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Agreement No. CE 18/2002 (EP)  
Environmental Impact Assessment Study for  
Construction of Helipads at  
Peng Chau and Yung Shue Wan, Lamma Island

**EM&A Manual for  
for Helipad at Yung Shue Wan, Lamma Island**

**EM&A Manual**

**BMT Asia Pacific Limited in  
Association With:**

Hyder Consulting Limited  
Asiatic Marine Limited  
Archaeo-Environments Limited  
Cosine Limited



**BMT Asia Pacific Limited**

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# 1 INTRODUCTION

## 1.1 Background

- 1.1.1 In August 2002 BMT Asia Pacific Limited (BMT) was awarded the contract for Agreement No. CE 18/2002: *Environmental Impact Assessment Study for Construction of Helipads at Peng Chau and Lamma Island / Investigation* by the Civil Engineering Office, Civil Engineering & Development Department (CEDD). Two separate Environmental Impact Assessment (EIA) studies have been carried out for the proposed helipads at Peng Chau and Yung Shue Wan, Lamma Island.
- 1.1.2 In accordance with the EIA Study Brief, this Environmental Monitoring and Audit (EM&A) Manual has been prepared by the EIA Study Team. The EM&A Manual specifies the recommended environmental monitoring and audit requirements, where these are considered necessary, for the concerned environmental aspects to ensure effective implementation of the environmental protection and pollution control measures.
- 1.1.3 This Manual provides systematic procedures for carrying out recommended monitoring and audit works for checking potential environmental impacts that may arise from the construction of the helipad at Yung Shue Wan, Lamma Island. Mitigation measures recommended in the EIA report for each key environmental aspect are also summarised and presented in this Manual.
- 1.1.4 The EM&A Manual has been developed as a means to verify the effectiveness and adequacy of the mitigation measures recommended in the EIA such that additional mitigation measures or remedial action, if deemed necessary, can be formulated during the construction of the project. The recommended EM&A Programme is to be carried out by an Environmental Team (ET) formed before the commencement of the works.
- 1.1.5 Environmental regulations currently enforced in Hong Kong pertaining to air quality, noise, waste management, water quality, and etc. and the recommendations given in the EIA Report have been referenced to in the preparation of this EM&A Manual.

## 1.2 Objectives of this EM&A Programme

- 1.2.1 The main objectives of this EM&A programme are:
- To provide a database of baseline environmental quality for subsequent checking during the construction phase of the works;
  - To provide information at an early stage for identification of potential problem areas and formulation of additional environmental mitigation measures where necessary should any of the environmental control measures or practices fail to achieve the target standards;
  - To verify the environmental impacts predicted in the EIA Study for the project;
  - To determine project compliance with relevant regulatory standards, requirements and guidelines;
  - To outline remedial measures to be undertaken if unexpected problems or unacceptable impacts arise; and
  - To provide data against which environmental audits may be undertaken effectively.

### 1.3 Content of this EM&A Manual

1.3.1 The recommended EM&A programme in this Manual contains the following information:

- Duties of the various project staff and their respective responsibilities with regards to the EM&A requirements during construction;
- Information on project organisation, work schedule and activities;
- Requirements with respect to the work schedule and the necessary EM&A programme to detect the various possible environmental impacts;
- Definition of Action Limit Levels and the establishment of Event/Action Plans;
- Requirements for reviewing potential sources of pollution and assessing working procedures in the event of non-compliance with the environmental criteria;
- Requirements for the presentation of EM&A data and appropriate reporting procedures; and
- Proposed field data forms to be adopted during the various phases of the works.

1.3.2 An Implementation Schedule (IS) of the environmental mitigation measures has been developed in accordance with the requirements of *clause 4.3* of the EIA Study Brief [*Appendix 1.1* refers].

1.3.3 This EM&A Manual shall be regarded as an evolving document that should be updated when necessary to reflect the activities on site (e.g. when alternative monitoring locations are proposed). The updated EM&A Manual shall be prepared by the Contractor's ET and submitted to the Engineer's Representative (ER) and EPD for agreement.

## 2 PROJECT DESCRIPTION

### 2.1 The Subject Site and its Environs

- 2.1.1 The Project involves the construction of a helipad by mini-bored piling in coastal waters at Kam Lo Hom (North), Yung Shue Wan. No dredging or reclamation works are required for the construction.
- 2.1.2 The helipad deck will be located approximately 25 metres from the existing formed land, and an access road will be constructed to link the proposed helipad with the existing Emergency Vehicular Access (EVA) [Figure 2.1 refers].
- 2.1.3 The site location was selected after due consideration of the operational requirements and environmental impact potential of constructing and operating the Yung Shue Wan helipad at each of seven site locations [refer to Sub-section 2.2 of the EIA Report for Helipad at Yung Shue Wan, Lamma Island].
- 2.1.4 The majority of the developments along the coast of Yung Shue Wan are residential village houses, varying from single to 3 storeys high. Some of these buildings are used for commercial purpose on the ground floor (e.g., grocery store and restaurant), which are not considered noise sensitive. There are isolated and abandoned village houses located to the north of Kam Lo Hom (currently zoned “Green Belt”). There is line of sight between developments and proposed helipad site/EVA works area.
- 2.1.5 In addition, the proposed helipad is bound by the Hongkong Electric Co. Ltd.’s Lamma Power Station, which is approximately 800 m due south west to Yung Shue Wan and a refuse transfer station (RTS) immediately adjacent to the proposed site (to the southeast). There are no major road networks within Lamma Island.

### 2.2 Project Design

- 2.2.1 The proposed construction programme can be broadly summarised as presented by Table 2.1. The detailed construction schedule is presented in Appendix 2.1.

**Table 2.1 Summary of Yung Shue Wan Helipad Construction Programme**

Construction Activity	Construction Period
Site Clearance	16-May-2006 to 22-Jul-2006
Mobilisation	24-May-2006 to 16-Aug-2006
Pile Installation	17-Aug-2006 to 27-Jan-2007
Helipad Construction	29-Jan-2007 to 22-Jun-2007
E&M Works	30-May-2007 to 5-Jul-2007
Demobilisation	6-Jul-2007 to 30-Jul-2007

### 2.3 Environmental Monitoring and Audit Requirements

- 2.3.1 The EM&A programme for this Study, as recommended in the EIA, allows for construction phase noise monitoring. This EM&A Manual also gives recommendations on protective measures to be undertaken by the Contractor to protect the surrounding natural and built environment from air and water quality, waste and ecological impacts which may be generated by the works.



## 2.4 Environmental Management Plans

- 2.4.1 Upon the commencement of the Project, the Contractor shall prepare an Environmental Management Plan (EMP) that shall form the framework within which the implementation of mitigation measures and good site practices are to be managed.
- 2.4.2 The EMP shall provide details of the means by which the Contractor (and their sub-contractors) shall implement the recommended mitigation measures and achieve the environmental performance standards defined in the relevant Hong Kong environmental legislation, the Contract and in the EIA. Provision shall be made in the Contract's Particular Specifications for the Contractor to prepare and submit the EMP to the IC(E) for verification and for the approval of the ER.
- 2.4.3 An environmental performance review programme, including a regular assessment of the effectiveness of the EMP, site practices and procedures shall be established prior to the commencement of construction works. The ET Leader shall prepare review protocols that shall include inspection and auditing requirements [*Section 3.2.3* refers].

### 3 PROJECT ORGANISATION

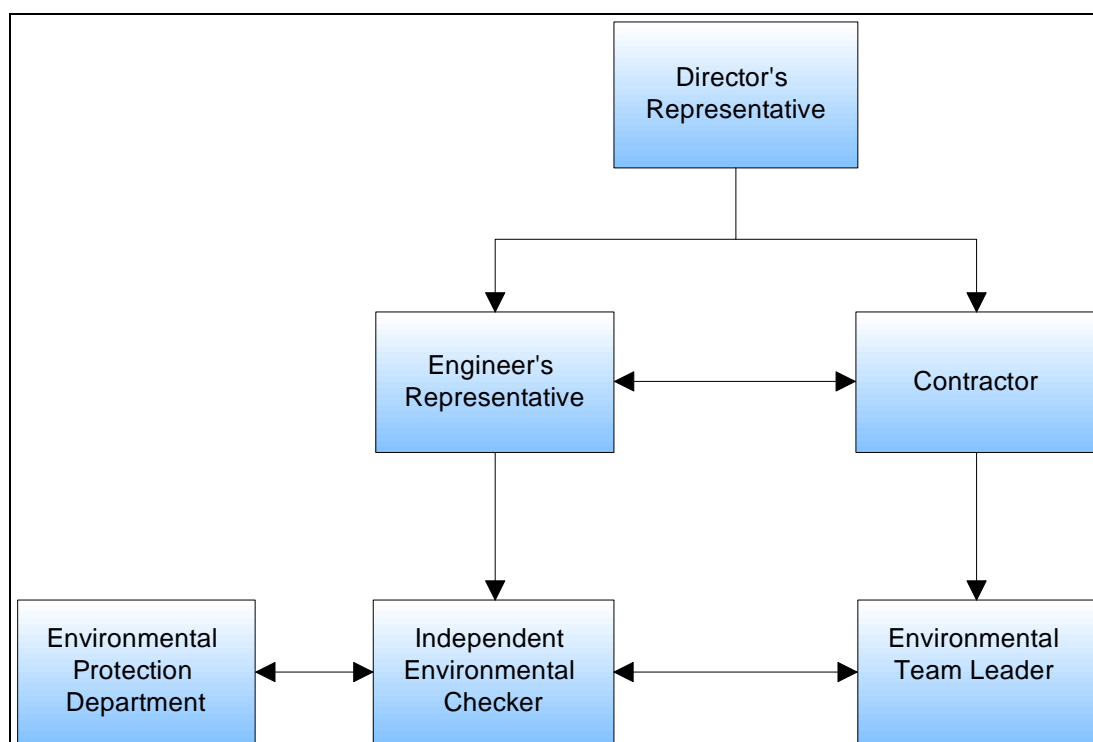
3.1.1 Involvement of relevant parties in a collaborative and interactive manner is essential for the implementation of the recommended EM&A programme. The key parties in an EM&A programme include:

