Environmental Monitoring Form for Construction Stage
Contract Package 1

Item	Location	Parameter/Means of Monitoring	Result (Average/ Max /Total..)	Standards (Local/Inter Standard)	Frequency	Remarks
Air Quality	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			Every day	site works
	Storage facilities for dust generation		No major adverse impacts			Every day, especially in dry season
	AQS-1 (April 08th, 2019) KP: 39+200 Okdong District Hospital, Kompong Speu Province.	**PM10**	AQS1 = 0.122mg/m^3	0.05 mg/m^3 (WHO, average 24h)	2 times in dry season 2 times in wet season	We will use mobile device to check for daily and weekly monitoring. Seasonal monitoring shall be done at the same point on EIA Both PM10 and PM2.5 are exceed the standard. This much amount of particulate matters might be owing to the emission of dust from the transportation activities along the NR5 rather than as result of the construction activities of the SMCC. Therefore, the air quality within above section is still good quality, no any impact to the environment as well as to the public health. If compare to the January data, PM10 and PM2.5 are better than that month due to no construction activities of SMCC near that area.
		PM2.5	AQS1 = 0.058mg/m^3	0.025 mg/m^3 (WHO, average 24h)		
		SO_2	AQS1 = 0.017mg/m^3	0.30 mg/m^3 (WHO average 24h)		
		NO_2	AQS1 = 0.022mg/m^3	0.10 mg/m^3 (WHO average 24h)		

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Item	Location	Parameter/Means of Monitoring	Result (Average/ Max /Total..)	Standards (Local/Inter Standard)	Frequency	Remarks
Water Quality	WS-1 (08th of April 2019) KP:32+000 at LHS, Pond, 200m from ROW (water sampling point will be replaced due to far from the road WS-2 (08th of April 2019) KP: 32+300 at RHS, in Tonle Sap river, in front of Prek Prang Pagoda	Visual observation/inspection	No major adverse impacts	No standards	Every day	Contractor and inspector
		pH	WS-1=7.16 WS-2=6.9	6.5-8.5 (MoE)	1 time in dry season 1 time in wet season	We will use mobile device to check for daily and weekly monitoring. Seasonal monitoring shall be done at the same point on EIA. The result of water quality analysis is indicated for two sites (WS-1 and WS-2). WS-3 and WS-4 are very dry in this month (April, 2019) and there is no water be available for sampling. Additionally, there are no construction activities nearby these sites.
		TSS	WS-1=31.00 WS-2=13.00	25-100 mg/l (MoE)		
		BOD	WS-1=1.00 WS-2=4.44	1-10 mg/l (MoE)		
		COD	WS-1=2.74 WS-2=7.84	1-8 mg/l (MoE)		
		Total Coliform	WS-1=1.5×10^3 WS-2=9.2×10^2	<5,000 (Japanese Standard)		
Noise	ANV-1 (April 08th, 2019) KP:39+200 Odong District, Kompong Speu Province (Odong district hospital)	Noise Level (MoE Laboratory)	ANV-1= -55dB (6:00-18:00) -54dB (18:00-22:00) -49dB (22:00-06:00)	- 60 dB (06:00-18:00) - 50dB (18;00-22:00) - 45dB (22:00-06:00) (MoE, residential area)	1 time in dry season 1 time in wet season	Visual check and maintain the construction equipment
Vibration		Vibration Level (MoE Laboratory)	ANV-1 -38Hz (7:00-20:00) -38Hz (20:00-7-00)	- 65Hz (7:00-20:00) - 60Hz (20:00-7:00) (MoE)		Visual regularly check and maintain the construction equipment. The engineer and contractor will use mobile device for daily/weekly check depend on situation at construction site

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Item	Location	Parameter/Means of Monitoring		Result (Average/ Max /Total..)	Standards (Local/Inter Standard)	Frequency	Remarks
Waste Generation	Waste storage at construction site	Slurry and other construction waste	Discharged amount	The result was shown in table of waste data	No standards	Every day	Septic tank
			Recycled amount				
			The way of recycle				
			Treated amount				
			Local of final disposal				
		General waste	Discharged amount	The result was shown in table of waste data			
			Recycled amount				
			The way of recycle				
			Treated amount				
			Local of final disposal				Land-fill of provincial authority
Subsidence	Subsidence prone locations along the project road	Visual inspection and interview to the local people		No impact at construction site	No standards	1 time/week to 1 time/month (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 and speed of water flow		No impacts at construction site		Every day	In The main rivers and canals are crossing NR-5, sometime, was raining.
Ecosystem	EC-1 KP 35 and KP 37+200 (29th of Jan 2019) Odong bypass as requested by JICA and Client	Visual observation of animals, reptiles, and amphibious		Mammal = None Amphibian =None Reptile = None Birds = 6 Fishes = 12 Flora = None Insect=None	No standards	One time in dry season and one time in rainy season	Visual survey shall be done near permanent river. Based on visual observation and interviewing with local villagers, there is no existing any species within the list of IUCN, so it is very minor impacts.

