PART F

ENVIRONMENTAL MONITORING & AUDIT

CONTENTS:

1 INTRODUCTION

1.1 BACKGROUND

This part of the EIA Report presents the Environmental Monitoring and Audit (EM&A) arrangements for the management of environmental requirements arising from the EIA process. The EM&A arrangements will be formalised in EM&A Manuals for the construction and operational phases, which will be submitted to the Director of Environmental Protection for approval prior to the commencement of construction works and the commissioning of the new units respectively.

The Manuals will provide information, guidance and instruction to personnel charged with environmental responsibilities and undertaking environmental monitoring work during the construction and operational phases of the new power station and will comply with the requirements of the relevant sections of *Annex 21* of the *EIA Ordinance Technical Memorandum.*

1.2 OBJECTIVES OF THE EM&A PROGRAMME

This Part of the EIA Report provides an overview of the environmental monitoring requirements arising from the EIA study including noise, air and water monitoring as well as audit recommendations for the noise, air, water, ecological, waste, and land contamination issues. Associated with this Part is a schedule for the implementation of specified mitigation measures which is presented in Part G of this Report. These components along with the EM&A programme reporting requirements and the procedures and lines of communication set out in the EM&A Manuals will form the basis of an environmental management system to be implemented by HEC in order to manage the environmental challenges posed during the construction and operation of the new power station and verify the performance pledges given in the EIA Report.

The main objectives of the EM&A programme include:

- To provide a database from which the environmental impacts of the project can be determined;
- To provide an early indication should any of the environmental control measures or practices fail to achieve the acceptable standards;
- To monitor the performance of the Project and the effectiveness of mitigation measures;
- To verify the environmental impacts predicted in the EIA;
- To determine project compliance with regulatory requirements, standards and government policies;
- To take remedial action if unexpected problems or unacceptable impacts arise; and
- To provide data to enable an environmental audit.

1.3 THE SCOPE OF THE EM&A PROGRAMME

The scope of the EM&A programme is to:

- Produce Construction and Operational Phase EM&A Manuals, the content and need for which shall be submitted to the EPD for approval prior to the commencement of construction works and the commissioning of the new power station;
- Establish baseline noise, air and water quality levels at specified locations and review these baseline levels at specified period acceptable to the Authority;
- Implement construction and operational noise, air and water quality impact monitoring programmes;
- Implement audit requirements for ecology, waste and land contamination issues;
- Liaise with and provide environmental advice (as requested or when otherwise necessary) to construction site and operational staff on the comprehension and consequences of the EM&A programme;
- Identify and resolve environmental issues and other functions as they may arise from works;
- Check and quantify the Contractor's overall environmental performance, implement Event & Action Plans, and recommend and implement remedial actions to mitigate adverse environmental effects as identified by the EM&A programme, the EIA and other relevant reports;
- Conduct regular reviews of monitored impact data as the basis for assessing compliance with defined criteria and to ensure that necessary mitigation measures are identified, designed and implemented, and to undertake additional *ad hoc* monitoring and auditing as required by special circumstances;
- Evaluate and interpret all environmental monitoring data to provide an early indication should any of the environmental control measures or practices fail to achieve the acceptable standards, and to verify the environmental impacts predicted in the EIA;
- Manage and liaise with other individuals or parties concerning any other environmental issues deemed to be relevant to the construction process;
- Conduct regular site audits of a formal or informal nature to assess:
  - the level of the Contractor's general environmental awareness,
  - the Contractor's implementation of the recommendations in the EIA,
  - the Contractor's performance as measured by the EM&A,
  - the need for specific mitigation measures to be implemented or the continued usage of those previously agreed,
  - to advise the site staff of any identified potential environmental issues; and

- Submit regular EM&A reports which summarise project monitoring and auditing data, with full interpretation illustrating the acceptability or otherwise of any environmental impacts and identification or assessment of the implementation status of agreed mitigation measures.

1.4 *STRUCTURE OF PART F OF THE EIA REPORT*

Following this introductory Section, this EM&A Chapter is set out as follows:

- *Section 2* presents the organisation and structure of the various parties involved in the EM&A process, the responsibilities and contact details of key individuals;
- *Section 3* summarises the requirements for noise monitoring;
- *Section 4* summarises the requirements for air quality monitoring;
- *Section 5* summarises the requirements for water quality monitoring;
- *Section 6* summarises the requirements for ecological monitoring;
- *Section 7* summarises the requirements for waste monitoring;
- *Section 8* summarises the requirements for land contamination monitoring; and
- *Section 9* summarises the requirements for site auditing.

2 ORGANISATION AND STRUCTURE OF THE EM&A PROGRAMME

2.1 EM&A MANAGEMENT STRUCTURE FOR THE CONSTRUCTION PHASE

According to the EM&A requirements stated in the EIA report, an EM&A programme shall be developed to design and specify the environmental monitoring and audit requirements.

An Environmental Management Committee (EMC) will be set up to oversee the EM&A programme for the Lamma Extension Project. The organisation and management structure for the EM&A programme is illustrated in *Figure 2.1a*. An EM&A Consultant will be employed to implement the environmental monitoring work as required by the Construction EM&A Manual.

The Chairman of the EMC (the "Environmental Manager") is the official contact person between EPD and HEC. The Environmental Manager shall be authorized to sign all submissions to the EPD in accordance with the requirements of the EM&A Manual.

The Engineer shall appoint appropriate members of the project and resident site staff to manage the Construction Contractor (the "Contractor"), the EM&A Consultant and its various specialist teams and other professional delegates.

The EM&A Consultant shall be responsible for field monitoring and for the preparation of EM&A reports on the environmental monitoring data and site environmental conditions. The Contractor shall be responsible for complying with the requirements set out in the construction and monitoring contracts. The Contractor is responsible for operating strictly in accordance with the guidelines of the mitigation measures set out in the specifications, instructions of the Engineer and the EM&A Consultant and Event & Action Plans in the event of any exceedance.

An Independent Environmental Checker (IEC) will be appointed by HEC to audit and verify the overall environmental performance of the construction site and assess the effectiveness of the EM&A Consultant.

2.2 EM&A MANAGEMENT STRUCTURE FOR THE OPERATIONAL PHASE

Similar to the EM&A Management Structure for the Construction Phase, an Environmental Management Committee (EMC) will be established to oversee the EM&A Programme for the operation of the Lamma Extension. The organisation and management structure for the operational EM&A programme is illustrated in *Figure 2.2a*. The Generation Team and the Environmental Team will be responsible for the implementation of all environmental monitoring as required by the Operational EM&A Manual.

The Chairman of the EMC (the "Environmental Manager") shall be the official contact person between the EPD and HEC. The Environmental Manager shall be authorized to sign all submissions to the EPD in accordance with the requirements of the Operational EM&A Manual.

The Generation Team and the Environmental Team shall be responsible for field monitoring and for the preparation of EM&A reports on the environmental monitoring data and site environmental conditions.

The Generation Team shall be responsible for ensuring that the plant and equipment are being operated in good conditions and emissions are maintained below Action/Limit Levels. In the case of an exceedance, the Event & Action Plans set out in the Operational EM&A Manual shall be implemented.

An Independent Environmental Checker (IEC) will be appointed by HEC to audit and verify the overall environmental performance of the plant and assess the effectiveness of the Generation Team and Environmental Team during the operational phase.

