#### ENVIRONMENTAL MONITORING FORMAT.

#### MONITORING POINT:

**QUARTER:** 

MONTH & YEAR: January/February / March 2018.

SITE: Construction of new 220/132/33/11 kV Port / Colombo L Substation.

#### Remarks

 The latest results of the below monitoring items shall be submitted to the lenders as part of Quarterly Progress Report throughout the construction phase.

Measurement points will be: i) at one place per Under Ground Cable line under Construction, and ii) at grid Substation
under construction. Total number of measurement points therefore depend on the construction progress. Please print
sufficient numbers of this form to collect all required information at all monitoring points.

# 1. RESPONSE / ACTIONS TO COMMENTS AND GUIDANCE FROM GOVEMENT AUTHORITIES AND THE PUBLIC

Monitoring Item	Area / Organization	Date	Monitoring: Results during Report Period
Number and contents of formal comments made by the public	None		
Number and contents of responses from Government agencies	None		

#### 2. POLLUTION

WATER OUALITY (Effluent /Wastewater/Ambient Water Ouality)

Item	Method	. Frequency	Measurement Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka	Standards for Contract	Referred Internationa Standards
SS (Suspended Solid)	Field sampling	Once a year	27-04-2017	mg/l	Less than 1	Less than 1	50 for inland surface waters 150 for marine coastal areas	АРНА	АРНА
Oil	Field sampling	Once a year	27-04-2017	mg/l	2.3	2.3	10 for inland surface waters 20 for marine coastal areas	APHA	АРНА

(Remarks) Please attach additional sheets for details information if required

(Other Remarks) Please refer attached additional sheets of project environmental measurements schedule Table 2.2:

AIR QUALITY (Ambient Air Quality)

Item	Method	Frequency	Measuremen t Date & Month	Unit	Measured Value (Mean) (ug/m3)	Measured Value (Max.)	Sri Lanka Standards*	Standard s for Contract	Referred Internatio nal Standards
SPM (Suspended Particulate Matter) incl. dust	Hi- Volume sampling Gravimetric	Two times during construction	23 <sup>rd</sup> March	mg/m³	67(ug/m³)	67(ug/m3)	Annual 0.10 24hrs: 0.30 8hrs: 0.3S 3hrs: 0.45 1hr. 0.50	ASTMD 4096-82	ASTMD 4096-82

(Remarks) 1. Frequency is subject to increase / decrease depending on the intensity of impact found in the previous result

2. National Environmental (Ambient Air Quality ) Regulations

Other Remarks) Please refer attached additional sheets of project environmental measurements schedule Table 2.2:

# NOISE

Item	Method	Frequenc y	Measureme nt Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
	Measurement-1		23 <sup>rd</sup> March 2017	dB(A)	66	70		ISO 1996 BS 4142(1990)	ISO 1996 BS 4142(1990)
Noise Level	Measurement-2	•	23 <sup>rd</sup> March 2017	dB(A)	66	70	day time: 75 night time: 50		
	Measurement-3		23 <sup>rd</sup> March 2017	dB(A)	66	70	day time: 75 night time: 50	· I	

(Remarks) National Environmental (Noise control ) Regulations
(Other remarks) Please refer attached additional sheets of project environmental measurements schedule Table 2.2:

#### VIBRATION.

Item	Method	Frequenc y	Measuremen t Date & Month	Unit	Measur ed Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
	Measurement-1		3 <sup>rd</sup> May 2017	mm / sec.	0.105	0.145	5.0 mm / sec.		
Vibration Level	Measurement-2	Annually (but not			1.000	1.009	5.0 mm / sec.		
	Measurement-3	mention)	,	,	0.900	0.957	5.0 mm / sec.		

(Remarks) There has been no official standard stipulated by CEA

(Other remarks) Please refer attached additional sheets of project environmental measurements schedule Table 2.2:

# SOIL CONDITION

Item	Method	Frequency	Measurement Date & Month	Monitoring Results during Report Period	Measured to be Taken
Soil condition	Physical Observation	weekly	January 05/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	January 12/2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	January 19/2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	January 26/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	February 02/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	February 09/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	February 16/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	February 23/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	March 02/2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	March 09/2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	March 16/2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	March 23/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	March 30/ 2018	No hannful soil	None.

(Remarks) Please attached additional sheets for bi-weekly reports (Other remarks) Please attach additional sheets if required.

#### SOLID WASTE

Item	Method	Frequency	Measurement Date & Month	Monitoring Results during Report Period	Measured to be Taken
Solid waste	Physical Observation	weekly	January 05/ 2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	January 12/2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	January 19/ 2018	No barraful soil	None.
Solid waste	Physical Observation	weekly	January 26/ 2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	February 02/ 2018	No hannful soil	None.
Solid waste	Physical Observation	weekly	February 09/ 2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	February 16/2018	No harmful soil	None.
Golid waste	Physical Observation	weekly	February 23/ 2018	No harmful soil	None.
solid waste	Physical Observation	weekly	March 02/2018	No harmful soil	None.
olid waste	Physical Observation	weekly	March 09/2018	No harmful soil	None.
olid waste	Physical Observation	weekly	March 16/2018	No harmful soil	None.
olid waste	Physical Observation	weekly	March 23/ 2018	No harmful soil	None.
olid waste	Physical Observation	weekly	March 30/2018	No harmful soil	None.
(emarks) Please	attach additional sheets if	required.			

# 3. NATURAL ENVIRONMENT

N/A

#### 4. SOCIAL ENVIRONMENT

# - WORKING CONDITION, SAFETY AND HEALTH

Item	Method	.Frequency	Measurement Date & Month	Monitoring Results during Report Period	Measured to be Taken
Working condition, safety and health	Physical Observation by Engineer.	Monthly	03 <sup>rd</sup> January 2018 6 <sup>th</sup> February 2018 14 <sup>th</sup> March 2018	Inspection report send to Main contractor	Action completed.
Working condition, safety and health, Environment	Physical Observation by Contractor.	Weekly	From first week January 2018 to last week March 2018.	Inspection report send to Sub contractors	Action completed and process on going.
(Remarks) Please	attach additional sheets	if required			

# TRAFFIC VOLUME (applied to Under Ground Cable extension work only. Not applied to construction of grid substations)

Iţem	Method	Frequency	Measuremen t Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Measured to be Taken
				1	ļ.		

(Remarks) Please attach additional sheets if required.

(Other remarks) Please attach additional sheets if required.

#### A COUNTINGS

Item	Method	Frequency	Measurement Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Measured to be Taken
No of accidents by increased traffic							
	None						
Traffic Volume					ļ ·		
No of accidents by construction work	Dagen firet am L	Weekly	From first week January 2018 to last week March 2018.	No's	Maintaining site based first aid registry		Reported 13 number of minor injuries. And 28 first aid treatments reported for the JAN-FEB-MAR 2018.

(Remarks) 1. Please attach additional sheets if required.

2. No of accident by increased traffic will be supplied only to Under Ground Cable extension work. Not applied to construction of grid substations.

[Other remarks) Please attach additional sheets if required.

# Greater Colombo Transmission and Distribution Loss Reduction Project

Table 2.2: Environmental Measurements Schedule

Aspect	Parameter	Method	Stage	Frequency	Responsibility	Location
Noise level	Day and Night time Noise level	Portable noise meter (range 0-120 dB(A))	Pre- construction	Once (Baseline measurement)	Contractor / CEB	At Substation boundary;
	(dB)	(1811) 0-120 0-171)	Construction	Once a year	Contractor / CEB	Sensitive locations of Transmission &
			Operation	Once; On complaints	CEB	Distribution routes;
Air quality	SO <sub>2</sub> , NO <sub>2</sub> , CO, PM <sub>10</sub> , SPM	Spectrometric method; High volume sampling	Pre- construction	Once (Baseline measurement)	Contractor / CEB	At Substations; Sensitive locations of
	1 111,0, 01 111	and Gravimetric analysis	Construction	Two times	Contractor / CEB	Transmission and Ostribution routes:
	1		Operation	Once; On complaints	CEB	ESUIDUIDIT TOURS.
Water Quality	EC, TSS, DO, BOD, COD, pH,	Portable water quality Meter, Spectrometric	Pre- construction	Once (Baseline measurement)	Contractor / CEB	Nearest water sources at Substations;
~~,	Oil and grease,	method	Construction	Once a year	Contractor / CEB	Sensitive locations of Transmission &
	{		Operation	Once;	CEB	Distribution routes;
				On complaints	,	

# ENVIRONMENTAL MONITORING FORMAT.

#### MONITORING POINT:

QUARTER:

MONTH & YEAR: January/ February / March 2018.