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

Note:

WHO: World Health Organization,
MoE: Ministry of Environment,
NO_2: Nitrogen Dioxide,
SO_2: Sulfur Dioxide,
PM: Particulate Matters,
BOD: Biochemical Oxygen Demand
COD: Chemical Oxygen Demand
TSS: Total Suspended Solid

1. Schedule of Seasonal Monitoring

The seasonal periodical monitoring for air quality, noise and vibration were done on 8th of April 2019, water quality was conducted on 8th of April 2019 and ecosystem survey was implemented on 8th of April 2019.

Table 1.1 Monitoring Items and Frequency

Year	2018	2019				2020				2021				2022			
	29th Nov	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct
Item	Rainy	Dry	Dry	Rainy	Rainy	Dry	Dry	Rainy	Rainy	Dry	Dry	Rainy	Rainy	Dry	Dry	Rainy	Rainy
1. Air Quality	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2. Water Quality	●		●		●		●		●		●		●		●		●
3. Noise	●		●		●		●		●		●		●		●		●
4. Vibration	●		●		●		●		●		●		●		●		●
8. Ecosystem		●	●		●		●		●		●		●		●		●

2. Seasonal Monitoring Points and Areas

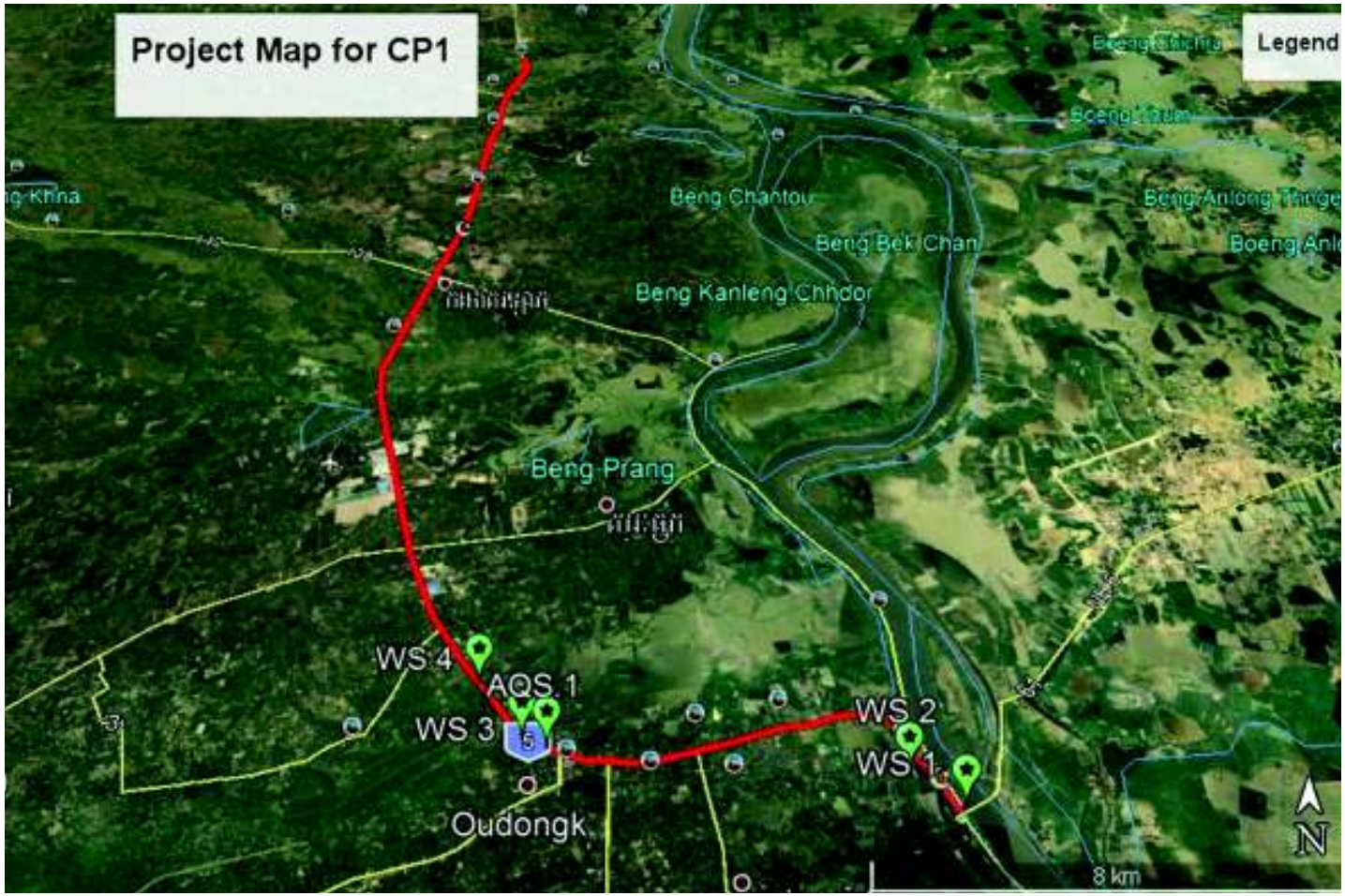
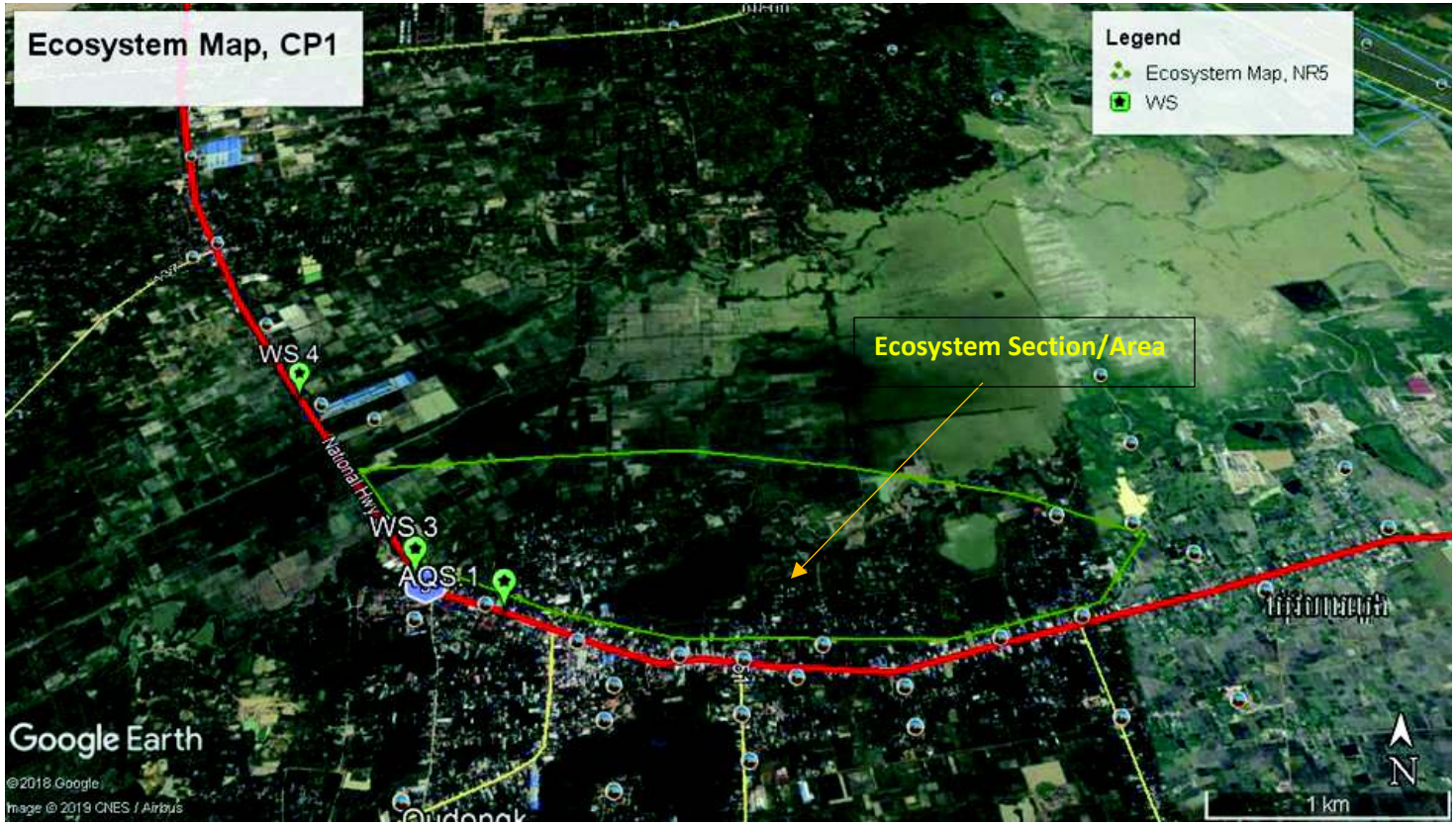


