7dBA. This noise level is higher than baseline data (monitored in March 2013) and permitted regulations of QCVN 26:2010/BTNMT (55dBA).

- *Vibration level:*

- + From 6:00 to 21:00: Vibration level was 50,2dB, this value is 1,28 times slightly higher than baseline data (monitored in March 2013 was 39,1dB) but this vibration level is lower than permitted regulation of QCVN 27:2010/BTNMT several times.
- + From 21:00 to 22:00: Vibration level was 44,6dB. This vibration level is higher than baseline data (monitored in March 2013) and it is 1,68 times higher than the allowable limits of regulations of QCVN 27:2010/BTNMT (26,5dB)

- *Surface water quality:* Analysis results in all samples of Ong Cai River are lower than permitted regulations of QCVN 08:2008/BTNMT Column B1, except BOD5 and Coliform at SW8-2 sample are slightly exceed the allowable limits.

- *Ground water quality:* Most analysis parameters in ground samples at project area in December 2013 meet permitted regulations of QCVN 09:2008/BTNMT, except Coliform of sample of GW8-2 was 4 MPN/100mL, it is slightly higher than the allowable limits of QCVN 09:2008/BTNMT (3 MPN/100mL).

- *Soil quality:* All analysis parameters of soil quality at project area in December 2013 are lower than permitted regulations of 03:2008/BTNMT several times. Cd and Hg contents are not detected in all analyzed samples.

c. PACKAGE 9

▪ Monitoring results of Package 9 in September 2013

- *Air quality:* According to the monitoring results are shown that air quality at Package 9 area is quite good. Most of parameters are many times lower than baseline data (monitored 03/2013) and permitted regulations QCVN

05:2009/BTNMT, except HC content is higher than baseline data but it is also lower than permitted regulations QCVN 06:2009/BTNMT.

- *Noise level:* According to the monitoring results are shown that surrounding areas of project have not impacted by construction activities of project. Noise level monitored during two periods from 6:00 to 21:00 and from 21:00 to 22:00 is lower than baseline data (monitored 03/2013) and permitted regulations QCVN 26:2010/BTNMT.
- *Vibration level:* According to the monitoring results are shown that vibration level at project area is the same noise level. They are lower than baseline data (monitored 03/2013) and permitted regulations QCVN 27:2010/BTNMT during two periods from 6:00 to 21:00 and from 21:00 to 22:00.
- *Ground water quality:* Analysis results of underground water regulations are compared with QCVN 09:2008/BTNMT showed that ground water quality at project area no sign of contamination including microbiological.
- *Soil quality:* According to the analyzed data showed that all parameters meet permitted regulations QCVN 03:2008/BTNMT.

▪ [Monitoring results of Package 9 in December 2013](#)

- *Air quality:* According to the monitoring results at project area in December 2013 are shown that dust content and concentration of pollutions parameters in the ambient air of Package 9 area are lower than baseline data (monitored in March 2013) and they are also lower than the allowable limits of regulations of QCVN 05:2009/BTNMT and QCVN 06:2009/BTNMT.
- *Noise level:*
 - + From 6:00 to 21:00: noise level was 55,2dBA, this value is 3,9dBA slightly higher than baseline data (it was 51,3dBA in March 2013) but this noise level is 1,26 times lower than permitted limit of QCVN 26:2010/BTNMT (70dBA)
 - + From 21:00 to 22:00: noise level was 50,5dBA. This noise level is 1,05 times lower than baseline data (monitored in March 2013) and it is 1,08 times lower than permitted regulations of QCVN 26:2010/BTNMT (55dBA).
- *Vibration level:* The monitoring results are shown that vibration level at project area in December 2013 at two periods from 6:00 to 21:00 and from 21:00 to 22:00

are lower than baseline data (monitored in March 2013) and permitted regulations of QCVN 27:2010/BTNMT.

- *Ground water quality*: The analyzed results of ground water samples at project area in December 2013 shows that they are lower than the allowable limits of QCVN 09:2008/BTNMT several times. Parameters of As, Cd, CN⁻, Pb and Ecoli are not detected in three samples.
- *Soil quality*: According to the analyzed results of pollutions in soil of project area in December 2013, all parameters meet permitted regulations of QCVN 03:2008/BTNMT. Cd and Hg are not detected in all samples.

