Greater Colombo Transmission & Distribution Loss Reduction Project

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
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		
(Remarks) Not received any complaint yet. Complaint register maintaining according to EMP-C.			

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	27-04-2017	mg/l	Less than 1	Less than 1	50 for inland surface waters 150 for marine coastal areas	APHA	APHA
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	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)**

Item	Method	Frequency	Measurement Date & Month	Unit	Measured Value (Mean) (ug/m3)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
SPM (Suspended Particulate Matter) incl. dust	Hi- Volume sampling Gravimetric	Two times during construction	23rd March 2017	mg/m^3	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	Frequency	Measurement Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
Noise Level	Measurement-1	Once a year.	23rd March 2017	dB(A)	66	70	day time:75 night time:50	ISO 1996 BS 4142(1990)	ISO 1996 BS 4142(1990)
	Measurement-2		23rd March 2017	dB(A)	66	70	day time: 75 night time: 50		
	Measurement-3		23rd 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	Frequency	Measurement Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
Vibration Level	Measurement-1	Annually (but not mention)	3rd May 2017	mm / sec.	0.105	0.145	5.0 mm / sec.		
	Measurement-2				1.000	1.009	5.0 mm / sec.		
	Measurement-3				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 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 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 harmful soil	None.
Solid waste	Physical Observation	weekly	March 30/ 2018	No harmful soil	None.
(Remarks) 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	03rd January 2018 6th February 2018 14th 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)**

Item	Method	Frequency	Measurement Date & Month	Unit	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.							

- ACCIDENTS.

Greater Colombo Transmission & Distribution Loss Reduction Project

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

Table 2.2: Environmental Measurements Schedule

Aspect	Parameter	Method	Stage	Frequency	Responsibility	Location
Noise level	Day and Night time Noise level (dB)	Portable noise meter (range 0-120 dB(A))	Pre-construction	Once (Baseline measurement)	Contractor / CEB	At Substation boundary; Sensitive locations of Transmission & Distribution routes;
			Construction	Once a year	Contractor / CEB	
			Operation	Once; On complaints	CEB	
Air quality	SO_2, NO_2, CO, PM_{10}, SPM	Spectrometric method; High volume sampling and Gravimetric analysis	Pre-construction	Once (Baseline measurement)	Contractor / CEB	At Substations; Sensitive locations of Transmission and Distribution routes;
			Construction	Two times	Contractor / CEB	
			Operation	Once; On complaints	CEB	
Water Quality	EC, TSS, DO, BOD, COD, pH, Oil and grease,	Portable water quality Meter, Spectrometric method	Pre-construction	Once (Baseline measurement)	Contractor / CEB	Nearest water sources at Substations; Sensitive locations of Transmission & Distribution routes;
			Construction	Once a year	Contractor / CEB	
			Operation	Once; On complaints	CEB	

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		
(Remarks) Not received any complaint yet. Complaint register maintaining according to EMP-C.			

2. POLLUTION

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

No generation of waste water

- **AIR QUALITY (Ambient Air Quality)**

Item	Method	Frequency	Measurement Date & Month	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/m^3	3hr: 94	-	3hrs: 450	= SL Standards	NA
PM_{10} (Particulate Matter - 10 micrometers or less in diameter)	ASTM 4096 – 82, 1997 High - Volume sampling Gravimetric Analysis	Quarterly	22-23/03/2017	ug/m^3	24hr: 52	-	24hrs: 100	= SL Standards	NA
$PM_{2.5}$ (Particulate Matter – 2.5 micrometers or less in diameter)	ASTM 4096 – 82, 1997 High - Volume sampling Gravimetric Analysis	Quarterly	22-23/03/2017	ug/m^3	24hr: 29	-	24hrs: 50	= SL Standards	NA

SO_2	ASTM D 2914 – 78, 1987 West Gaek & Pararosaniline Spectrometric method	Quarterly	23/03/2017	ug/m³	8hr: 11	-	8hr: 120	= SL Standards	NA
NO_2	ASTM D 1607 – 76, 1987, Griess – Saltzman Reaction method	Quarterly	23/03/2017	ug/m³	8hr: 25	-	8hr: 150	= SL Standards	NA
CO	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	Frequency	Measurement Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
Noise Level	Measurement-1	Once a year.	23rd March 2017	dB(A)	66	70	day time:75 night time:50	ISO 1996 BS 4142(1990)	ISO 1996 BS 4142(1990)
	Measurement-2		23rd March 2017	dB(A)	66	70	day time: 75 night time: 50		
	Measurement-3		23rd 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	Frequency	Measurement Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
Vibration Level	Measurement-1	Annually (but not mention)	3rd May 2017	mm / sec.	0.112	0.158	5.0 mm / sec.		
	Measurement-2				1.090	1.041	5.0 mm / sec.		
	Measurement-3				0.985	0.997	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 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 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 harmful soil	None.
Solid waste	Physical Observation	weekly	March 30/ 2018	No harmful soil	None.