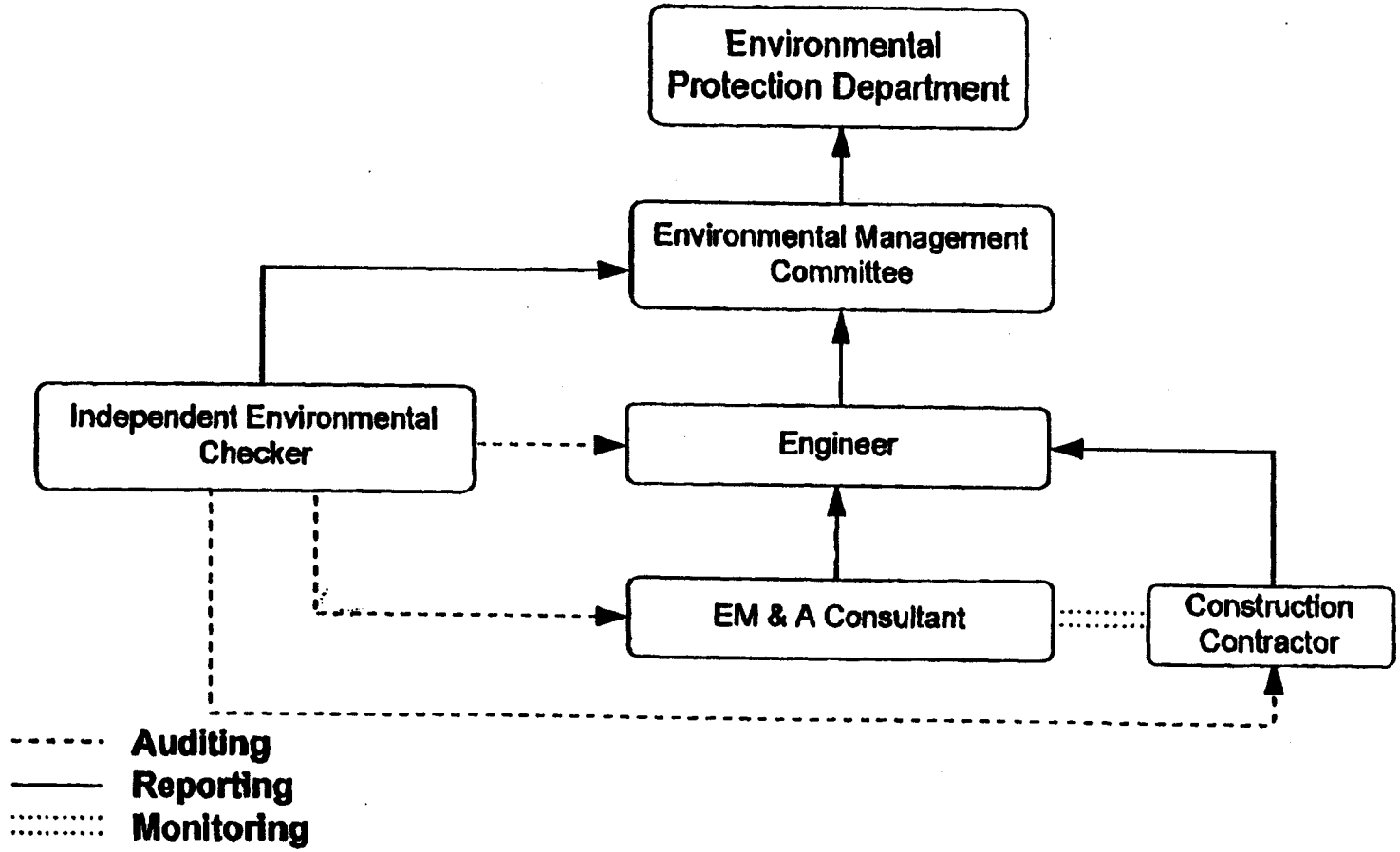

FIGURE 2.1a

ORGANIZATION OF HEC ENVIRONMENTAL MONITORING & AUDITING PROGRAMME AT CONSTRUCTION PHASE

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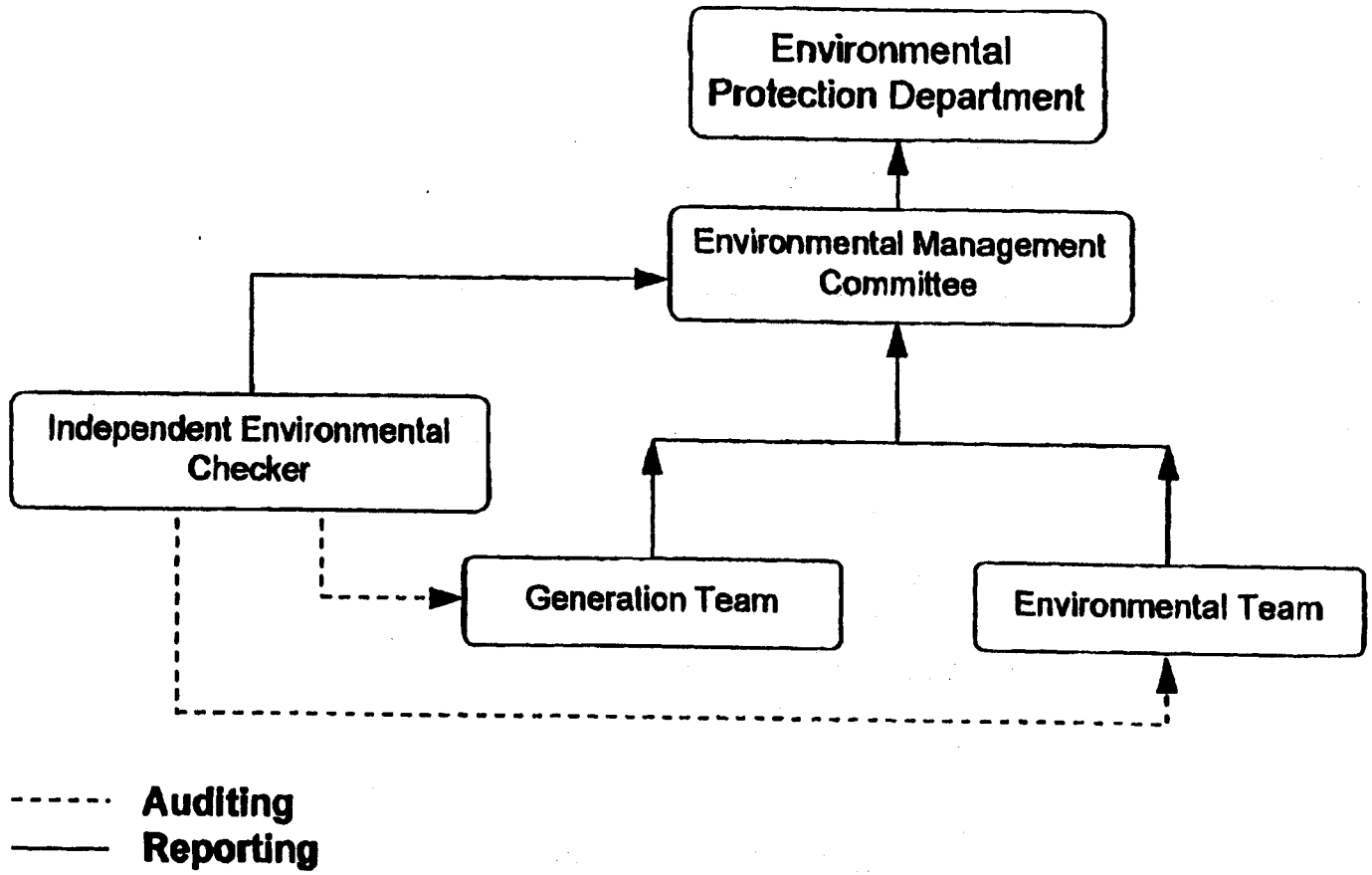

FIGURE 2.2a

ORGANIZATION OF HEC ENVIRONMENTAL MONITORING & AUDITING PROGRAMME AT OPERATIONAL PHASE

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3 NOISE MONITORING

3.1 INTRODUCTION

In this section, the requirements for the monitoring and audit of noise impacts from the construction and operation of the new power station are presented.

3.1.1 *Baseline Conditions*

Lamma Island is a lightly populated area without a conventional road system. A limited number of small petrol or diesel-powered carts are used to transport materials but there is otherwise no vehicular traffic. As a result, ambient (baseline) noise levels are quite low and, at least over that portion of the island surrounding the present HEC plant, are dominated by noise from local village activities, natural sources (wind and waves) and the power plant.

3.1.2 *Sensitive Receivers*

Settlement on the northern end of Lamma Island (mostly one to three storey residential buildings) is largely concentrated around the harbour at Yung Shue Wan and in the adjacent villages of Yung Shue Long, Sha Po, Ko Long, Wang Long and Tai Wan San Tsuen . These residences are shielded from plant noise to varying degrees by the intervening hill (Kam Lo Hom) which defines the plant's northern boundary. Northeast of the plant, the villages of Long Tsai Tsuen and Hung Shing Ye (beach area) lie outside the area shielded by the hill and hence are more directly exposed to noise from the plant.