4.2. Environmental Monitoring by Contractors

4.2.1. Monitoring Program

According to the Clause 2 - Environmental Monitoring - Section 01300 – Volume 3 of Tender Document, the contractor shall implement environmental monitoring work in two phases: prior to the start of construction and during construction.

Table 5. Environmental monitoring plan of contractors

TT	Item	Package 7	Package 8	Package 9
1	Air	3 points: Km 0+100 Km 0+740 Km 1+195	3 points: Km 2+200 Km 3+200 Km 4+000	3 points: Km 0+000 Km 0+800 Km 1+700
2	Noise	3 points: Km 0+100 Km 0+740 Km 1+195	3 points: Km 2+200 Km 3+200 Km 4+000	3 points: Km 0+000 Km 0+800 Km 1+700
3	Vibration	3 points: Km 0+100 Km 0+740 Km 1+195	3 points: Km 2+200 Km 3+200 Km 4+000	3 points: Km 0+000 Km 0+800 Km 1+700
4	Surface water quality	2 points: Ba Dai bridge Muong Kenh bridge	1 point: Ong Cai river	1 point: Mot Tan canal

TT	Item	Package 7	Package 8	Package 9
5	Ground water quality	1 point: Km 0+800	1 point: Km 4+000	1 point: Km 0+000
6	Soil quality	1 point: Km 1+950	1 point: Km 3+200	1 point: Km 1+700

The monitoring of construction contractors is carried out every month as shown in table 6.

Table 6. Environmental monitoring schedule of contractors

Monitoring	Package 7	Package 8	Package 9
1 st monitoring (Baseline monitoring)	04/2013	04/2013	04/2013
2 nd monitoring	05/2013	05/2013	05/2013
3 rd monitoring	06/2013	06/2013	06/2013
4 th monitoring	07/2013	07/2013	07/2013
5 th monitoring	08/2013	08/2013	08/2013
6 th monitoring	09/2013	09/2013	09/2013
7 th monitoring	10/2013	10/2013	10/2013
8 th monitoring	11/2013	11/2013	11/2013
9 th monitoring	12/2013	12/2013	12/2013

4.2.2. Monitoring Result

The covering monitoring result in August, September, October, November and December 2013 of Packages 7, 8 and 9 are summarized as follows:

a. PACKAGE 7

- *Air quality*

Monitoring results of air quality at three locations of Package 7 at 6 times during August, September, October, November and December 2013 are shown that some parameters of SO₂, NO₂, CO are lower than baseline date and they meet the permitted values of 05:2009/BTNMT.

Except dust content, according to analysis results are shown that dust content monitored during August, September and October 2013 meet permitted values of regulation. Detailed of the above values as follows:

- August 2013: dust content ranged from 0,075mg/m³ to 0,150mg/m³, average dust content was 0,108 mg/m³;
- September 2013: dust content ranged from 0,084mg/m³ to 0,176mg/m³, average dust content was 0,128 mg/m³;
- October 2013: dust content ranged from 0,084mg/m³ to 0,164mg/m³, average dust content was 0,122 mg/m³;

Dust content during November and December 2013 at locations of VT1 and VT2 meet permitted values of regulation except dust content at VT3 location exceed the allowable limit of regulation due to temporary road access to the site had not watered regularly.

- November 2013: the average dust content was 0,180 mg/m³, dust content in VT3 (km1+950) location at time 3, 4, 5 and 6 was 0,357 mg/m³, 0,338 mg/m³, 0,417 mg/m³, 0,354 mg/m³ respectively. These dust content are higher than baseline data and they are 1,13 to 1,39 times also higher than permitted values of QCVN 05:2009/BTNMT (0,3 mg/m³).
- December 2013: the average dust content was 0,181 mg/m³, dust content in VT3 (km1+950) location at time 2, 3, 4, 5 and 6 was 317 mg/m³, 0,375 mg/m³, 0,373 mg/m³, 0,437 mg/m³ and 0,368 mg/m³ respectively. These dust content are 1,06 to 1,46 times higher than baseline data and they are also higher than permitted values of QCVN 05:2009/BTNMT (0,3 mg/m³).