- Civil Engineering & Development Department (CECD) (Project Proponent);
- Environmental Protection Department (EPD) (Environmental Regulations Enforcer);
- The Engineer of the Engineer's Representative (ER) (e.g. Engineers from CED);
- The Contractor;
- The Environmental Team (ET); and
- The Independent Checker (Environment) (IC(E)).

### 3.2 Environmental Team

3.2.1 An Environmental Team (ET) shall be appointed to carry out the recommended EM&A works for the helipad project. The ET shall not be an associated company of the Contractor. The ET Leader\* shall plan, organise and manage the implementation of the EM&A programme, and ensure that the EM&A works are undertaken to the required standards. The ET Leader shall have relevant professional qualifications in Environmental Sciences or Environmental Engineering, and possess at least 7 years experience in EM&A and/or environmental management. An organisation chart that shows the relationships of different stakeholders under the EM&A framework is presented by Figure 3.1.

**Figure 3.1 Organisation Chart of Different Stakeholders under the EM&A Framework**



\* The Environmental Team (ET) leader refers to the person delegated the role of executing the environmental monitoring and audit requirements, and who shall be responsible for, and in charge of, the ET.

- 3.2.2 The ET Leader shall be responsible for the implementation of the EM&A programme in accordance with the EM&A requirements specified in this Manual. The ET Leader shall keep a contemporaneous logbook of each and every instance or circumstance or change of circumstances that may affect the EIA and each and every non-compliance with the Environmental Permit or the recommendations in the EIA report. This logbook shall be kept readily available for inspection by the IC(E), and Director of Environmental Protection (DEP) or his authorised officers. The ET shall not be an associated body of the IC(E) in the project.
- 3.2.3 Sufficient and suitably qualified professional and technical staff shall be employed by the respective parties to ensure full compliance with their duties and responsibility, as required under the EM&A programme for the duration of the project. The ET shall not be in any way an associated body of the Contractor. The ET shall be under the supervision of the ET Leader in fulfilling the EM&A duties specified in this Manual. The broad categories of works of the ET comprise the following:
1. Sampling, analysis and statistical evaluation of monitoring parameters with reference to the EIA study recommendations and requirements;
  2. Environmental site surveillance (*Section 9 refers*);
  3. Inspection and audit of compliance with environmental protection, and pollution prevention and control regulations;
  4. Inspection and audit of compliance with procedures established to enable an effective response to environmental incidents, exceedances or non-compliance;
  5. Assess the effectiveness of the environmental mitigation measures implemented;
  6. Monitor the implementation of environmental mitigation measures;
  7. Monitor compliance with the environmental protection clauses/specifications in the Contract;
  8. Review the construction schedule and provide comments as necessary;
  9. Review work methodologies which may affect the extent of environmental impact during the construction phase and comment as necessary;
  10. Complaint investigation, evaluation and identification of corrective measures;
  11. Liaison with the Project IC(E) on all environmental performance matters, and timely submission of all relevant EM&A proforma for IC(E)'s approval;
  12. Advice to the Contractor on environmental improvement, awareness, enhancement matters, etc., on site; and
  13. Timely submission of the EM&A report to the Project Proponent and the DEP.
- 3.2.4 In the event of any exceedance in Action/Limit levels, the ET shall inform the IC(E), ER and the Contractor within one working day of the occurrence of each and every occurrence, change of circumstances or non-compliances with the EIA Report or the Environmental Permit (EP) so that appropriate remedial action can be undertaken by the Contractor promptly.
- 3.2.5 The ET is also responsible for the preparation of the monthly EM&A reports for submission to IC(E), the Contractor and the ER, and through the ER, to EPD. The ET shall assist the Contractor and the ER in formulating any necessary corrective actions and/or additional mitigation measures, and liaising with relevant Government Departments where necessary.

### **3.3 Independent Checker (Environmental)**

- 3.3.1 The Independent Checker (Environment) (IC(E)) shall advise the ER on environmental issues related to the Project. The IC(E) shall not be in any way an associated body of the Contractor or the ET for the Project. IC(E) shall be empowered to audit from an independent viewpoint the environmental

performance during the construction of the helipad. The IC(E) shall be a person who has at least 7 years experience in EM&A or environmental management.

- 3.3.2 The IC(E) shall be responsible for the duties defined in the Environmental Permit (EP) and this EM&A Manual, and shall audit the overall EM&A programme, including the implementation of all environmental mitigation measures, submissions required in this EM&A Manual, and any other submissions required under the Environmental Permit. The IC(E) shall be responsible for verifying the environmental acceptability of permanent and temporary works, relevant design plans and submissions under the Environmental Permits. The IC(E) shall verify the logbook prepared and kept by the ET Leader. The IC(E) shall notify DEP by fax, within 24 hours of receipt of notification from the ET Leader of any such instance or circumstance or change of circumstances or non-compliance with the EIA Report or the EP, which might affect the monitoring or control of adverse environmental impact.
- 3.3.3 The main duty of the IC(E) is to carry out independent environmental audit of the project. This shall include, inter alias, the following:
1. Review and audit in an independent, objective and professional manner in all aspects of the EM&A programme;
  2. Validate and confirm the accuracy of monitoring results, appropriateness of monitoring equipment, monitoring locations with reference to the locations of the nearby sensitive receivers, and monitoring procedures;
  3. Carry out random sample check and audit on monitoring data and sampling procedures, etc;
  4. Conduct random site inspection;
  5. Audit the EIA recommendations and requirements against the status of implementation of environmental protection measures on site;
  6. Review the effectiveness of environmental mitigation measures and project environmental performance;
  7. On an as needed basis, verify and certify the environmental acceptability of the construction methodology (both temporary and permanent works), relevant design plans and submissions under the environmental permit. Where necessary, the IC(E) shall agree in consultation with the ET Leader and the Contractor the least impact alternative;
  8. Verify investigation results of complaint cases and the effectiveness of corrective measures;
  9. Verify EM&A report submitted and certified by the ET Leader; and
  10. Feedback audit results to ET/CED/ER by signing according to the Event/Action Plans specified in this EM&A Manual.

### **3.4 The Contractor**

- 3.4.1 Upon the commencement of the Project, the Contractor shall prepare and submit an EMP for the Engineer's approval, further to the IC(E)'s verification [*Section 2.4 refers*]. The EMP shall comprise of the appropriate extracts from (and references to) the Project EIA report and EM&A Manual, and include such elements as the relevant statutory environmental standards, general environmental control clauses and specific environmental management clauses as well as an outline of the scope and content of the EMP. Consideration shall be given to the predictive nature of the EIA process and the consequent need to manage and accommodate the actual impacts arising from the construction process. Any changes in the construction method, progress rates and other estimates made in the preliminary design stage to carry out the EIA and the implications of such changes shall be identified and controlled under the EMP.
- 3.4.2 The Contractor is responsible for providing requested information to the ET in the event of any

exceedance in the environmental criteria (Action/Limit levels) specified in this Manual or other current environmental standards and to rectify unacceptable practices. The Contractor shall discuss with the ET, IC(E) and ER on any additional mitigation measures identified to be required by the ET and implement the agreed measures to alleviate any identified environmental impact to acceptable levels. The design and implementation of the control and mitigation measures shall be the responsibility of the Contractor.

3.4.3 In the event that the ET needs to undertake complaint investigation work, the Contractor and the Engineer shall co-operate with the ET Leader in providing all the necessary information and assistance for completion of the investigation. If mitigation measures are required following the investigation, the Contractor shall promptly carry out these measures.

3.4.4 The Contractor shall report to the ET on the action(s) taken targeting at environmental protection for inclusion in the monthly report to be prepared by the ET.

### **3.5 Civil Engineering & Development Department**

3.5.1 Civil Engineering & Development Department (CEDD) is the project proponent in this project and shall hold ultimate responsibility for the project. CEDD shall liaise with EPD on environmental issues associated with the project.