For purposes of assessing potential construction noise impacts, the GW-TM and PP-TM ask that "the Noise Sensitive Receiver (NSR) which will be most affected by noise from the construction work shall be identified". However, because of the complex terrain and the history of noise concerns expressed within the community, three representative residential locations have been identified as NSR's. These are NSR 1 in Long Tsai Tsuen/Hung Shing Ye, NSR 2 in Ko Long and NSR 3 on the north slope above Yung Shue Wan harbour. In addition a fourth location (NSR 4) has been identified at a school within the Village of Tai Wan San Tsuen. The locations of these four NSR's are shown in *Figure 6.3a* of Part B, Section 6.

3.1.3 *Noise Monitoring Methodology*

Noise level measurements shall be carried out by suitably qualified members of the ET using the methodology set out in the *Technical Memorandum on Noise from Construction Work other than Percussive Piling* (GW-TM), published under the *Noise Control Ordinance* (NCO).

The appropriate parameter for measuring construction noise impacts shall be the equivalent A-weighted sound pressure level (L_{Aeq}) measured in decibels (dB).

The criterion against which the recorded noise levels shall be assessed refers to the noise level 1 m from the nearest part of the building façade and at a height approximately 1.2 m above the ground or at the height that has the least obstructed view of the construction activity in relation to the receiver.

3.2 CONSTRUCTION PHASE

The Action and Limit Levels for construction noise are defined in *Table 3.2a* and *Table 3.2b*. Should non-compliance of the noise criteria occur, action in accordance with the Event & Action Plans shall be carried out.

Table 3.2a ***Action and Limit Levels for Construction Noise (Other Than Percussive Piling)***

Time Period	Action	Limit
0700-1900 hrs on normal weekdays	When one documented complaint is received	75 dB(A)[1]
0700-2300 hrs on holiday; & 1900-2300 hrs on all other days		60/65/70 dB(A)[2]
2300-0700 hrs of next day		45/50/55 dB(A)[2]

1 $L_{eq,30min}$ - reduced to 70 dB(A) for educational institutions NSRs; 65 dB(A) during examination periods
2 $L_{eq,5min}$ to be selected based on Area Sensitivity Rating

Table 3.2b ***Action and Limit Levels for Construction Noise (Percussive Piling)***

Time Period	Action	Limit
0700-1900 hrs[1]	When one documented complaint is received	75/80/90 dB(A)[2]

1 $L_{eq,5min}$ 10 dB(A) to be reduced for NSR being educational institution
2 $L_{eq,5min}$ to be selected based on Area Sensitive Ratings

Daytime construction noise levels (both from percussive piling and general work) have been found to be well within the limits indicated in the *EIAO TM*. However, it is desirable to carry out a limited amount of daytime noise monitoring, at least within the initial 18 months of the construction schedule, to observe the first of the projected maximum general construction noise output periods as well as the first several months of percussive pile driving. Given the large margins between the projected daytime levels and their limits, noise monitoring for 30 to 60 active minutes on a weekly basis should be sufficient. The preferred location for noise monitoring within the community would be at Hung Shing Ye, with the Police Station site currently used by HEC being a conservative choice, suitable for daytime and perhaps evening monitoring.

Projected evening noise levels from general construction are also comfortably below the applicable limit but much less so than the daytime levels. Therefore, monitoring should be conducted on a twice-weekly basis (30 to 60 minutes), particularly during the period between October 2000 and September 2001 when the levels of construction activity during the evening are scheduled to be near their peak. This should be continued until a sustained pattern of compliance has been established. A similar approach should be taken to noise monitoring if, as indicated, construction work is to be carried out on Sundays or public holidays. Here, it would be reasonable to conduct 30 to 60 minutes of monitoring on every Sunday and holiday worked.

The need to monitor night time construction noise levels during the first eight months of the schedule will be most critical. However, it will not generally be possible to confidently measure construction noise levels in the vicinity of 45

dB(A) within the community due to the presence of both existing plant operation noise and other local ambient noise. Therefore, it is likely to be necessary to conduct such monitoring much closer to the site, at a location where construction noise clearly dominates the noise from existing plant operations and all other sources. Construction noise levels within the community (eg, at Hung Shing Ye) could then be obtained by applying the anticipated noise reduction between the two locations. This latter could either be estimated from basic acoustic principles or measured directly under more favourable "signal to noise" conditions.

Given the need to carry out construction noise monitoring over a period of years, it may be most efficient to establish a permanent monitoring station dedicated to the task from which data could be selected as needed to fulfill the above requirements as well as any others which may arise during construction or operation. Mitigation measures have been recommended to reduce the noise emitted during the construction phase.

3.3 *OPERATIONAL PHASE*

A detailed description of the operational EM&A requirements will be provided in the Operational EM&A Manual, which will be submitted to the EPD prior to the commissioning of the new power station.

The Operational noise monitoring and audit will comprise the following:

Equipment Compliance Monitoring

Noise compliance tests shall be conducted at the vendor works or, failing this, at the site for all major items of rotating equipment in order to ensure vendor compliance with project noise requirements.

Plant / Community Noise Survey

A comprehensive on-plant and community noise survey shall be conducted on completion of commissioning of the new plant at a period of peak demand. Further surveys shall be conducted following any significant changes in plant design or operational procedures.

Monitoring Locations / Parameters

Monitoring shall be carried out at the two nearest NSRs for the daytime, evening and night time periods. However, in practice, it is expected to generally be difficult to monitor new plant operational noise levels at the NSRs discussed earlier due to noise from the existing plant and from other sources in the community. Under such circumstances it would be appropriate to monitor noise levels at a point closer to the site (eg on the east boundary) and extrapolate the results so obtained to the NSR's.

Monitoring Procedure

Prior to any monitoring programme being undertaken, all monitoring equipment shall be serviced, calibrated and certified by an accredited laboratory. Equipment shall be operated in accordance with the manufacturer's instructions and all tests and checks recommended by the manufacturer shall be carried out. During monitoring activities, wind direction, windspeed and ambient humidity and temperature shall be measured and recorded.

Monitoring Audit Reporting

Monitoring results from the designated monitoring stations can be compared with the operational noise limits given in *Part B - Section 6.2.3*. If monitoring results indicate exceedance of the limits, the individual nominated for environmental responsibility within the management structure, will be responsible for further monitoring, checking operational procedures, equipment and mitigation measures and instigating any additional remedial action. Mitigation measures have been recommended in *Part B - Section 6.6* to reduce the noise emitted during the operational phase.

4 AIR QUALITY MONITORING

4.1 INTRODUCTION

In this section, the requirements for the monitoring and audit of air quality impacts from the construction and operation of the new power station are presented.

4.2 CONSTRUCTION PHASE

4.2.1 *Baseline Conditions*

The air quality of Lamma Island is mainly affected by the existing HEC Lamma Power Station. The emission from the chimney has been controlled by good engineering practice with tall stacks. With the pollutant discharged from the 215mPD chimney, dispersion of pollutants has been enhanced and its impact on the surrounding area well within the criteria.

The fugitive emissions from the ash lagoon and coal yard are the major dust sources. Three TSP monitoring stations are located at the Reservoir Area, East Gate and Tai Yuen Village to monitor the dust emissions from these sources. The locations of three TSP Samplers are shown in *Figure 4.2a*.

4.2.2 *Air Sensitive Receivers*

The land use of the surrounding areas from HEC Lamma Power Station is mainly open area and low-rise village houses of 2-3 storeys. The nearest villages to the Power Station are Ko Long, Tai Wan To and Hung Shing Ye.

According to the *EIAO TM*, domestic premises, hotel, hostel, hospital, clinic, nursery, temporary housing accommodation, school, educational institution, office, factory, shop, shopping centre, place of public worship, library, court of law, sports stadium or performing arts centre are classified as ASRs. The identified representative ASRs are listed in *Table 4.2a* respectively and their locations are shown in *Figure 4.2b*.

