香港電燈有限公司
The Hongkong Electric Co., Ltd.

Lamma Power Station Extension
Operational Phase
Monthly Environmental Monitoring & Audit Report

September 2020

香港電燈有限公司
The Hongkong Electric Co., Ltd.

港燈
HK Electric

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) ORDINANCE, CAP. 499

ENVIRONMENTAL PERMIT NO. EP-071/2000/D

LAMMA POWER STATION EXTENSION ENVIRONMENTAL MONITORING & AUDIT PROGRAMME AT OPERATIONAL PHASE

Report Title	Monthly EM&A Report (September 2020)
Date	14 October 2020
Certified by	(Mr. IP Tat-Yan, Environmental Team Leader)
Verified by	Mr. Y T Tang (AECOM Asia Company Limited, Independent Environmental Checker)

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EXECUTIVE SUMMARY

This is the 168th monthly Environmental Monitoring and Audit (EM&A) report for the Project "Operation of Lamma Power Station Extension" prepared by the Environmental Team (ET). This report presents the results of impact monitoring on air quality, noise, water quality and environmental audit for the operation of the said in September 2020.

Air quality, noise and water quality monitoring were performed. The results were checked against the established Action/Limit (AL) levels. The implementation status of the environmental mitigation measures, Event/Action Plan and environmental complaint handling procedures were also checked.

Plant Availability

Unit L9 and L10 out of service during the following period:

Unit	Period	Remark
L10	03/09/2020 03:43 to 04/09/2020 05:21	Defect rectification
L10	30/09/2020 20:57 to 30/09/2020 23:59	Defect rectification

Environmental Monitoring Works

EPD officials from Regional Office (South) visited Lamma Power Station on 9 & 23/9/2020. There was no adverse comment received from EPD regarding the operation of Lamma Power Station Extension.

Environmental monitoring works, as mentioned in the EM&A Manual (Operational phase), were performed during the operation of Lamma Power Station Extension in the reporting period.

Air Quality
No exceedance of Action and Limit levels for stack NOx was recorded in the reporting month.

Noise
No exceedance of Action and Limit levels for noise was recorded in the reporting month.

Water Quality
No exceedance of Action and Limit levels for water quality was recorded in the reporting month.

Environmental Licensing and Permitting

Description	Permit / Licence No.	Valid Period		Issued To	Date of Issuance
		From	To		
Environmental Permit	EP-071/2000/C	18/05/2005	-	HK Electric	18/05/2005

Description	Permit / Licence No.	Valid Period		Issued To	Date of Issuance
		From	To		
Environmental Permit	EP-071/2000/D	28/09/2020	-	HK Electric	28/09/2020
Specified Processes Licence issued under APCO	L-7-002(12)	04/10/2019	31/12/2020	HK Electric	04/10/2019
WPCO Discharge Licence for L1-L10 and GT57	WT00034992-2019	10/02/2020	30/11/2021	HK Electric	10/2/2020

Implementation Status of Environmental Mitigation Measures

Environmental mitigation measures were implemented in the reporting month.

Environmental Complaints

No complaint against the Project was received in the reporting month. Yet there was feedback about discharge from Lamma Power Station on a morning during which nothing abnormal at the power station was identified.

Future Key Issues

Key issues to be considered in the coming month include:

Air Impact
- To continuously monitor the stack NOx for Lamma Power Station Extension.

Noise Impact
- To continuously monitor the noise for Lamma Power Station Extension.

Water Impact
- To continuously carry out the water quality monitoring for Lamma Power Station Extension.

Concluding Remarks

The environmental performance of the project was generally satisfactory.

1. INTRODUCTION

The operational phase Lamma Power Station Extension commenced in mid October 2006 following the completion of erection works and commissioning tests for Unit L9. The Environmental Team (hereinafter called the "ET") was formed within The Hongkong Electric Co., Ltd. (HK Electric) to undertake Environmental Monitoring and Audit for "Operation of Lamma Power Station Extension" (hereinafter called the "Project"). Under the requirements of Section 6 of Environmental Permit EP-071/2000/C, an EM&A programme for impact environmental monitoring set out in the EM&A Manual (Operational Phase) is required to be implemented. In accordance with the EM&A Manual, environmental monitoring of air quality, noise and water quality are required for the Project.

This report summarizes the environmental monitoring and audit work for the Project for the month of September 2020.

1.1 Plant Availability

Unit L9 and L10 out of service during the following period:

Unit	Period	Remark
L10	03/09/2020 03:43 to 04/09/2020 05:21	Defect rectification
L10	30/09/2020 20:57 to 30/09/2020 23:59	Defect rectification

1.2 Summary of EM&A Requirements

The EM&A program requires environmental monitoring for air quality, noise and water quality. The EM&A monitoring work for air quality, noise and water quality are described in Sections 2, 3 and 4 respectively.

The following environmental audits are summarized in Section 5 of the report:

- Environmental monitoring results;
- The implementation status of environmental protection and pollution control / mitigation measures.

The future key issues for the Project will be reported in Section 6 of this report.