### **3.6 Environmental Protection Department**

3.6.1 Environmental Protection Department (EPD) is the statutory enforcement body for environmental protection matters in Hong Kong. Apart from the provision of mandatory environmental standards, EPD also forms the consultation board for environmental issues arising from the project.

### **3.7 Engineer/Engineer's Representative**

3.7.1 The Engineer or Engineer's Representative (ER) shall be responsible for overseeing the operations of the Contractor and the ET. He shall advise, co-ordinate and give instruction when appropriate for efficient implementation of any specific environmental mitigation measures identified to be required by the contractor, and/or outstanding EM&A works required to be carried out by ET in consultation with the IC(E). The ER shall supervise the Contractor's activities and ensure that the requirements in the EIA Report and EM&A Manual are fully complied with. He shall inform the Contractor when action is required to reduce impacts in accordance with the Event/Action Plans. He shall review the EM&A Reports submitted by the ET and follow up the recommendations. He shall ensure that the Contractor is implementing the environmental controls and mitigation measures as set out in the EIA report and EM&A Manual, as well as additional measures necessary for compliance with the relevant environmental standards.

3.7.2 In the event that the ET needs to undertake complaint investigation work, the Engineer (and the Contractor) shall co-operate with the ET Leader in providing all the necessary information and assistance for completion of the investigation. If mitigation measures are required following the investigation, the ER shall ensure that the Contractor has carried them out.

3.7.3 CEDD will play the role of the ER should the detailed design and oversight of the construction of the helipad be carried out in-house by staff of CEDD.

## **4 AIR QUALITY**

### **4.1 Introduction**

- 4.1.1 Based on the air quality impact assessment, it has been identified that no significant impacts will arise from the construction and operation of the helipad through the proper implementation of dust control measures as required under the Air Pollution Control (Construction Dust) Regulation. While no specific control measures have been recommended, general air quality control measures are recommended for implementation as good site practices.
- 4.1.2 The ET shall check the Contractor's implementation of air quality control measures during the regular site environmental audit.

### **4.2 Environmental Audit**

- 4.2.1 As described in *Section 9* of the Manual, the ET Leader is responsible for formulating an environmental site inspection, deficiency and action reporting system, and for carrying out site inspections under the EM&A programme.
- 4.2.2 In order to check that the air quality control measures have been implemented by the Contractor as good site practices, the ET shall include the following items as part of their site inspections:
- Heights from which materials are dropped should be restricted as far as practicable to minimise the fugitive dust arising from unloading/loading.
  - All spraying of materials and surfaces should avoid excessive water usage;
  - Immediately before leaving a construction site, every vehicle shall be washed to remove any dusty materials from its body and wheels.
  - Erection of hoarding of not less than 2.4 m high from ground level along the site boundary;
  - Vehicles that have the potential to create dust while transporting materials should be covered, with the cover properly secured and extended over the edges of the side and tail boards;
  - Travelling speeds should be controlled to reduce traffic induced dust dispersion and re-suspension within the site from the operating haul trucks.
  - Where a vehicle leaving a construction site is carrying a load of dusty materials, the load shall be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle.
  - Any stockpile of dusty materials shall be either: (a) covered entirely by impervious sheeting; (b) placed in an area sheltered on the top and the 3 sides; or (c) sprayed with water or a dust suppression chemical so as to maintain the entire surface wet.
  - All dusty materials shall be sprayed with water or a dust suppression chemical immediately prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet.
- 4.2.3 All the dust control measures as recommended in the Air Pollution Control (Construction Dust) Regulation, where applicable, should also be implemented.

## 5 NOISE

### 5.1 Introduction

5.1.1 During the construction phase of the helipad, power mechanical equipment (PME) used for the helipad construction will be the primary noise sources. The key noise generating activities include:

- Site clearance for the erection of site office, hoarding and fencing;
- Temporary staging construction and demolition;
- Pile installation; and
- Deck and EVA construction.

5.1.2 Noise sensitive receivers (NSRs) have been identified in accordance with Annex 13 of the EIAO TM. As required under *Clause 3.4.2.2 (iii) (b)* of the EIA Study Brief, the selection of representative NSRs has been presented to and agreed by the Authority prior to commencement of this noise impact assessment.

### 5.2 Noise Monitoring Parameters

5.2.1 Monitoring of noise levels at the proposed sensitive receiver locations shall be undertaken by the ET during the baseline and construction phases of the project to ensure that any increase in noise levels as a result of the construction works are readily detected and rectified in a timely fashion.

5.2.2 The construction noise level will be measured in terms of the A-weighted equivalent continuous sound pressure level ( $L_{eq}$ ). Noise measurements will be carried out with an integrating sound level meter using the 'fast' response mode.  $L_{eq(30 \text{ min})}$  will be used as the monitoring parameter for the time period between 07:00-19:00 hours on normal weekdays. For all other time periods,  $L_{eq(5 \text{ min})}$  will be employed for comparison with the Noise Control Ordinance criteria.

5.2.3 As supplementary information for data auditing statistical results such as  $L_{10}$  and  $L_{90}$  will also be obtained for reference.

5.2.4 In addition to carrying out noise monitoring, control and mitigation measures are recommended for implementation by the Contractor. The ET shall check the implementation of these measures during the regular site environmental audits. As described in *Section 9* of this Manual, the ET Leader is responsible for formulating an environmental site inspection, deficiency and action reporting system, and for carrying out site inspections under the EM&A programme.

### 5.3 Monitoring Equipment

5.3.1 As referred to in the Technical Memorandum (TM) issued under the Noise Control Ordinance (NCO), sound level meters in compliance with the International Electrical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications will be used for carrying out the noise monitoring.

5.3.2 Immediately prior to and following each noise measurement the accuracy of the sound level meter will be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements may be accepted as valid only if the calibration level from before and after the noise measurement agrees to within 1.0dB. Calibration equipment to be used should meet IEC 942, Type 1



specifications, and succeeding standard specifications for sound level meters applicable in Hong Kong. Annual calibration of the noise monitoring equipment by an accredited laboratory will be carried out for compliance with IEC publications 651 and 804 and any other relevant standards.

- 5.3.3 Noise measurements shall not be made if the wind speed exceeds  $5\text{ms}^{-1}$  or if gusts exceed  $10\text{ms}^{-1}$ . The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in  $\text{ms}^{-1}$ . Measurements shall not be made while air temperatures are outside the manufacturer's specified range or when other intrusive noise sources (other than influencing factors) are apparent at the assessment point.
- 5.3.4 Sufficient noise measuring equipment and associated instrumentation should be available for carrying out the baseline monitoring, regular impact monitoring and ad hoc monitoring. All the equipment and associated instrumentation will be clearly labelled, stored and maintained according to the manufacturer's instructions.

## 5.4 Monitoring Procedure

- 5.4.1 Monitoring will be carried out with reference to the following documents:
- *Technical Memorandum on the Assessment of Noise from Construction Work other than Percussive Piling, Hong Kong Government;*
  - *Technical Memorandum on the Assessment of Noise from Construction Works in Designated Areas, Hong Kong Government*
  - *Technical Memorandum for the Assessment of Noise from places other than Domestic Premises, Public Places or Construction Sites, Hong Kong Government;*
  - or succeeding standards and guidelines.
- 5.4.2 The monitoring stations will normally be at a point 1 m from the exterior of the sensitive receivers building facade and be at a position 1.2 m above the ground. When a measurement is to be made of noise being received at a place other than a building, the assessment point will be at least 1.2 m above ground level, at an appropriate point. The appropriate measurement positions should be at least 3.5 m from any reflecting surface other than the ground and have an unobstructed view of the Site. In such instances where free-field measurements are conducted, a positive correction of 3dB(A) will be applied to the relevant target limits.
- 5.4.3 The microphone of the sound level meter will be so orientated that it is pointing in the direction of the Site and at the source of noise being monitored such that the microphone is perpendicular to the plane of the incident sound-waves. It will be protected using an appropriate windshield. To avoid reflections from the operator's body, the microphone will be mounted on a tripod, whether attached to the sound level meter or not. Noise measurements will be rounded to the nearest whole dB, with values of 0.5 dB or more being rounded upwards.
- 5.4.4 Noise will not be monitored in the presence of mist, fog or rain, when wind is at a steady speed exceeding 5 m/s, or when gusts exceed 10m/s.
- 5.4.5 For monitoring locations located in the vicinity of the sensitive receivers, care shall be taken to cause minimal disturbance to the occupants during monitoring.
- 5.4.6 Noise measurements shall be recorded on a field data sheet together with relevant information including project name, date and time of sampling, monitoring location and parameters, site observations and remarks. A sample field data sheet is attached in *Appendix 10.1*.