Figure-1: Designed Monitoring Points for Package 1 Section (Sta 31+370 - Sta 73+000)

3. Ecosystem Map and Area for CP1 (Odong Bypass)



4. The Solid Waste Generation in May, 2019

Location	General waste				Construction waste			
	General Amount Kg/month	Recycle Amount (kg/month)	Mean of Recycle	Disposal	General Amount Kg/month	Recycle Amount (kg/month)	Mean of Recycle	Disposal
CP1 office (PK35)	50	5	Provide to cleaner	Dumpsite	-	-	-	-
Concrete waste of clearing	-	-	-	-	50 m^3			Under process of negotiation with dump truck to collect
Feb yard (PK78)	40	10	Sold to scavenger	Dumpsite	15kg of scarp waste	15kg	Sold to scavenger	
KV yard (37+570)	20	5	Sold to scavenger	Dumpsite	100kg of Scarp waste	100kg	Sold to scavenger	-
CT yard (PK65)	-	-	-	-	-	-	-	-
Bridge 16A	-	-	-	-	13m^3 of concrete waste	13m^3	Backfill at bridge 16A	-
Total	**110**	**20**	-	-	**115kg+60m^3**	**115kg+13m^3**	-	-

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Item	Location	Parameter/Means of Monitoring	Result (Average/ Max /Total..)	Standards (Local/Inter Standard)	Frequency	Remarks
Air Quality	Construction site	Visual inspection of mechanical condition and exhaust gas	No major adverse impacts	No standards	Every day before working	At construction campsites
	Storage facilities for dust generation	Visual observation of dust	No major adverse impacts		Every day	site works
						Every day, especially in dry season
	AQS-2 (April 7th, 2019) KP: 89+250 At RHS in Department of Social Veteran and Youth Rehabilitation of Krong Kompong Chhnang, Kompong Chhnang Province. AQS-3 (April 6th, 2019) KP: 97+300 At LHS, rice field area more than 100m from ROW, in Trapaeng Por Village, Pong Ru commune, Rolea B'ear district, Komponng Chhnang province.	**PM10**	AQS-2=0.104 AQS-3=0.079	0.05 mg/m^3 (WHO, average 24h)	2 times in dry season 2 times in wet season	We will use mobile device to check for daily and weekly monitoring. Both PM10 and PM2.5 are exceed the standard. This much amount of particulate matters might be owing to the emission of dust from the transportation activities along the NR5 rather than as result of the construction activities of the SMCC. The presence of the construction activities of NR.5 improvement project might contribute little to this because following the daily monitoring and SMCC inspector has always implement the dust control measure such as water spraying on the access road to construction sites and limit the driving speed of vehicles and loading trucks.
		PM2.5	AQS-2= 0.042 AQS-3=0.042	0.025 mg/m^3 (WHO, average 24h)		
		SO_2	AQS-2=0.018 AQS-3=0.016	0.30 mg/m^3 (WHO average 24h)		
		NO_2	AQS-2= 0.020 AQS-3=0.022	0.10 mg/m^3 (WHO average 24h)		

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Item	Location	Parameter/Means of Monitoring	Result (Average/ Max /Total..)	Standards (Local/Inter Standard)	Frequency	Remarks
Water Quality	WS-5 (5th of April 2019) KP:82+500 at RHS, Chrey Bak river downstream, near Phnom Chompus Pagoda Andoung Svay commune, Rolea Bíer district, Kompong chhnang province. WS-6 (5th of April 2019) KP: 91+700 at LHS of bypass, Srah Por lake, Thmar Keo village, Svay Chrum commune, Rolea B'ier district, Kompong Chhnang province. WS-7 (5th of April 2019) KP: 106+350 at RHS, downstream Srah Angkam lake, Thmar Keo village, Svay Chrum commune, Rolea B'ier district, Kompong chhnang province. WS-8 (5th of April 2019) KP: 117+118 at RHS, downstream Boribo river, Phsar village, Phsar commune, Boribo district, Kompong Chhnang province.	Visual observation/inspection	No major adverse impacts	No standards	Every day	Contractor and inspector
		pH	WS-5=6.95 WS-6=7.35 WS-7=6.33 WS-8=6.69	6.5-8.5 (MoE)	1 time in dry season 1 time in wet season	We will use mobile device to check for daily and weekly monitoring. Seasonal monitoring shall be done at the same point on EIA WS-5 and WS-6 have SS and Total Coliform exceed the standards of public water quality. The reason behind this status are mostly related to the activities of local people living around the water bodies such as using water for bathing their cattle at SW-6, and sand dredging or dyke building at WS-5 site.
		TSS	**WS-5=282.00** **WS-6=177.00** WS-7=42.00 WS-8=36.00	25-100 mg/l (MoE)		
		BOD	WS-5=1.40 WS-6=3.00 WS-7=1.60 WS-8=2.00	1-10 mg/l (MoE)		
		COD	WS-5=4.49 WS-6=8.23 WS-7=3.92 WS-8=5.09	1-8 mg/l (MoE)		
		Total Coliform	**WS-5=15,000** **WS-6=46,000** WS-7=4,300 WS-8=4,300	<5,000 (Japanese Standard)		