2. AIR QUALITY

2.1 Monitoring Requirements

In accordance with the EM&A Manual (Operational Phase) for Lamma Extension, stack NOx is continuously monitored. Stack NOx monitoring data would be checked against the Action/Limit Levels stated in the EM&A Manual. The monitoring frequency is shown in Table 2.1 below:

Table 2.1 Air Quality Monitoring Parameter and Frequency

Parameter	Frequency
Hourly Average Stack NOx	Continuous

2.2 Summary of Results and Observations

Monitoring of stack NOx was conducted during the operation of Units L9 and L10 in the reporting month. A monthly summary of monitoring data is shown in Appendix C.

No Action/Limit Level exceedance on stack NOx was recorded in the reporting month.

2.3 Implementation Status of Monitoring of Ammonia

Monitoring of ammonia for the use of Selective Catalytic Reduction System for NOx control was conducted pursuant to the requirement of Specified Process (SP) licence under the Air Pollution Control Ordinance. No non-compliance of SP licence requirement on stack NH_3 emission was recorded in the reporting month. The relevant data would be submitted to EPD under a separate submission for the SP licence. To avoid duplication of effort, the monitoring and reporting requirements for ammonia under the SP licence will not be included in this EM&A programme.

3. NOISE

3.1 Monitoring Requirements/

In accordance with the EM&A Manual for Lamma Extension (Operational Phase), continuous noise monitoring at Ash Lagoon is carried out to calculate the noise arising from the operation of Lamma Extension at the critical NSR at Hung Shing Ye. Baseline noise levels are applied for correction to the noise monitoring data. The data after corrections would be checked against the Limit Levels specified in the EM&A Manual.

The noise monitoring location is shown in Figure 3.1. The monitoring parameter and frequency are shown in Table 3.1 below:

Table 3.1 Noise Monitoring Parameter and Frequency

Parameter	Frequency	Time Period
30-min L_{Aeq}	continuous	0700 - 2300 hrs and 2300 - 0700 hrs of next day

With the endorsement of the Independent Environmental Checker, the enhancement of calibration of sound level meter at the noise monitoring station was implemented. The monthly manual on-site calibration using sound level calibrator was replaced by the daily auto charge injection calibration function of the sound level meter. For additional quality assurance, manual on-site calibration is still conducted for the noise monitoring station once every 6 months. The manual on-site calibration was carried out in September 2020 and the next calibration was scheduled in March 2021. The verification of the sound level meter/calibrator by the manufacturer or an accredited laboratory biennially / annually remains unchanged.

3.2 Summary of Results and Observations

Continuous noise monitoring was conducted at the monitoring station at Ash Lagoon. The monitoring results are shown in Appendix D.

No Action/Limit Level exceedance on noise was recorded in the reporting month.