■ *Noise*

Noise level monitored at three locations (VT1=Km0+100, VT2=Km0+740 and VT3=Km1+950) of project area at 6 times (06:00 – 08:00, 08:00 – 10:00, 10:00 – 12:00, 12:00 – 14:00, 14:00 – 16:00 and 16:00 – 18:00) as follows:

- August 2013: noise level ranged from 49,3 to 63,9dBA, the average noise level was 56,6dBA;

- September 2013: noise level ranged from 52,5 to 63,1dBA, the average noise level was 57,8dBA;
- October 2013: noise level ranged from 53,2 to 64,7dBA, the average noise level was 58,9dBA;
- November 2013: noise level ranged from 47,4 to 64,5dBA, the average noise level was 55,9dBA;
- December 2013: noise level ranged from 50,5 to 64,6dBA, the average noise level was 58,9dBA;

All the above average noise level are higher than the average noise level of baseline (54,7dBA). However, all monitored noise level meet the allowable limits of Vietnamese regulation of QCVN 26:2010/BTNMT (70dBA).

■ *Vibration*

The results of vibration level monitored at three locations VT-1(Km0+100), VT-2 (Km0+740 and VT-3 (Km1+950) at 6 times at project area (06:00 – 08:00, 08:00 – 10:00, 10:00 – 12:00, 12:00 – 14:00, 14:00 – 16:00 and 16:00 – 18:00) during in recent months, they arranged as follows:

- August 2013: vibration level ranged from 41,7 – 52,5 dB;
- September 2013: vibration level ranged from 44,6 – 50,2 dB;
- October 2013: vibration level ranged from 42,1 – 52,4 dB;
- November 2013: vibration level ranged from 43,2 – 51,4 dB;
- December 2013: vibration level ranged from 44,1 – 51,4 dB.

All above vibration level meet the permitted values of QCVN 27:2010/BTNMT (75dB).

■ *Surface water*

The analysis results of surface water at Package 7 area are shown that:

- Analysis results of surface water during August, September and October 2013 are lower than baseline data.
- Analysis results of surface water during November and December 2013 are higher than baseline data but not much.

Most analysis results meet the allowable limits of QCVN 08:2008/BTNMT –

Column B1, except the concentration of BOD, COD, TSS, NH_4^+ , NO_2^- and Coliform are higher than allowable limits of Vietnamese regulation.

- *Underground water*

Ground water quality at project area was analyzed during August, September, October, November and December 2013 shows that pH and Cl^- of most analysis samples do not meet the permitted values of Vietnamese regulations of QCVN 09:2008/BTNMT. The remaining parameters meet the allowable limits of regulation QCVN 09:2008/BTNMT.

- *Soil quality*

Analysis results of soil quality during construction stage of August, September, October, November and December 2013 at project area is quite good. All analysis parameters meet the allowable limit of Vietnamese regulation of QCVN 03:2008/BTNMT.

Analysis result of excavated soil during August to in October 2013 are shown that they meet the permitted values of regulations of QCVN 03:2008/BTNMT.

b. Monitoring results of Package 8

- *Air quality*

Monitoring results of air quality at project area of Package 8 during five months (August, September, October, November and December 2013) in three locations (VT1 = Km2+200, VT2=Km2+300 and VT3=Km4+000) at six times (06:00 – 08:00, 08:00 – 10:00, 10:00 – 12:00, 12:00 – 14:00, 14:00 – 16:00 and 16:00 – 18:00) are shown that most pollution parameters and dust content meet the allowable limits of regulation of QCVN 05:2009/BTNMT, except dust content at VT1 location of November 2013 is 1,09 to 1,37 times higher than permitted values of regulation due to the temporary road had not watered regularly.