Environmental Monitoring Form for Construction Stage
Contract Package 2

Item	Location	Parameter/Means of Monitoring	Result (Average/ Max /Total..)	Standards (Local/Inter Standard)	Frequency	Remarks
Noise	ANV-2 (07th of April, 2019) PK 89+250 at RHS in Department of Social Veteran and Youth Rehabilitation of Krong Kampong Chhnang, Kampong Chhnang province ANV-3 (06th of April, 2019) PK 97+300 at LHS, residential area in Trapeang Por village, Pong Ro commune, Rolea B'ier district, Kampong Chhnang province	Noise Level (MoE Laboratory)	ANV-2 - 58dB (06:00-18:00) - 52dB (18:00-22:00) - 51dB (22:00-06:00) ANV-3 - 67dB (06:00-18:00) - 60dB (18:00-22:00) - 61dB (22:00-06:00)	- 60 dB (06:00-18:00) - 50dB (18;00-22:00) - 45dB (22:00-06:00) (MoE, residential area)	1 time in dry season 1 time in wet season	Visual check and maintain the construction equipment The results of sound level were found slightly over the allowable standard of noise level. These noises are results of unexhausted commuting activities on the national road No.5 between crowed cities of Poipet & Battambong to Phnom Penh, the capital city of Cambodia. The presence of construction activities which consist of transportation of loading trucks from borrow pits to road construction sites and road clearing and grubbing might have contributed very little or none to these noise statuses. This is because of the very few activities of the project within measurement period owing to the standby of most of the project activities from 22th of March 2019 to 18th of April 2019.
Vibration		Vibration Level (MoE Laboratory)	ANV-2 - 18Hz (07:00-20:00) - 18Hz (20:00-07:00)	- 65Hz (07:00-20:00) - 60Hz (20:00-07:00)		The vibration levels were generally within the standards for the construction activities. This means that daily traffic activity and construction activities of the project have not resulted in any concern over the vibration yet.

Environmental Monitoring Form for Construction Stage
Contract Package 2

Item	Location	Parameter/Means of Monitoring		Result (Average/ Max /Total..)	Standards (Local/Inter Standard)	Frequency	Remarks
Waste Generation	Waste storage at construction site and campsites	Slurry and other construction waste	Discharged amount	The attached result table will be shown	No standards	Every day	Septic tank
			Recycled amount				
			The way of recycle				
			Treated amount				
			Local of final disposal				
		General waste	Discharged amount	The attached result table will be shown			
			Recycled amount				
			The way of recycle				
			Treated amount				
			Local of final disposal				Land-fill of provincial authority
Subsidence	Subsidence prone locations along the project road	Visual inspection and interview to the local people		No impact at construction site	No standards	1 time/week to 1 time/month (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 and speed of water flow		No impacts at construction site		Every day	In The main rivers and canals are crossing NR-5, sometime, was raining.
Ecosystem	(23rd of April 2019) EC-02 KP 78+800 At Kiri Vong Kut Pagoda EC-03 KP 106+000 near Srah Angkam Bridge EC-04 KP 117+000 Boribo river along NR5 EC-05&EC-06 KP 91+700 At Trapaeng Por Lake	Visual observation of animals, reptiles, and amphibious		Mammal = 8 Amphibian =4 Reptile = 16 Birds = 30 Fishes = 83	No standards	One time in dry season and one time in rainy season	Visual survey shall be done near permanent river This survey was conducted by interviewing with local fisherman and local people about the presence of fauna resource listed in the table of checklist and taking photos of observing fauna resources by the environmentalist.