Table 4.2a ***Location of identified representative Air Sensitive Receivers***

ASRs	Location	Distance from the Site boundary (m)
A1	Village House at the south of Ko Long	850
A2	Scattered Village House at the south of Wang Long	1000
A3	Village House at the north of Hung Shing Ye	1350
A4	Hung Shing Ye Beach	1300
A5	Scattered Village House at the southeast of Hung Shing Ye Beach	1325

4.2.3 *Air Quality Monitoring Methodology*

The impact of fugitive dust on ambient air pollution depends on the quantity, as well as the drift potential of the dust particles injected into the atmosphere. Large dust particles will settle out near the source and particles that are 30-100 μm in diameter are likely to undergo impeded settling. These particles, depending on the extent of atmospheric turbulence, would settle within a distance of 100 m from the source. The main dust impact will arise from fine particles of a diameter less than 30 μm, measured as Total Suspended Particulates (TSP), dispersed over greater distances from the sources. TSP levels will, therefore, be monitored to evaluate the dust impact during the construction works.

24-hour TSP concentrations shall be measured by the *High Volume Method for Total Suspended Particulates, Part 50 Chapter 1 Appendix B, Title 40 of the Code of Federal Regulations of the USEPA.*

TSP is sampled by drawing air through a conditioned, pre-weighed filter paper inside a High Volume Air Sampler (HVAS) at a controlled rate. After sampling, the filter paper with retained particles is collected and returned to the laboratory for drying in a desiccator followed by accurate weighing. TSP levels are calculated from the ratio of the mass of particulates retained on the filter paper to the total volume of air sampled over the time period. The drying and analysis of HVS samples normally takes about two days to complete.

Due to the lengthy delay between sampling time and result availability for 24-hour sampling, 1-hour TSP sampling should also be conducted. 1-hour TSP levels, while assessed under different criteria, are considered to be indicative of forthcoming 24-hour results conducted on the same day. In this way expedient remedial actions, should they be required, may be undertaken based on the 1-hour data, before the 24-hour results become available.

1-hour sampling, providing real time airborne particulate measurement, can be undertaken using a direct reading dust meter. Despite the advantages of using a real time monitor to measure particulate concentrations such as in response to dust complaints, results are not comparable with 24-hour HVS data. Therefore, if the use of a direct reading monitor is agreed for 1-hour TSP sampling both baseline and impact monitoring must be carried out by the direct reading method.

No comparisons between direct reading and physically measured (HVS) data shall be attempted except that, where the direct reading method for 1-hour TSP sampling is used, the measured TSP concentrations shall be regarded as indicative of the 24-hour TSP results and the actions specified in the following section shall be implemented.

4.2.4 *Environmental Monitoring Requirements for Construction Work*

The construction work will inevitably lead to dust emissions, mainly from heavy construction, truck haulage, concrete batching and wind erosion. To monitor the total suspended particulate (TSP) levels at the construction sites, it is considered that periodic monitoring (usually once every 6 days) of these activities using high volume air sampler at agreed locations would be a useful means of ensuring that such dust is adequately controlled to agreed levels.