## 5.5 Proposed Monitoring Locations

- 5.5.1 The noise impact assessment presented in the EIA report indicated that the unmitigated construction noise levels at all NSRs are found to comply with the daytime noise standards stated in Table 1B, Annex 5 of EIAO TM. Noise mitigation measures have been recommended in the EIA report and shall be implemented by the Contractor in accordance with the requirements under the Noise Control Ordinance. The Contractor shall be responsible for the design and implementation of the noise mitigation measures.
- 5.5.2 *Figure 5.1* illustrates the locations of the proposed noise monitoring locations NSR3 and NSR4, as referred in the EIA Report. NSR3 corresponds to the North Lamma Clinic, while NSR4 is a residential village house located about 220 metres southeast of the helipad site,. The status and locations of noise sensitive receivers may change after issuing this Manual. If such case exists, the ET Leader shall propose updated monitoring locations and seek approval from ER and agreement from the IC(E) and EPD of the proposal.
- 5.5.3 When alternative monitoring locations are proposed, the monitoring locations shall be chosen based on the following criteria:
- At locations close to the major site activities which are likely to have noise impacts;
  - Close to the noise sensitive receivers (as defined by the EIAO TM); and
  - For monitoring locations located in the vicinity of the sensitive receivers, care shall be taken to cause minimal disturbance to occupants during monitoring.

## 5.6 Baseline Monitoring

- 5.6.1 Daily noise monitoring shall be carried out at all designated monitoring locations for a period of at least two weeks prior to the commencement of the Work to establish the baseline noise conditions. The frequency of monitoring for each station will include at least:
- One set of measurements between 07:00-19:00 hours on normal weekdays;
  - One set of measurements between 19:00-23:00 hours on normal weekdays;
  - One set of measurements between 23:00-07:00 hours of next day; and
  - One set of measurements between 07:00-19:00 hours on holidays.

## 5.7 Impact Monitoring

- 5.7.1 The ET shall conduct noise monitoring at all designated monitoring stations. Noise monitoring shall be conducted on a weekly basis when noise-generating activities are underway. One set of measurements shall be taken between 07:00-19:00 hours on normal working days.
- 5.7.2 General construction works carried out during restricted hours are controlled by the Construction Noise Permit System, under the NCO. The Contractor shall apply for a Construction Noise Permit (CNP) and abide by the requirements of the permit should works be necessary in the restricted hours.
- 5.7.3 In case of non-compliance with the construction noise criteria, more frequent monitoring as specified in the Event/Action Plans [*Appendix 5.1 refers*] shall be carried out. This additional monitoring shall be continued until the recorded noise levels are rectified or proved to be irrelevant to the construction activities.

## 5.8 Event and Action Plan

- 5.8.1 The Action Limit levels for construction noise are defined in *Table 5.1*. Should non-compliance of the noise criteria occur, actions in accordance with the Event/Action Plan [*Appendix 5.1 refers*] shall be carried out.

**Table 5.1 Action Limit Levels for Construction Noise**

Time Period	Action	Limit
07:00 – 19:00 hours on normal weekdays	When one documented complaint is received	75 dB(A)

## 5.9 Noise Mitigation Measures

- 5.9.1 While no adverse noise impacts have been identified through the noise impact assessment, the EIA report has nevertheless recommended construction noise control and mitigation measures to be implemented by the Contractor as good site practice.
- 5.9.2 As described in *Section 9* of the Manual, the ET Leader is responsible for formulating an environmental site inspection, deficiency and action reporting system, and for carrying out site inspections under the EM&A programme.
- 5.9.3 In order to check that the noise control measures have been implemented by the Contractor as good site practices, the ET shall include the following items as part of their site inspections:
- Noisy equipment and noisy activities should be located as far away from the NSRs as is practical;
  - Use of silence equipment and installation of temporary and movable noise barriers. Movable barriers shall be positioned as close as possible to powered mechanical equipment so that they are not visible to sensitive receivers;
  - Unused equipment should be turned off;
  - Powered mechanical equipment should be kept to a minimum and the parallel use of noisy equipment / machinery should be avoided; and
  - Regular maintenance of all plant and equipment.
- 5.9.4 The Contractor shall observe and comply with the relevant statutory requirements and guidelines.
- 5.9.5 Operational noise monitoring is impracticable as there are no scheduled helicopter flights, and so operational phase noise monitoring is not recommended.
- 5.9.6 Should the need arise, the local community may lodge noise complaints with the Islands District Office by the following means:
- Fax: 2815 2291
  - Email: dois@had.gov.hk
  - Address: Islands District Office, Harbour Building, 20<sup>th</sup> Floor, 38 Pier road, Central.

## 6 WASTE MANAGEMENT

### 6.1 Introduction

- 6.1.1 Based on the initial waste generation assessment, it has been identified that minimal volumes of C&D materials (including inert and non-inert materials), chemical waste and general refuse will be generated from the construction activities.
- 6.1.2 Through proper on-site handling and storage (covered containers), reuse (of inert C&D materials) and off-site disposal (via approved waste collectors to approved waste facilities and/or disposal grounds) the generation, handling and disposal of these wastes will not give rise to any adverse environmental impacts. However, given the potential for environmental impacts to arise from improper waste management (e.g. visual impact, nuisance, etc.), it is recommended that control and mitigation measures be implemented as part of general good site practices.

### 6.2 Environmental Audit

- 6.2.1 As described in *Section 9* of the Manual, the ET Leader is responsible for formulating an environmental site inspection, deficiency and action reporting system, and for carrying out site inspections under the EM&A programme.
- 6.2.2 In order to check that the waste control and mitigation measures have been implemented by the Contractor as good site practices, the ET shall include the following items as part of their site inspections and audit:
- Spoil generated from the piling activities needs to be properly handled to minimise contamination to the marine water and any exposed ground areas due to leakage or improper storage (i.e. onto bare ground instead of into tanks). Any dredged sediments generated from the site works shall be handled in accordance with ETWB TCW No. 34/2002;
  - The reuse/recycling of all materials on site shall be investigated prior to treatment/disposal off site;
  - Good site practices shall be adopted from the commencement of works to avoid the generation of waste, reduce cross contamination of waste and to promote waste minimisation practices;
  - All waste materials shall be sorted on site into inert and non-inert C&D materials, and where the materials will be recycled or reused these shall be further segregated. The Contractor shall be responsible for identifying which materials can be recycled/reused, whether on site or off site. In the event of the latter, the Contractor shall make arrangements for the collection of the recyclable materials. Any remaining non-inert waste shall be collected and disposed of to the refuse transfer station whilst any inert C&D material shall be re-used on site as far as possible. Alternatively, if no use of the inert material can be found on site, the material should be delivered to a public filling area or a public fill bank after obtaining the appropriate licence;
  - With reference to ETWBTC (W) No.31/2004, Trip-ticket System for Disposal of Construction and Demolition Material, a trip ticket system should be established at the outset of the construction of the helipad to monitor the disposal of C&D and solid wastes from the site to public filling facilities and landfills;
  - Under the Waste Disposal (Chemical Waste) (General) Regulation, the Contractor shall register with EPD as a Chemical Waste Producer if there is any use of chemicals on site including lubricants, paints, diesel fuel, etc. Only licensed chemical waste collectors shall be employed to collect any chemical waste generated at site. The handling, storage, transportation and

disposal of chemical wastes shall be conducted in accordance with the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes* and *A Guide to the Chemical Waste Control Scheme* both published by EPD;

- vii) Stockpiling is not envisaged, however if it becomes unavoidable, stockpiling in any vegetated areas shall be avoided (as far as possible) and shall be covered with tarpaulin and/or watered to prevent windblown dust and/or surface runoff;
- viii) A sufficient number of covered bins shall be provided on site for the containment of general refuse to prevent visual impacts and nuisance to sensitive receivers. These bins shall be cleared daily and the collected waste disposed of to the refuse transfer station. Further to the issue of ETWBTC (Works) No. 6/2002A, Enhanced Specification for Site Cleanliness and Tidiness, the Contractor is required to maintain a clean and hygienic site throughout the project works;
- ix) All chemical toilets shall be regularly cleaned and the nightsoil collected and transported by a licensed contractor to a Government Sewage Treatment Works facility for disposal;
- x) Tool-box talks should be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycling; and
- xi) A recording system for the amount of wastes generated, recycled and disposed of (including the disposal sites) shall be proposed by the contractor, and the ET Leader shall include a summary of such information in each monthly EM&A Report.

6.2.3 The Contractor shall also observe and comply with the relevant statutory requirements and guidelines and their updated versions.

## **7 WATER QUALITY**

### **7.1 Introduction**

- 7.1.1 Given the scale and nature of the Project, and given that there will be no dredging or reclamation works involved, the initial water quality assessment conducted under the EIA study indicates that minimal disturbances will be generated and thus no unacceptable water quality impacts are foreseen.
- 7.1.2 Although no significant adverse water quality impacts are predicted and no specific mitigation is necessary, general control and mitigation measures are recommended for implementation by the works Contractor as good site practices.