(Remarks) 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	03rd January 2018 6th February 2018 14th 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)**

Item	Method	Frequency	Measurement Date & Month	Unit	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.

- **ACCIDENTS.**

Item	Method	Frequency	Measurement Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Measured to be Taken
No of accidents by increased traffic Traffic Volume		Weekly					
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.

Table 2.2: Environmental Measurements Schedule

Aspect	Parameter	Method	Stage	Frequency	Responsibility	Location
Noise level	Day and Night time Noise level (dB)	Portable noise meter (range 0-120 dB(A))	Pre-construction	Once (Baseline measurement)	Contractor / CEB	At Substation boundary;
			Construction	Once a year	Contractor / CEB	Sensitive locations of Transmission & Distribution routes;
			Operation	Once; On complaints	CEB	
Air quality	SO_2, NO_2, CO, PM_{10}, SPM	Spectrometric method; High volume sampling and Gravimetric analysis	Pre-construction	Once (Baseline measurement)	Contractor / CEB	At Substations;
			Construction	Two times	Contractor / CEB	Sensitive locations of Transmission and Dstribution routes;
			Operation	Once; On complaints	CEB	

ENVIRONMENTAL MONITORING FORMAT

MONITORING POINT:

QUARTER/ 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.
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		
(Remarks) Not received any complaint yet. Complaint register maintaining according to EMP-C.			

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	Quarterly	8th February 2017	mg/l	Less than 1	Less than 1	S0 for inland surface waters 150 for marine coastal areas	APHA	APHA
Oil	Field sampling	Quarterly	8th February 2017	mg/l	2	2	10 for inland surface waters 20 for marine coastal areas	APHA	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)**

Item	Method	Frequency	Measurement Date & Month	Unit	Measured Value (Mean) (ug/m3)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
SPM (Suspended Particulate Matter) incl. dust	Hi- Volume sampling Gravimetric	Quarterly	29th and 30th March 2017	mg/m^3	142(ug/m3)	142(ug/m3)	Annual 0.10 24hrs: 0.30 8hrs: 0.3S 3hrs: 0.45 1hr. 0.50	ASTMD 4096-82-1997.	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	Frequency	Measurement Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
Noise Level	Measurement-1	Quarterly	15th March 2017	dB(A)	67 65	67 65	day time:75 night time:50	ISO 1996 BS 4142(1990)	ISO 1996 BS 4142(1990)
	Measurement-2		15th 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	Frequency	Measurement Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
Vibration Level	Measurement-1	Annually	15th March 2017	mm / sec.	0.010	0.165	5.0 mm / sec.		
	Measurement-2		15th March 2017	mm / sec.	0.060	0.039	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 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 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 harmful soil	None.
Solid waste	Physical Observation	weekly	March 30/ 2018	No harmful soil	None.
(Remarks) 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	03rd January 2018 6th February 2018 14th 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. – Ref: attached pictures 1 & 2.					

- **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
(Remarks) Please attach additional sheets if required.							
(Other remarks) Please attach additional 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 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	Maintaining site based first aid registry		Reported 12 number of minor injuries. And 24 first aid 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.

Table 2.2: Environmental Measurements Schedule

Aspect	Parameter	Method	Stage	Frequency	Responsibility	Location
Noise level	Day and Night time Noise level (dB)	Portable noise meter (range 0-120 dB(A))	Pre-construction	Once (Baseline measurement)	Contractor / CEB	At Substation boundary;
			Construction	Once a year	Contractor / CEB	Sensitive locations of Transmission & Distribution routes;
			Operation	Once; On complaints	CEB	
Air quality	SO_2, NO_2, CO, PM_{10}, SPM	Spectrometric method; High volume sampling and Gravimetric analysis	Pre-construction	Once (Baseline measurement)	Contractor / CEB	At Substations;
			Construction	Two times	Contractor / CEB	Sensitive locations of Transmission and Dstribution routes;
			Operation	Once; On complaints	CEB	
Water Quality	EC, TSS, DO, BOD, COD, pH, Oil and grease,	Portable water quality Meter, Spectrometric method	Pre-construction	Once (Baseline measurement)	Contractor / CEB	Nearest water sources at Substations;
			Construction	Once a year	Contractor / CEB	Sensitive locations of Transmission & Distribution routes;
			Operation	Once; On complaints	CEB	

pENVIRONMENTAL MONITORING FORMAT.