SITE: Construction of new 132/11 kV Colombo M Substation.

#### Remarks

1. The latest results of the below monitoring items shall be submitted to the lenders as part of Quarterly Progress Report throughout the construction phase.

2. Measurement points will be: i) at one place per Under Ground Cable line under Construction, and ii) at grid Substation under construction. Total number of measurement points therefore depend on the construction progress. Please print sufficient numbers of this form to collect all required information at all monitoring points.

# 1. RESPONSE / ACTIONS TO COMMENTS AND GUIDANCE FROM GOVEMENT AUTHORITIES AND THE PUBLIC

Monitoring Item	Area / Organization	Date	Monitoring: Results during Report Period
Number and contents of formal comments made by the public	None		
Number and contents of responses from Government agencies	None	,	

#### 2. POLLUTION

# - WATER QUALITY (Effluent /Wastewater/Ambient Water Quality)

No generation of waste water

AIR QUALITY (Ambient Air Quality)

Item	Method	Frequency	Measurement	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
TSPM (Total Suspended Particulate Matter) incl. dust	ASTM 4096 – 82, 1997 High - Volume sampling Gravimetric Analysis	Quarterly	23/03/2017	ug/m³	3hr: 94	-	3hrs: 450	= SL Standards	NA
PM <sub>10</sub> (Particulate Matter - 10 micrometers or less in diameter)	ASTM 4096 – 82, 1997 High - Volume sampling Gravimetric Analysis		22-23/03/2017	ug/m³	24lır: 52	- -	24hrs: 100	= SL Standards	NA
PM2.5 (Particulate Matter - 2.5 micrometers or less in diameter)	ASTM 4096 – 82, 1997 High : Volume sampling Gravimetric Analysis	Quarterly	22-23/03/2017	ug/m³	24hr: 29	-	24hrs: 50	= SL Standards	NA

SO <sub>2</sub>	ASTM D 2914 – 78, 1987 West Gaek & Pararosaniline Spectrometric method	Quarterly	23/03/2017	ug/m³	8hr: 11	·;- · <u>-</u>	8hr: 12 <b>0</b>	= SL Standards	NA
NO <sub>2</sub>	ASTM D 1607 – 76, 1987, Griess – Saltzman Reaction method	Quarterly	23/03/2017	ug/m³	8hr: 25	-	8hr: 150	= SL Standards	NA
со	ASTM D 3162 – 78, 1987 Non – dispersive infrared Spectrometric method	Quarterly	23/03/2017	ug/m³	8hr: <2,200	-	8hr: 10,000	= SL Standards	NA

(Remarks) 1. Frequency is subject to increase / decrease depending on the intensity of impact found in the previous result
2. National Environmental (Ambient Air Quality ) Regulations

# NOISE

Item	Method	Frequenc y	Measureme nt Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
	Measurement-I		23 <sup>rd</sup> March 2017	dB(A)	66	70	day time:75 night time:50	ISO 1996 BS 4142(1990)	ISO 1996 BS 4142(1990)
Noise Level	Measurement-2		23 <sup>nl</sup> March 2017	dB(A)	66	70	day time: 75 night time: 50		
	Measurement-3		23 <sup>rd</sup> March 2017	dB(A)	66	70	day time: 75 night time: 50		

(Remarks) National Environmental (Noise control ) Regulations
(Other remarks) Please refer attached additional sheets of project environmental measurements schedule Table 2.2.

# VIBRATION.

Item	Method	Frequenc y	Measuremen t Date & Month	Unit	Measur ed Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
	Measurement-1		3 <sup>rd</sup> May 2017	mm / sec.	0.112	0.158	5.0 mm / sec.		•
Vibration Level	Measurement-2	Annually (but not			1.090	1.041	5.0 mm / sec.		
	Measurement-3	mention)			0.985	0.997	5.0 mm / sec.		

(Retitalis) There has been no official standard supplied by CERT

(Other remarks) Please refer attached additional sheets of project environmental measurements schedule Table 2.2:

Item	Method	Frequency	Measurement Date & Month	Monitoring Results during Report Period	Measured to be Taken
Soil condition	Physical Observation	weekly	January 05/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	January 12/2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	January 19/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	January 26/ 2018	No hannful soil	None.
Soil condition	Physical Observation	weekly	February 02/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	February 09/ 2018	No harmful soil	Nопе.
Soil condition	Physical Observation	weekly	February 16/2018	No hannful soil	None.
Soil condition	Physical Observation	weekly	February 23/ 2018	No hannful soil	None.
Soil condition	Physical Observation	weekly	March 02/2018	No hannful soil	None.
Soil condition	Physical Observation	weekly	March 09/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	March 16/2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	March 23/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	March 30/ 2018	No harmful soil	None.

(Remarks) Please attached additional sheets for bi-weekly reports (Other remarks) Please attach additional sheets if required.

# SOLID WASTE

Item	Method	Frequency	Measurement Date & Month	Monitoring Results during Report Period	Measured to be Taken
Solid waste	Physical Observation	weekly	January 05/ 2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	January 12/2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	January 19/ 2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	January 26/ 2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	February 02/ 2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	February 09/ 2018	No hannful soil	None.
Solid waste	Physical Observation	weekly	February 16/ 2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	February 23/ 2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	March 02/ 2018	No hammful soil	None.
Solid waste	Physical Observation	weekly	March 09/ 2018	No harmful soil	Noņe.
Solid waste	Physical Observation	weekly	March 16/2018	No hannful soil	None.
Solid waste	Physical Observation	weekly	March 23/ 2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	March 30/ 2018	No hannful soil	None.
Remarks) Plea	se attach additional sheets i	f required.			

# 3. NATURAL ENVIRONMENT N/A

# 4. SOCIAL ENVIRONMENT

WORKING CONDITION, SAFETY AND HEALTH

		F	Measurement Date &	Monitoring Results	Measured to be	l
Item	Method	Frequency	. Month	during Report Period	Taken	ļ

Working ondition, safety and health	Physical Observation by Engineer.	Monthly	03 <sup>rd</sup> January 2018 6 <sup>th</sup> February 2018 14 <sup>th</sup> March 2018	Inspection report send to Main contractor	Action completed.
Working ondition, safety and health, Environment	Physical Observation by Contractor.	Weekly	i e	Inspection report send to Sub contractors	Action completed and process on going.

TRAFFIC VOLUME (applied to Under Ground Cable extension work only. Not applied to construction of grid substations)

FF					·		
Item	Method	Frequency	Measuremen t Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Measured to be Taken
	·						
(Remarks) Please a	ıttach additional sl	neets if requ	uired.				
(Other remarks) Pl	ease attach additio	nal sheets	if required.				

# - ACCIDENTS.

· Item	Method	Frequency	Measurement Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Measured to be Taken
No of accidents by increased traffic		Weekly					
Traffic Volume	i						
No of accidents by construction work	Maintaining site based first aid registry	Weekly	From first week January 2018 to last week March 2018.	No's	Maintaining site based first aid registry		Reported 8 number of minor injuries. And 18 first aid treatments. And one LTI incident during JAN-FEB- MAR-2018.

(Remarks) 1. Please attach additional sheets if required.

2. No of accident by increased traffic will be supplied only to Under Ground Cable extension work. Not applied to

construction of grid substations.
(Other remarks) Please attach additional sheets if required.

# Greater Colombo Transmission and Distribution Loss Reduction Project

#### Table 2.2: Environmental Measurements Schedule

Aspect	Parameter	Method	Stage	Frequency	Responsibility	Location
Noise level	Day and Night time Noise level	Portable noise meler (range 0-120 dB(A))	Pre- construction	Once (Baseline measurement)	Contractor / CEB	At Substation boundary;
	(dB)	(Junga o 120 vot v)	Construction	Once a year	Contractor / CEB	Sensitive locations of Transmission &
			Operation	Once; On complaints	CEB	Distribution routes;
Air quality	SO <sub>2</sub> , NO <sub>2</sub> , CO, PM <sub>10</sub> , SPM	Spectrometric method; High volume sampling	Pre- construction	Once (Baseline measurement)	Contractor / CEB	At Substations; Sensitive locations of
		and Gravimetric analysis	Construction	Two limes	Contractor / CEB	Transmission and
		• •	Operation of 29	Onca:	CEB	Dstribution routes:
			33 6 6 1 26	On complaints		• • •
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# ENVIRONMENTAL MONITORING FORMAT

#### MONITORING POINT:

**OUARTER/ MONTHLY:** 

MONTH & YEAR: January/February / March 2018.

