

National Road N.5 Improvement Project (Battambang- Sri Sophorn Section)
Environmental Monitoring for Construction Stage
(September 2020)

Item	Location	Parameter/Mean of Monitoring	Result (Average/ Max /Total)	Standards (Local/Inter Standard)	Frequency	Remarks
	Construction site	Visual inspection of mechanical condition and exhaust gas	No major adverse impacts	No standards	Every day before working	At construction camp site
	Construction site	Visual observation of dust	No major adverse impacts		Every day	Camp sites and site works
	Storage facilities for dust generation					Every day, especially in dry season
Air Quality	CP1: The air quality is conducted on bypass, in Beong Raing village, Ormal commune, BTB town	TSP/SPM	0.185	< 0.33 mg/m ³ (MoE, average 24h)	2 time in dray season	The air quality monitoring is conduct by MoE laboratory on 6 September 2020
		SO ₂	0.028	< 0.30 mg/m ³ (WHO average 24h)	2 times in wet season	
		NO ₂	0.036	< 0.10 mg/m ³ (WHO average 24h)		
	CP2: The air quality monitoring is located on widening road in Phnom Tho village, O Prasath commune, Mongkuol Borei district	TSP/SPM	0.230	< 0.33 mg/m ³ (MoE, average 24h)	2 times in dray season	The air quality monitoring is conduct by MoE laboratory on 6 September 2020
		SO ₂	0.036	< 0.30 mg/m ³ (WHO average 24h)	2 times in wet season	
		NO ₂	0.042	< 0.10 mg/m ³ (WHO average 24h)		
Water Quality	CP1: No action in this month	Visual observation/inspection	No major adverse impacts	No standards	Every day	Contractor and inspector
		Upstream	Results	Standards		
		pH		6.5-8.5 (MoE)	1 time in dry season	
		TSS		25-100 mg/l (MoE)	1 time in wet season	
		BOD		1-10 mg/l (MoE)		
		COD		1-8 mg/l (MoE)		
		Oil-Grease		< 5.00		
		Downstream	Results			
		pH		--	1 time in dry season	
		TSS		--	1 time in wet season	
		BOD		--		
		COD		--		
		Oil-Grease		--		
	CP2: No action in this month	Visual observation/inspection	No major adverse impacts	No standards	Every day	Contractor and inspector
Upstream		Results	Standards			
pH			6.5-8.5 (MoE)	1 time in dry season		
TSS			25-100 mg/l (MoE)	1 time in wet season		
BOD			1-10 mg/l (MoE)			
COD			1-8 mg/l (MoE)			

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Water Quality		Oil-Grease		< 5.00		
		Downstream	Results			
		pH		--	1 time in dry season	
		TSS		--	1 time in wet season	
		BOD		--		
		COD		--		
		Oil-Grease		--		
Noise	Boundary of land plot nearest to the construction site	Noise Level: Visual inspection, the contractor plan to conduct site measures next time	No major adverse impacts (assessed by visual)	- 50 dB (06:00-18:00) - 50dB (18:00-22:00) - 45dB (22:00-06:00) (MoE, for residential area)	- When noise/vibration level exceeding the Cambodian standards in suspected. - When local residents complain.	Visual check or monitoring. Plan to measure next time. The noise is regularly generate from heavy trucks are moving on NR5.
Vibration		Vibration Level (Visual inspection)	No major adverse impacts to communities at construction sites	- 65Hz (5:00-17:00) - 60Hz (17:00-05:00) (MoE)	- When local residents complain.	the vibration is the same as trucks movement on NR5 (widening road)
Waste Generation	CP1: Waste storage at construction sites (contractor campsites and temporary worker campsites)	Slurry and other construction waste (Oil waste)	Oil waste: is about 500 l/month	No standards. The oil waste (old oil) discharge from machines	Every day: collect, and temporary store in safety oil waste tanks. The local sub-contractor to collect out 1 time/week (reuse or any purposes)	The oil-plastic waste sell to local private collector
			Recycled amount			
			The way of recycle			
			Treated amount			
			Sell to local subcontractor			waste water flow into the Septic tanks
		General waste (Solid-household waste)	Discharged amount: 70 kg/week	Solid waste/household waste is 70 kg/week	Every day: clean, collect, and temporary store in solid waste tanks. The local sub-contractor collects out 1 time/week to dispose in public waste dumping site	
			Recycled amount	No		
			The way of recycle	No		
			Treated amount	No treat		