MONITORING POINT:

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

SITE: Augmentation of 132/11kV Colombo A Grid 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		
(Remarks) Not received any complaint yet. Complaint register maintaining according to EMP-C.			

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 1	Less than 1	50 for inland surface waters 150 for marine coastal areas	APHA	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	APHA	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)**

Item	Method	Frequency	Measurement Date & Month	Unit	Measured Value (Mean) (ug/m3)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
SPM (Suspended Particulate Matter) incl. dust	Hi- Volume sampling Gravimetric	Two times during construction	03-05-2017	mg/m^3	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	Measurement Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
Noise Level	Measurement-1	Once a year.	03-05-2017	dB(A)	1 Hour	56	day time:56 night time:50	ISO 1996 BS 4142(1990)	ISO 1996 BS 4142(1990)
	Measurement-2		03-05-2017	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	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
Vibration Level	Measurement-1	Annually (but not scheduled)	30-05-2017	mm / sec.	0.134	0.220	5.0 mm / sec.		
	Measurement-2				1.420	1.068	5.0 mm / sec.		
	Measurement-3				0.700	0.894	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 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**

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 harmful soil	None.
Solid waste	Physical Observation	weekly	March 30/ 2018	No harmful soil	None.
(Remarks) 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	03rd January 2018 6th February 2018 14th 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 attach additional sheets if required.					

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

Table 2.2: Environmental Measurements Schedule

Aspect	Parameter	Method	Stage	Frequency	Responsibility	Location
Noise level	Day and Night time Noise level (dB)	Portable noise meter (range 0-120 dB(A))	Pre-construction	Once (Baseline measurement)	Contractor / CEB	At Substation boundary; Sensitive locations of Transmission & Distribution routes;
			Construction	Once a year	Contractor / CEB	
			Operation	Once; On complaints	CEB	
Air quality	SO_2, NO_2, CO, PM_{10}, SPM	Spectrometric method; High volume sampling and Gravimetric analysis	Pre-construction	Once (Baseline measurement)	Contractor / CEB	At Substations; Sensitive locations of Transmission and Distribution routes;
			Construction	Two times	Contractor / CEB	
			Operation	Once; On complaints	CEB	
Water Quality	EC, TSS, DO, BOD, COD, pH, Oil and grease,	Portable water quality Meter, Spectrometric method	Pre-construction	Once (Baseline measurement)	Contractor / CEB	Nearest water sources at Substations; Sensitive locations of Transmission & Distribution routes;
			Construction	Once a year	Contractor / CEB	
			Operation	Once; On complaints	CEB	

ENVIRONMENTAL MONITORING FORMAT.

MONITORING POINT:

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

SITE: Augmentation of 132/11kV Colombo I Grid 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		
(Remarks) Not received any complaint yet. Complaint register maintaining according to EMP-C.			

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 1	Less than 1	50 for inland surface waters 150 for marine coastal areas	APHA	APHA
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	APHA	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)**

Item	Method	Frequency	Measurement Date & Month	Unit	Measured Value (Mean) (ug/m3)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
SPM (Suspended Particulate Matter) incl. dust	Hi- Volume sampling Gravimetric	Two times during construction	03-05-2017	mg/m^3	2 Ug/m3	SO2-8 Hrs-15. NO2-8 Hrs-21. CO- 8 Hrs.- <2300 TSPM-3 Hrs.- 100 PM1.0- 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**

Item	Method	Frequency	Measurement Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
Noise Level	Measurement-1	Once a year.	03-05-2017	dB(A)	1 Hour	69	day time:69 night time:67	ISO 1996 BS 4142(1990)	ISO 1996 BS 4142(1990)
	Measurement-2		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	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
Vibration Level	Measurement-1	Annually (but not scheduled)	30-05-2017	mm / sec.	0.104	0.120	5.0 mm / sec.		
	Measurement-2				1.120	1.100	5.0 mm / sec.		
	Measurement-3				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 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**

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 harmful soil	None.
Solid waste	Physical Observation	weekly	March 30/ 2018	No harmful soil	None.
(Remarks) 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	03rd January 2018 6th February 2018 14th 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 attach additional sheets if required.					