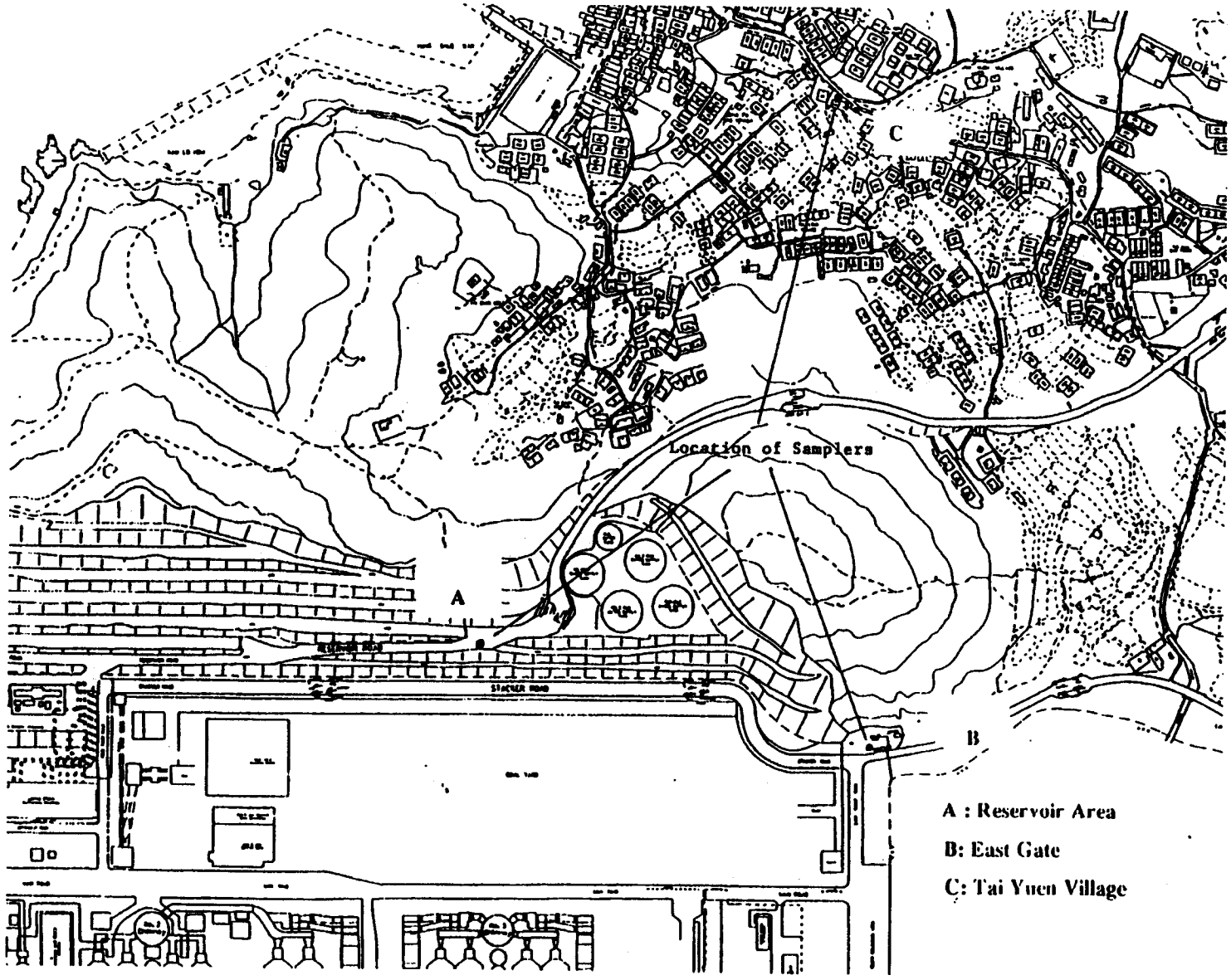

FIGURE 4.2a

LOCATION OFTSP SAMPLERS

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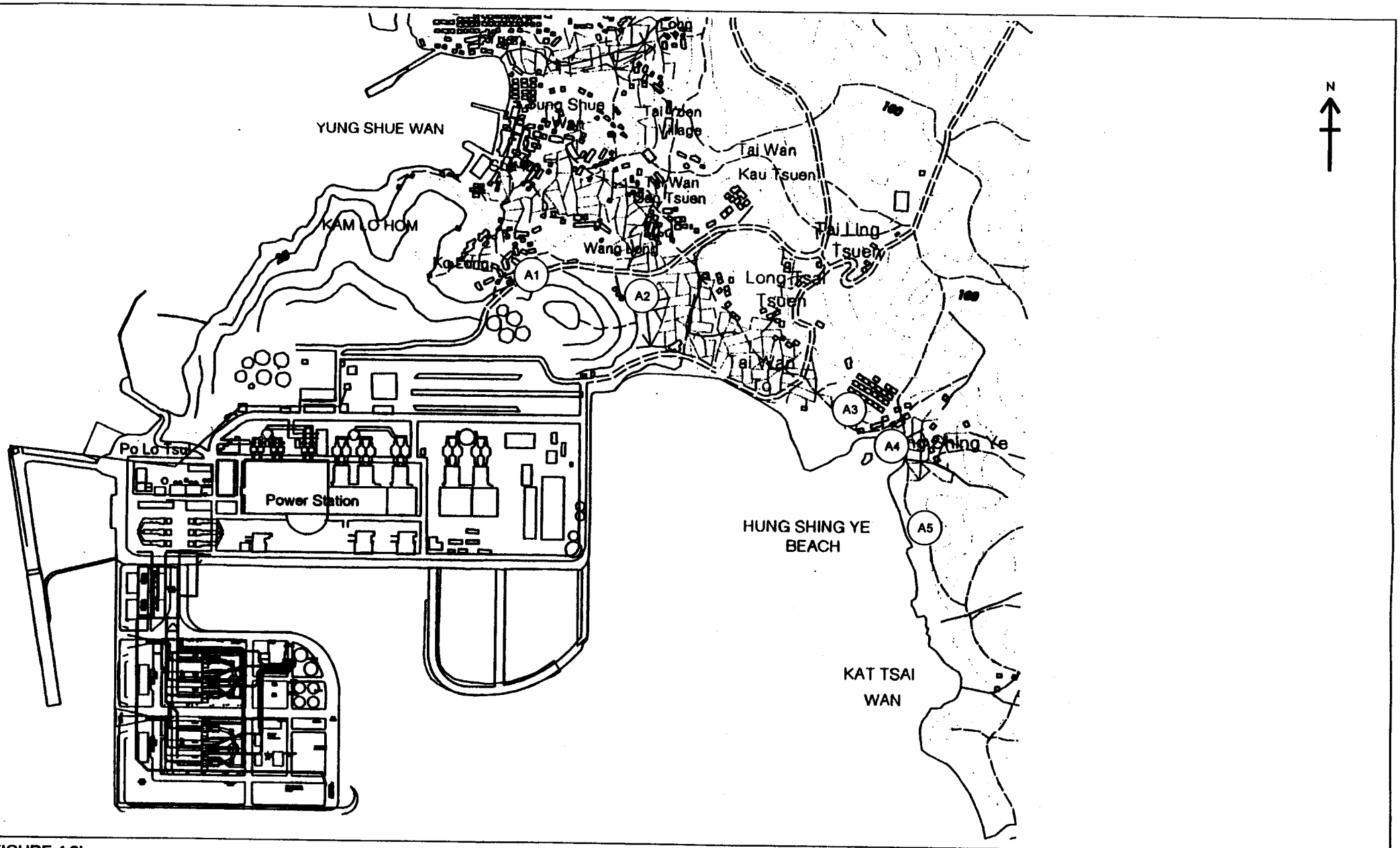

FIGURE 4.2b

LOCATION OF IDENTIFIED AIR SENSITIVE RECEIVERS

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It is predicted that the dust level will satisfy the dust criteria at all ASRs with the implementation of the recommended dust control measures. Specific dust control measures should be considered as part of Contractor contracts and regular compliance checking by the EM&A Consultant and the Engineer at site and as well as at the Sensitive Receivers should be conducted.

The baseline monitoring results form the basis for determining the air quality criteria for the impact monitoring. *Table 4.2b* shows the air quality criteria, namely Action and Limit Levels for Air Quality (Construction Dust). Should monitored TSP levels exceed Action Level during construction, HEC will take appropriate control measures to restore the dust level to acceptable levels.

Table 4.2b *Action and Limit Levels for Air Quality*

Parameters	Action	Limit
24 Hour TSP Level in μgm^{-3}	For baseline level ≤ 200 μgm^{-3}, Action level = (Baseline level * 1.3 + Limit level)/2; For baseline level > 200 μgm^{-3}, Action level = Limit level	260
1 Hour TSP Level in μgm^{-3}	For baseline level ≤ 384 μgm^{-3}, Action level = (Baseline level * 1.3 + Limit level)/2; For baseline level > 384 μgm^{-3}, Action level = Limit level	500

4.3 OPERATIONAL PHASE

4.3.1 *Environmental Monitoring Requirements*

Air emission from the new units in Lamma Extension is anticipated to be regulated under the terms of a licence issued by the EPD under the Air Pollution Control Ordinance. The licence will specify regulated limits on all identified emission points in terms of emission rates and concentration; and the monitoring requirements at both source and the receivers. The results of the monitoring data and statistics will be submitted to the EPD at specified intervals or by on-line transmission.

The analysis of air quality impacts by physical modelling study clearly identified an improvement on air quality due to the adoption of gas-fired units at Lamma Extension and shifting of the base load from the existing coal units to the new gas-fired units. The pollutant emitted from the gas-fired units is dominantly NO_x. The results of physical modelling and numerical modelling have also indicated a very minute contribution of SO_2 to the ambient air quality.

Stack emissions from the gas-fired units will be monitored by continuous monitoring equipment installed in flue gas path to collect the data of efflux NO_x, CO, oxygen and stack temperature, in line with the requirements for similar gas-fired generating units. This provides a continual check on the performance of pollution control devices incorporated in the new units. A requirement to provide continuous records of emission concentration for inspection by the EPD together with suitable alarm facilities to warn operations staff of equipment failure of pollution control plant will provide an adequate basis for monitoring emission at source.

For the ambient air quality monitoring, the existing monitoring network operated by HEC has already been set up as a condition of the specified process licence for the operation of the existing Lamma Power Station. It has proved to be extremely useful in assessing any changes in pollution level in the external environment that have arisen following the development of Lamma Power Station. The existing HEC ambient air quality monitoring stations collect the air quality data on SO_2 and NO_x at designated locations on Hong Kong Island and Lamma Island. Since the total emissions in 2012 from Lamma Extension and existing Lamma Power Station will be reduced compared with the total emissions from Lamma Power Station alone in 2002, it is considered that the existing HEC ambient air quality monitoring network will be sufficient for assessing any impact of the extension on the air environment at the identified ASRs, as well as for assessing cumulative impacts. Detailed requirement on ambient air quality monitoring will be further reviewed by the EPD as part of the conditions in the Specified Process Licence for the new gas-fired units in the future.

The greenhouse gas inventory shall be updated annually. Records to demonstrate compliance with the operations plan for minimising greenhouse gas emissions shall be maintained and kept on-site. The operations include a conversion programme of existing peak lopping oil-fired gas turbines to gas-firing ones, shifting the base-load from coal-fired to gas-fired, and operations and maintenance practices to result in smaller or less frequent CH_4 emissions. Records to demonstrate compliance with the comprehensive life cycle management program for HFC/PFC/SF_6 containing equipment and records of carbon sinks under a carbon accounting system for afforestation or reforestation schemes, shall also be maintained and kept on-site.

The results of environmental monitoring enable a continuing appraisal of the environmental impact of the HEC air emissions to be made and also provide the means of monitoring, ensuring that the station has no adverse environmental impacts to the ambient air quality.

A detailed description of the operational EM&A requirements will be provided in the EM&A Manual, which will be submitted to the EPD before the commissioning of Lamma Extension.

5 SUMMARY AND CONCLUSIONS FOR THE CUMULATIVE IMPACT ASSESSMENTS

5.1 INTRODUCTION

The assessment of cumulative impacts was a key focus of the EIA Study for the Lamma Extension project. The assessment methodologies used were able to combine the projected impacts of existing and proposed projects and predict the likely "worst case" impacts that might arise from the combined influences of these projects.

A wide range of potential cumulative impacts were assessed in the EIA Study as an integral part of the individual technical assessments for the different components of the project. Details of these assessments are contained within the individual sections of Parts B, C and D and summarised in Part E. An overview of these assessments and their findings is provided below.

5.2 AIR QUALITY

The cumulative impacts on local air quality of HEC's existing and proposed power stations were tested with quantitative tracer gas measurements during the wind tunnel studies of the air quality assessment. The results indicated that there would be no breaches of the Air Quality Objectives (AQOs) due to the peak load operation in 2012. The wind tunnel studies also indicated that there would be no exceedances of the AQOs with the additional operation of a proposed waste-to-energy incineration facility (WEIF) at Lamma Island in 2012.

The PATH photochemical air quality modelling system was used to identify both the *cumulative* and *incremental* impacts on air quality of the new power station at Lamma Extension, by predicting air quality at hourly intervals throughout the SAR with and without the emissions from the proposed new facility. Under the simulated conditions, predicted one-hour, 24-hour and annual average concentrations were well below the AQOs, and the contributions of the new power station to the maximum levels observed with model were negligible in the locations where those maxima were predicted to occur.