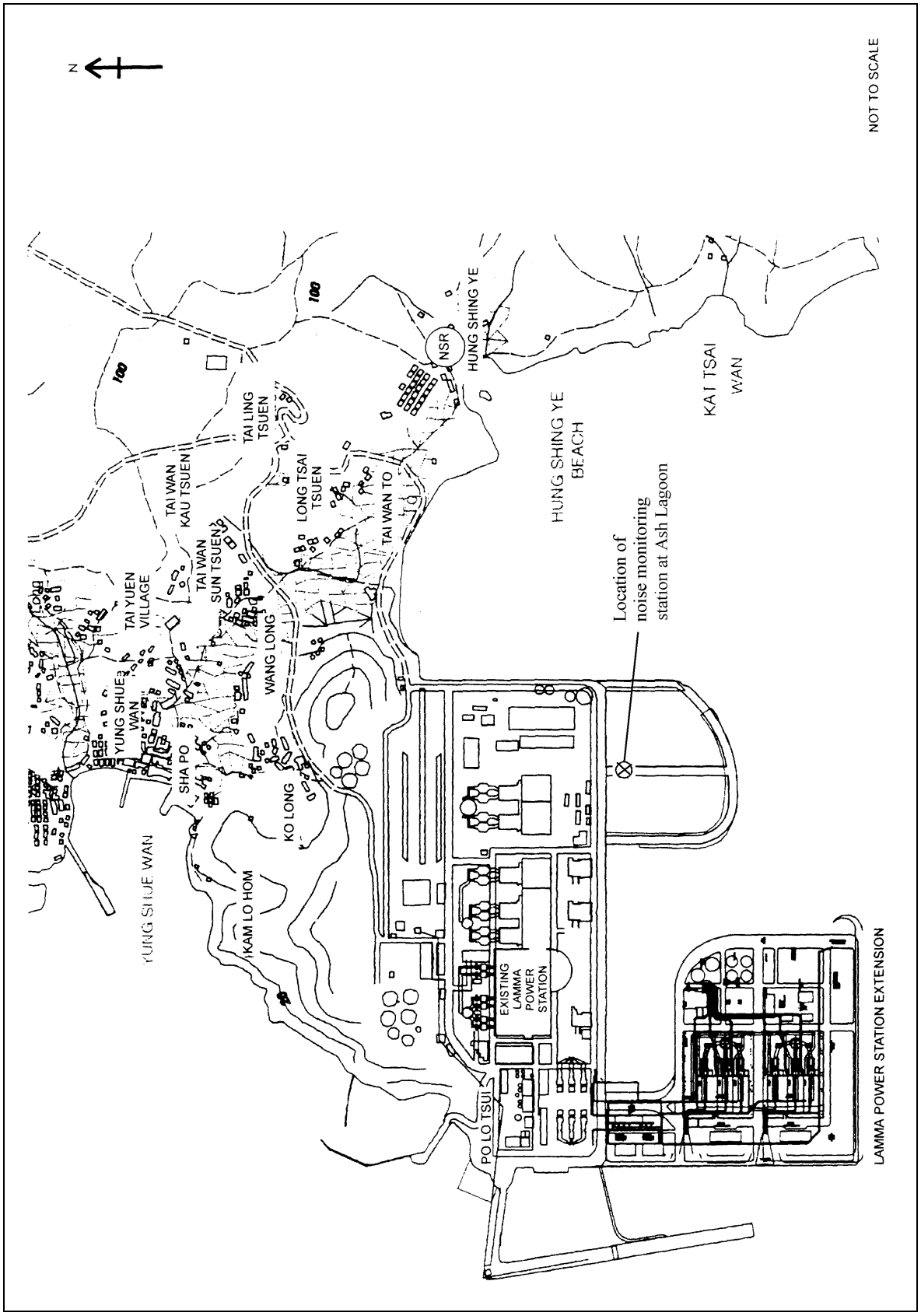

Figure 3.1 Location of Noise Monitoring Station

4. WATER QUALITY

4.1 Monitoring Requirements

In accordance with the EM&A Manual for Lamma Extension (Operational Phase), the monitoring requirements for the EM&A work should strictly follow the discharge licence for L1-L10 & GT57 issued under the Water Pollution Control Ordinance (WPCO).

The parameters as stated in Table 4.1 were monitored and checked against the Action/Limit Levels as given in Appendix B.

Table 4.1 Water Quality Monitoring Parameters and Frequencies

Item	Parameters	Frequencies
1	Cooling Water Temperature Rise	Daily
2	Total Residual Chlorine	Bi-weekly
3	Temperature of Blowdown Effluent	At least twice per year
4	Suspended Solids from Blowdown Effluent	At least twice per year
5	Grease & Oil from Blowdown Effluent	At least twice per year
6	Scum of foam in ambient water	Daily

4.2 Summary of Results and Observations

Monitoring of various parameters as listed in Table 4.1 above was carried out during the operation of Units L9 and L10 in the reporting month. A monthly summary of the data is shown in Appendix E.

The data recorded for the monitoring parameters were all below their corresponding Action/Limit Levels. No Action/Limit level exceedance was recorded in the reporting month. There was no foam present within 500 meters of Hung Sing Ye Beach in the reporting month. Details of the foam observation report are also given in Appendix E. The effluent quality was generally satisfactory.

4.3 Implementation Status on Thermal Plume and Residual Chlorine Surveys

One survey for thermal plume and residual chlorine concentration at the seawater around the discharges from the Lamma Power Station and Lamma Power Station Extension shall be carried out after the commissioning of each of the generating units for the Project. The survey for L10 would be tentatively conducted in the coming winter (2020) / next summer (2021) tentatively.

5. ENVIRONMENTAL AUDIT

EPD officials from Regional Office (South) visited Lamma Power Station on 9 & 23/9/2020. There was no adverse comment received from EPD regarding the operation of Lamma Power Station Extension.

5.1 Review of Environmental Monitoring Procedures

The environmental monitoring procedures were regularly reviewed by the Environmental Team. No modification to the existing monitoring procedures was recommended.

5.2 Assessment of Environmental Monitoring Results

Monitoring results for Air Quality, Noise and Water Quality

The environmental monitoring results for air quality, noise and water quality in September 2020 presented in Sections 2, 3 and 4 respectively are summarized in Table 5.1.

Table 5.1 Summary of Action/Limit Level Exceedances on Monitoring Parameters

Item	Parameter Monitored	Monitoring Period	No. of Exceedances In		Event/Action Plan Implementation Status and Results
			Action Level	Limit Level	
Air					
1	Stack NOx	01/09/2020 30/09/2020	0	0	
Noise					
1	Noise levels at the critical NSR at Hung Shing Ye calculated by the noise alarm monitoring system	01/09/2020 30/09/2020	0	0	
Water					
1	Cooling Water Temperature Rise	01/09/2020 30/09/2020	0	0	
2	Total Residual Chlorine	01/09/2020 30/09/2020	0	0	

Item	Parameter Monitored	Monitoring Period	No. of Exceedances In		Event/Action Plan Implementation Status and Results
			Action Level	Limit Level	
3	Temperature of Blowdown Effluent	01/09/2020 30/09/2020	N.A.	0	
4	Suspended Solids from Blowdown Effluent	01/09/2020 30/09/2020	N.A.	0	
5	Grease & Oil from Blowdown Effluent	01/09/2020 30/09/2020	N.A.	0	
6	Inspection of Scum/Foam in ambient water	01/09/2020 30/09/2020	0	0	

Land Contamination

There was no land contamination incident happened in the reporting month.