### **7.2 Environmental Audit**

- 7.2.1 As described in *Section 9* of the Manual, the ET Leader is responsible for formulating an environmental site inspection, deficiency and action reporting system, and for carrying out site inspections under the EM&A programme.
- 7.2.2 The ET shall include the measures outlined below as part of their site inspections to check that the Contractor has implemented the waste control and mitigation measures as good site practices.
- 7.2.3 As a precautionary good site practice measure, it is recommended that a silt curtain be installed around the working area.
- 7.2.4 The following good site practices are also recommended to further minimise the potential water quality impacts in order to comply with ProPECC PN 1/94:
- The holding tank should be fitted with a tight fitting seal to prevent sediment leakage; and
  - The holding tank should not be filled to a level which will cause overflow of sediment during loading and transportation.
- 7.2.5 The Contractor shall also observe and comply with the relevant statutory requirements and guidelines.

## **8 ECOLOGY**

### **8.1 Introduction**

- 8.1.1 Based on the initial ecological impact assessment of the EIA report, it was identified that the project will not result in any significant sub-tidal habitat loss and there is not anticipated to be any impact on the hard coral community from pile installation so long as good working practices are followed.
- 8.1.2 While no specific mitigation measures are considered necessary, the control and mitigation measures recommended for water quality are relevant to the mitigation against ecological impacts and as such should be implemented by the Contractor as part of their day-to-day good site practice. The ET should check the implementation of these measures during the regular site environmental audit.

### **8.2 Environmental Audit**

- 8.2.1 As described in *Section 9* of the Manual, the ET Leader is responsible for formulating an environmental site inspection, deficiency and action reporting system, and for carrying out site inspections under the EM&A programme.
- 8.2.2 The ET shall include the measures outlined in *Section 7.2.4* and *Section 8.2.4* as part of their site inspections to check that the Contractor has implemented the waste control and mitigation measures as good site practices. These measures shall apply to the control of both water quality and sub-tidal and inter-tidal life around the helipad site.
- 8.2.3 As a precautionary good site practice measure, it is recommended that a silt curtain be installed around the working area.
- 8.2.4 In addition to the good site practices recommended to further minimise the potential water quality impacts [refer to *Section 7.2.4*] the following measures are also recommended to be implemented to reduce impacts on the sub-tidal ecology:
- Particular care should be taken when demolishing the existing concrete planter to ensure no waste enters the water column;
  - Particular care should be taken when decommissioning the silt curtain to avoid sudden dispersion of muddy water which may cause adverse impact to the nearby marine life; and
  - Materials storage areas should be located well away from the seawall, and any such areas should be covered during the works.
- 8.2.5 The measures outlined in the relevant statutory requirements and guidelines should also be observed and complied with.

## 9 SITE ENVIRONMENTAL AUDIT

### 9.1 Site Surveillance

- 9.1.1 Site surveillance provides a direct means to trigger and enforce the specified environmental protection and pollution control measures are in compliance with the contract specifications. They shall be undertaken regularly and routinely by ET to inspect the activities at the works site in order to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented by the Contractor in accordance with the EM&A recommendations. With well-defined pollution control and mitigation specifications and a well-established site inspection, deficiency and action reporting system, the site inspection is one of the most effective tools to enforce the environmental protection requirements on the site.
- 9.1.2 The ET Leader is responsible for formulation of the environmental site inspection, deficiency and action reporting system, and for carrying out the site inspections under the EM&A works. He shall prepare and submit a proposal on the site inspection, deficiency and action reporting procedures within 21 days of the construction contract commencement to the Contractor for agreement and to the ER and IC(E) for approval. A preliminary site inspection, deficiency and action reporting system in the form of a flowchart has been prepared for reference, and is presented in *Figure 9.1* for review and refinement by the ET at the commencement of the Project.
- 9.1.3 The ET shall conduct a site inspection at least once per week during helipad construction. The areas of inspection shall include, but are not be limited to, the environmental situation, and pollution control and mitigation measures within the site. It should also review the environmental situation outside the site area that is likely to be affected, directly or indirectly, by the site activities. The ET Leader shall make reference to the following information in conducting the inspection:
1. The EIA recommendations on environmental protection and pollution control mitigation measures with regard to air quality, noise, waste management, water quality, and ecological impacts;
  2. On-going results of the EM&A programme;
  3. Works progress and programme;
  4. Individual works methodology proposals (which shall include proposals on associated pollution control measures);
  5. The contract specifications on environmental protection and pollution prevention;
  6. The relevant environmental protection and pollution control laws, ProPECC Notes; and
  7. Previous site inspection results.
- 9.1.4 The Contractor shall update with the ET on all relevant information of the contract for him to carry out the site inspections. The inspection results and its associated recommendations on improvements to the environmental protection and pollution control works shall be submitted to the IC(E) and the Contractor in a site inspection proforma within 24 hours, for reference and for taking immediate action. The Contractor shall follow the procedures and time-frame as stipulated in the environmental site inspection, deficiency and action reporting system formulated by the ET to report on any remedial measures subsequent to the site inspections.
- 9.1.5 The ET shall conduct *ad hoc* site inspections if significant environmental problems are identified. The IC(E) shall also conduct independent site audits. Inspections may also be required subsequent to receipt of any environmental complaints, or as part of the investigation work, as specified in the Event/Action Plan for environmental monitoring and audit.

## 9.2 Compliance with Legal and Contractual Requirements

- 9.2.1 There are contractual environmental protection and pollution control requirements as well as environmental protection and pollution control laws in Hong Kong, with which the activities associated with the construction of the helipad shall comply.
- 9.2.2 The ET shall review the progress and programme of the works to check that relevant environmental laws have not been violated, and that any foreseeable potential for violating the laws can be prevented.
- 9.2.3 The Contractor shall regularly copy relevant documents to the ET so that the checking work can be carried out. The documents shall at least include the updated Work Progress Reports, the updated Works Programme, application letters for different license/permits under the environmental protection laws, and all valid licence(s)/permit(s). The site diary shall also be available for the ET's inspection upon his request.
- 9.2.4 After reviewing the document, the ET shall advise the ER and the Contractor of any non-compliance with the contractual and legislative requirements on environmental protection and pollution control for them to take follow-up actions. If the ET's review concludes that the current status on licence/permit application and any environmental protection and pollution control preparation works may not cope with the works programme or may result in potential violation of environmental protection and pollution control requirements by the works in due course, he shall also advise the Contractor and the ER accordingly. The review shall be copied to IC(E) for any follow-up action.
- 9.2.5 Upon receipt of the advice, the Contractor shall undertake immediate action to remedy the situation. The ER shall check that the Contractor has taken appropriate action in order that the environmental protection and pollution control requirements are fulfilled.

## 9.3 Environmental Complaints

- 9.3.1 Complaints reviewed on environmental issues shall be referred to the ET Leader for carrying out complaint investigation procedures. Upon receipt of complaints the ET shall undertake the tasks outlined in points 1-9 below. The complaint investigation procedures are also presented in form of a flow chart in *Figure 9.2* for easy reference.
1. Log complaint and date of receipt onto the complaint database and inform the IC(E) immediately;
  2. Investigate the complaint to determine its validity, and to assess whether the source of the problem is due to works activities;
  3. If a complaint is valid and due to works, identify mitigation measures in consultations with the IC(E);
  4. If mitigation measures are required, advise the Contractor accordingly;
  5. Review the Contractor's implementation of the identified mitigation measures, and the concurrent situation;
  6. If the complaint is transferred from EPD, submit interim report to EPD on status of the complaint investigation and follow-up action within the time frame assigned by EPD;
  7. Undertake additional monitoring and audit to verify the complaint if necessary, and ensure that any valid reason for complaint does not recur through proposed amendments to work methods, procedures, machines and/or equipment, etc;
  8. Report the investigation results and the subsequent actions to the source of complaint. (If the source of complaint is identified through EPD, the results should be reported within the time frame assigned by EPD); and



9. Log a record on the complaint, investigation, the subsequent actions and the results in the monthly EM&A reports.

9.3.2 The ER shall immediately notify the Contractor, ER, Project Proponent and EPD (Local Control Office) of any complaints received and keep him well informed of the actions being taken to settle these complaints.

9.3.3 During the complaint investigation work, the Contractor and ER shall co-operate with the ET Leader in providing all the necessary information and assistance for completion of the investigation. If mitigation measures are identified to be required in the investigation in consultation with the IC(E), the Contractor shall promptly carry out the measures. The ER shall ensure that the Contractor has implemented the mitigation measures.

#### **9.4 Documentation**

9.4.1 All documentation is required to be filed in a traceable and systematically manner and ready for inspection upon request. All EM&A results and findings shall be documented in the EM&A report prepared by the ET and endorsed by IC(E) prior to circulation to the Contractor, ER and EPD.

## **10 REPORTING**

### **10.1 General**

- 10.1.1 The following reporting requirements are based upon a paper-documented approach. However, the same information shall be provided in an electronic medium upon agreeing the format with the ER and EPD. All the monitoring data (baseline and impact) shall also be submitted in an agreed electronic format in accordance with the requirements under Annex 21 of the EIAO TM. This would enable a transition from a paper/historic and reactive approach to an electronic/real time proactive approach.