The quantitative assessment of the regional air quality impacts undertaken as part of the Stage 1 EIA was reviewed and updated during the detailed EIA Study. Estimates of oxides of nitrogen (NO_x) and SO_2 emissions from vehicle, domestic and industrial sources in Hong Kong were updated and projected for the years 2002 and 2012, and pollutant concentrations were re-estimated. The contributions of HEC emissions to regional NO_x and SO_2 levels in 2012 were estimated at 1.5% and 0.7% respectively.

This assessment included the compilation of a greenhouse gas emissions inventory for all HEC operations, and an investigation of the impacts of proposed greenhouse gas mitigation measures on both existing and proposed facilities at Lamma. Total emissions were projected to increase from 1990 levels by 80% (5.11 Mt) and 62% (3.97 Mt) in 2002 and 2012 respectively, illustrating the beneficial impact of gas-fired operation after 2002 despite total electricity generation in year 2012 being 2.57 times that of 1990. Estimated greenhouse gas emissions per unit of energy produced were predicted to fall from 1990 levels by

37% in 2012. A cumulative gain of 6.4 million tonnes of emissions of CO_2 equivalent is predicted in 2012 as a result of the mitigation measures (a 39% reduction in unmitigated emissions), leaving an estimated total of 10.3 million tonnes for HEC operations in that year.

5.3 *WATER QUALITY*

The hydrodynamic assessment for the Lamma Extension reclamation considered the combined impacts of the Lamma Extension and WEIF reclamations. Modelled changes at the cross-section were found to be relatively small, and it was concluded that the overall flushing characteristics of the area would not be adversely affected by the two reclamations. The assessment of impacts on the sedimentation regime was also based on the hydrodynamic modelling results, and concluded that there would be no significant changes to either the tidal or sedimentation regimes as a result of reclamations constructed for the Lamma Extension and WEIF projects.

The cumulative impacts of dredging for the Lamma Extension and other projects, such as dredging for Container Terminal 9 and sand winning and backfilling at the South Tsing Yi Marine Borrow Area (STY MBA), were considered in the water quality assessment. Predicted impacts on levels of SS, dissolved oxygen and ammonia were found to be environmentally acceptable although, in relation to SS levels, this conclusion relied on backfilling rates at South Tsing Yi not increasing significantly over current levels. It was therefore recommended that backfilling rates at the STY MBA and associated SS levels at selected SRs be monitored as part of the environmental monitoring and audit programme for the construction phase, and that dredging activity be regulated as required to prevent unacceptable impacts.

Assessment of the thermal discharge in cooling water considered the cumulative impacts of the existing and proposed power stations and the WEIF, and found that the water quality objective (no more than 2°C rise) was met at all of the SRs.

5.4 *NOISE*

Operational noise levels were predicted for the combined impacts of both the existing and proposed power stations. The new plant will generally give rise to levels below those of the existing plant at the NSRs. Model results show that the culmulative noise impacts will be below the NCO limits due to shifting of base load operation to Lamma Extension and hence less units will be operated in the existing Lamma Power Station during night time.

5.5 *LANDSCAPE AND VISUAL IMPACTS*

This assessment considered the combined impacts of both the existing and proposed HEC power stations. The partial nearfield views available from locations on Lamma island were not considered to have significant adverse impacts, as the existing station is larger and closer to viewers. For some of the more distant viewers, the intervening distance and the existing visual character of the area (which is dominated by the existing power station) would reduce the expected impacts to negligible or acceptable levels.

these Control Stations can be used as upstream and downstream controls for the SR stations. Locations of control stations shall be subject to change depending on the location and timing of dredging and other marine works projects in the Study Area. Any proposal for changes to the locations of control/impact stations shall be subject to EPD approval.

Water quality monitoring shall be undertaken by suitably qualified members of the EM&A Consultant. Water quality monitoring results from both Control Stations and SR Stations will be compared with EPD's WQOs. Control Stations are used to determine ambient water quality. SR Stations are in the immediate vicinity of the dredging site and expected to experience elevated suspended sediment concentrations during the reclamation construction activities.

Baseline conditions for water quality shall be established and agreed with EPD prior to the commencement of reclamation construction works. The purposes of the baseline monitoring are to establish ambient conditions prior to the commencement of the works and to demonstrate the suitability of the proposed Control and SR Stations. The baseline conditions shall normally be established by measuring the water quality parameters specified *below*. The measurements shall be taken at all Control and SR Stations, three days per week, at mid-flood and mid-ebb tides, for at least four weeks prior to the commencement of construction works.

During the course of the dredging operations, monitoring shall be undertaken three days per week, at mid-flood and mid-ebb tides, with sampling and measurement at the designated monitoring stations. The interval between two sets of monitoring shall not be less than 36 hours except where there are exceedances of Action and/or Limit levels, in which case the monitoring frequency will be increased.

Upon completion of all dredging activities, a post project monitoring exercise on water quality shall be carried out for four weeks in the same manner as the impact monitoring.

Water Quality Monitoring Methodology

The values of turbidity, dissolved oxygen (DO) and suspended solids (SS) will be determined at each designated monitoring stations. Two measurements of DO concentration (mg l^{-1}), DO saturation (%) and turbidity (NTU) will be taken *in situ* at Control and SR Stations at 1 metre below surface, mid-depth and 1 metre above sea bed. The monitoring probes must be removed from the water after the first measurement and redeployed for the second measurement. Where the difference in value between the first and second measurement of DO or turbidity parameters is more than 25% of the value of the first reading, the readings will be discarded and further readings will be taken. Water samples for SS (mg l^{-1}), NH_3-N (mg l^{-1}) and TIN (mg l^{-1}) measurements shall be collected at the same three depths. As for the *in situ* measurements, duplicates will be taken at both Control and SR Stations.

In addition to the above *in-situ* measurements temperature, salinity and pH will be determined at all control and monitoring stations at the same three depths, as specified above.

For the purpose of evaluating water quality, the values obtained from individual water depths (ie surface, middle, bottom) will be assessed individually against the specified WQOs criteria. Note that in addition to the monitoring location/position, time, water depth, water temperature, salinity, weather

conditions, sea conditions, tidal stage, and any special phenomena and work underway at the dredging site should be recorded.

Water samples for all monitoring parameters shall be collected, stored, preserved and analysed according to the Standard Methods, APHA 17 ed, and/or methods agreed by the Director of Environmental Protection (DEP).

All *in-situ* monitoring instruments shall be checked, calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme before use, and subsequently re-calibrated at 3-monthly intervals throughout all stages of the water quality monitoring. Responses of sensors and electrodes shall be checked with certified standard solutions before each use. Wet bulb calibration for a DO meter shall be carried out before measurement at each monitoring station. The turbidity meter shall be calibrated to establish the relationship between turbidity readings (in NTU) and levels of suspended solids (in mg l^{-1}) where possible.

For the on-site calibration of field equipment, the BS 127:1993 *Guide to field and on-site test methods for the analysis of waters* shall be observed. Sufficient stock of spare parts shall be maintained for replacement when necessary. Backup monitoring equipment shall also be made available so that monitoring can proceed uninterrupted even when some equipment is under maintenance, calibration, etc.

Analysis of SS, NH_3-N and TIN shall be carried out in a HOKLAS or other international accredited laboratory. Water samples of about 1000ml shall be collected at the monitoring and control stations for carrying out the laboratory determinations. The determination work shall start within 24 hours after collection of the water samples. The determination work shall follow APHA 19 ed 2540D for suspended solids, 4500-NH_3 G for ammoniacal nitrogen and 4500-N_{org}/NO_3 for total nitrogen or equivalent methods subject to approval of DEP.

For the each of the testing methods detailed testing methods, pre-treatment procedures, instrument use, Quality Assurance/Quality Control (QA/QC) details (such as blank, spike recovery, number of duplicate samples per batch, etc.), detection limits and accuracy shall be submitted to DEP for approval prior to the commencement of monitoring programme. The QA/QC shall be in accordance with the requirements of HOKLAS or international accredited scheme. The QA/QC results shall be reported. EPD may also request the laboratory to carry out analysis of known standards provided by EPD for quality assurance. Additional duplicate samples may be required by EPD for inter-laboratory calibration. Remaining samples after analysis shall be kept by the laboratory for three months in case repeat analysis is required. If in-house or non-standard methods are proposed, details of the method verification may also be required to submit to DEP. In any circumstance, the sample testing shall have comprehensive quality assurance and quality control programmes. The laboratory shall prepare to demonstrate the programmes to DEP or his representatives when requested.