Environmental Monitoring Form for Construction Stage
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Item	Location	Parameter/Means of Monitoring	Result (Average/ Max /Total..)	Standards (Local/Inter Standard)	Frequency	Remarks
						Most of the mammal, amphibian, reptile and bird are generally present in the area in both rainy and dry season. For this result, we find there is no much change from the previous survey in the beginning of dry season in January 2019.

Remarks: Past trend and current statute including remedial measures, if necessary.
Note:
WHO: World Health Organization, **SO_2:** Sulfur Dioxide, **COD:** Chemical Oxygen Demand
MoE: Ministry of Environment, **PM:** Particulate Matters, **TSS:** Total Suspended Solid
NO_2: Nitrogen Dioxide, **BOD:** Biochemical Oxygen Demand

1. Schedule of Seasonal Monitoring

The seasonal periodical monitoring for air quality, noise and vibration were done on 6th and 7th of April 2019, water quality was conducted on 5th of April 2019 and ecosystem survey was implemented on 23rd of April 2019.

Table 1.1 Schedule of Seasonal Monitoring

Year	2018	2019				2020				2021				2022			
	29th Nov	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct
Item	Rainy	Dry	Dry	Rainy	Rainy	Dry	Dry	Rainy	Rainy	Dry	Dry	Rainy	Rainy	Dry	Dry	Rainy	Rainy
1. Air Quality	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2. Water Quality	●		●		●		●		●		●		●		●		●
3. Noise	●		●		●		●		●		●		●		●		●
4. Vibration	●		●		●		●		●		●		●		●		●
8. Ecosystem		●	●		●		●		●		●		●		●		●

2. Seasonal Monitoring Points and Areas

Figure 2.1: Designed Monitoring Points for Package 2 Section (Sta 73+000 - Sta 120+000)

3. The Solid Waste Generation in May, 2019

Location	General waste				Construction waste			
	General Amount Kg/month	Recycle Amount (kg/month)	Mean of Recycle	Disposal	General Amount Kg/month	Recycle Amount (kg/month)	Mean of Recycle	Disposal
CP2 office	165	7	Sold to scavenger	Dumpsite	-	-	-	-
SMCC Accommodation	150	5	Sold to scavenger	Dumpsite	-	-	-	- -
MOTORPOOL	450	-	-	Dumpsite	20 (Scrap waste)	20	Sold to scavenger	-
LOT1	15	-	-	Dumpsite	55 (Formwork)	-	-	Dumpsite
LAT2	20	-	-	Dumpsite	45 (Formwork)	-	-	Dumpsite
CLE Accommodation	130	4	Sold to scavenger	Dumpsite	15 (Scrap waste)	50	Sold to scavenger	-
CLE Yard	190	5	Sold to scavenger	Dumpsite	-	-	-	-
KCNC	-	-	-	-	-	-	-	-
Total	**1,120**	**21**	-	-	**135**	**70**	-	-

Environmental Monitoring Form for Construction Stage
Contract Package 3

Item	Location	Parameter/Means of Monitoring	Result (Average/ Max /Total..)	Standards (Local/Inter Standard)	Frequency	Remarks
Air Quality	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			Every day	site works
	Storage facilities for dust generation		No major adverse impacts			Every day, especially in dry season
	AQS-4 (11th of May, 2019) PK-135+600 Kbal Damrei village, Ansa Chambork commune, Krakor district, Pursat province AQS-5 (22th of January, 2019) PK-170+340 Kcandol Sar Village, Beung Kantout commune, Krakor district, Pursat province	**PM10**	AQS4 = 0.078mg/m^3 AQS5 = 0.081mg/m^3	0.05 mg/m^3 (WHO, average 24h)	2 times in dry season 2 times in wet season	We will use mobile device to check for daily and weekly monitoring. Seasonal monitoring shall be done at the same point on EIA PM10 and PM2.5, are highly above the standard value of MoE and guideline of IFC. This might be because of the increase of transportation along the road, as well as the presence of dust on the road. Through this result, we could draw a conclusion that even there is no many activities of the road construction, the air quality at the monitoring sites is already polluted by the particular matter.
		PM2.5	AQS4 = 0.044mg/m^3 AQS5 = 0.056mg/m^3	0.025 mg/m^3 (WHO, average 24h)		
		SO_2	AQS4 = 0.008mg/m^3 AQS5 = 0.011mg/m^3	0.30 mg/m^3 (WHO average 24h)		
		NO_2	AQS4 = 0.011mg/m^3 AQS5 = 0.013mg/m^3	0.10 mg/m^3 (WHO average 24h)		
Water Quality	WS-9 (11th of May 2019) PK-170+700 Ou Chankok river, Tnot Chum commune, Krokor district, Pursat province	Visual observation/inspection	No major adverse impacts	No standards	Every day	Contractor and inspector
		pH	7.18	6.5-8.5 (MoE)	1 time in dry season 1 time in wet season	We will use mobile device to check for daily and weekly monitoring. Seasonal monitoring shall be done at the same point on EIA. The water quality in this main river is under the water standard as stipulated in the Sub-decree on Water Pollution Control (1999)
		TSS	160	25-100 mg/l (MoE)		
		BOD	1.96	1-10 mg/l (MoE)		
		COD	4.40	1-8 mg/l (MoE)		
		Total Coliform	1200	<5,000 (Japanese Standard)		

