The Hongkong Electric Co Ltd
香港電燈有限公司

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) ORDINANCE, CAP. 499

ENVIRONMENTAL PERMIT NO. EP-071/2000/C

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

Report Title	Baseline Monitoring Report
Date	9 February 2006
Certified by	(Mr. IP Tat-Yan, Environmental Team Leader)
Verified by	(Maunsell Environmental Management Consultants Ltd, Independent Environmental Checker)

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

Lamma Power Station Extension (Operational Phase)

Baseline Monitoring Report

January 2006

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Executive Summary

This is an environmental baseline monitoring report for the operational phase of the Lamma Power Station Extension (the Project). This report contains the background information of the Project. Similar environmental monitoring work would be conducted to meet the requirements set out in the Licenses issued under the Air Pollution Control Ordinance (APCO) and the Water Pollution Control Ordinance (WPCO).

The Action and Limit Levels for stack NOx would be established from the NOx emission limit stated in section 3(b) of EPD's guideline "Notes on Best Practicable Means Requirements for Electricity Works".

Similar to the construction EM&A, continuous noise monitoring would be carried out for the EM&A (Operational Phase) of the Project. The monthly average Leq's measured at the two existing Ash Lagoon and Ching Lam noise monitoring stations for the construction EM&A programme from January 2004 to December 2004 were regarded as the baseline noise levels for the EM&A (Operational Phase).

Effluent discharges from the Project would be covered in the Water Pollution Control Ordinance (WPCO) licence. The action/limit levels would be established from the limit levels/criteria to be stipulated in the WPCO licence.

1. Introduction

As per Condition 6.11 of the Environmental Permit (EP-071/2000/C) for the Environmental Monitoring and Audit (Operational Phase) for Lamma Power Station Extension (the Project), HEC is required to submit the Baseline Monitoring Report to EPD.

1.1 Purpose of the Report

The primary purpose of the baseline monitoring prior to the commencement of the Project is to form the basis for establishing the criteria (viz. A/L Levels) for the impact monitoring.

However, unlike the EM&A programme for the construction project, baseline monitoring for the Project during the operational phase is not required to measure monitoring parameters of air and water quality at the sensitive receivers during a representative pre-project period. Similar environmental monitoring work would be conducted to meet the requirements set out in the Licences issued under the Air Pollution Control Ordinance (APCO) and the Water Pollution Control Ordinance (WPCO). The purpose of the baseline monitoring report is to provide background information of the Project and the baseline data for noise.

1.2 Background of the Project

The Project involves the construction and operation of a gas-fired power station employing combined cycled gas turbine technology, forming an extension to the existing Lamma Power Station. The following outlines the key elements of the Project including the new power station and its associated transmission system and submarine gas pipeline.

(a) The New Power Station

Combined Cycle Plant

Six 300 MW gas-fired combined cycle units will be constructed on the Lamma Extension. Each unit will consist of gas turbines, heat recovery steam generators (HRSGs), a steam turbine, generators and a flue gas stack of about 110 m.

Gas Receiving Station

To receive natural gas delivered from a regional LNG receiving terminal through a pipeline, a gas receiving station will be required. Received natural gas will be processed in the receiving station and subsequently delivered to the plant for combustion. Major components of the station include shut-off valves, pig receiver, filter, gas heaters, pressure regulator, metering device, stack and protection system to ensure safe operation.

The Project area for the operation of new power station is shown in Figure 1.1.

(b) Transmission System

The electricity generated from the Lamma Extension Project will be transmitted via a new transmission system linking the Lamma Extension to load centres on Hong Kong Island as shown in Figure 1.2.

(c) Gas Pipeline

Natural gas for the new power station will be supplied via a submarine pipeline from a regional LNG receiving terminal located at Cheng Tou Jiao in Shenzhen as shown in Figure 1.3.

The Environmental Impact Assessment (EIA) Report for the Project, which was prepared in response to the EIA Study Brief No. ESB-001/1998 issued to Hongkong Electric Company Limited (HEC) by the Environmental Protection Department (EPD), was completed in February 1999. The EIA Report was submitted to the Director of Environmental Protection (DEP) in accordance with the Environmental Impact Assessment Ordinance (EIAO) on 23 December 1998 and was approved by DEP on 5 May 1999.