Compliance Assessment

Water quality monitoring results will be evaluated against Action and Limit levels as shown in *Table 5.2a*. Exceedence of the Action and Limit Level will result in changes to the monitoring and dredging operations, potentially involving increased monitoring and implementation of mitigation measures.

Table 5.2a ***Action and Limit Levels for Water Quality***

Parameters	Action	Limit
Do in mg l^{-1} (surface, Middle & Bottom	Surface & Middle 5%-ile of baseline data for surface and middle layer	Surface & Middle 4 mg l^{-1} or 1%-ile of baseline data for surface and middle layer
	Bottom 5%-ile of baseline data for bottom layer	Bottom 2 mg l^{-1} or 1%-ile of baseline data for bottom layer
SS in mg l^{-1} (depth averaged)	95%-ile of baseline data or 120% upstream control station's SS at the same tide of the same day[5]	99%-ile of baseline data or 130% of upstream control station's SS at the same tide of the same day[5]
Turbidity (Tby) in NTU (depth averaged)	95%-ile of baseline data or 120% upstream control station's turbidity at the same tide of the same day	99%-ile of baseline data or 130% of upstream control station's turbidity at the same tide of the same day
NH_3-N in mg l^{-1} (depth averaged)	95%-ile of baseline data	99th percentile of baseline data or 0.021 mg l^{-1} for unionized ammoniacal nitrogen, whichever is greater
TIN in mg l^{-1} (depth averaged)	95%-ile of baseline data	99%-ile of baseline data or 0.1 mg l^{-1}, whichever is greater

Notes:
1. Depth-averaged is calculated by taking the arithmetic mean of all three depths.
2. For DO, non-compliance of the water quality limits occurs when monitoring result is lower then the limits.
3. For SS and Tby, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
4. All the figures given in the table are used for reference only and the EPD may amend the figures whenever it is considered necessary.
5. Whichever of the two criteria is greater shall be used as the Action and Limit levels, subject to approval by the EPD.
6. Unionized ammoniacal nitrogen shall be calculated from the monitored ammoniacal nitrogen based on temperature, pH and salinity which are routinely monitored.

Water Quality Mitigation Measures

The Contractor shall be responsible for the design and implementation of the water quality control and mitigation measures recommended for the construction phase in *Part B, Section 5.4.2.*

If the above measures are not sufficient to restore the water quality to an acceptable level upon the advice of the EM&A Consultants, the Contractor shall liaise with the EM&A Consultants on other mitigation measures, propose these to Independent Checker (Environmental) and Engineer's Representative for approval, and carry out the mitigation measures.

5.3 OPERATIONAL PHASE

Introduction

This sub-section provides details of the environmental monitoring programme and presents technical requirements for monitoring water quality during the operation of the power station extension. The programme and the requirements will be subject to review depending on the results of the environmental monitoring. An *Initial Review Report* will be submitted after the first three months of monitoring or on an agreed suitable date. The EM&A Consultant will

discuss the adequacy of the monitoring programme and provide recommendations on how to improve the monitoring programme, if required.

Water Quality Monitoring

The objectives of the water quality monitoring programme are as follows:

- to determine the size of the 2°C mixing zone, that is the area within which the water temperature is greater than 2°C above ambient;
- to determine the extent of the detectable chlorine concentrations; and
- to verify the predictions of the thermal and chlorine dispersion modelling.

The WQOs for the Southern Water Control Zone (WCZ), in which the reclamation site is located, are as follows:

- human activity shall not cause the natural daily temperature range to change by more than 2°C.

It should be noted that there is currently no standard for residual chlorine concentrations in marine waters. The concentration used for assessment purposes in the chlorine dispersion modelling was taken to be 0.01 mg l^{-1}, which was based on ecotoxicity data. However, it is not possible to detect residual chlorine at this concentration in marine waters. A detection limit of 0.04 mg l^{-1} is achievable under optimal conditions. If alternative biocides are to be used then monitoring of the concentrations of such biocides should be carried out and the extent of detectable concentrations be determined with reference to any available ecotoxicity data.

Monitoring of water quality, in terms of temperature and residual chlorine, or alternative biocide, concentrations, will be undertaken within the area (exact area of monitoring will be agreed with EPD prior to the commencement of measurements) shown on *Figure 5.6b* of *Part B Section 5.6.2*.

The location of the monitoring area is chosen to cover the area predicted by the computer modelling to experience elevated temperatures and chlorine concentrations. Control, or background, values will be determined from measurements made on the outer edges of the monitoring area, which will not be influenced by the discharges from the power station.

Baseline conditions shall be established prior to the commencement of the discharges from the power station. The purposes of the baseline monitoring are to establish conditions prior to the commissioning of the power station extension. The baseline conditions shall normally be established by measuring temperature and chlorine, or alternative biocide, concentrations, as specified below. The measurements shall be taken over the whole of the monitoring area, over a spring tide and a neap tide in both the wet and dry seasons.
During the course of the operation of the power station extension, monitoring shall be undertaken for complete spring and neap tidal cycles in the wet and dry seasons.

Water Quality Monitoring Methodology

The value of temperature will be determined at each designated monitoring point within the monitoring area *in situ*. Measurements will be made at 2 metre intervals over the whole water column. Water samples for residual chlorine, or alternative biocide, measurement will be collected at each designated monitoring

point within the monitoring area. The water samples will be collected at the same depths as the temperature measurements.

For the purposes of evaluation, measurements at each of the depths and stations will be combined to form contours of temperature and residual chlorine, or alternative biocide,. This will enable a determination of the areal extent of different contour bands. Note that in addition to the monitoring location/position, time water depth, salinity, weather conditions, sea conditions, tidal stage and any special phenomena and work underway within the monitoring area shall be recorded.

Compliance Assessment

The results of the monitoring for temperature and residual chlorine, or alternative biocide, will be compiled to show contours of excess temperature and residual chlorine, or alternative biocide, at each 2 hourly interval. This will then enable the size of the mixing zone, predicted during the modelling assessment, to be verified for both temperature and residual chlorine. The acceptability of the measured sizes of the mixing zones will be determined in consultation with the EPD.

5.3.1 *EM&A Requirements on Water Quality for the Construction of the Gas Pipeline*

Introduction

This section provides a summary of the environmental monitoring programme for monitoring water quality during the laying of the gas pipeline. Monitoring will only be required for the jetting operations, and this monitoring will only be undertaken at the beginning of the construction programme unless unacceptable impacts are found.

Water quality monitoring results will be compared to Action and Limit Levels to determine whether impacts associated with pipeline laying are acceptable. An Event and Action Plan will be provided to outline procedures to be undertaken when monitoring results exceed Action or Limit levels. The procedures are designed to ensure that if any significant exceedances occur (either accidentally or through inadequate implementation of mitigation measures on the part of the Contractor), the cause is quickly identified and remedied, and that the risk of a similar event re-occurring is reduced.

Action and Limit levels will be used to determine whether modifications to the pipeline laying operations are required. Action and Limit levels are environmental quality standards chosen such that their exceedance indicates potential deterioration of the environment. Exceedance of Action levels can result in an increase in the frequency of environmental monitoring, modification of laying operations and implementation of the proposed mitigation measures. Exceedance of Limit levels indicates a greater potential deterioration in environmental conditions any may require the cessation of works unless appropriate remedial action, including a critical review of plant and working methods, are undertaken.

Water Quality Monitoring

The objectives of the water quality monitoring programme are as follows:

- to determine the effectiveness of the operational controls and mitigation measures employed, and the need for supplementary mitigation measures;

- to check compliance with the relevant WQOs; and
- to verify the assessment of impacts.

The relevant WQOs for the Southern and Mirs Bay WCZs, in which the pipeline is to be laid, are as follows:

> *Suspended solids (SS)*: SS should not be raised above ambient levels by an excess of 30% nor cause the accumulation of SS which may adversely affect aquatic communities.

Monitoring is to be employed as jetting progresses along the pipeline route, and should be designed to demonstrate the localised nature of the impacts from jetting. Control stations are to be positioned upstream of the jetting machine during monitoring at the impact stations. An indicative layout for the monitoring programme is shown in *Figure 4.6b* of *Part D*. In addition to the above described monitoring requirement, monitoring should also be carried out at the Po Toi FCZ when jetting passes within 1km of the FCZ. Impact monitoring should be carried out at the FCZ during such times.