### **10.2 Baseline Monitoring Report**

- 10.2.1 The ET Leader shall prepare and submit a Baseline Environmental Monitoring Report within 10 working days of completion of the baseline monitoring. Copies of the Baseline Environmental Monitoring Report shall be submitted to each of the four parties: the Contractor, the IC(E), the ER and EPD. The ET Leader shall liaise with the relevant parties on the exact number of copies needed. The format and content of the report and the presentation of the baseline monitoring data to be submitted to EPD shall be agreed with EPD prior to submission.
- 10.2.2 The baseline monitoring report shall include at least the following:
1. Up to half a page executive summary;
  2. Brief project background information;
  3. Drawings showing locations of the baseline monitoring stations;
  4. An updated programme on construction/ of the helipad with milestones of environmental protection/mitigation activities annotated;
  5. Monitoring results (in both hard and diskette copies) together with the following information:
    - Monitoring methodology;
    - Types of equipment used and calibration details;
    - Parameters monitored;
    - Monitoring locations;
    - Monitoring date, time, frequency and duration; and
    - QA/QC results and detection limits.
  6. Details on influencing factors, including:
    - Major activities, if any, being carried out on the site during the period;
    - Weather conditions during the period; and
    - Other factors which might affect the results.
  7. Determination of the Action Limit levels for each monitoring parameter and statistical analysis of the baseline data, the analysis shall conclude if there is any significant difference between control and impact actions for the parameters monitored;
  8. Revisions for inclusion in the EM&A Manual; and
  9. Comments and conclusions.

- 10.2.3 It is necessary to characterise the deployment site in respect of the local hydrodynamic regime, water depth and bottom sediment types prior to the deployment of the silt curtain. Findings from the site investigation for determining the deployment configuration and anchor points of the silt curtain shall also be included in the Baseline Monitoring Report

### **10.3 Monthly EM&A Reports**

- 10.3.1 The results and findings of all EM&A work required in the Manual shall be presented in a monthly EM&A report that shall be prepared by the ET Leader. The EM&A report shall be endorsed by IC(E), and then submitted to EPD within 10 working days of the end of each reporting month. The first report is due in the month after the establishment phase commences. A maximum of 4 copies of each monthly EM&A report shall be submitted to each of the four parties: the Contractor, the IC(E), the ER and EPD. Before submission of the first EM&A report, the ET Leader shall liaise with the parties on the exact number of copies and format of the monthly reports in both hard copy and electronic medium required.
- 10.3.2 The ET Leader shall review the number and location of monitoring stations and parameters to be monitored every 6 months or on a needed basis in order to cater for the changes in surrounding environment and nature works in progress.
- 10.3.3 The condition of the silt curtain shall be checked and reported in all monthly EM&A reports to ensure its proper functioning in respect of retaining silt dispersion during the marine works.

### **10.4 First Monthly EM&A Report**

- 10.4.1 The first monthly EM&A report shall include at least the following:
1. Executive Summary (1-2 pages);
    - Breaches of Action Limit levels;
    - Complaint Log;
    - Notifications of any summons and successful prosecutions;
    - Reporting Changes; and
    - Future key issues.
  2. Basic Project Information
    - Project organisation including key personnel contact names and telephone numbers;
    - Programme with fine tuning of activities showing the inter-relationship with environmental protection/mitigation measures for the month;
    - Management structure; and
    - Work undertaken during the month.
  3. Environmental Status
    - Works undertaken during the month with illustrations (such as location of works, daily dredging/filling rates, etc.); and
    - Drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations.

4. Summary of EM&A requirements including:
  - All monitoring parameters;
  - Environmental quality performance limits (Action Limit levels);
  - Event/Action Plans;
  - Environmental mitigation measures, as recommended in the project EIA study final report;
  - Environmental requirements in contract documents;
5. Implementation Status
  - Advice on the implementation status of environmental protection and pollution control/mitigation measures as recommended in the project EIA study report, summarised in the updated implementation schedule.
6. Monitoring Results (in both hard and electronic copies) together with the following information;
  - Monitoring methodology;
  - Types of equipment used and calibration details;
  - Parameters monitored;
  - Monitoring locations;
  - Monitoring date, time, frequency, and duration;
  - Weather conditions during the period;
  - Graphical plots of the monitored parameters in the month annotated against;
    - Major activities being carried out on site during the period;
    - Weather conditions that may affect the results; and
    - Any other factors which might affect the monitoring results;
  - QA/QC results and detection limits;
  - Waste generation and disposal records;
  - All monitoring results should be tabulated with exceedances highlighted for ease of reference; and
  - Compare/contrast and assess the EM&A data with the EIA predictions and provide discussion for any discrepancies.
7. Report on Non-compliance, Complaints, Notifications of Summons and Successful Prosecutions
  - Compliance status with the EP under the EIAO and any EP submissions;
  - Record of all non-compliance (exceedances) of the environmental quality performance limits (Action Limit levels);
  - Record of all complaints received (written or verbal) for each media, including locations and nature of complaints investigation, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary;
  - Record of all notifications of summons and successful prosecutions for breaches of the current environmental protection/pollution control legislation, including locations and nature of the breaches, investigation, follow-up actions taken, result and summary;
  - Review of the reasons for and the implications of non-compliance, complaints, summons and prosecutions including review of pollution sources and working procedures; and
  - Description of the actions taken in the event of non-compliance and deficiency reporting and any follow-up procedures related to earlier non-compliance.

## 8. Comments, Recommendations and Conclusions

- An account of the future key issues reviewed from the works programme and work method statements;
- Advice on the solid and liquid waste management status; and
- Submission of implementation status proforma, proactive environmental protection proforma, regulatory compliance proforma, site inspection proforma, data recovery schedule and complaint log summarising the EM&A of the period.

## 10.5 Subsequent Monthly EM&A Reports

### 10.5.1 The subsequent monthly EM&A reports shall including the following:

1. Executive Summary (1-2 pages)
  - Breaches of Action Limit levels;
  - Complaint log;
  - Notifications of any summons and successful prosecutions;
  - Reporting changes;
  - Future key issues.
2. Environmental Status
  - Programme with fine tuning of activities showing the inter-relationship with environmental protection/mitigation measures for the month;
  - Work undertaken during the month with illustrations included (such as location of works, daily, dredging/filling rates, etc); and
  - Drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations.
3. Monitoring Results to provide monitoring results (in both hard and electronic copies) together with the following information.
  - Monitoring methodology;
  - Types of equipment used and calibration details;
  - Parameters monitored;
  - Monitoring locations;
  - Monitoring date, time, frequency, and duration;
  - Weather conditions during the period;
  - Graphical plots of the monitored parameters in the month annotated against;
    - Major activities being carried out on site during the period;
    - Weather conditions that may affect the results; and
    - Any other factors which might affect the monitoring results;
  - QA/QC results and detection limits;
  - Waste generation and disposal records;
  - All monitoring results should be tabulated with exceedances highlighted for ease of reference; and

- Compare/contrast and assess the EM&A data with the EIA predictions and provide discussion for any discrepancies.
4. Implementation Status
    - Advice on the implementation status of environmental protection and pollution control/mitigation measures as recommended in the project EIA study report, summarised in the updated implementation schedule.
  5. Report on Non-compliance, Complaints, Notifications of Summons and Successful Prosecutions
    - Compliance status with the EP under the EIAO and any EP submissions;
    - Record of all non-compliance (exceedances) of the environmental quality performance limits (Action Limit levels);
    - Record of all complaints received (written or verbal) for each media, including locations and nature of complaints investigation, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary;
    - Record of all notifications of summons and successful prosecutions for breaches of the current environmental protection/pollution control legislation, including locations and nature of the breaches, investigation, follow-up actions taken, result and summary;
    - Review of the reasons for and the implications of non-compliance, complaints, summons and prosecutions including review of pollution sources and working procedures; and
    - A description of the actions taken in the event of non-compliance and deficiency reporting and any follow-up procedures related to earlier non-compliance.
  6. Comments, Recommendations and Conclusions
    - An account of the future key issues reviewed from the works programme and work method statements;
    - Advice on the solid and liquid waste management status; and
    - Submission of implementation status proforma, proactive environmental protection proforma, regulatory compliance proforma, site inspection proforma, data recovery schedule and complaint log summarising the EM&A of the period.
  7. Appendix
    - Action Limit Levels;
    - Graphical plots of trends of monitored parameters at key stations over the past four reporting periods for representative monitoring stations annotated against the following:
      - Major activities being carried out on Site during the periods;
      - Weather conditions during the period; and
      - Any other factors which might affect the monitoring results
    - Monitoring schedule for the present and next reporting period;
    - Cumulative statistics on complaints, notifications of summons and successful prosecutions; and
    - Outstanding issues and deficiencies.