The application for Environmental Permit (EP) was submitted to EPD on 10 July 2000. The Environmental Permit (EP-071/2000) was granted on 8 August 2000. The subsequent applications and approvals of the variation of Environmental Permit are summarised in the following table:

Environmental Permit	Application	Purpose of Variation	Approved by EPD
Environmental Permit (EP-071/2000/A)	25 November 2000	Shortening of various notification periods.	22 December 2000
Environmental Permit (EP-071/2000/B)	20 June 2001	Addition of dredging scenarios for reclamation work.	13 July 2001
Environmental Permit (EP-071/2000/C)	23 April 2005	Change of dredging and jetting rates for gas pipeline construction work, and change of the time period for which the pipeline jetting work is not allowed.	18 May 2005

1.3 Structure of the Baseline Monitoring Report

The structure of the report is as follows:

Section 1: Introduction – detailing the purpose and structure of the report.

Section 2: Air Quality – presenting the zero baseline emission result.

Section 3: Noise – presenting the baseline noise data.

Section 4: Water Quality – presenting the zero baseline emission result.

Section 5: Conclusion

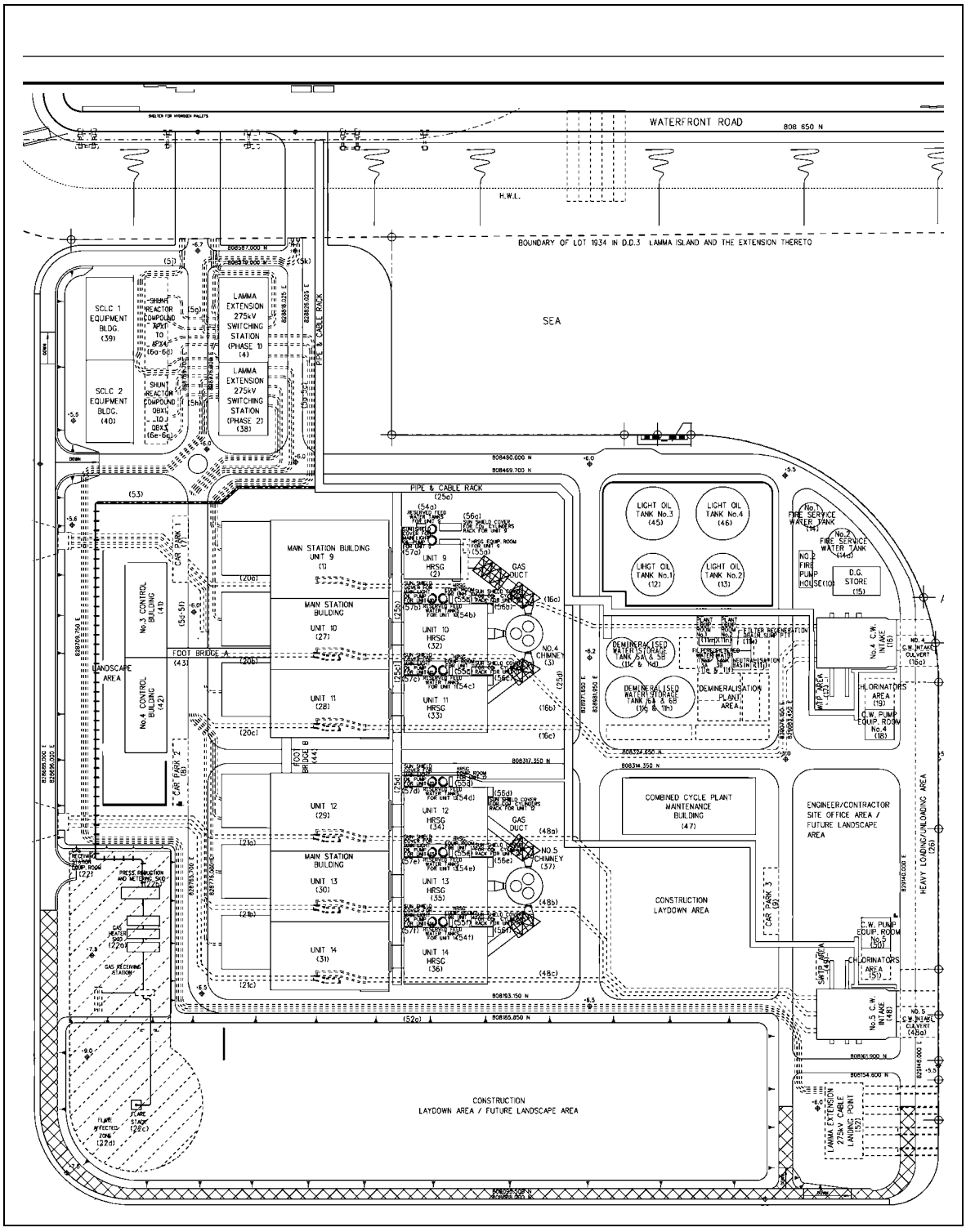

Figure 1.1 Layout of Lamma Power Station Extension

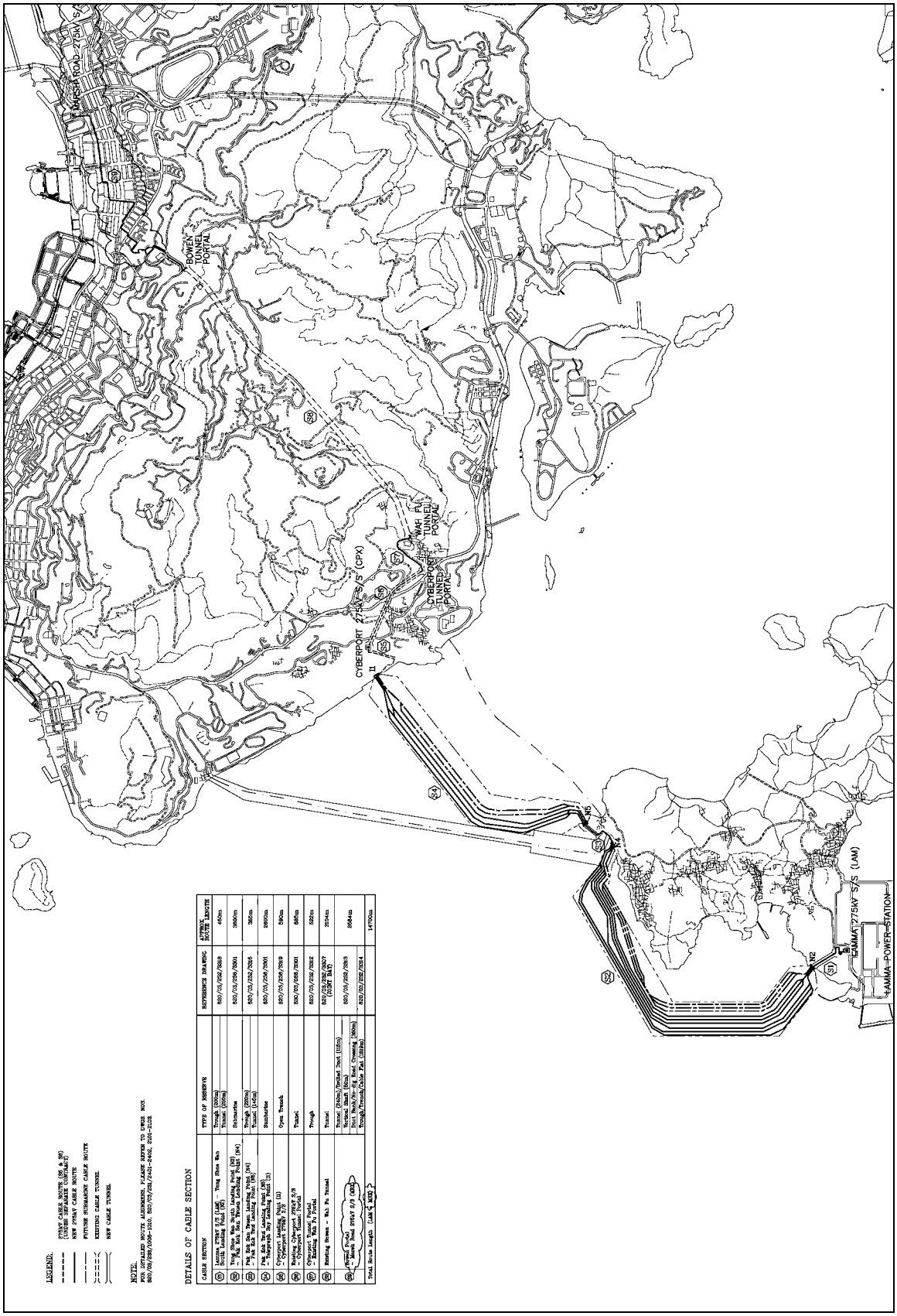

Figure 1.2 Layout of Transmission System

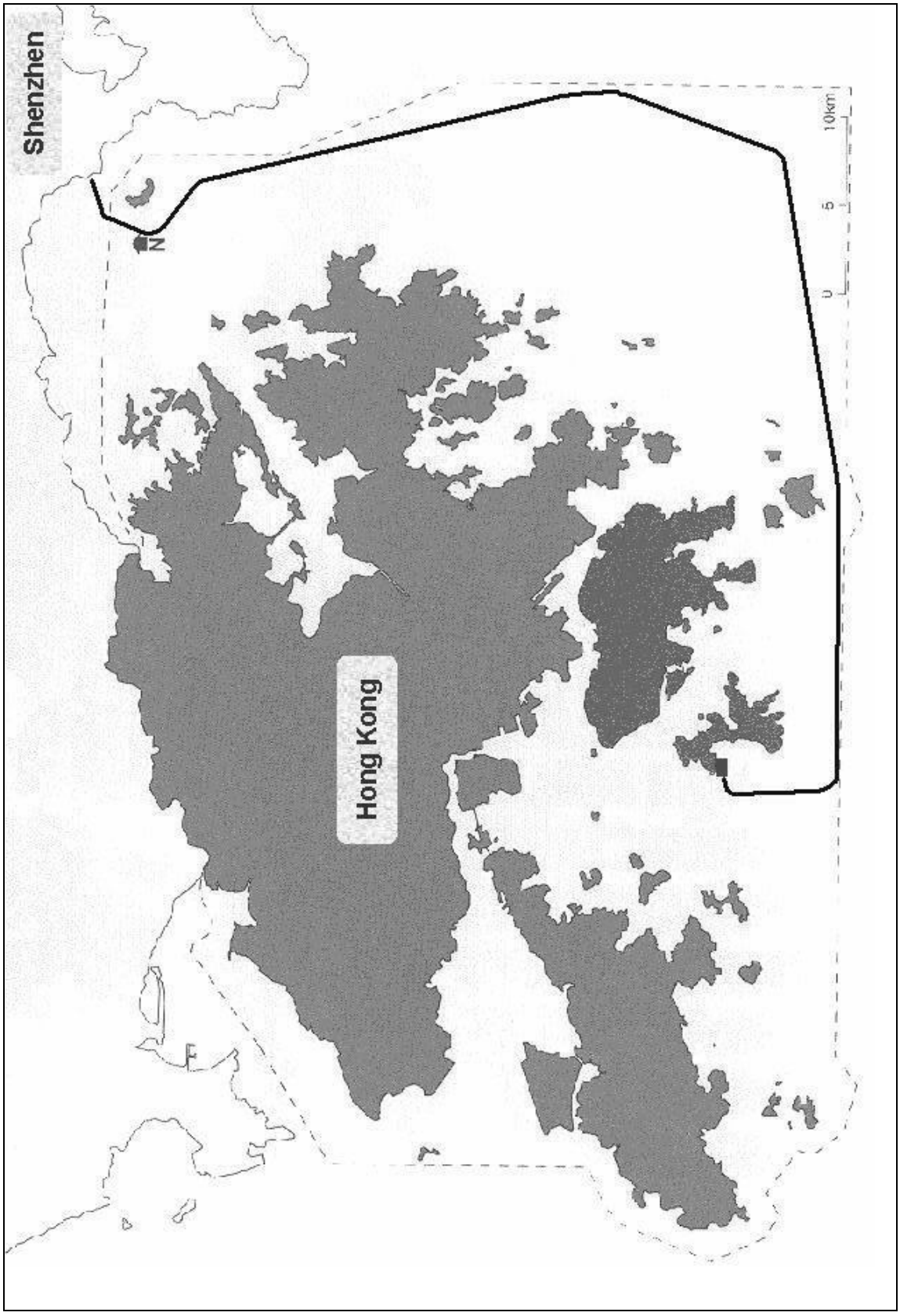

Figure 1.3 Layout of Gas Pipeline

2. Air Quality

The environmental monitoring requirement of air pollutants emissions from new gas-fired units will be stipulated in a Specified Processes licence issued under Air Pollution Control Ordinance. The licence will specify the emission limits in terms of concentrations and emission rates.