SITE: Construction of new 132/11 kV Colombo N Substation.

#### Remarks

1. The latest results of the below monitoring items shall be submitted to the lenders as part of Quarterly Progress Report throughout the construction phase.

Measurement points will be: i) at one place per Under Ground Cable line under Construction, and ii) at grid Substation under construction. Total number of measurement points therefore depend on the construction progress. Please print sufficient numbers of this form to collect all required information at all monitoring points.

# 1. RESPONSE / ACTIONS TO COMMENTS AND GUIDANCE FROM GOVEMENT AUTHORITIES AND THE PUBLIC

Monitoring Item	Area / Organization	Date	Monitoring: Results during Report Period
Number and contents of formal comments made by the public	None		
Number and contents of responses from Government agencies	None		

#### 2. POLLUTION

# WATER QUALITY (Effluent /Wastewater/Ambient Water Quality)

Item	Method	.Frequency	Measurement Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka	Standards for Contract	Referred International Standards
SS (Suspended Solid)	Field sampling	Quarterly	8 <sup>th</sup> February 2017	ṁg/l	Less than 1	Less than I	S0 for inland surface waters 150 for marine coastal areas	АРНА	АРНА
Oil	Field sampling	Quarterly	8 <sup>th</sup> February 2017	mg/l	2	2	10 for inland surface waters 20 for marine coastal areas	АРНА	АРНА

(Remarks) Please attach additional sheets for details information if required

(Other Remarks) Please refer attached additional sheets of project environmental measurements schedule Table 2.2:

AIR QUALITY (Ambient Air Quality)

	Item	Method	Frequency	Measuremen t Date & Month	Unit	Measured Value (Mean) (ug/m3)	Measured Value (Max.)	Sri Lanka	stor	Referred Internatio nal Standards
1	SPM (Suspended Particulate Matter) incl. dust	Hi- Volume sampling Gravimetric	Quarterly	29 <sup>th</sup> and 30 <sup>th</sup> March 2017	mg/m³	142(ug/m3)	142(ug/m3)	Annual 0.10 24hrs: 0.30 8hrs: 0.3S	ASTMD	ASTMD 4096-82- 1997

(Remarks) 1. Frequency is subject to increase / decrease depending on the intensity of impact found in the previous result

2. National Environmental (Ambient Air Quality ) Regulations

(Other Remarks) Please refer attached additional sheets of project environmental measurements schedule Table 2.2:

#### - NOISE

Item	Method	Frequenc y	nt Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
	Measurement-1		15 <sup>th</sup> March 2017	dB(A)	67 65	67 65	day time:75 night time:50	ISO 1996 BS 4142(1990)	ISO 1996 BS 4142(1990)
Noise Level	Measurement-2	ſ	15 <u>li</u> ∷March 2017	dB(A)	65 64	65 64	day time: 75 night time: 50		
						_			

(Remarks) National Environmental (Noise control ) Regulations
(Other remarks) Please refer attached additional sheets of project environmental measurements schedule Table 2.2:

# VIBRATION.

Item	Method	Frequenc y	Measureme nt Date & Month	Unit	Measur ed Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
1	Measurement-I		15 <sup>th</sup> March 2017	пип / sec.	0.010	0.165	5.0 mm / sec.		· ·
Vibration Level	Measurement-2	Annually	15 <sup>th</sup> March 2017	mm / sec.	0.060	0.039	5.0 mm / sec.		
		į				_			

(Remarks) There has been no official standard stipulated by CEA

(Other remarks) Please refer attached additional sheets of project environmental measurements schedule Table 2.2:

# SOIL CONDITION

	COMBILION		1	Nontrada Banda	3.7
Item	Method	Frequency	Measurement Date & Month	Monitoring Results during Report Period	Measured to be Taken
Soil condition	Physical Observation	weekly	January 05/ 2018	No harmful soil	None,
Soil condition	Physical Observation	weekly	January 12/2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	January 19/2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	January 26/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	February 02/ 2018	No hannful soil	None.
Soil condition	Physical Observation	weekly	February 09/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	February 16/2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	February 23/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	March 02/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	March 09/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	March 16/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	March 23/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	March 30/ 2018	No harmful soil	None.

(Remarks) Please attached additional sheets for bi-weekly reports (Other remarks) Please attach additional sheets if required.

- SO	LID WASTE				<del></del>
Item	Method	Frequency	Measurement Date & Month	Monitoring Results during Report Period	Measured to be Taken
Solid waste	Physical Observation	weekly	January 05/ 2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	January 12/ 2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	January 19/ 2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	January 26/ 2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	February 02/2018	No harmful soil	None,
Solid waste	Physical Observation	weekly	February 09/ 2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	February 16/2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	February 23/ 2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	March 02/2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	March 09/ 2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	March 16/2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	March 23/ 2018	No hannful soil	None.
Solid waste	Physical Observation	weekly	March 30/ 2018	No harmful soil	None.
Remarks) Plea	se attach additional sheets i	f required.			

# 3. NATURAL ENVIRONMENT

N/A

# 4. SOCIAL ENVIRONMENT

- WORKING CONDITION, SAFETY AND HEALTH

Item	Method	.Frequency	Measurement Date & Month	Monitoring Results during Report Period	Measured to be Taken
Working condition, safety and health	Physical Observation by Engineer.	Monthly	03 <sup>rd</sup> January 2018 6 <sup>th</sup> February 2018 14 <sup>th</sup> March 2018	Inspection report send to Main contractor	Action completed.
Working condition, safety and health, Environment	Physical Observation by Contractor.	Weekly		Inspection report send to Sub contractors	Action completed and process on going.

TRAFFIC VOLUME (applied to Under Ground Cable extension work only. Not applied to construction of grid substations)

	Item	Method	 Measureme	 Measured Value (Mean)	Measured Value (Max.)	Measured to be Taken
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(Remarks) Please attach additional sheets if required.
(Other remarks) Please attach additional sheets if required.

ACCIDENTS.

	Method	Frequenc	Measureme nt Date &	Unit	Measured Value	Value	Measured to be Taken	
Item	Method	<u>y</u>	Month	<u> </u>	(Mean)	(Max.)		İ

		·	<del></del>			 
No of accidents by increased				ĺ		
traffic			rew r			
	None	ĺ	America ,			
Traffic Volume						
No of accidents by construction	Maintaining site based first aid	Weekly	From first week	No.'a	Maintaining	 Reported 12 number of minor injuries. And 24 first aid
work	registry	Weekiy	January 2018 to last week March 2018.	No's	site based first aid registry	treatments. During period of JAN-FEB-MAR-2018.

(Remarks) 1. Please attach additional sheets if required.

2. No of accident by increased traffic will be supplied only to Under Ground Cable extension work. Not applied to

construction of grid substations.

(Other remarks) Please attach additional sheets if required.

#### Greater Colombo Transmission and Distribution Loss Reduction Project

Table 2.2: Environmental Measurements Schedule

Aspect	Parameter	Method	Stage	Frequency	Responsibility	Location
Noise level	Day and Night time Noise level	Portable noise mater (range 0-120 dB(A))	Pre- construction	Once (Baseline measurement)	Contractor / CEB	At Substation boundary;
	(dB)	(,4,,9, 4, ,1, 1, 1, 4, 4,	Construction	Once a year	Contractor / CEB	Sensitive locations of Transmission &
			Operation	Once; On complaints	CEB	Distribution routes;
Airquality	SO <sub>2</sub> , NO <sub>2</sub> , CO, PM <sub>10</sub> , SPM	Spectrometric method; High volume sampling and Gravimetric	Pre- construction	Once (Baseline measurement)	Contractor / CEB	At Substations; Sensitive locations of
		analysis	Construction	Two times	Contractor / CEB	Transmission and Dsmbution routes:
			Operation	Once; On complaints	CEB	ESTRECTIONES,
Water Quality	EC, TSS, DO, BOD, COD, pH,	Portable water quality Meter, Spectrometric	Pre- construction	Once (Baseline measurement)	Contractor / CEB	Nearest water sources at Substations;
•	Oil and grease,	method	Construction	Once a year	Confractor / CEB	Sensitive locations of
			Operation	Once; On complaints	CEB ,	Transmission & Distribution routes;

# PENVIRONMENTAL MONITORING FORMAT.

#### MONITORING POINT:

QUARTER/ MONTHLY:

MONTH & YEAR: January/ February / March 2018.