## 10.6 Quarterly EM&A Summary Reports

- 10.6.1 The quarterly EM&A summary report, which should generally be around 5 pages (including about 3 of text and tables and 2 of figures), should contain at least the following listed information. Apart from these, the first quarterly summary report should also confirm that the monitoring work is proving effective and that it is generating data with the necessary statistical power to categorically identify or confirm the absence of impact attributable to the works.
1. Up to half a page executive summary;
  2. Basic project information including a synopsis of the project organisation, programme, contacts of key management, and a synopsis of work undertaken during the quarter;
  3. A brief summary of EM&A requirements including:
    - Monitoring parameters;
    - Environmental quality performance limits (Action Limit levels); and
    - Environmental mitigation measures, as recommended in the project EIA study final report;
  4. Advice on the implementation status of environmental protection and pollution control/mitigation measures, as recommended in the project EIA study report, summarised in the updated implementation schedule, including waste generation and disposal records;
  5. Drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations;
  6. Compliance status with the EP under the EIAO and any EP submissions;
  7. Graphical plots of the trends of monitored parameters over the past 4 months (the last month of the previous quarter and the present quarter) for representative monitoring stations annotated against;
    - The major activities being carried out on site during the period;
    - Weather conditions during the period; and
    - Any other factors which might affect the monitoring results.
  8. Compare/contrast and assess the EM&A data with the EIA predictions and provide discussion for any discrepancies;
  9. Comments, Recommendations and Conclusions
    - Advice on the solid and liquid waste management status;
    - A summary of non-compliance (exceedances) of the environmental quality performance limits (Action Limit levels);
    - A brief review of the reasons for and the implications of non-compliance including review of pollution sources and working procedures;
    - A summary description of the action taken in the event of non-compliance and any follow-up procedures related to earlier non-compliance;
    - A summary record of all complaints received (written or verbal) for each media, liaison and consultation undertaken, actions and follow-up procedures taken;
    - A summary record of all notifications of summons and successful prosecutions for breaches of the current environmental protection/pollution control legislation, locations and nature of the breaches, investigation, follow-up actions taken and results; and
    - Comments (e.g. effectiveness and efficiency of the mitigation measures), recommendations (e.g. any improvement in the EM&A programme) and conclusions for the quarter.

- 10.6.2 Apart from the above, the first quarterly summary report should also confirm that the monitoring works are proven to be effective, and the monitoring works are generating data with the necessary statistical power to categorically identify or confirm the absence of impact attributable to the works.

## 10.7 Final EM&A Summary Report

- 10.7.1 Timing for completion of the EM&A Programme shall be confirmed by ER in liaison with the IC(E). Impact monitoring shall continue until the completion of all construction works as approved by the ER.

- 10.7.2 The final EM&A summary report shall include the following:

1. An executive summary;
2. Basic project information including a synopsis of the project organisation, programme, contacts of key management, and a synopsis of work undertaken during the entire construction phase, including baseline phase activities, of the works;
3. A brief summary of EM&A requirements including:
  - Monitoring parameters;
  - Environmental quality performance limits (Action Limit levels); and
  - Environmental mitigation measures, as recommended in the project EIA study final report.
4. Advice on the implementation status of environmental protection and pollution control/mitigation measures, as recommended in the project EIA study report, summarised in the updated implementation status proformas, including waste generation and disposal records;;
5. Drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations;
6. Compliance status with the EP under the EIAO and any EP submissions;
7. Graphical plots of the trends of monitored parameters over the period of construction (of the helipad) for representative monitoring stations annotated against;
  - The major activities being carried out on site during the period;
  - Weather conditions during the period;
  - Any other factors which might affect the monitoring results; and
  - The return of ambient environmental conditions in comparison with baseline data.
8. Compare/contrast and assess the EM&A data with the EIA predictions and provide discussion for any discrepancies;
9. Provide clear-cut decisions on the environmental acceptability of the project with reference to the specific impact hypothesis;
10. Advice on the solid and liquid waste management status;
11. Comments, Recommendations and Conclusions
  - A summary of non-compliance (exceedances) of the environmental quality performance limits (Action Limit levels);
  - A brief review of the reasons for and the implications of non-compliance including review of pollution sources and working procedures;
  - A summary description of the actions taken in the event of non-compliance and any follow-up procedures related to earlier non-compliance;
  - A summary record of all complaints received (written or verbal) for each media, liaison and consultation undertaken, actions and follow-up procedures taken;



- Review the monitoring methodology adopted and with the benefit of hindsight, comment on its effectiveness (including cost effectiveness);
- A summary record of all notification of summons and successful prosecutions for breaches of the current environmental protection/pollution control legislation, locations and nature of the breaches, investigation, follow-up actions taken and results;
- Review the practicality and effectiveness of the EIA process and EM&A programme (e.g. effectiveness and efficiency of the mitigation measures);
- Recommend any improvement in the EM&A programme; and
- A conclusion to state the return of ambient and/or the predicted scenario as per EIA findings.

10.7.3 Upon its decommissioning, the condition of the silt curtain and its overall effectiveness in retaining silt dispersion during the marine works shall also be reported in the Final EM&A summary report.

## **10.8 Forms to be Adopted**

10.8.1 To facilitate the management of the EM&A programme for the construction of the helipad, the record forms presented in *Appendix 10.1* (including those presented in the preceding sections) should be adopted where applicable during the construction phase of the Project. These forms are listed as follows:

1. Implementation Schedule [*Section 9 of the EIA Report for Helipad at Yung Shue Wan, Lamma Island refers*];
2. Implementation Status Performa;
3. Data Recovery Schedule;
4. Site Inspection Corrective Action Proforma;
5. Proactive Environmental Protection Proforma;
6. Regulatory Compliance Proforma;
7. Complaint Log;
8. Sample Template for Interim Notifications of Environmental Quality Limits Exceedances; and
9. Noise Monitoring Field Record Sheet.

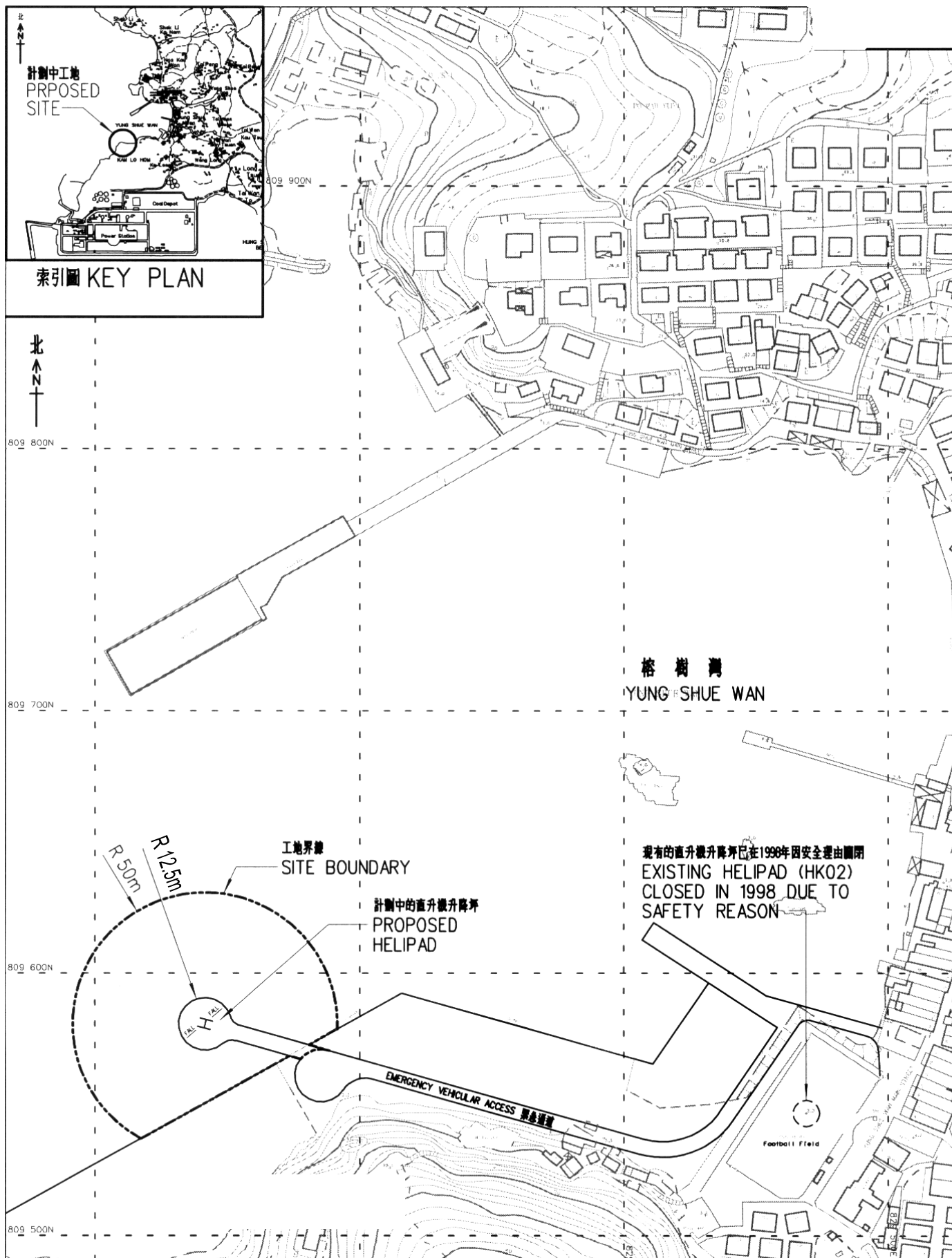
## **10.9 Data Keeping**

10.9.1 The site document such as the monitoring field records, laboratory analysis records, site inspection forms, etc. are not required to be included in the monthly EM&A reports, for submission. However, the document shall be well kept by the ET and be ready for inspection upon request. All relevant information shall be clearly and systematically recorded in the document. The monitoring data shall also be recorded in magnetic media form, and the software copy can be available upon request. All the documents and data shall be kept for at least one year after completion in construction of the helipad.