At the time of writing this baseline monitoring report, the plant is still under construction and no environmental monitoring data related to air pollutant emission is available. Hence, a "zero" emission baseline can be assumed for air quality monitoring. Furthermore, no information regarding the licence emission limit is available, the action/limit levels would be established from the NOx emission limit stated in section 3(b) of EPD's guideline "Notes on Best Practicable Means Requirements for Electricity Works".

3. Noise

Similar to the construction EM&A, continuous noise monitoring for the two nearest noise sensitive receivers (NSRs) at Hung Shing Ye and Wang Long/Ko Long would be carried out for the EM&A (Operational Phase) of the Project. The baseline noise levels will be used for applying correction to the impact noise monitoring data for the NSRs.

The major noisy dredging and site formation works had been completed before 2004. In this regard, the monthly average Leq's measured at the two existing Ash Lagoon and Ching Lam noise monitoring stations from January 2004 to December 2004 are regarded as the baseline noise levels for the EM&A (Operational Phase) of the Project. The locations of the two existing Ash Lagoon and Ching Lam noise monitoring stations are shown in Figure 3.1.

The noise measurements at Ash Lagoon and Ching Lam were made in accordance with standard acoustical principles and practices in relation to weather conditions. The sound level meters used comply with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1).

Baseline Data of Monthly Average Noise Level at the Existing Ash Lagoon Noise Monitoring Station:

Month	Monthly Average Leq Noise Level (dB(A))	
	07:00-23:00	23:00-07:00 of next day
January 2004	62.7	56.8
February 2004	63.2	55.9
March 2004	62.5	55.6
April 2004	63.4	55.7
May 2004	62.1	55.4
June 2004	60.8	55.3
July 2004	60.7	55.1
August 2004	60.1	55.8
September 2004	60.8	56.2
October 2004	61.0	56.1
November 2004	61.1	56.1
December 2004	61.4	56.2

Baseline Data of Monthly Average Noise Level at the Existing Ching Lam Noise Monitoring Station:

Month	Monthly Average Leq Noise Level (dB(A))	
	07:00-23:00	23:00-07:00 of next day
January 2004	57.4	57.2
February 2004	57.7	57.3
March 2004	59.0	58.3
April 2004	58.6	58.5
May 2004	60.8	59.6
June 2004	60.1	58.5
July 2004	58.4	57.7
August 2004	58.3	57.8
September 2004	57.8	57.5
October 2004	57.5	57.0
November 2004	58.2	57.7
December 2004	57.8	57.3