Attachment 14-3

Item	Location	Parameter/Means of Monitoring	Result (Average/ Max /Total)	Standards (Local/Inter Standard)	Frequency	Remarks
			Sell to local buyer for reuse.			
Waste Generation	CP2: Waste storage at construction sites (contractor campsites and temporary worker campsites)	Slurry and other construction waste (Oil waste)	Oil waste: is about 400kg /month	No standards. The oil waste (old oil) discharge from machines	Every day , collection The local sub-contractor to collect out 1 time/week (reuse or any purposes)	Collect an store in safety tanks and sell to local private subcontractor for re-use
		Recycled amount	No			
		The way of recycle	No			
		Treated amount	No treat Sell to local buyer for reusing (oil waste and plastic waste).			Sell to local buyer for re-use and recycle
		General waste (Solid-household waste)	Discharged amount: 65 kg/week		Every day: clean, collect, and temporary store in solid waste tanks.	Contract with local license waste company to transport to public dumping site
		Recycled amount	No			
		The way of recycle	No			
		Treated amount	No treat Sell to local buyer for reuse.			
Subsidence	Subsidence prone locations along the project road	Visual inspection, site assessment and interview to the local people	No major adverse impacts	No standards	1 time/week to 1 time/2 weeks (depending on situation)	Minor affects to prone locations along the project road.
Hydrology	River, stream, and reservoir where construction works are executed	Visual inspection on volume of water flow (in up and down stream), and flood occurs	No major adverse impacts		Every day	In The main rivers are crossing NR-5, Most action in raining season.
	CP1, Along NR-5	Visual observation of animals, reptiles, and amphibious	No major adverse impacts or complains. base of discussion with commune leaders and communities, during RAP	No standards Species funded: Acacia, Eucalyptus, Rain tree,	4 time/month	Most village garden crops. The road project is located in village areas, so there are not any sensitive

Item	Location	Parameter/Mean of Monitoring	Result (Average/ Max /Total)	Standards (Local/Inter Standard)	Frequency	Remarks
Ecosystem			meetings and HIV awareness meetings	coconut, banana and a few paddy fields.		ecological and animal resources located there.
	CP2, Along NR-5	Visual observation of animals, reptiles, and amphibious	No major adverse impacts, or complains. base of discussion with commune leaders and communities, during RAP meetings and HIV awareness meetings	No standards Species funded: Acacia, Eucalyptus, Rain tree, coconut, banana and a few paddy fields.	4 time/month	Most village garden crops. The road project is located in village areas, so there are not any sensitive ecological and animal resources located there.
Ecosystem	CP1, BTB bypass	Visual observation and site consultation of animals, reptiles, and amphibious	No major adverse impacts on local ecosystem resources. Most are rice crops and fruit trees	No standards. Species funded: Orange tree, Pomelo, Lagen tree, Neen tree, banana, coconut, Cashew nut, Sugar palm, Rain tree, and more paddy fields.	4 times/month	Bypass is considered than along NR5, especially in wet season, but most are rice crops and fruit trees.
	CP2, SS bypass	Visual observation and site consultation of animals, reptiles, and amphibious	No major adverse impacts on local ecosystem resources. Most are rice crops.	No standards. Species funded: Acacia, Eucalyptus, Neen tree, grass filed, and most areas are paddy fields.	4 times/month	The road project is located in and near village areas, so there are not any sensitive ecological and animal resources. Most of bypass is passing the paddy fields
Endangered Reptiles (Turtle-Fish)	Widening and bypasses	Visual observation/inspection in rivers and ponds	during site investigation. No fund any endangered turtles and wildlife species are in the project areas.	No standards	1-2 time/week	There are not endangered reptiles or species in the project areas. The road project is located in village areas, farm, and rice filed.

Updated: September 2020

Sources: Contractors (CP1-CP2)

Remarks: Past trend and current statute including remedial measures, if necessary.

- The Water Quality results are analyzed by MoE laboratory, in Phnom Penh,

Note:

WHO: World Health Organization,

MoE: Ministry of Environment

N/A: No Applicable

NO₂: Nitrogen Dioxide

SO₂: Sulfur Dioxide

SPM: Suspended Particulate Matters

BOD: Biochemical Oxygen Demand

COD: Chemical Oxygen Demand

TSS: Total Suspended Solid.