SITE: Augmentation of 132/11kV Colombo A Grid substation.

#### Remarks

 The latest results of the below monitoring items shall be submitted to the lenders as part of Quarterly Progress Report throughout the construction phase.

Measurement points will be: i) at one place per Under Ground Cable line under Construction, and ii) at grid Substation
under construction. Total number of measurement points therefore depend on the construction progress. Please print
sufficient numbers of this form to collect all required information at all monitoring points.

# 1. RESPONSE / ACTIONS TO COMMENTS AND GUIDANCE FROM GOVEMENT AUTHORITIES AND THE PUBLIC

Monitoring Item	Area / Organization	Date	Monitoring: Results during Report Period
Number and contents of formal comments made by the public	None		
Number and contents of responses from Government agencies	None		

# 2. POLLUTION

#### WATER OUALITY (Effluent /Wastewater/Ambient Water Quality)

ltem	Method	Frequency	Measurement Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
SS (Suspended Solid)	Field sampling	Once a year	03-05-2017	mg/l	Less than 1	Less than 1	50 for inland surface waters 150 for marine coastal areas	АРНА	APHA
Oil & Grease	Field sampling	Once a year	03-05-2017	mg/l	2.1	2.1	10 for inland surface waters 20 for marine coastal areas		АРНА

(Remarks) Please attach additional sheets for details information if required

(Other Remarks) Please refer attached additional sheets of project environmental measurements schedule Table 2.2:

AIR QUALITY (Ambient Air Quality)

Item	Method	Frequency	Measureme nt Date & Month		Measured Value (Mean) (ug/m3)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred Internation al Standards
SPM (Suspended Particulate Matter) incl. dust	Hi- Volume sampling Gravimetric	during	03-05-2017	mg/m³	2 Ug/m3	SO2-8 Hrs-17. NO2-8 Hrs-38. CO- 8 Hrs <2100 TSPM-3 Hrs 74 PM1.0- 24 Hrs. 41. PM2.5-24 Hrs.22.	Annual 0.10 24hrs: 0.30 8hrs: 0.3S 3hrs: 0.45 1hr. 0.50	ASTMD 4096-82	ASTMD 4096-82

(Remarks) 1. Frequency is subject to increase / decrease depending on the intensity of impact found in the previous result

2. National Environmental (Ambient Air Quality ) Regulations

(Other Remarks) Please refer attached additional sheets of project environmental measurements schedule Table 2.2:

# NOISE

Item	Method	Frequency	Measuremen Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
	Measurement-1		03-05-2017	dB(A)	1 Hour	56	day time:56 night time:50	ISO 1996 BS 4142(1990)	ISO 1996 BS 4142(1990)
Noise Level	Measurement-2	Once a year.	03 <b>-</b> 05-2017	dB(A)	1 Hour	68	day time: 68 night time: 59		
	Measurement-3		03-05-2017	dB(A)	1 Hour	66	day time: 66 night time: 57		

(Remarks) National Environmental (Noise control ) Regulations
(Other remarks) Please refer attached additional sheets of project environmental measurements schedule Table 2.2:. – Note: Monitoring carried out with existing diesel generator noise condition of the Colombo A power plant.

#### VIBRATION.

Item	Method	   Frequency	Measurement Date & Month	1	Measure d Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
	Measurement-1		30-05-2017	mın / sec.	0.134	0.220	5.0 mm / sec.		
Vibration Level	Measurement-2	Annually (but not		·	1.420	1.068	5.0 mm / sec.		
(Pamerica) There has been	Measurement-3	scheduled)			0.700	0.894	5.0 mm / sec.		

Remarks) There has been no otheral standard supulated by CEA
(Other remarks Please refer attached additional sheets of project environmental measurements schedule Table 2.2:. - Note: Monitoring carried out with existing diesel generator noise condition of the Colombo A power plant.

# SOIL CONDITION

Item	Method	Frequency	Measurement Date & Month	Monitoring Results during Report Period	Measured to be Taken
Soil condition	Physical Observation	weekly	January 05/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	January 12/2018	No harmful soil	None,
Soil condition	Physical Observation	weekly	January 19/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	January 26/ 2018	No harmful soil	None,
Soil condition	Physical Observation	weekly	February 02/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	February 09/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	February 16/2018	No harmful soil	None,
Soil condition	Physical Observation	weekly	February 23/ 2018	No harmful soil	None,
Soil condition	Physical Observation	weekly	March 02/2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	March 09/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	March 16/2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	March 23/2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	March 30/2018	No harmful soil	None.

(Remarks) Please attached additional sheets for bi-weekly reports (Other remarks) Please attach additional sheets if required.

#### SOLID WASTE

D WASTE	_		L Maritania Desila	Measured to be
Method	Frequency	Measurement Date & Month	during Report Period	Taken
Physical Observation	weekly	January 05/ 2018	No harmful soil	None.
Physical Observation	weekly	January 12/2018	No hannful soil	<b>N</b> опе.
Physical Observation	weekly January 19/ 2018		No harmful soil	None.
Physical Observation	weekly	. January 26/ 2018	No harmful soil	None.
Physical Observation	weekly	February 02/2018	No harmful soil	None.
Physical Observation	weekly	February 09/2018	No harmful soil	None.
Physical Observation	weekly	February 16/2018	No hannful soil	Nопе,
Physical Observation	weekly	February 23/ 2018	No harmful soil	None.
Physical Observation	weekly	March 02/2018	No harmful soil	None.
Physical Observation	weekly	March 09/ 2018	No harmful soil	None.
Physical Observation	weekly	March 16/ 2018	No harmful soil	None.
Physical Observation	weekly	March 23/2018	No harmful soil	None.
Physical Observation	weekly	March 30/ 2018	No harmful soil	None.
	Physical Observation	Physical Observation weekly	Physical Observation weekly January 05/ 2018  Physical Observation weekly January 12/ 2018  Physical Observation weekly January 19/ 2018  Physical Observation weekly January 26/ 2018  Physical Observation weekly February 02/ 2018  Physical Observation weekly February 09/ 2018  Physical Observation weekly February 16/ 2018  Physical Observation weekly February 23/ 2018  Physical Observation weekly March 02/ 2018  Physical Observation weekly March 09/ 2018  Physical Observation weekly March 09/ 2018  Physical Observation weekly March 16/ 2018  Physical Observation weekly March 16/ 2018  Physical Observation weekly March 23/ 2018	Physical Observation weekly January 05/2018 No harmful soil Physical Observation weekly January 12/2018 No harmful soil Physical Observation weekly January 19/2018 No harmful soil Physical Observation weekly January 26/2018 No harmful soil Physical Observation weekly February 02/2018 No harmful soil Physical Observation weekly February 09/2018 No harmful soil Physical Observation weekly February 16/2018 No harmful soil Physical Observation weekly February 23/2018 No harmful soil Physical Observation weekly February 23/2018 No harmful soil Physical Observation weekly March 02/2018 No harmful soil Physical Observation weekly March 09/2018 No harmful soil Physical Observation weekly March 16/2018 No harmful soil Physical Observation weekly March 16/2018 No harmful soil Physical Observation weekly March 23/2018 No harmful soil

# 3. NATURAL ENVIRONMENT

N/A

# 4. SOCIAL ENVIRONMENT

# WORKING CONDITION, SAFETY AND HEALTH

and health  Working condition, safety Physical Observation by and health  Weekly Weekly Weekly Weekly  Weekly  Weekly  Weekly  Weekly  Instrument 2018  No accident incident reported (Zero accident plant week March 2018)	Item	Method	.Frequency	Measurement Date & Month	Monitoring Results during Report Period	Measured to be Taken
condition, safety Physical Observation by Weekly From first week January 2018 to reported (Zero accident	condition, safety	,	Monthly	6th February 2018	reported(Zero accident	(For information).
Environment state)	condition, safety and health,	Physical Observation by Contractor.	Weekly			(For information).

# TRAFFIC VOLUME (applied to Under Ground Cable extension work only. Not applied to construction of grid substations)

Item	Method	Frequency	Measurement Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Measured to be Taken
						i	

(Remarks) Please attach additional sheets if required.

(Other remarks) Please attach additional sheets if required.