Waste Management

Waste management practice was properly implemented for operation of the project as outlined in the Waste Management Plan for Lamma Power Station Extension. There was no unacceptable environmental impact on waste management in the reporting month.

5.3 Status of Environmental Licensing and Permitting

All permits/licenses obtained as of September 2020 are summarised in Table 5.2.

Table 5.2 Summary of Environmental Licensing and Permit Status

Description	**Permit / Licence No.**	**Valid Period**		**Status**
		From	**To**	
Environmental Permit	EP-071/2000/C	18/05/2005	-	Superseded by EP-071/2000/D from 28/9/2020
Environmental Permit	EP-071/2000/D	28/09/2020	-	Valid
Specified Processes Licence issued under APCO*	L-7-002(12)	04/10/2019	31/12/2020	Valid

Description	Permit / Licence No.	Valid Period		Status
		From	To	
WPCO Discharge Licence for L1-L10 and GT57#	WT00034992-2019	10/02/2020	30/11/2021	Valid

Notes: * - The varied SP licence for L10 operation was issued on 4/10/2019.
- The varied WPCO discharge licence for L10 operation was issued on 23/7/2019 and was subsequently renewed on 10/2/2020.

5.4 Implementation Status of Environmental Mitigation Measures

Mitigation measures detailed in the permits and the EM&A Manual (Operational Phase) are required to be implemented. An updated summary of the Environmental Mitigation Implementation Schedule (EMIS) is presented in Appendix F.

5.5 Implementation Status of Event/Action Plans

The Event/Action Plans for air quality, noise and water quality extracted from the EM&A Manual (Operational Phase) are presented in Appendix A.

5.6 Implementation Status of Environmental Complaint Handling Procedures

In September 2020, no complaint against the Project was received. Yet feedback was received via EPD on 03/09/2020 regarding concern from a public member about discharge from Lamma Power Station in the morning of 01/09/2020 during which nothing abnormal at the power station was identified.

Table 5.3 Environmental Complaints Received in September 2020

Case Reference / Date, Time Received / Date, Time Concerned	Descriptions / Actions Taken	Conclusion / Status
Nil	N/A	N/A

Table 5.4 Outstanding Environmental Complaints Carried Over

Case Reference / Date, Time Received / Date, Time Concerned	Descriptions / Actions Taken	Conclusion / Status
Nil	N/A	N/A

6. FUTURE KEY ISSUES

6.1 Outage Plan for the coming 3 months

No major outage plan in the coming three months.

6.2 Key issues for the coming month

Key issues to be considered in the coming month include:

Air Impact

- To continuously monitor the stack NOx for Lamma Power Station Extension.

Noise Impact

- To continuously monitor the noise for Lamma Power Station Extension.

Water Impact

- To continuously carry out the water quality monitoring for Lamma Power Station Extension.

7. CONCLUSION

Environmental monitoring was performed as required in the reporting month. All monitoring results were checked and reviewed.

No Action/Limit level exceedance on stack NOx was recorded in the reporting month

No Action/Limit level exceedance on noise was recorded in the reporting month.

No Action/Limit level exceedance on water quality parameters was recorded in the reporting month.

Environmental mitigation measures recommended in the EM&A Manual for the operational activities were implemented in the reporting month. No complaint against the Project was received in the reporting month. Yet there was feedback about discharge from Lamma Power Station on a morning during which nothing abnormal at the power station was identified. No prosecution was received for this Project in the reporting period.

The environmental performance of the Project was generally satisfactory.

Appendix A Event/Action Plans

Table A.1 Event/Action Plan for Air Quality

Exceedance	ET Leader	IEC	Operations Engineer
Action Level			
Exceedance of one sample	Identify source; Inform IEC verbally; Repeat measurement to confirm finding.	Check monitoring data submitted by ET Leader and advise ET Leader for any finding.	Rectify any unacceptable practice; Amend any working methods if appropriate.
Exceedance of two or more consecutive samples	Identify source; Inform IEC verbally; Repeat measurement to confirm finding; Increase monitoring frequency; Discuss with Operations Engineers on remedial actions required; If exceedance stops, discontinue additional monitoring.	Check monitoring data submitted by ET Leader and advise ET Leader for any finding; Verify the implementation of the remedial measures;	Discuss with ET Leader on remedial actions required; Implement the agreed remedial actions.
Limit level			
Exceedance of one sample	Repeat measurement to confirm finding; Identify the source(s) of the impact. Verbally inform IEC and EPD of the exceedance as soon as practicable; Discuss with Operations Engineers on remedial actions required; Increase monitoring frequency; Assess the effectiveness of the remedial actions and keep IEC and EPD informed of the results.	Check monitoring data submitted by ET Leader and advise ET Leader of any finding; Verify the implementation of the remedial measures.	Take immediate action to avoid further exceedances; Discuss with ET Leader on remedial actions required; Implement the agreed remedial actions.
Exceedance of two or more consecutive samples	Identify source; Identify the source(s) of the impact. Verbally inform IEC and EPD of the exceedance as soon as practicable; Repeat measurement to confirm finding; Increase monitoring frequency; Carry out analysis on existing control procedures to determine possible mitigation to be implemented; Discuss with Operations Engineers on the remedial actions to be taken; If exceedance stops, discontinue additional monitoring.	Provide feedback and advise ET Leader/Operations Engineers on the effectiveness of the remedial actions proposed by them; Verify the implementation of the remedial measures.	Take immediate action to avoid further exceedance; Discuss with ET Leader on remedial actions required; Implement the agreed remedial actions; Check the suspected defective parts if the problem still does not come under control.