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

Table 2.2: Environmental Measurements Schedule

Aspect	Parameter	Method	Stage	Frequency	Responsibility	Location
Noise level	Day and Night time Noise level (dB)	Portable noise meter (range 0-120 dB(A))	Pre-construction	Once (Baseline measurement)	Contractor / CEB	At Substation boundary;
			Construction	Once a year	Contractor / CEB	Senisitive locations of Transmission & Distribution routes;
			Operation	Once; On complaints	CEB	
Air quality	SO_2, NO_2, CO, PM_{10}, SPM	Spectrometric method; High volume sampling and Gravimetric analysis	Pre-construction	Once (Baseline measurement)	Contractor / CEB	At Substations;
			Construction	Two times	Contractor / CEB	Sensitive locations of Transmission and Dstribution routes;
			Operation	Once; On complaints	CEB	
Water Quality	EC, TSS, DO, BOD, COD, pH, Oil and grease,	Portable water quality Meter, Spectrometric method	Pre-construction	Once (Baseline measurement)	Contractor / CEB	Nearest water sources at Substations;
			Construction	Once a year	Contractor / CEB	Sensitive locations of Transmission & Distribution routes;
			Operation	Once; On complaints	CEB	

ENVIRONMENTAL MONITORING FORMAT.

MONITORING POINT:

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

SITE: Construction of new 33 kV GIS at Kelanitissa.

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		
(Remarks) Not received any complaint yet. Complaint register maintaining according to EMP-C.			

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 1	50 for inland surface waters 150 for marine coastal areas	APHA	APHA
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	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)**

Item	Method	Frequency	Measurement Date & Month	Unit	Measured Value (Mean) (ug/m3)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
SPM (Suspended Particulate Matter) incl. dust	Hi- Volume sampling Gravimetric	Two times during construction	14th 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.	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	Measurement Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
Noise Level	Measurement-1	Once a year.	09th May 2017	dB(A)	3 Hrs.	77	day time:75 night time:50	ISO 1996 BS 4142(1990)	ISO 1996 BS 4142(1990)
	Measurement-2		09th May 2017	dB(A)	3 Hrs.	79	day time: 75 night time: 50		
	Measurement-3		09th 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	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka Standards*	Standards for Contract	Referred International Standards
Vibration Level	Measurement-1	Annually (but not mention)	10rd May 2017	mm / sec.	0.125	0.165	5.0 mm / sec.		
	Measurement-2				1.010	1.018	5.0 mm / sec.		
	Measurement-3				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.
l condition	sical Observation	weekly	January 12/ 2018	No harmful soil	None.
l condition	sical Observation	weekly	January 19/ 2018	No harmful soil	None.
l condition	sical Observation	weekly	January 26/ 2018	No harmful soil	None.
l condition	sical Observation	weekly	February 02/ 2018	No harmful soil	None.
l condition	sical Observation	weekly	February 09/ 2018	No harmful soil	None.
l condition	sical Observation	weekly	February 16/ 2018	No harmful soil	None.
l condition	sical Observation	weekly	February 23/ 2018	No harmful soil	None.
l condition	sical Observation	weekly	March 02/ 2018	No harmful soil	None.
l condition	sical Observation	weekly	March 09/ 2018	No harmful soil	None.
l condition	sical Observation	weekly	March 16/ 2018	No harmful soil	None.
l condition	sical Observation	weekly	March 23/ 2018	No harmful soil	None.
l condition	sical 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 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 harmful soil	None.
Solid waste	Physical Observation	weekly	March 30/ 2018	No harmful soil	None.

(Remarks) 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	03rd January 2018 6th February 2018 14th 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 attach additional sheets if required.

- **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

(Remarks) Please attach additional sheets if required.

(Other remarks) Please attach additional 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 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.