4	4	С	C	K	Œ	Ν	T	S

item Method Frequency Month	Unit Measured Value (Measured Value (Max.) Measured to be Taken
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No of accidents by increased traffic							
Traffic Volume	None						
No of accidents by construction work	Maintaining site based first aid registry	Weekly	From first week January 2018 to last week March 2018.	No's	None	None	No accident incident reported(Zero accident state)

(Remarks) 1. Please attach additional sheets if required.

2. No of accident by increased traffic will be supplied only to Under Ground Cable extension work. Not applied to construction

of grid substations.

(Other remarks) Please attach additional sheets if required.

Greater Colombo Transmission and Distribution Loss Reduction Project

Table 2.2: Environmental Measurements Schedule

Aspect	Parameter	Method	Stage	Frequency	Responsibility	Location
Noise level	Day and Night time Noise level	Portable noise meter (range 0-120 dB(A))	Pre- construction	Once (Baseline measurement)	Contractor / CE8	At Substation boundary;
	(dB)	(Tenge o-120 do(H))	Construction .	Once a year	Contractor / CEB	Sensitive locations of Transmission &
			Operation	Once;	CEB	Distribution routes;
				On complaints	İ	
Air quality	SO <sub>2</sub> , NO <sub>2</sub> , CO, PM <sub>10</sub> , SPM	Spectrometric method; High volume sampling	Pre- construction	Once (Baseline measurement)	Contractor / CEB	At Substations; Sensitive locations of
1 111/01 41 12	and Gravimetric	Construction	Two times	Contractor / CEB	Transmission and Dstribution routes;	
	<u> </u>		Operation	Once; On complaints	CEB	Danbagonrouces
	FO TOO 50	Portable water quality	Pre-	Orice (Baseline	Contractor / CEB	Nearest water sources
Water Quality	EC, TSS, DO, BOD, COD, pH,	Meter, Spectrometric	construction	measurement)		at Substations;
Oil and grease,	Oil and grease, method		Construction	Once a year	Contractor / CEB	Sensitive locations of Transmission &
		Operation	Once;	CEB	Distribution routes;	
			1	On complaints		

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#### ENVIRONMENTAL MONITORING FORMAT.

#### MONITORING POINT:

**QUARTER/MONTHLY:** 

MONTH & YEAR: January/February / March 2018.

SITE: Augmentation of 132/11kV Colombo I Grid substation.

#### Remarks

 The latest results of the below monitoring items shall be submitted to the lenders as part of Quarterly Progress Report throughout the construction phase.

Measurement points will be: i) at one place per Under Ground Cable line under Construction, and ii) at grid Substation
under construction. Total number of measurement points therefore depend on the construction progress. Please print
sufficient numbers of this form to collect all required information at all monitoring points.

# 1. RESPONSE / ACTIONS TO COMMENTS AND GUIDANCE FROM GOVEMENT AUTHORITIES AND THE PUBLIC

Monitoring Item	Area / Organization	Date	Monitoring: Results during Report Period
Number and contents of formal comments made by the public	None		
Number and contents of responses from Government agencies	None		

#### 2. POLLUTION

# - WATER QUALITY (Effluent /Wastewater/Ambient Water Quality)

Item	Method	.Frequency	Measurement Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
SS (Suspended Solid)	Field sampling	Once a year	03-05-2017	mg/l	Less than I	Less than 1	50 for inland surface waters 150 for marine coastal areas	АРНА	АРНА.
Oil & Grease	Field sampling	Once a year	03-05-2017	mg/l	2.0	2.0	10 for inland surface waters 20 for marine coastal areas	1	АРНА

(Remarks) Please attach additional sheets for details information if required

(Other Remarks) Please refer attached additional sheets of project environmental measurements schedule Table 2.2:

- AIR QUALITY (Ambient Air Quality)

Item	Method	Frequency	Measureme nt Date & Month	1	Measured Value (Mean) (ug/m3)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Internation
(Suspended	Hi- Volume sampling Gravimetric			mg/m³.	2 Ug/m3	SO2-8 Hrs-15. NO2-8 Hrs-21. CO- 8 Hrs <2300 TSPM-3 Hrs 100 PM!.0- 24 Hrs. 55. PM2.5-24 Hrs.30.	Annual 0.10 24hrs: 0.30 8hrs: 0.3S 3hrs: 0.45 1hr. 0.50	ASTMD 4096-82	ASTMD 4096-82

(Remarks) 1. Frequency is subject to increase / decrease depending on the intensity of impact found in the previous result

2. National Environmental (Ambient Air Quality ) Regulations

(Other Remarks) Please refer attached additional sheets of project environmental measurements schedule Table 2,2:

#### NOISE

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Item	Method	Frequency	Measurement Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
:	Measurement-Ì		03-05-2017	dB(A)	1 Hour	69	day time:69 night time:67	ISO 1996 BS 4142(1990)	ISO 1996 BS 4142(1990)
Noise Level	Measurement-2	Once a year.	03-05-2017	dB(A)	1 Hour	61	day time: 61 night time: 59		
	Measurement-3		03-05-2017	dB(A)	1 Hour	63	day time: 63 night time: 63		

(Remarks) National Environmental (Noise control ) Regulations
(Other remarks) Please refer attached additional sheets of project environmental measurements schedule Table 2.2:. – Note: Monitoring carried out with existing diesel generator noise condition of the Colombo I power plant.

# VIBRATION.

Item	Method	Frequency	Measurement Date & Month		Measure d Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
	Measurement-1	,	30-05-2017	mm/sec.	0.104	0.120	5.0 mm / sec.		
Vibration Level	Measurement-2	Annually (but not			1.120	1.100	5.0 mm / sec.		
	Measurement-3	scheduled)			0.300	0.504	5.0 mm / sec.		•

(Remarks) There has been no official standard stipulated by CEA

(Other remarks Please refer attached additional sheets of project environmental measurements schedule Table 2.2:, - Note; Monitoring carried out with existing diesel generator noise condition of the Colombo I power plant.

#### SOIL CONDITION

Item	Method	Frequency	Measurement Date & Month	Monitoring Results during Report Period	Measured to be Taken
Soil condition	Physical Observation	weekly	January 05/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	January 12/2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	January 19/2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	January 26/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	February 02/2018	No hannful soil	None.
Soil condition	Physical Observation	weekly	February 09/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	February 16/2018	No harmful soil	· None.
Soil condition	Physical Observation	weekly	February 23/2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	March 02/2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	March 09/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	March 16/2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	March 23/ 2018	No harmful soil	None.
Soil condition	Physical Observation	weekly	March 30/ 2018	No harmful soil	None.

(Remarks) Please attached additional sheets for bi-weekly reports (Other remarks) Please attach additional sheets if required.

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Item	Method '	Frequency	Measurement Date & Month	Monitoring Results during Report Period	Measured to be Taken
Solid waste	Physical Observation	weekly	January 05/ 2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	January 12/2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	January 19/2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	January 26/ 2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	February 02/2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	February 09/2018	No harmful soil	None
Solid waste	Physical Observation	weekly	February 16/2018	No harmful soil	None.
Solid waste	Physical Observation	weekly	February 23/2018	No harmful soil	None.
olid waste	Physical Observation	weekly	March 02/ 2018	No harmful soil	None.
olid waste	Physical Observation	weekly	March 09/ 2018	No harmful soil	None.
olid waste	Physical Observation	weekly	March 16/2018	No harmful soil	None.
olid waste	Physical Observation	weekly	March 23/ 2018	No harmful soil	None,
olid waste	Physical Observation	weekly	March 30/ 2018	No harmful soil	None.
Remarks) Please	attach additional sheets if re	quired.			

# 3. NATURAL ENVIRONMENT

N/A

### 4. SOCIAL ENVIRONMENT

# WORKING CONDITION, SAFETY AND HEALTH

Item	Method	.Frequency	Measurement Date & Month	Monitoring Results during Report Period	Measured to be Taken					
Working condition, safety and health	Physical Observation by Engineer.	Monthly	03 <sup>rd</sup> January 2018 6 <sup>th</sup> February 2018 14 <sup>th</sup> March 2018	No accident incident reported(Zero accident state)	(For information).					
Working condition, safety and health, Environment	Physical Observation by Contractor.	Weekly	From first week January 2018 to last week March 2018.	No accident incident reported(Zero accident state)	(For information).					
(Remarks) Please	Remarks) Please attach additional sheets if required.									