Table A.2 Event/Action Plan for Noise

Exceedance	ET Leader	IEC	Operations Engineer
Action Level	If the complaint against Lamma Extension operation is valid, identify the source(s) of the noise and propose remedial measures if necessary;	Verify the implementation of the remedial measures.	Discuss with ET Leader on remedial actions required; Implement the agreed remedial actions.
Limit Level	Check monitoring data to confirm findings; Identify the source(s) of the impact. If the exceedance is found to be valid and due to the Lamma Extension operation, verbally inform IEC and EPD of the exceedance as soon as practicable; Discuss with Operations Engineers on remedial actions required.	Check monitoring data submitted by ET Leader and advise ET Leader of any finding; Verify the implementation of the remedial measures.	Take action to avoid further exceedance; Discuss with ET Leader on the remedial actions required; Implement the agreed remedial actions.

Table A.3 Event/Action Plan for Water Quality

Exceedance	ET Leader	IEC	Operations Engineer
Action Level			
Exceedance on one sampling day	Identify source(s) of impact; Verbally inform IEC.	Check monitoring data submitted by ET Leader and advise ET Leader for any findings.	Rectify unacceptable practice; Amend any working methods if appropriate.
Exceedances on more than one consecutive sampling day	Identify source(s) of impact; Verbally inform IEC; Repeat in-situ measurements to confirm findings; Discuss with Operations Engineers on remedial actions required; Increase monitoring frequency; If exceedance stops, discontinue additional monitoring.	Check monitoring data submitted by ET Leader and advise ET Leader for any finding; Verify the implementation of the remedial measures.	Discuss with ET Leader on remedial actions required; Implement the agreed remedial actions.
Limit Level			
Exceedance on one sampling day	Identify the source(s) of impact; Verbally inform IEC and EPD of the exceedance, as soon as practicable; Repeat measurement to confirm finding; Discuss with Operations Engineers on remedial actions required; Increase monitoring frequency; Assess the effectiveness of the remedial actions and keep IEC and EPD informed of the results.	Check monitoring data submitted by ET Leader and advise ET Leader for any finding; Verify the implementation of the remedial measures.	Take immediate action to avoid further exceedance; Discuss with ET Leader on remedial actions required; Implement the agreed remedial actions.
Exceedances on more than one consecutive sampling day	Identify the source(s) of impact; Verbally inform IEC and EPD of the exceedance as soon as	Provide feedback and advise ET Leader/Operations Engineers on the effectiveness of the remedial	Take immediate action to avoid further exceedance; Discuss with ET Leader on

Exceedance	ET Leader	IEC	Operations Engineer
	practicable; Repeat measurement to confirm finding; Discuss with Operations Engineers on remedial actions required; Increase monitoring frequency; Carry out analysis on existing control procedures to determine possible mitigation to be implemented; If exceedance stops, discontinue additional monitoring.	actions proposed; Verify the implementation of the remedial measures.	remedial actions required; Implement the agreed remedial actions; Check the suspected defective parts if the problem still does not come under control.

Appendix B Action and Limit Levels for Air Quality, Noise and Water Quality Monitoring

B.1 Air

Unit L9			
Parameter	**Frequency**	**Action**	**Limit**
Hourly Average Stack NOx (Natural Gas)	Continuous	81 mg/Nm^3	90 mg/Nm^3
Hourly Average Stack NOx (Light Oil)	Continuous	135 mg/Nm^3	150 mg/Nm^3

Unit L10			
Parameter	**Frequency**	**Action**	**Limit**
Hourly Average Stack NOx (Natural Gas)	Continuous	81 mg/Nm^3 (Loading ≤ 182 MW)	90 mg/Nm^3 (Loading≤182 MW)
		13.5 mg/Nm^3 (182MW ≤ Loading ≤ 266 MW)	15 mg/Nm^3 (182MW ≤ Loading ≤ 266 MW)
		4.5 mg/Nm^3 (Loading ≥ 266 MW)	5 mg/Nm^3 (Loading ≥ 266 MW)
Hourly Average Stack NOx (Light Oil)	Continuous	135 mg/Nm^3	150 mg/Nm^3

Note: Expressed as at 0ºC, 101.325kPa, dry and corrected to 15% O_2 condition.