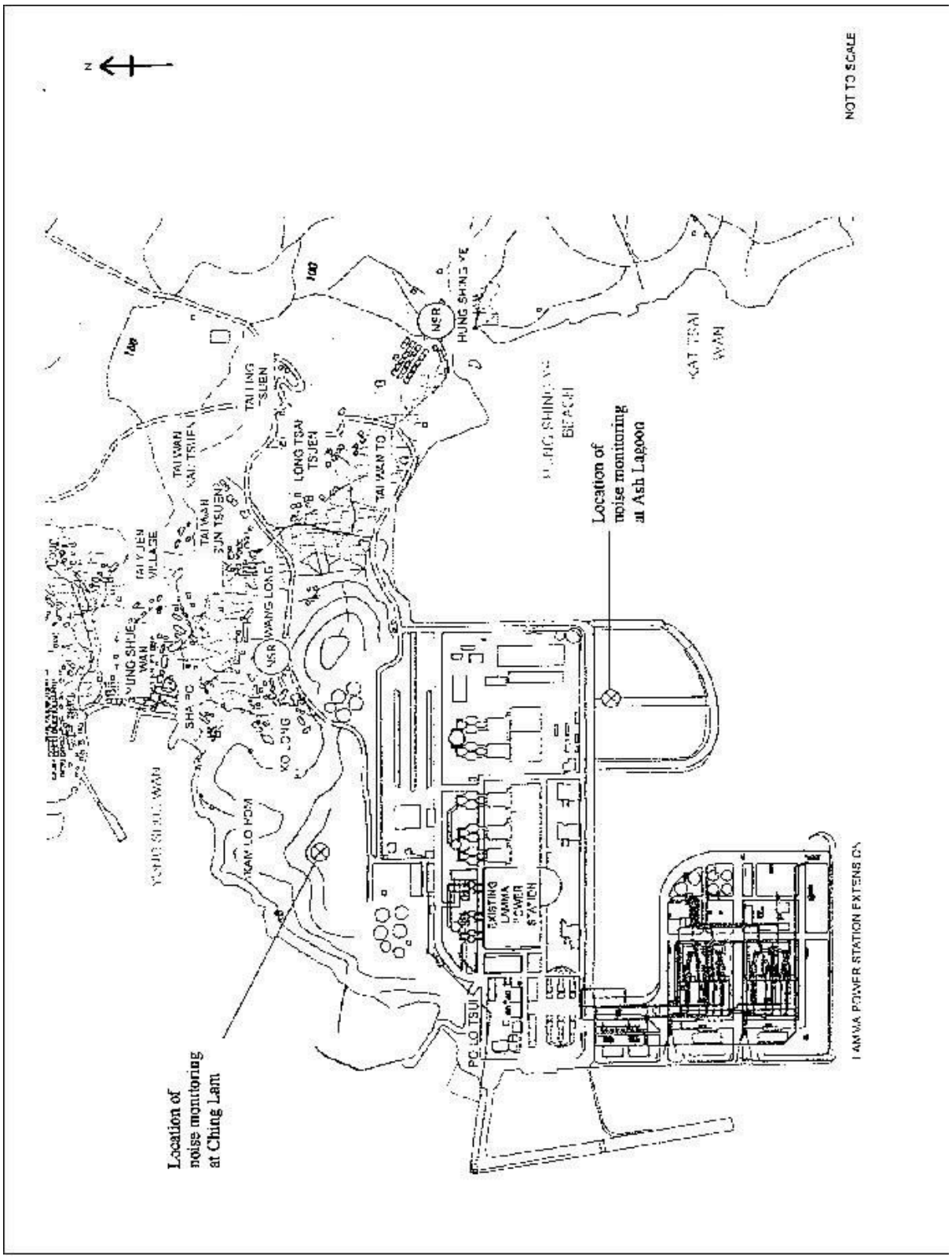

Figure 3.1 Locations of Existing Ash Lagoon and Ching Lam Noise Monitoring Stations

4. Water Quality

Effluent discharges from the Project would be covered in the Water Pollution Control Ordinance (WPCO). At the time of writing the baseline monitoring report, the plant is still under construction and no environmental monitoring data related to effluent is available. Hence, a "zero" emission baseline can be assumed for water quality monitoring. The action/limit levels would be established from the limit levels/criteria to be stipulated in the WPCO licence.

5. Conclusion

Similar environmental monitoring work would be implemented in the future to meet the requirements set out in the licences issued under the Air Pollution Control Ordinance (APCO) or the Water Pollution Control Ordinance (WPCO).

The Action and Limit Levels for stack NOx would be established from the NOx emission limit stated in section 3(b) of EPD's guideline "Notes on Best Practicable Means Requirements for Electricity Works".

Similar to the construction EM&A, continuous noise monitoring would be carried out for the EM&A (Operational Phase) of the Project. The major noisy dredging and site formation works had been completed before 2004. The monthly average Leq's measured at the two existing Ash Lagoon and Ching Lam noise monitoring stations for the construction EM&A programme from January 2004 to December 2004 were regarded as the baseline noise levels for the EM&A (Operational Phase) of the Project.

Effluent discharges from the Project would be covered in the Water Pollution Control Ordinance (WPCO). The action/limit levels would be established from the limit levels/criteria to be stipulated in the WPCO licence.