Compliance Assessment

Water quality monitoring results will be evaluated against Action and Limit levels as shown in *Table 5.3a*. Exceedance of the Action or Limit Level will result in changes to the monitoring and jetting operations in accordance with the Event and Action Plan.

Table 5.3a ***Action and Limit Levels for Water Quality***

Parameters	Action	Limit
SS in mg l^{-1} (depth-averaged)	95%-ile of baseline data or 120% upstream control station's SS at the same tide of the same day[4]	99%-ile of baseline data or 130% of upstream control station's SS at the same tide of the same day[4]

Notes:
1. Depth-averaged is calculated by taking the arithmetic mean of all three depths.
2. Non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and the EPD may amend the figures whenever it is considered necessary.
4. Whichever of the two values is greater shall be used for the Action and Limit Levels.

6 ECOLOGICAL RESOURCES

6.1 INTRODUCTION

In this section, the requirements for the monitoring and audit of marine ecological, fisheries and terrestrial ecological resource impacts from the construction and operation of the Lamma Extension are presented.

6.2 MARINE ECOLOGY

6.2.1 *Construction EM&A Requirements*

The dredging operations include constraints which act as appropriate mitigation measures to control environmental impacts to within acceptable levels. Actual impacts of construction activities will be monitored through impacts to water quality. Monitoring and audit activities designed to detect and mitigate any unacceptable impacts to water quality will serve to protect against unacceptable impacts to marine ecological resources. The water quality monitoring programme will provide management actions and supplemental mitigation measures to be employed should impacts arise, thereby ensuring the environmental acceptability of the project.

According to the EIAO TM Section 8.3 an EM&A programme would be required in a situation where:

"the project involves mitigation measures of which the effectiveness may require a long period to establish"

and/or, according to Annex 20, Section 8 if there are any uncertainties regarding the scale of impacts. Both of these sections of the TM are applicable in this situation as the effectiveness of providing rubble mound seawalls for the recolonisation of soft corals and gorgonians will take time to evaluate, and also because the severity of the impact of elevated SS levels on the soft corals and gorgonians adjacent to the reclamation site is uncertain (though assumed to be the worst case).

In response to this it is recommended that an Ecological M&A programme be conducted to determine both the severity of the impact to soft corals and gorgonians and to monitor the process of recolonisation of the area once the construction works have been completed. The following text presents the preliminary Objectives, Methodology and Rationale for the ecological monitoring. Before monitoring can begin details of the monitoring programme should be agreed with AFD and EPD.

Ecological Monitoring Objectives

The objectives of the ecological monitoring programme are as follows:

- to determine the severity of impacts arising from construction activities on soft corals and gorgonians located adjacent to the proposed extension site;

- to determine the rate and effectiveness of colonisation of the rubble mound seawall by soft coral and gorgonian assemblages; and

- to determine the rate and effectiveness of recolonisation of existing habitats indirectly impacted during construction by soft coral and gorgonian assemblages.

Ecological Monitoring Methodology & Rationale

Ecological monitoring will consist of subtidal surveys during the dredging and reclamation works for the power station extension and for a period after reclamation works have ceased. Specific requirements of the ecological monitoring programme are presented below:

Baseline Data:	Subtidal surveys using a remotely operated vehicle (ROV) have been conducted as part of this EIA compiling an extensive database on the abundance and diversity of the soft coral and gorgonian assemblages in the vicinity of the power station. However in order to update this baseline a survey following the exact methodology presented in this EIA will be conducted 3 months before construction works begin. A Baseline Survey Report will be produced and submitted to EPD and AFD. This data will serve the purpose of a baseline with which the severity of impacts and rate of colonisation can be gauged.
Location:	Once the extension has been constructed the ROV should be used to survey the southern and western rubble mound seawalls as well as the sites surveyed in the baseline survey adjacent to the reclamation site.
Monitoring Frequency:	Once the seawalls are constructed the frequency of monitoring should be at six monthly intervals for a period of two years. This monitoring will be used to assess the extent of recolonisation of soft corals and gorgonians adjacent to the reclamation site, and the extent of colonisation of the extension rubble mound seawalls by soft corals and gorgonians.

Results of these surveys are to be reported to EPD and AFD and will form the basis for deciding the quantity of artificial reefs that HEC have established a commitment to deploy (above and beyond a minimum deployment of 400 m^3).

6.2.2 *Operation EM&A Requirements*

Impacts of operational activities will be monitored through on-site monitoring of water quality parameters (including residual chlorine or alternative biocide and temperature) of the discharged cooling waters. Monitoring and audit activities designed to detect and mitigate any unacceptable impacts to water quality will serve to protect against unacceptable impacts to marine ecological resources.

The discharge monitoring programme will provide management actions and supplemental mitigation measures to be employed should impacts arise, thereby ensuring the environmental acceptability of the project. As no unacceptable impacts to marine ecological resources are predicted to occur, the development and implementation of a monitoring and audit programme specifically designed

to assess the effects of operational activities on marine ecological resources is not deemed necessary.

6.3 FISHERIES

6.3.1 EM&A Requirements

The dredging operations include constraints which act as appropriate mitigation measures to control environmental impacts to within acceptable levels. Actual impacts of construction activities will be monitored through impacts to water quality. Monitoring and audit activities designed to detect and mitigate any unacceptable impacts to water quality will serve to protect against unacceptable impacts to fisheries resources.

The water quality monitoring programme will provide management actions and supplemental mitigation measures to be employed should impacts arise, thereby ensuring the environmental acceptability of the project. As no impacts of concern to the fishery are predicted to occur, the development and implementation of a monitoring and audit programme specifically designed to assess the effects of the construction activities on commercial fisheries resources is not deemed necessary.

6.4 TERRESTRIAL ECOLOGY

6.4.1 EM&A Requirements

As no impacts of concern to terrestrial ecological resources are predicted to occur, the development and implementation of a monitoring and audit programme specifically designed to assess the effects of the construction activities on terrestrial ecological resources is not deemed necessary.

It is recommended that auditing of each waste stream should be carried out periodically by the Independent Environmental Checker to determine if wastes are being managed in accordance with approved procedures and the site waste management plan and to assess whether waste reduction could be enhanced.

The audits shall investigate all aspects of waste management including waste generation, storage, recycling, transport, and disposal.

8 LAND CONTAMINATION

8.1 INTRODUCTION

In this section, the requirements for the monitoring and audit of land contamination impacts from the construction of the new power station are presented.

8.2 CONTAMINATION AVOIDANCE APPROACH

As a corporate environmental policy, HEC have indicated that its *Chemical Control Standards and Procedures* and *Standing Instructions for Handling and Disposal of Hazardous Substances and Dangerous* Goods, which are currently used for the Lamma Power Station, will also be used for the Lamma Extension, where appropriate. In order to formulate appropriate operational practices and precautionary measures for prevention of land contamination at the Lamma Extension site, the existing standard procedures and standing instructions have been reviewed and considered adequate for prevention of land contamination.

As no mitigation measures on land contamination are required during construction, no EM&A on this aspect is required.

The environmental audit is to be carried out by an Independent Environmental Checker (IEC) employed by HEC. The IEC is responsible for assessment of the environmental performance of the Engineer, the Construction Contractor and the EM&A Consultant. The Audits will be carried out at agreed period of intervals in line with the recommendation in the EM&A Manuals. The main responsibilities and duties of IEC are given as follows:

- Interview the representatives of the Engineer, the Construction Contractor and the EM&A Consultant during the construction phase and the Generation Team and the EM&A Consultant during operational phase;
- Inspect the construction site during the construction phase and operating plant during the operational phase;
- Review all the EM&A programmes for compliance checking against the agreed standards as set out in the construction contract, operation instruction, etc., Construction and Operational EM&A Manuals;
- Ensure that the mitigation measures recommended in the EIA Report are properly implemented;
- Ensure that the Event & Action Plans set out in the Construction and Operational EM&A Manuals are properly carried out in case of Action/Limit Level exceedance;
- Evaluate the performance of the various parties against the requirements set out in the Construction and Operational EM&A Manuals; and
- Report the findings of site inspections and other recommendation or environmental reviews to the EPD through the EMC.