Environmental Monitoring Form for Construction Stage
Contract Package 3

Item	Location	Parameter/Means of Monitoring	Result (Average/ Max /Total..)	Standards (Local/Inter Standard)	Frequency	Remarks
						of Ministry of Environment (MoE), except TSS parameter is higher than MoE standard and Japanese standard, caused by rain at the upstream of river a few days before sampling.
Noise	ANV-4 (11th of May, 2019) PK-135+600, Kbal Damrei village, Ansar Chambork commune, Krakor district, Pursat province. ANV-5 (11th of May, 2019) PK-170+340, Kandol Sar village, Beung Kantuot commune, Krakor district, Pursat province.	Noise Level (MoE Laboratory)	ANV-4, 59 dB (06:00-18:00) 50 dB (18:00-22:00) 47 dB (22:00-06:00) AQS-5 67 dB (06:00-18:00) 64 dB (18:00-22:00) 65 dB (22:00-06:00)	- 60 dB (06:00-18:00) - 50dB (18;00-22:00) - 45dB (22:00-06:00) (MoE, residential area)	1 time in dry season 1 time in wet season	Visual check and maintain the construction equipment. The noise level at both sampling sites, ANV-4 and ANV-5 are lower than standard, except at nigh time, the noise level slightly above the allowance standard value. We found that even there is no many construction activities at the monitoring site during the monitoring date, the monitoring sites are already disturbed by the transportation activities on NR.5, which is an important route connecting Phnom Penh capital city to Battambong and Poipet, an international border gate to Thailand.
Vibration		Vibration Level (MoE Laboratory)	AQS-4 20 Hz (7:00-20:00) 19 Hz (20:00-07:00) AQS-5 34 Hz (7:00-20:00) 33 Hz (20:00-07:00)	- 65Hz (06:00-18:00) - 60Hz (18:00-06:00) (MoE)		The results of vibration level measurement in 24 hours at both sampling sites, ANV-4 and ANV-5 within the package 3 area showed a good condition. Vibration levels are under the allowable maximum standard level. This is because of no major construction activities have been done during the point of time of the construction stage.

Environmental Monitoring Form for Construction Stage
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Item	Location	Parameter/Means of Monitoring		Result (Average/ Max /Total..)	Standards (Local/Inter Standard)	Frequency	Remarks
Waste Generation	Waste storage at construction site and campsites	Slurry and other construction waste	Discharged amount	The result table will be shown below.	No standards	Every day	Septic tank
			Recycled amount				
			The way of recycle				
			Treated amount				
			Local of final disposal				
		General waste	Discharged amount	The result table will be shown below.			
			Recycled amount				
			The way of recycle				
			Treated amount				
			Local of final disposal				
Subsidence	Subsidence prone locations along the project road	Visual inspection and interview to the local people		No impact at construction site	No standards	1 time/week to 1 time/month (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 and speed of water flow		No impacts at construction site		Every day	In The main rivers and canals are crossing NR-5, sometime, was raining.
Ecosystem	EC-1 KP 170+700 (24th of April 2019)	Visual observation of animals, reptiles, and amphibious		Mammal = 4 Amphibian = 4 Reptile = 8 Birds = 5 Flora = 20 Insect = 2 Flora = 61	No standards	One time in dry season and one time in rainy season	Visual survey shall be done near permanent river This survey was conducted by interviewing with local fisherman and local people about the presence of fauna resource listed in the table of checklist and taking photos of observation fauna resource by the environmentalist.

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

Note:
WHO: World Health Organization,
MoE: Ministry of Environment
NO_2: Nitrogen Dioxide
SO_2: Sulfur Dioxide
PM: Particulate Matters
BOD: Biochemical Oxygen Demand
COD: Chemical Oxygen Demand
TSS: Total Suspended Solid

1. Schedule of Seasonal Monitoring

The seasonal periodical monitoring for air quality, noise and vibration were done on 11th May 2019, water quality was conducted on 11th of May 2019 and ecosystem survey was implemented on 24th of April 2019.