- *Noise*

Noise level monitored in three locations VT1, VT2 and VT3 at six times during five months ranged around baseline data (46,1dBA to 62,7dBA). These values meet the allowable limits of regulation QCVN 26:2010/BTNMT (70 dBA). Noise level during five months ranged as follows:

- August 2013: noise level ranged between 53,8 and 67,2dBA;
- September 2013: noise level ranged between 48,2 to 61,8dBA;
- October 2013: noise level ranged between 47,5 to 66,1dBA;
- November 2013: noise level ranged between 48,7 to 67,6dBA;
- December 2013: noise level ranged between 49,7 to 67,7dBA;

■ *Vibration*

The average vibration level in August to December 2013 in three locations VT-1, VT-2 and VT-3 at 6 times are shown that most average vibration level are higher than the average vibration level during pre-construction stage (46,7dB) but all the above values meet the allowable limits of Vietnamese regulation of QCVN 27:2010/BTNMT (75 dB). Detailed of the above values as follows:

- August 2013: the average vibration level was 47,3dB;
- September 2013: the average vibration level was 46,8dB;
- October 2013: the average vibration level was 45,9dB;
- November 2013: the average vibration level was 47,3dB;
- December 2013: the average vibration level was 47,1dB;

■ *Surface water*

Analysis results of surface water quality at project area during August, September, October, November and December 2013 are shown that surface water quality at this area is still good. Most analysis parameters ranged around baseline data and most of them are lower than baseline data, they meet permitted values of regulation QCVN 08:2008/BTNMT column B1, except PO_4^{3-} content of August is 2,3 to 2,9 times higher than the allowable limits of regulation.

■ *Underground water*

Analysis results of ground water at project area during August, September, October, November and December 2013 are shown that they did not change more than pre-construction stage. All analysis results meet permitted values of regulation of QCVN 09:2008/BTNMT. This proves that soil quality at project area is not affected by activities of project.

■ *Soil quality*

Analysis results of soil quality during August, September, November and December 2013 are the same ground quality, analysis results did not change more than months. Most analysis values are lower than baseline data and they also meet the allowable limits of QCVN 03:2008/BTNMT. Analysis results of excavated soil at project area are under permitted values of regulation of QCVN 03:2008/BTNMT.

c. Monitoring results of Package 9

▪ *Air quality*

All in all, monitoring results of SO₂, NO₂, CO in August, September, October, November and December 2013 in three locations (VT-1=Km 1+700, VT-2=Km 0+000, VT-3=Km 0+800) of Package 9 at 6 times (06:00 – 08:00, 08:00 – 10:00, 10:00 – 12:00, 12:00 – 14:00, 14:00 – 16:00 and 16:00 – 18:00) are shown that, they did not change more than baseline data, they are lower than permitted values of regulation of QCVN05:2009/BTNMT. However, TSP content at VT1 during September, November and December 2013 are higher than baseline data and exceed the allowable limits of regulation of QCVN05:2009/BTNMT (0,3 mg/m³). Under the action of construction vehicle access to Ring Road 2 and beside the Ring Road 2 has not applied asphalt concrete which cause arising much dust for this area. Detailed of dust content as follows:

- September 2013: dust content at 6 times ranged from 1,12 mg/m³ to 1,87 mg/m³.
- November 2013: dust content at time 3, 4, 5 and 6 is 0,341mg/m³, 0,401 mg/m³, 0,387 mg/m³ and 0,353 mg/m³ respectively.
- December 2013: dust content at time 5, 6 is 0,357mg/m³, 0,376 mg/m³ respectively.

Dust content at the rest of locations still meets the permitted values of regulation.