B.2. Noise

Parameter	**Frequency**	**Action**	**Limit**
Noise Levels at the critical NSR at Hung Shing Ye calculated by the noise alarm monitoring system	Continuous	When more than one complaint is received within two weeks, which are concerning the same event or location	a. 60 dB(A) in $L_{Aeq,30\ min}$ (07:00-23:00 hrs) b. 50 dB(A) in $L_{Aeq,30\ min}$ (23:00-07:00 hrs on next day)

B.3 Water

Monitoring Area / Location	Parameters to be Monitored	Frequency	Concentration Not to Be Exceeded	Action	Limit
Trade Effluent Cooling Water	Temperature	Daily, when the combined cycle unit is operating	Temperature at outfall should not exceed that at intake by > 10°C	9.5°C	+10°C above intake
	Total Residual Chlorine	Bi-weekly, when the combined cycle unit is operating	0.5mg/L	0.47 mg/L	0.5 mg/L
Trade Effluent Boiler Blowdown	Temperature	At least twice per year, when the combined cycle unit is operating	40°C	-	40°C
	Suspended Solids	At least twice per year, when the combined cycle unit is operating	30 mg/L	-	30 mg/L
	Grease & Oil	At least twice per year, when the combined cycle unit is operating	20 mg/L	-	20 mg/L
Marine waters cooling water outfall	Scum of foam in ambient water	Daily, when the combined cycle unit is operating	No scum within 500 m of Hung Shing Ye Beach	When scum passes the station south-west corner and north-west corner	No scum within 500 m of Hung Shing Ye Beach

Appendix C Air Quality Monitoring Results

Site: Lamma Power Station – Unit L9

Month: September 2020

Monthly Summary of Stack NOx

Date	Daily Maximum Stack NOx concentration (mg/Nm^3)#
1/9/2020	48
2/9/2020	48
3/9/2020	47
4/9/2020	47
5/9/2020	47
6/9/2020	48
7/9/2020	48
8/9/2020	47
9/9/2020	47
10/9/2020	47
11/9/2020	48
12/9/2020	49
13/9/2020	51
14/9/2020	49
15/9/2020	50
16/9/2020	51
17/9/2020	51
18/9/2020	50
19/9/2020	50
20/9/2020	51
21/9/2020	51

Date	Daily Maximum Stack NOx concentration (mg/Nm^3)#
22/9/2020	52
23/9/2020	52
24/9/2020	50
25/9/2020	52
26/9/2020	53
27/9/2020	51
28/9/2020	51
29/9/2020	50
30/9/2020	52

Note: # - Hourly average value. Expressed as at 0ºC, 101.325kPa, dry and corrected to 15% O_2 condition.

Site: Lamma Power Station – Unit L10

Month: September 2020

Monthly Summary of Stack NOx

Date	Daily Maximum Stack NOx concentration (mg/Nm^3)#
1/9/2020	3
2/9/2020	3
3/9/2020	3
4/9/2020	3
5/9/2020	3
6/9/2020	3
7/9/2020	3
8/9/2020	3
9/9/2020	3
10/9/2020	3
11/9/2020	3
12/9/2020	3
13/9/2020	3
14/9/2020	3
15/9/2020	3
16/9/2020	3
17/9/2020	3
18/9/2020	3
19/9/2020	3
20/9/2020	3
21/9/2020	3
22/9/2020	3
23/9/2020	3

Date	Daily Maximum Stack NOx concentration (mg/Nm^3)#
24/9/2020	3
25/9/2020	3
26/9/2020	3
27/9/2020	3
28/9/2020	3
29/9/2020	3
30/9/2020	3

The daily maximum stack NOx concentration complies with the Action/Limit Level for all unit loading ranges.

Note: # - Hourly average value. Expressed as at 0ºC, 101.325kPa, dry and corrected to 15% O_2 condition.

Appendix D Noise Monitoring Results

Site: Lamma Power Station Extension
Measurement Location: Ash Lagoon
Measurement Parameter: 30-min Leq (07:00-23:00 hrs and 23:00-07:00 hrs on next day)