TRAFFIC VOLUME (applied to Under Ground Cable extension work only. Not applied to construction of grid substations)

	to contribution of Brita values and the second seco											
Į				Меаѕигетепт		Measured						
-	Item	Method	Frequency	Date & Unit		Value   Value		Measured to be Taken				
	<u>, , , , , , , , , , , , , , , , , , , </u>			Month		(Mean)	(Max.)					
Ī		·										
ı							۱					

(Remarks) Please attach additional sheets if required.
(Other remarks) Please attach additional sheets if required.

# ACCIDENTS.

			Measurement Date &	<b>.</b>	Measure Measured	
Item	Method	Frequency	Month	Unit	d Value   Value   (Mean) (Max.)	Measured to be Taken

			CHION MOOD Teams. 411				
No of accidents by increased traffic							
 m m 11 1	Noné	<b>_</b>	<u> </u>				
Traffic Volume						1	
No of accidents by construction work	nased tiret ata	Weekly	From first week January 2018 to last week March 2018.	No's	None	None	No accident incident reported(Zero accident state)

(Remarks) 1. Please attach additional sheets if required.

2. No of accident by increased traffic will be supplied only to Under Ground Cable extension work. Not applied to construction of grid substations.

(Other remarks) Please attach additional sheets if required.

#### Greater Colombo Transmission and Distribution Loss Reduction Project

#### Table 2.2: Environmental Measurements Schedule

Aspect	Parameter	Method	Stage	Frequency	Responsibility	Location	
Noise level	Day and Night time Noise level	Portable noise meter (range 0-120 dB(A))	Pre- construction	Once (Baseline measurement)	Contractor / CEB	At Substation boundary;	
•	(dB)	(tougo o neo opt v)	Construction	Once a year	Contractor / CEB	Sensitive locations of Transmission &	
			Operation	Once;	CEB	Distribution routes;	
				On complaints			
Air quality	\$0 <sub>2</sub> , NO <sub>2</sub> , CO, PM <sub>10</sub> , SPM	Spectrometric method; High volume sampling	Pre- construction	Once (Baseline measurement)	Contractor / CEB	At Substations; Sensitive locations of	
		and Gravimetric analysis	Construction	Two times	Contractor / CEB	Transmission and Dstribution routes:	
		•	Operation	Once;	CEB	Dayington	
				On complaints	1	_	
Water Quality	EC, TSS, DO, BOD, COD, pH,	Portable water quality Meter, Spectrometric	Pre- construction	Once (Baseline measurement)	Contractor / CEB	Nearest water sources at Substations;	
400,	Oil and grease,	melhod	Construction	Once a year	Contractor / CEB	Sensitive locations of Transmission &	
				Once;	CEB	Distribution routes;	
				On complaints			

Environmental Monitoring Plan

#### ENVIRONMENTAL MONITORING FORMAT.

#### MONITORING POINT:

**QUARTER/ MONTHLY:** 

MONTH & YEAR: January/February / March 2018.

SITE: Construction of new 33 kV GIS at Kelanitissa.

#### Remarks

 The latest results of the below monitoring items shall be submitted to the lenders as part of Quarterly Progress Report throughout the construction phase.

Measurement points will be: i) at one place per Under Ground Cable line under Construction, and ii) at grid Substation
under construction. Total number of measurement points therefore depend on the construction progress. Please print
sufficient numbers of this form to collect all required information at all monitoring points.

# 1. RESPONSE / ACTIONS TO COMMENTS AND GUIDANCE FROM GOVEMENT AUTHORITIES AND THE PUBLIC

ization	Date	Monitoring: Results during Report Period
one		
one		
	one	one

#### 2. POLLUTION

. WATER QUALITY (Effluent /Wastewater/Ambient Water Quality)

Item	Method	Frequency	Measurement Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
SS (Suspended Solid)	Field sampling	Once a year	07-06-2017	mg/l	Less than 1	Less than I	50 for inland surface waters 150 for marine coastal areas	АРНА	АРНА
Oil & Grease	Field sampling	Once a year	07-06-2017	mg/l	2.0	2.0	10 for inland surface waters 20 for marine coastal areas		APHA

(Remarks) Please attach additional sheets for details information if required

(Other Remarks) Please refer attached additional sheets of project environmental measurements schedule Table 2.2:

AIR QUALITY (Ambient Air Quality)

- AIR	COMPIL	I (Ambiei	II Ali Qu	antj					
Item	Method	Frequency	Measureme nt Date & Month		Measured Value (Mean) (ug/m3)	Measured Value (Max.)	Sri Lanka Standards*	Contract	Internation
(Suspended	Hi- Volume sampling Gravimetric	during	14 <sup>th</sup> May 2017	mg/m³	2 Ug/m3	SO2-8 Hrs-14. NO2-8 Hrs-32. CO-8 Hrs <1000 TSPM-3 Hrs 62 PM1.0-24 Hrs. 37. PM2.5-24 Hrs.20.	Xire (1.48	ASTMD 4096-82	ASTMD 4096-82

(Remarks) 1. Frequency is subject to increase / decrease depending on the intensity of impact found in the previous result

2. National Environmental (Ambient Air Quality ) Regulations

Other Remarks) Please refer attached additional sheets of project environmental measurements schedule Table 2.2:

#### NOISE

	1101010									
	Item	Method	Frequency	Measurement Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
: 1		Measurement-I		09 <sup>th</sup> May 2017	dB(A)	3 Hrs.	77	day time:75 night time:50	ISO 1996 BS 4142(1990)	ISO 1996 BS 4142(1990)
	Noise Level	Measurement-2	1	09 <sup>น</sup> May 2017	dB(A)	3 Hrs.	79	day time: 75 night time: 50		
		Measurement-3		09 <sup>th</sup> May 2017	dB(A)	3 Hrs.	78	day time: 75 night time: 50		

(Remarks) National Environmental (Noise control ) Regulations
(Other remarks) Please refer attached additional sheets of project environmental measurements schedule Table 2.2:. – Note: Monitoring carried out with existing diesel generator noise condition of the kelinittissa power plant.

#### VIBRATION.

Item	Method	Frequency	Measurement Date & Month	Unit	Measure d Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
	Measurement-1	Annually (but not mention)	10 <sup>rd</sup> May 2017	mm / sec.	0.125	0.165	5.0 mm / sec.		
Vibration Level	Measurement-2		-		1.010	1.018	5.0 mm / sec.		
	Measurement-3	memion)			0.800	0.853	5,0 mm / sec.		

(Remarks) There has been no official standard stipulated by CEA

(Other remarks Please refer attached additional sheets of project environmental measurements schedule Table 2.2:. - Note: Monitoring carried out with existing diesel generator noise condition of the kelinittissa power plant.

# SOIL CONDITION

Item	Method	Frequency	Measurement Date & Month	Monitoring Results during Report Period	Measured to be Taken
l condition	sical Observation	weekly	January 05/ 2018	No harmful soil	None.
condition	sical Observation	weekly	January 12/2018	No harmful soil	None.
condition	sical Observation	weekly	January 19/ 2018	No harmful soil	None.
condition	sical Observation	weekly	January 26/ 2018	Vo harmful soil	None.
condition	sical Observation	weekly	February 02/2018	No harmful soil	None.
condition	sical Observation	weekly	February 09/2018	No harmful soil	None.
condition	sical Observation	weekly	February 16/2018	No harmful soil	None.
condition	sical Observation	weekly	February 23/2018	Vo harmful soil	None.
condition	sical Observation	weekly	March 02/2018	No harmful soil	None.
condition	sical Observation	weekly	March 09/ 2018	Vo harmful soil	None.
condition	sical Observation	weekly	March 16/ 2018	io harmful soil	None,
condition	sical Observation	weekly	March 23/ 2018	lo harmful soil	None.
condition	sical Observation	weekly	March 30/ 2018	lo harmful soil	None.

(Remarks) Please attached additional sheets for bi-weekly reports (Other remarks) Please attach additional sheets if required.