▪ *Noise*

Results of noise level in August, September, October, November and December 2013 in three monitored locations at 6 times are shown that most noise level are lower than the average noise level of baseline date (61,0dBA) and they are lower

than permitted values of QCVN 26:2010/BTNMT (70dBA). Detailed of noise level of the above months as follows:

- August 2013: the average noise level was 59,8dBA;
- September 2013: the average noise level was 60,7dBA;
- October 2013: the average noise level was 60,0dBA;
- November 2013: the average noise level was 61,8dBA;
- December 2013: the average noise level was 59,3dBA;

■ *Vibration*

The monitoring results of vibration level in August, September, October, November and December 2013 in three locations VT-1, VT-2 and VT-3 at 6 times are shown that most average vibration level are higher than average vibration level of baseline data but they are lower than the allowable limits of QCVN 27:2010/BTNMT (75dB). Detailed of the above vibration level as follows:

- August 2013: the average vibration level was 47,5dB;
- September 2013: the average vibration level was 49,7dB;
- October 2013: the average vibration level was 48,5dB;
- November 2013: the average vibration level was 51,5dB;
- December 2013: the average vibration level was 48,6dB;

■ *Surface water*

In general, analysis results of surface water at project area during August, September, October, November and December 2013 are shown that most analysis parameters are lower than baseline data, except concentration of TSS, NO₂⁻ of samples during October 2013 and PO₄³⁻ content of sample during August 2013 are higher than baseline data and they are also higher than permitted values of regulation of QCVN08:2008/BTNMT –column B1. The rest of parameters meet the allowable limit of regulation.

■ *Underground water*

Underground water quality at project area is still good. There is no change more than ground water quality at project area between months of August, September, October, November, December 2013 and baseline data. Most analysis parameters

meet the permitted values of QCVN 09:2008/BTNMT. Except, Mn content of samples in August was 0,688 mg/l and December was 0,683 mg/l, they are higher than QCVN09:2008/BTNMT (0,5 mg/l) but not much and Cl⁻ content of sample in December was 293 mg/l, it is a litter higher than QCVN09:2008/BTNMT (250mg/l).

▪ *Soil quality*

Analysis results of soil quality at project area are shown that soil quality is still under control. There are not change more than months of August, September, October, November and December 2013 and they are the same results of baseline. All parameters meet the allowable limit of regulation of 03:2008/BTNMT.

4.3. Assessment of Monitoring Results

Through the monitoring of CS Consultant and contractors, there are finding as follows:

In general, the environmental condition monitored during construction stage from August to December 2013 of Packages 7, 8 and 9 as follows:

- Air quality: according to monitoring results are shown that concentration of SO₂, NO₂, CO of Packages 7, 8 and 9 areas are lower than permitted values of QCVN 05:2009/BTNMT many times. Most dust content are also lower than allowable limits of regulation, except dust content at some area during some months has exceeded permitted values such as: VT3 location during November and December 2013 of Package 7, VT1 location during November 2013 of Package 8 and VT1 location during September, November and December 2013 of Package 9 due to temporary road had not water regularly on sunny days.
- Noise and vibration level: most of noise level and vibration level of Packages 7 and 8 are higher than baseline data but they meet permitted values of regulation. Noise level and vibration level of Package 9 is still lower than baseline data and the allowable limits of regulations.
- Surface water quality: concentration of BOD, COD, TSS, NH₄⁺, NO₂⁻ and Coliform of Ba Dai canal and Muong Kenh canal had exceeded permitted values of regulation. All the rest meet permitted values of QCVN08:2008/BTNMT column B1. Analysis results of Surface water of Ong

Cai River are shown that most parameters meet the allowable limits of regulation, except BOD and Coliform content are a bit over permitted values of regulations.

- Ground water: ground water at project areas of Packages 7, 8 and 9 are not change much between months, most parameters meet permitted values of regulation of QCVN 09:2008/BTNMT, except pH and Cl- content and Coliform of all samples are higher than the allowable limits of regulation.
- Soil: The analysis results of soil in all monitoring always meet the allowable limit of Vietnamese regulation of QCVN 03:2008/BTNMT.

5. ENVIRONMENTAL AND TRAINING AND ORIENTATION

An Environmental Training Program is required and shall consist of:

- *Initial Induction Course:* All workmen shall be required to attend an induction course within their first week on site.
- *Periodic Training Courses:* Periodic safety course shall be conducted not less than once every six months. All employees will be required to participate in relevant training courses appropriate to the nature, scale and duration of the Works. Training courses shall be organized for all workmen on the site and at all levels of supervision and management. Regular environmental and safety meetings will be conducted on a monthly basis and shall require attendance by the ESO and safety representatives of Subcontractors.