Table 1.1 Schedule of Seasonal Monitoring

Year	2018	2019					2020				2021				2022			
Item	28th Dec	21st Feb	24th Apr	11th May	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct
	Dry	Dry	Dry	Dry	Rainy	Rainy	Dry	Dry	Rainy	Rainy	Dry	Dry	Rainy	Rainy	Dry	Dry	Rainy	Rainy
1. Air Quality	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2. Water Quality	●			●		●		●		●		●		●		●		●
3. Noise	●			●		●		●		●		●		●		●		●
4. Vibration	●			●		●		●		●		●		●		●		●
8. Ecosystem		●	●			●		●		●		●		●		●		●

2. Seasonal Monitoring Points/Areas and Ecosystem survey

Figure-2: Designed Monitoring Points for Package 3 Section (Sta 120+000 - Sta 171+200)

3. The Solid Waste Generation in May, 2019

Location	General waste				Construction waste			
	General amount	Recycle amount	Mean of recycle	Disposal	General amount	Recycle amount	Mean of recycle	Disposal
HS office (PK145)	86	65	provide to cleaner	dumpsite	-	-	-	-
VHCM office (PK145)	94	58	provide to cleaner	dumpsite	0.90m^3 of concrete waste	0.85 m3	backfill at courtyard	-
					160kg of scarp waste	154 kg	sold to scavenger	dumpsite
DP office (PK144)	136	86	provide to cleaner	dumpsite	3m3 of concrete waste	3 m3	backfill at courtyard	-
					30kg of scarp waste	28 kg	sold to scavenger	dumpsite
HSB office (PK164)	128	71	provide to cleaner	dumpsite	-	-	-	-
					15kg of scarp waste	12 kg	sold to scavenger	dumpsite
Total	**444**	**280**	-	-	**205kg+3.9m3**	**194kg+3.85m3**	-	-

Attachment 4-2

Environmental Monitoring Form for Service Stage

Item	Location		Parameter/ Means of Monitoring	Result (Average / Max / Total, etc.)	Standard	Frequency	Remarks
Air quality	BTB-KP 300	road side	SPM10		0.05 mg/m^3 (WHO, average 24h)	2 times in dry season and 2 times in rainy season	
		200m away from road side					
	BTB Bypass intersection with NR-57	road side					
		200m away from road side					
	BMCH-KP 356	road side					
		200m away from road side					
	BTB-KP 300	road side	SPM2.5		0.02 mg/m^3 (WHO, average 24h)		
		200m away from road side					
	BTB Bypass intersection with NR-57	road side					
		200m away from road side					
	BMCH-KP 356	road side					
		200m away from road side					
	BTB-KP 300	road side	SO_2		0.30 mg/m^3 (MOE, average 24h)		
		200m away from road side					
	BTB Bypass intersection with NR-57	road side					
		200m away from road side					
	BMCH-KP 356	road side					
		200m away from road side					
	BTB-KP 300	road side	NO_2		0.10 mg/m^3 (MOE, average 24h)		
		200m away from road side					
	BTB Bypass intersection with NR-57	road side					
		200m away from road side					
	BMCH-KP 356	road side					
		200m away from road side					
Noise	BTB KP 300, ROW boundary		Noise Level		60dB (06:00-18:00) 50dB (18:00-22:00) 45dB(22:00-06:00) (MOE, residential area)		
	BTB Bypass intersection with NR-57, ROW boundary						
	BMCH-KP 356, ROW boundary						
Vibration	BTB KP 300, ROW boundary		Vibration Level		65Hz (05:00-17:00) 60Hz (17:00-05:00) (Lab. MOE)		
	BTB Bypass intersection with NR-57, ROW boundary						
	BMCH-KP 356, ROW boundary						
General waste	Along the road and public gathering		Discharged amount			Surveyed 1 time per year based on the data of institution for garbage collection.	
			Recycled amount				
			The way of recycle				
			Treated amount				
			Location of final disposal site				
Subsidence	Building and other structure in BTB Province		Rising up of building is visually inspected			2 times in dry season and 2 times in rainy season	
	Building and other structure in BMCH Province						
Ecosystem	Along NR-5		Visual observation of animals, reptiles and amphibious			Every half year (1 time in dry season and 1 time in rainy season)	
	Odongk bypass						
	Kampong Chhnang bypass						

**Remarks; Past trend and current status including remedial measures if necessary