Date	Time	Calculated Noise Level at NSR at Hung Shing Ye (dB(A))		Limit Noise Level (dB(A))
		Max	Avg	
1/9/2020	07:00-23:00	38	37	60
1/9/2020	23:00-07:00	45	43	50
2/9/2020	07:00-23:00	44	44	60
2/9/2020	23:00-07:00	50	49	50
3/9/2020	07:00-23:00	54	54	60
3/9/2020	23:00-07:00	---	---	50
4/9/2020	07:00-23:00	---	---	60
4/9/2020	23:00-07:00	---	---	50
5/9/2020	07:00-23:00	---	---	60
5/9/2020	23:00-07:00	---	---	50
6/9/2020	07:00-23:00	---	---	60
6/9/2020	23:00-07:00	49	46	50
7/9/2020	07:00-23:00	---	---	60
7/9/2020	23:00-07:00	---	---	50
8/9/2020	07:00-23:00	56	50	60
8/9/2020	23:00-07:00	---	---	50
9/9/2020	07:00-23:00	50	48	60
9/9/2020	23:00-07:00	47	47	50
10/9/2020	07:00-23:00	56	52	60
10/9/2020	23:00-07:00	41	41	50
11/9/2020	07:00-23:00	43	40	60
11/9/2020	23:00-07:00	30	30	50
12/9/2020	07:00-23:00	40	40	60
12/9/2020	23:00-07:00	48	48	50
13/9/2020	07:00-23:00	39	39	60
13/9/2020	23:00-07:00	42	39	50
14/9/2020	07:00-23:00	54	52	60
14/9/2020	23:00-07:00	---	---	50
15/9/2020	07:00-23:00	56	51	60
15/9/2020	23:00-07:00	---	---	50
16/9/2020	07:00-23:00	---	---	60
16/9/2020	23:00-07:00	29	28	50
17/9/2020	07:00-23:00	---	---	60
17/9/2020	23:00-07:00	30	30	50
18/9/2020	07:00-23:00	---	---	60
18/9/2020	23:00-07:00	---	---	50

Date	Time	Calculated Noise Level at NSR at Hung Shing Ye (dB(A))		Limit Noise Level (dB(A))
		Max	Avg	
19/9/2020	07:00-23:00	43	43	60
19/9/2020	23:00-07:00	---	---	50
20/9/2020	07:00-23:00	51	51	60
20/9/2020	23:00-07:00	44	41	50
21/9/2020	07:00-23:00	55	54	60
21/9/2020	23:00-07:00	---	---	50
22/9/2020	07:00-23:00	---	---	60
22/9/2020	23:00-07:00	36	36	50
23/9/2020	07:00-23:00	---	---	60
23/9/2020	23:00-07:00	43	43	50
24/9/2020	07:00-23:00	50	46	60
24/9/2020	23:00-07:00	33	33	50
25/9/2020	07:00-23:00	37	37	60
25/9/2020	23:00-07:00	---	---	50
26/9/2020	07:00-23:00	50	50	60
26/9/2020	23:00-07:00	39	39	50
27/9/2020	07:00-23:00	---	---	60
27/9/2020	23:00-07:00	50	44	50
28/9/2020	07:00-23:00	---	---	60
28/9/2020	23:00-07:00	28	25	50
29/9/2020	07:00-23:00	56	51	60
29/9/2020	23:00-07:00	41	39	50
30/9/2020	07:00-23:00	43	42	60
30/9/2020	23:00-07:00	---	---	50

Note: 1. "---"represents the measured noise monitoring data lower than the established notional background level/discarded under strong wind.

2. Pursuant to the EM&A Manual (Operational Phase), the corrections for accounting the differences of barrier attenuations and atmospheric absorption attenuations for the noise alarm station and noise sensitive receiver are 5 dB(A) and 2 dB(A) respectively.

Appendix E Summary Results and Observations on Water Quality Monitoring

Maximum Outlet Temperature Rise (Deg. Celsius) of Cooling Water at C.W. Outfall No.3 Serving L9 & L10 Condensers

Weighted by Flowrates of Individual Streams (September 2020)

Date	Maximum Outlet Temperature Rise (Deg. Celsius)
1/9/2020	7.4
2/9/2020	7.4
3/9/2020	8.2
4/9/2020	8.1
5/9/2020	7.3
6/9/2020	7.3
7/9/2020	7.3
8/9/2020	7.3
9/9/2020	7.2
10/9/2020	7.2
11/9/2020	7.3
12/9/2020	7.4
13/9/2020	7.3
14/9/2020	7.3
15/9/2020	7.4
16/9/2020	7.3
17/9/2020	7.2
18/9/2020	7.3
19/9/2020	7.3
20/9/2020	7.4
21/9/2020	7.3
22/9/2020	7.4
23/9/2020	7.4
24/9/2020	7.4
25/9/2020	7.4
26/9/2020	7.3
27/9/2020	7.3
28/9/2020	7.3
29/9/2020	7.2
30/9/2020	7.9

Total Residual Chlorine Level at C.W. Outfall No. 3 (September 2020)

Date of sampling	11/09/2020	25/09/2020
Total Residual Chlorine, mg/L	0.30	0.35

Blowdown from Units L9 and L10 Steam Turbine and HRSG to C.W. Outfall No. 3 (September 2020)

Source of discharge	Unit L9 HSRG	Unit L9 Steam Turbine	Unit L10 HSRG	Unit L10 Steam Turbine
Date of sampling	#	#	#	#
Suspended Solid, mg/L	#	#	#	#
Grease & Oil, mg/L	#	#	#	#
Temperature, Deg. Celsius	#	#	#	#

Note: # Monitoring was not scheduled in the reporting month. The last monitoring for L9 and L10 was carried out in March 2020 and February 2020 respectively.