Training program, schedule, participants and documents as follows:

- *Scope of training program:*
 - Requirements of environmental protection during construction
 - Measures to collect, dispose and treat wastes including fuel, oil, grout, concrete, living waste and spoils from equipment repair,...
 - Handling procedures in case of chemicals, hazardous substance spills,...
 - Occupational safety and health act matters
 - How to work in compliance with standard of safety
 - Other safety and health management.

- *Training schedule:* every month
- *Participants:* All staff and workers of contractors and subcontractors
- *Resources trainers/persons:* Environmental Specialist and Safety officers of the main Contractor.
- *Training document:* site environmental management plans and health and safety plans of contractors, environmental management plan updated May 2013.

Table 7: Number of workers participating in environmental and safety trainings

Time	Package 7	Package 8	Package 9
	Regular training	Regular training	Regular training
08/2013	52	-	408
09/2013	55	-	415
10/2013	47	197	410
11/2013	42	40	421
12/2013	41	8	465

6. KEY ENVIRONMENTAL ISSUES

6.1. Key Issues Identified

a. Environmental issues through environmental monitoring results:

- Monitoring results during construction stage from August to December 2013 are shown that construction activities had impact on surroundings, typical dust content have exceeded the allowable limit of regulation during November and December 2013 of Package 7, November 2013 of Package 8 and September, November and December 2013 of Package 9. In addition, although noise level of Packages 7 and 8 meet permitted values of regulation but they are higher than baseline data.
- Analysis results of surface water, ground water and soil quality at project area are under control. There is no impact on environment by construction activities of project.

b. The environmental issues exit through the site supervisor:

The Contractors are not aware of environmental protection during construction. Therefore, they always repeat environmental violations such as: domestic solid

waste was not collected from the camps and disposal accordance with regulation, waste water from batching plant untreated before discharge into environment and sedimentation has not been dredged regularly as Consultant's requirement.

6.2. Action Taken

Implementation of necessary measures to avoid environmental issues cited in previous report: spraying water to reduce dust, regular clean of batching plant and Do Xuan Hop Street at the entrance to Package 8 office to reduce dust, supply of garbage bins, training of workers on environment and safety, etc.