- SOLID WASTE

Method	Frequency	Measurement Date & Month	Monitoring Results during Report Period	Measured to be Taken
Physical Observation	weekly	January 05/ 2018	No harmful soil	None.
Physical Observation	weekly	January 12/ 2018	No harmful soil	None.
Physical Observation	weekly	January 19/2018	No harmful soil	None.
Physical Observation	weekly	January 26/ 2018	No harmful soil	None.
Physical Observation	weekly	February 02/2018	No harmful soil	None.
Physical Observation	weekly	February 09/ 2018	No harmful soil	None.
Physical Observation	weekly	February 16/2018	No harmful soil	None.
Physical Observation	weekly	February 23/2018	No harmful soil	None.
Physical Observation	weekly	March 02/2018	No harmful soil	None.
Physical Observation	weekly	March 09/ 2018	No harmful soil	None.
Physical Observation	weekly	March 16/2018	No harmful soil	None.
Physical Observation	weekly	March 23/2018	No harmful soil	None.
Physical Observation	weekly	March 30/ 2018	No harmful soil	None.
	Physical Observation Physical Observation Physical Observation Physical Observation Physical Observation Physical Observation Physical Observation Physical Observation Physical Observation Physical Observation Physical Observation Physical Observation Physical Observation	Physical Observation weekly Physical Observation weekly Physical Observation weekly Physical Observation weekly Physical Observation weekly Physical Observation weekly Physical Observation weekly Physical Observation weekly Physical Observation weekly Physical Observation weekly Physical Observation weekly Physical Observation weekly Physical Observation weekly Physical Observation weekly	Physical Observation weekly January 12/ 2018  Physical Observation weekly January 19/ 2018  Physical Observation weekly January 26/ 2018  Physical Observation weekly February 02/ 2018  Physical Observation weekly February 09/ 2018  Physical Observation weekly February 16/ 2018  Physical Observation weekly February 23/ 2018  Physical Observation weekly February 23/ 2018  Physical Observation weekly March 02/ 2018  Physical Observation weekly March 09/ 2018  Physical Observation weekly March 16/ 2018  Physical Observation weekly March 23/ 2018  Physical Observation weekly March 23/ 2018	Physical Observation weekly January 12/2018 No harmful soil Physical Observation weekly January 19/2018 No harmful soil Physical Observation weekly January 26/2018 No harmful soil Physical Observation weekly February 02/2018 No harmful soil Physical Observation weekly February 09/2018 No harmful soil Physical Observation weekly February 16/2018 No harmful soil Physical Observation weekly February 23/2018 No harmful soil Physical Observation weekly February 23/2018 No harmful soil Physical Observation weekly March 02/2018 No harmful soil Physical Observation weekly March 09/2018 No harmful soil Physical Observation weekly March 16/2018 No harmful soil Physical Observation weekly March 23/2018 No harmful soil Physical Observation weekly March 23/2018 No harmful soil

# 3. NATURAL ENVIRONMENT

N/A

# 4. SOCIAL ENVIRONMENT

- WORKING CONDITION, SAFETY AND HEALTH

working condition, safety and health, Contractor.  Weekly Weekly I and health   Contractor.  Weekly I and health   Contractor.   Weekly   From first week January 2018 to last week March 2018.   No accident incident reported (Zero accident state)   From first week January 2018 to last week March 2018.	Item	Method	.Frequency	Measurement Date & Month	Monitoring Results during Report Period	Measured to be Taken
condition, safety and health, Contractor.  Weekly From first week January 2018 to last week March 2018.  Weekly Is week March 2018.  From first week January 2018 to reported (Zero accident reported (Zero accident state) (For information)	condition, safety	1 * 1	Monthly	6th February 2018	reported(Zero accident	(For information).
ENVIRONMENT	condition, safety	1 7	Weekly		reported(Zero accident	(For information).

TRAFFIC VOLUME (applied to Under Ground Cable extension work only. Not applied to construction of grid substations)

Item	Method	Frequency	Measurement Date & Month	Uniț	Measured Value (Mean)	Measured Value (Max.)	Measured to be Taken

(Remarks) Please attach additional sheets if required.

(Other remarks) Please attach additional sheets if required.

AUUH	ENIS.							_
Item	Method	Frequency	Measurement Date & Month	Unit	Measured Value	Measured Value (Max.)	Measured to be Taken	

	4114411			Attribut Dodg Transfer	0] 00:			
•	No of accidents by increased traffic		}					
	Traffic Volume	None						
	No of accidents by construction work	Maintaining site based first aid registry	Weekly	From first week January 2018 to last week March 2018.	No's	None	None	No accident incident reported(Zero accident state)

(Remarks) 1. Please attach additional sheets if required.

2. No of accident by increased traffic will be supplied only to Under Ground Cable extension work. Not applied to construction of grid substations.

(Other remarks) Please attach additional sheets if required.

#### Greater Colombo Transmission and Distribution Loss Reduction Project

#### Table 2.2: Environmental Measurements Schedule

Aspect	Parameter	Method	Stage	Frequency	Responsibility	Location	
Noise level	Day and Night time Noise level		Pre- construction	Once (Baseline measurement)	Contractor / CEB	At Substation boundary;	
	(dB)	hanger in the	Construction	Once a year	Contractor / CEB	Sensitive locations of Transmission &	
			Operation	Once;	CEB	Distribution routes;	
			ļ	On complaints			
Air quality	SO <sub>2</sub> , NO <sub>2</sub> , CO, PM <sub>10</sub> , SPM		Pre- construction	Once (Baseline measurement)	Contractor / CEB	At Substations; Sensitive locations of	
			Construction	Two times	Contractor / CEB	Transmission and Dstribution routes;	
			Operation	Once; On complaints	CEB		
Water Quality	eality BOD, COD, pH, Meter, Spec		Pre- construction	Once (Baseline measurement)	Contractor / CEB	Nearest water sources at Substations;	
•	Oil and grease,		Construction	Once a year	Contractor / CEB	Sensitive locations of Transmission &	
	1	e ·	Operation	Once;	CEB	Distribution routes;	
				On complaints			

Environmental Monitoring Plan

12

#### ENVIRONMENTAL MONITORING FORMAT

MONITORING POINT: Package 2: Construction of Transmission and Distribution Cables

QUARTER: / MONTHLY: MONTH & YEAR: January/ February / March 2018.

#### Remarks

1. The latest results of the below monitoring items shall be submitted to the lenders as part of Quarterly Progress Report throughout the construction phase.

 Measurement points will be: i) at one place per Under Ground Cable line under Construction, and ii) at grid Substation under construction. Total number of measurement points therefore depend on the construction progress. Please print sufficient numbers of this form to collect all required information at all monitoring points.

# 1. RESPONSE / ACTIONS TO COMMENTS AND GUIDANCE FROM GOVEMENT AUTHORITIES AND THE PUBLIC

Monitoring Item	Area / Organization	Date '	Monitoring: Results during Report Period
Number and contents of formal comments made by the public	-	-	<del>-</del>
Number and contents of responses from Government agencies	-	-	-
(Remarks) Please attach additional sheets for deta	ils information i	frequired	

No environmental matters related comments made either by government authorities or public up to now.

#### 2. POLLUTION

# - WATER QUALITY (Effluent /Wastewater/Ambient Water Quality)

In the said monitoring period, there were no any significant instances reported which can contaminate natural water sources.

During the operations of GCTDLRP - Package 2 in the considered time period no such Effluent or Waste water has been generated.

The roads are washed with clean water after completing the backfilling of the trenches. The water is collected from the Fire Water Well or Yugadhanavi Power Plant.

# AIR QUALITY (Ambient Air Quality)

Below Ambient Air Quality parameters were monitored on 11th August 2017 by National Building Research Organization (NBRO). Results are as follows.