Observation of Scum Formation in Marine Waters Mixing Zone at Lamma Power Station Extension (September 2020)

Date	Observation
1/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall, chlorination output was reduced and defoamer added to Outfalls No.1 & No.2
2/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall and dispersed by water spraying system
3/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall and dispersed by water spraying system
4/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall and dispersed by water spraying system
5/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall and defoamer added to Outfalls No.1 & No.2
6/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall, dispersed by ferry and defoamer added to Outfalls No.1 & No.2
7/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall and defoamer added to Outfalls No.1 & No.2
8/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside

Date	Observation
	CW Outfall, dispersed by ferry and chlorination output was reduced
9/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall, dispersed by ferry and chlorination output was reduced
10/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall and chlorination output was reduced
11/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall, dispersed by ferry, defoamer added to Outfalls No.1 & No.2, and chlorination output was reduced
12/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall, dispersed by ferry, defoamer added to Outfalls No.1 & No.2 and chlorination output was reduced
13/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall, defoamer added to Outfalls No.1 & No.2 and chlorination output was reduced
14/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall, defoamer added to Outfalls No.1 & No.2 and chlorination output was reduced
15/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall, defoamer added to Outfalls No.1 & No.2 and chlorination output was reduced
16/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall, defoamer added to Outfalls No.1 & No.2 and chlorination output was reduced
17/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall, defoamer added to Outfalls No.1 & No.2 and chlorination output was reduced
18/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall and chlorination output was reduced
19/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall, defoamer added to Outfalls No.1 & No.2, and chlorination output was reduced
20/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall and chlorination output was reduced
21/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall, defoamer added to Outfalls No.1 & No.2 and chlorination output was reduced
22/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall, defoamer added to Outfalls No.1 & No.2 and chlorination output was reduced
23/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall, defoamer added to Outfalls No.1 & No.2 and chlorination output was reduced
24/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall and defoamer added to Outfalls No.1 & No.2
25/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall and dispersed by water spraying system
26/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall and dispersed by water spraying system
27/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall and dispersed by water spraying system
28/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside

Date	Observation
	CW Outfall and defoamer added to Outfalls No.1 & No.2
29/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall and defoamer added to Outfalls No.1 & No.2
30/9/2020	No scum within 500m of HSY Beach & NW/SW corner of the Station; Some foam outside CW Outfall and defoamer added to Outfalls No.1 & No.2

Note: The water spraying system at C.W. Outfall No.1 was in service in the reporting month.

Appendix F Summary of EMIS

EM&A Log Ref.	Mitigation Measures	Implementation Status
	AIR QUALITY	
A1	Implement the gas-fired units as base-load units. For the existing power station, the more efficient units incorporating FGD and low NOx systems shall be operated first under normal situation to meet system demand. In case of any deviations from this, EPD shall be notified of the details and circumstances for the deviation.	Complied
A2	HK Electric shall undertake annual revisions and update of its GHG emissions inventory, which covers all HK Electric existing facilities and new extension, for at least the six GHGs specified under the Kyoto Protocol (CO2, CH4, N2O, HFCs, PFCs and SF6). The inventory shall be established and maintained in accordance with the latest IPCC Guidelines or any other guidelines issued by Government, with details documented for regular reviews and updates. The inventory shall be reported on an annual basis, including actual figures and targets for the previous and current years, as well as the next year's forecast. Discrepancies for actual versus target figures and actions for improvement or enhancement shall be discussed. HK Electric shall update the inventory according to the figures of the electricity load forecast, upon every subsequent review by the Government. This shall also be reported in the annual report. (The annual report of GHG emissions inventory shall be deposited with the Director of Environmental Protection within three months after the end of the reporting period.)	Complied
	WATER QUALITY	
B1	No further mitigation measures were found to be necessary provided the discharge of cooling water and residual chlorine are kept below the rates assumed in the water quality assessment*. *All discharges of effluent/wastewater shall be controlled through licensing under the *Technical Memorandum for Effluents Discharged into Drainage and Sewerage Systems. Inland and Coastal Waters*, issued under Section 21 of the *Water Pollution Control Ordinance*.	Complied
	NOISE	
C1	HK Electric shall implement the gas-fired units for based-load operation to minimize the noise generated from the existing units.	Complied
	LANDSCAPE & VISUAL IMPACTS	
D1	No mitigation measures were considered necessary.	N/A

EM&A Log Ref.	Mitigation Measures	Implementation Status
	LAND CONTAMINATION AND WASTE MANAGEMENT	
E1	HK Electric shall maintain records of the following items: - integrity testing of light oil tanks; - daily inspection of the light oil tanks and bunded areas; - quantities of oily waste and sludge generated from oil interceptors and chemical waste generated from operation of the power station; - deposal oil oily waste/sludge and chemical waste to licenced site; - quantities of chemical and chemical waste; - incident of spillage and remediation actions; and - emergency response training and drills.	Complied
	MARINE ECOLOGY	
F1	No mitigation measures were considered necessary.	N/A
	FISHERIES	
G1	No mitigation measures were considered necessary.	N/A
	RISK ASSESSMENT	
H1	No mitigation measures were considered necessary.	N/A