Table 2.2: Environmental Measurements Schedule

Aspect	Parameter	Method	Stage	Frequency	Responsibility	Location
Noise level	Day and Night time Noise level (dB)	Portable noise meter (range 0-120 dB(A))	Pre-construction	Once (Baseline measurement)	Contractor / CEB	At Substation boundary; Sensitive locations of Transmission & Distribution routes;
			Construction	Once a year	Contractor / CEB	
			Operation	Once; On complaints	CEB	
Air quality	SO_2, NO_2, CO, PM_{10}, SPM	Spectrometric method; High volume sampling and Gravimetric analysis	Pre-construction	Once (Baseline measurement)	Contractor / CEB	At Substations; Sensitive locations of Transmission and Dstribution routes;
			Construction	Two times	Contractor / CEB	
			Operation	Once; On complaints	CEB	
Water Quality	EC, TSS, DO, BOD, COD, pH, Oil and grease,	Portable water quality Meter, Spectrometric method	Pre-construction	Once (Baseline measurement)	Contractor / CEB	Nearest water sources at Substations; Sensitive locations of Transmission & Distribution routes;
			Construction	Once a year	Contractor / CEB	
			Operation	Once; On complaints	CEB	

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.
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	-	-	-
Number and contents of responses from Government agencies	-	-	-
(Remarks) Please attach additional sheets for details information if required			

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

Item	Method	Frequency	Measurement Date & Month	Unit[1]	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	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_{10} (Particulate Matter - 10 micrometers or less in diameter)	ASTM 4096 – 82, 1997 High - Volume sampling Gravimetric Analysis	Two times during construction	10-08-2017	ug/m³	L1: 24hr: 75 L2: 24hr: 51	-	24hrs: 100	= SL Standards	NA
$PM_{2.5}$ (Particulate Matter – 2.5 micrometers or less 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
O_3	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_2	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_2	ASTM D 1607 – 76, 1987, Griess – Saltzman Reaction method	Two times during construction	11-08-2017	ug/m³	L1: 8hr: 20 L2: 8hr:18	-	8hr: 150	= SL Standards	NA
CO	ASTM D 3162 – 78, 1987 Non – dispersive infrared Spectrometric method	Two times during construction	11-08-2017	ug/m³	L1: 8hr: <0.1 L2: 8hr: <0.1	-	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

(Other Remarks) Please attach additional sheets if required

[1] Unit ug = microgram

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

- NOISE

Boundary Noise Levels of Sample Locations was monitored on 10th 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

Item	Method	Frequency*	Measurement Date & Month	Unit	Measured Value (Mean)	Measured Value (Max.)	Sri Lanka Standards**	Standards for Contract	Referred International Standards
Noise Level	ISO 1990 (part 1,2,3) and BS 4142; 1990	Once a year	Location N1 – during cutting of road surface						
			10-08-2017	dB(A)	74	-	day time:75 night time:50	= SL Standards	NA
			Location N1 – during digging of road using backhoe						
			10-08-2017	dB(A)	72	-	day time: 75 night time: 50	= SL Standards	NA
			Location N1 – during excavation, cabling, filling, compaction						
			10-08-2017	dB(A)	65	-	day time: 75 night time: 50	= SL Standards	NA
			Location N2 – during cutting of road surface						
			10-08-2017	dB(A)	72	-	day time:75 night time:50	= SL Standards	NA
			Location N2 – during digging of road using backhoe						
			10-08-2017	dB(A)	67	-	day time: 75 night time: 50	= SL Standards	NA
			Location N2 – during excavation, cabling, filling, compaction						
			10-08-2017	dB(A)	65	-	day time: 75 night time: 50	= SL Standards	NA

(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)**

W/E- Week End

Cable Route	Line Section	Traffic Volume	
		Shift	Volume
220kV	Canal Bank	Night:	Low
		Day (W/E):	Low
220kV	Cyril 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/E):	Medium
132kV (N-Kol.)	Hyde Park Corner	Night:	Low
		Day (W/E):	Medium
132kV (L-F)	Police HQ	Night:	Low
		Day (W/E):	Low
132kV (N-Kolonnawa)	Kent Road	Night:	Low
		Day (W/E):	Low
	Park Avenue	Night:	Low
		Day (W/E):	Low
	Norris Avenue	Night:	Low
		Day (W/E):	Low
	Nandadasa Kodagoda Mw.	Night:	Low
		Day (W/E):	Medium
	Kynsey Road.	Night:	Low
		Day (W/E):	Medium
	De Seram Place	Night:	Low
		Day (W/E):	Medium
	Foster Lane	Night:	Low
		Day (W/E):	Low
	Braybrooke Street	Night:	Low
		Day (W/E):	Medium
	Union Place	Night:	Low
		Day (W/E):	Medium
	Staple Street	Night:	Low
		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 of 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.