6.3. Additional Action Required

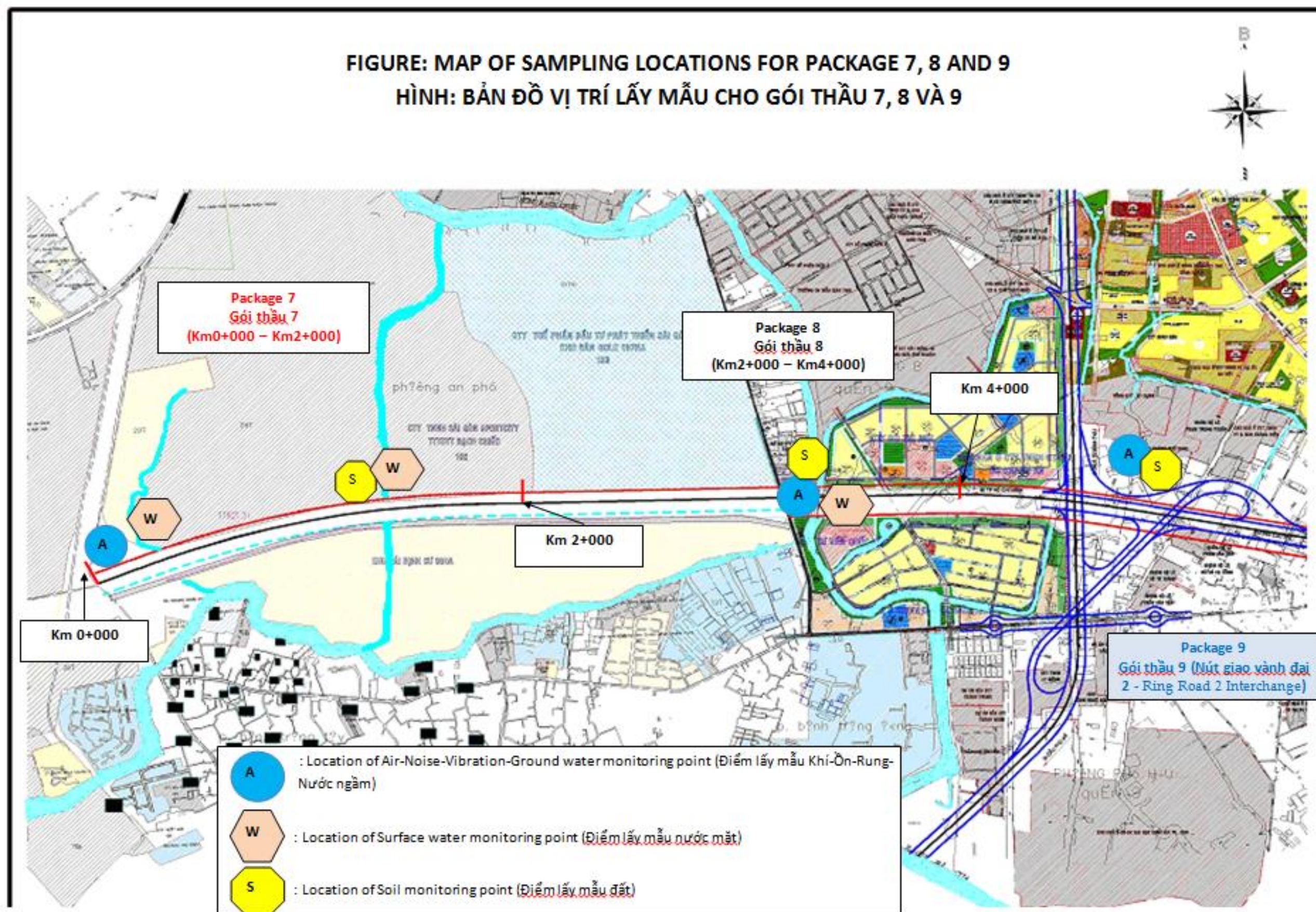
Although contractors have implemented mitigations, continuous and further actions shall be conducted as follows:

- Regular clean of batching plant and drainage system.
- Regular spraying water and this practice shall be enhanced in dry day and strong wind
- Safety onsite was not properly implemented. Contractors shall strongly implement safety measures and the consultant shall more closely supervise the site to immediately stop violation of safety.

7. CONCLUSION AND RECOMMENDATION

- High concentration of dust at VT3 location of Package 7, VT1 location of Package 8 and 9 had been issued letter right in the same month for dust control by CS Consultant. In addition to dust, although noise level is higher than baseline data but they are also lower than the permitted values of Vietnamese regulation. There is not impact on environment of surface water, ground water and soil.
- In order to control environmental issues at project areas are better, the temporary road shall be water regularly by Contractors.
- Collect garbage and sedimentation from settling tanks of batching plant shall be dredged regularly by Contractor.

Appendix 1. MAP OF SAMPLING LOCATIONS



Appendix 2. PHOTOS OF ENVIRONMENTAL MONITORING AND SUPERVISION

Environmental monitoring by CS Consultant



Noise, air, vibration sampling, Pk 7



Surface water sampling (Muong Kenh canal), Pk7



Noise, air, vibration sampling, Pk 8



Surface water sampling (Ong Cai river), Pk8



Noise, air, vibration sampling, Pk 9



Ground water sampling, Pk 9

Environmental monitoring by contractors



Air, noise, vibration monitoring, Pk 7



Surface water sampling at Muong Kenh canal, Pk7



Surface water sampling at Ong Cai river, Pk8



Soil sampling, Pk8



Air, noise, vibration monitoring, Pk9



Surface water sampling, Pk9

Supervision activities



Construction site was cleared, Pk 2.



Sedimentation had dredged by Contractor, Pk7



Cleaning and water – spraying Do Xuan Hop Street in order to dust control, Package 8



Water – spraying the temporary road in order to dust control, Package 9