#### Sampling Locations:

- Location L1 At a location in Dawson Street, Colombo 2 about 10 m away from the project site
- · Location L2 At a location in Baybrook Street, Colombo 2 about 10 m away from the project site

Greater Colonii	oo rransmissioi		ution Loss	Reduct	ion Projec	iL			
Item	Method	Frequency	Measurement Date & Month	Unit <sup>1</sup>		Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
TSPM (Total Suspended Particulate Matter) incl. dust	ASTM 4096 ~ 82 1997 High - Volume sampling Gravimetric Analysis	Two times during construction	11-08-2017	ug/m³	L1: 3hr: 0.085 L2: 3hr: 0.125	-	3hrs: 0.45 (as per NBRO report)	= SL Standards	NA
PM <sub>10</sub> (Particulate Matter - 10 micrometers or less in diameter)	ASTM 4096 82, 1997 High - Volume sampling Gravimetric Analysis	Two times	10-08-2017	ug/m³	L1: 24hr: 75 L2: 24hr: 51	-	24hrs: 100	= SL Standards	NA
PM2.5 (Particulate Matter – 2.5 nicrometers or ess in diameter)	ASTM 4096 – 82, 1997 High - Volume sampling Gravimetric Analysis	Two times during construction	10-08-2017	ug/m³	L1: 24hr: 41 L2: 24hr: 28	-	24hrs: 50	= SL Standards	NA
	ASTM D 2912 – 76, 1987 Neutral Buffered Potassium Iodide method (NBKI) UV Spectrometric method	Two times during construction	11-08-2017	ug/m³	L1: 1hr: 12 L2: 1hr: 16	-	200	= SL Standards	NA
SO <sub>2</sub>	ASTM D 2914 – 78, 1987 West Gaek & Pararosaniline Spectrometric method	Two times during construction	11-08-2017	ug/m³	L1: 8hr: 9 L2: 8hr: 11	-	8hr: 120	= SL Standards	NA
NO.	o, 1987, Griess —	Two times during construction	11-08-2017	ug/m³	L1: 8hr: 20 L2: 8hr:18	-	8hr: 150	= SL Standards	NA
CO d	ispersive infrared	onstruction		ug/m³	L1: 8hr: <0.1 L2: 8hr: <0.1	-		= SL Standards	NA

(Remarks) 1. Frequency is subject to increase / decrease depending on the intensity of impact found in the previous result 2. National Environmental (Ambient Air Quality ) Regulations

(Other Remarks) Please attach additional sheets if required

Unit ug = microgram

Ambient Air Quality Standard - Extra Ordinary Gazzet No. 1562/22, August 15, 2008

#### MOISE

Boundary Noise Levels of Sample Locations was monitored on 10<sup>th</sup> August 2017 by National Building Research Organization (NBRO). Results are as follows;

Monitoring Locations:

- · Location N1 At a location in Dawson Street, Colombo 2 about 25 m to the colour light at Union Place
- Location N2 At a location in Baybrook Street, Colombo 2 about 15 m from the Richard Peiris Company

Noise measurements were taken during following activities separately;

- Cutting of road surface
- · Digging of road using backhoe

Excavation, cabling, filling, compaction

O Exca	ivation, cabling	, minug, co	mpaction				<del>,</del>	<del>, ,</del>	·	
	3.6.1.1	7	Measuremen	i e	1	Measured	Sri Lanka	Standards for	Referred International	
Item	Method	Frequency*		Unit	Value	Value	Standards**	1 '' !		
			Month	<u> </u>	(Mean)	(Max.)		Contract	Standards -	
			Location N1	– during	g cutting of r	oad surface				
j	1	1	10.00.0015	777/15		1	day time: 75	= SL	NA	
			10-08-2017	aR(V)	74	] -	night time:50	Standards	INA	
	[		Location N1	- during	digging of	road using I	oackhoe			
		i					day time: 75	=SL	NA	
			10-08-2017	ab(A)	72	•	night time: 50	Standards	IVA	
			Location N1 - during excavation, cabling, filling, compaction							
1	ISO 1990 (part						day time: 75	= SL		
Noise Level	1,2,3) and BS 4142; 1990	Once a year	10-08-2017	dB(A)	65	-	night time: 50		NA	
				! <b> </b>			mgin time: 50	Standa os		
		İ	Location N2 - during cutting of road surface							
[			10 00 0017	4D(4)	72	1	day time:75	= SL	NA	
			10-08-2017	aR(V)	12	-	night time:50	Standards	INA	
!		•	Location N2 – during digging of road using backhoe							
. i				ĺ			day time: 75	= SL	374	
-			10-08-2017	dB(A)	67	- 1		Standards	NA	
	i		Location N2 -	during	excavation	cabling fill	ling, compaction		······································	
		ř	Location 142 -	- uming	Ozouration,	odornig, in				
		ļ	10-08-2017	dB(A)	65	1	day time: 75	=SL	NA	
	i		10 00 2017	ارديات	33		night time: 50	Standards		
						<del></del>				

(Remarks) \* Frequency is subject to increase / decrease depending on the intensity of impact found in the previous result

(Other remarks) Please attach additional sheets if required.

Noise Control Regulations Gazzet No. 924/12, 1996

#### - VIBRATION

Some pile driving and rock drilling operations have been carried out at Chaitya Road, Colombo. However, during the considered period, there were no vibration impact on adjacent buildings and structures.

# - SOIL CONDITION

The soil condition at each location has been monitored and recorded in the daily construction monitoring report. The report included the water table levels, soil type.

#### SOLID WASTE

The below solid waste generated at site has been monitored and the disposal methods have been informed to the site staff.

- Wooden Pallets (collected at the project stores at Panchikawatte and distributed for domestic use such as firewood for cooking)
- Empty Collast Barrels (Reused to store collast and construction waster at site)
- Excavated Soil (Disposed at approved landfills within the sonsent of the land owners)

- HDPE Offcuts (collected at the project stores at Panchikawatte and stored for reuse)

# 3. NATURAL ENVIRONMENT

N/A

# 4. SOCIAL ENVIRONMENT

# - WORKING CONDITION, SAFETY AND HEALTH

The below parameters have been checked daily by the HSE officer and recorded

Check Item	Status
1. Personal Protective Equipment are in adequate numbers for workers, supervisory staff. Safety Helmet.	Available
2. Fire Extinguisher 2kg CO2	Available
3. Availability of Emergency Vehicle and the First Aid Kit.	Available
4. Traffic arrangement requirements fulfilled with sign boards as per the Traffic Management Plan.	Yes
5. Adequate number of Flud Lights available. (Min. 2 per 24m stretch)	Available
6. Traffic Indicators available - Blinking (Min. 4 per 24m stretch) and Rotating Lights (Min. 2 per 24m).	Available
7. The barricading of the location is adequate with hard barricades, traffic cones (spaced at 1.2m) and barricade tapes.	Available
8. Temporary power supplies are done using industrial type sockets, three core wires, proper earthing and are safe to use.	Yes
9. Fitness certificates of all machinery and equipment have been checked and are safe to use.	Yes
10. The personnel are fit (not under the influence of drugs).	Yes
11. Checked the Entry Permissions, Vehicle Permits obtained for personnel and vehicles planned for the work.	Yes
12. Adequate machinery and personnel are available at stores for issuing and handling materials.	Yes

TRAFFIC VOLUME (applied to Under Ground Cable extension work only. Not applied to construction of grid substations)

	•	WYL	ANGE	K FUI
	٦		•	Ten

		W/E- Week End	
Cable Route	Line Section	THE PARTY OF THE P	Volume
<u> </u>	121	Shift	Volume
220kV	Canal Bank	Night:	Low
		Day (W/E):	Low
220kV	Cyrll C. Perera Mw.	Night:	Low
		Day (W/E):	Low
220kV (SLPA)	Chaithya Road	Night:	Low
		Day (W/E):	Low
132kV (L-F-N)	York Street	Night:	Low
		Day (W/ξ):	Medium
132kV [N-Kol.]	Hyde Park Corner	Night:	Low
	Section 2	Day (W/E):	Medium
132kV (L-F)	Palice HC	Night:	Fow
_ <u></u> -		Day (W/E):	Low
The second secon	16 cm	Night:	Low
	Kent Road	Day (W/E):	Low
		Night:	Low
	Park Avenue	Day (W/E):	Low
		Night:	Low
	Norris Avenue	Day (W/E):	Low
•		Night:	Low
•	Nandadasa Kodagoda Mw.	Day (W/E):	Medium
		Night:	Low
	Kynsey Road.	Day (W/E):	Medium
32kV (N-Kolonnawa)	- 4	Night:	Low
	De Seram Place	Day (W/E):	Medium
		Might:	Low
	Foster Lane	Day (W/E):	Low
		Night:	Lòw
	Bráybrooke Street	Day (W/E):	Medium
		Night:	Low
	Union Place	Day (W/E):	Medium
		Night:	Low
	Staple Street	Day (W/E):	Low

#### ACCIDENTS

Item	Details of incident
No of accidents by increased traffic	2 minor vehicle accidents at Baseline Road
No of accidents by construction work	2 lost time injuries

(Remarks) 1. Please attach additional sheets if required.

2. No of accident by increased traffic will be supplied only to Under Ground Cable extension work. Not applied to construction grid substations.

(Other remarks) Please attach additional sheets if required.
Two incidents have been recorded due to increased traffic. There were no any injuries reported. The property damages of the two incidents have been compensated by the contracto's insurance. The corrective actions have been implemented to prevent recurrence of the same.