## **10.10 Interim Notifications of Environmental Quality Limit Exceedances**

10.10.1 With reference to Event/Action Plans in previous sections, when the environmental quality limits are exceeded, the ET shall immediately notify the IC(E), ER and EPD, as appropriate. The notification shall be followed up with advice to EPD on the results of the investigation, proposed action and success of the action taken, with any necessary follow-up proposals. A sample template for the interim notifications is shown in *Appendix 10.1*.

## Figures

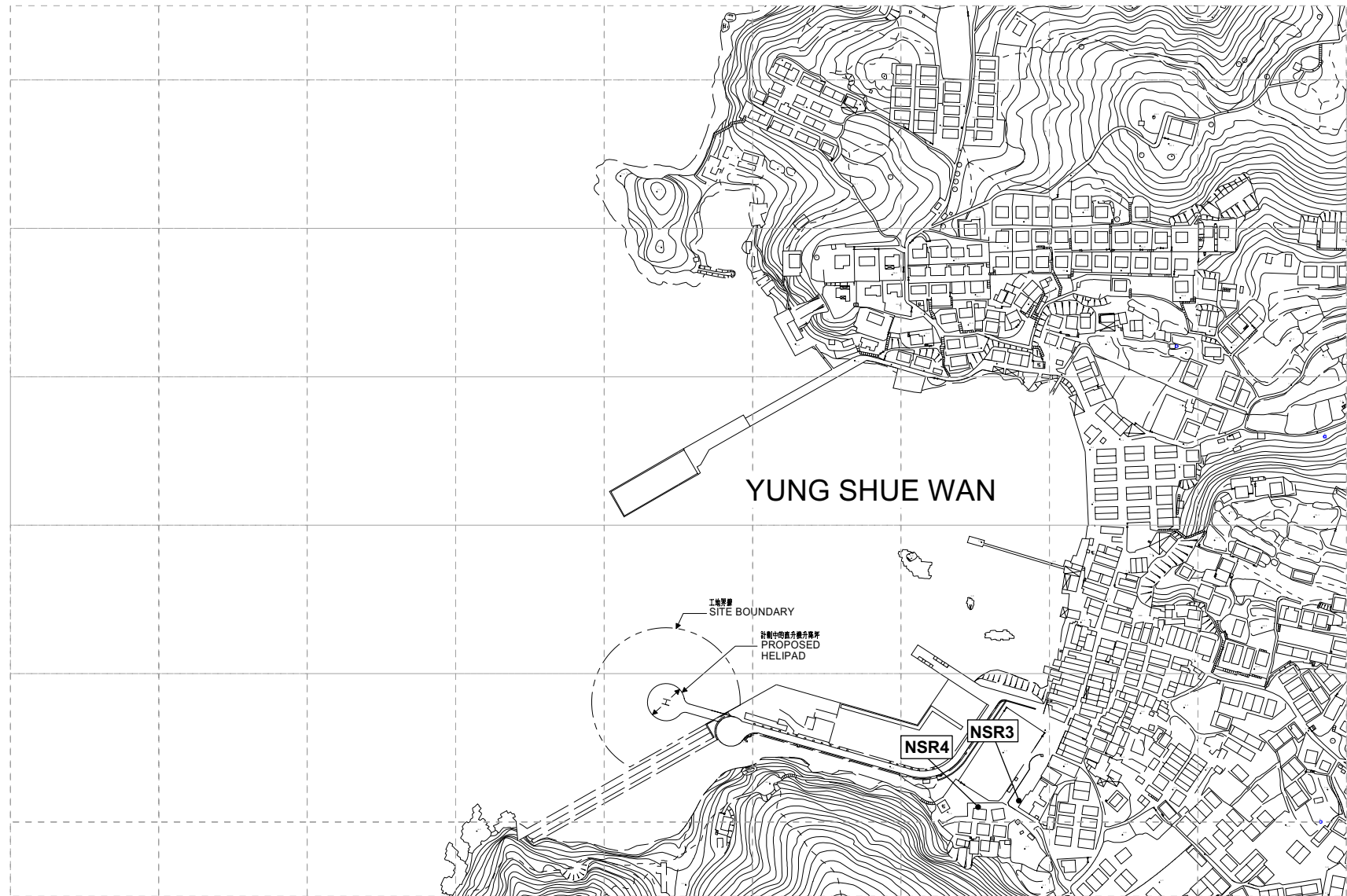


EIA Study for Helipad at Yung Shue Wan, Lamma Island

# SITE LOCATION PLAN

Figure 2.1

Drawn	LYI	Checked	RBR
Scale	NTS	Date	November 2005



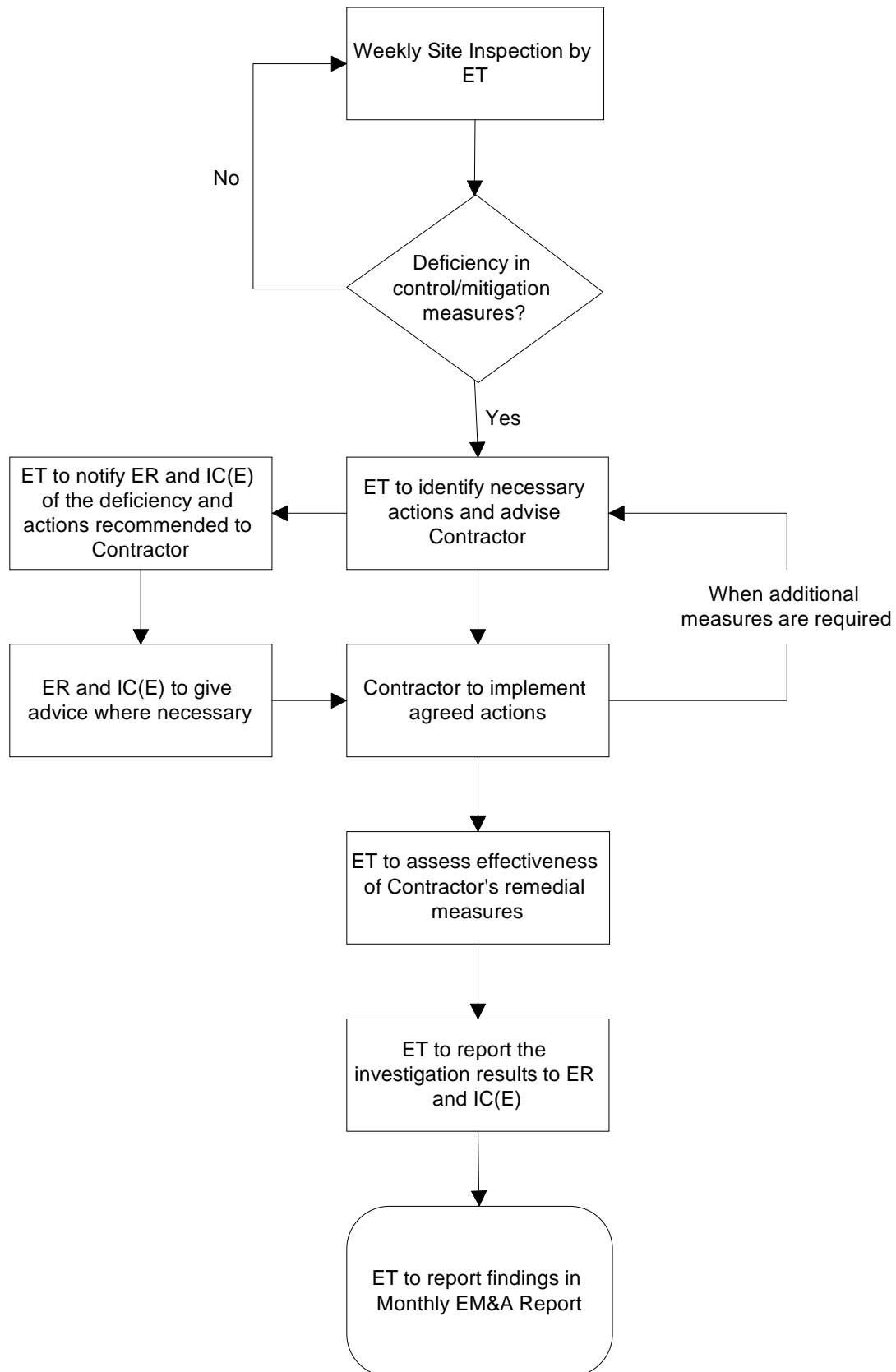
EIA Study for Helipad at Yung Shue Wan, Lamma Island

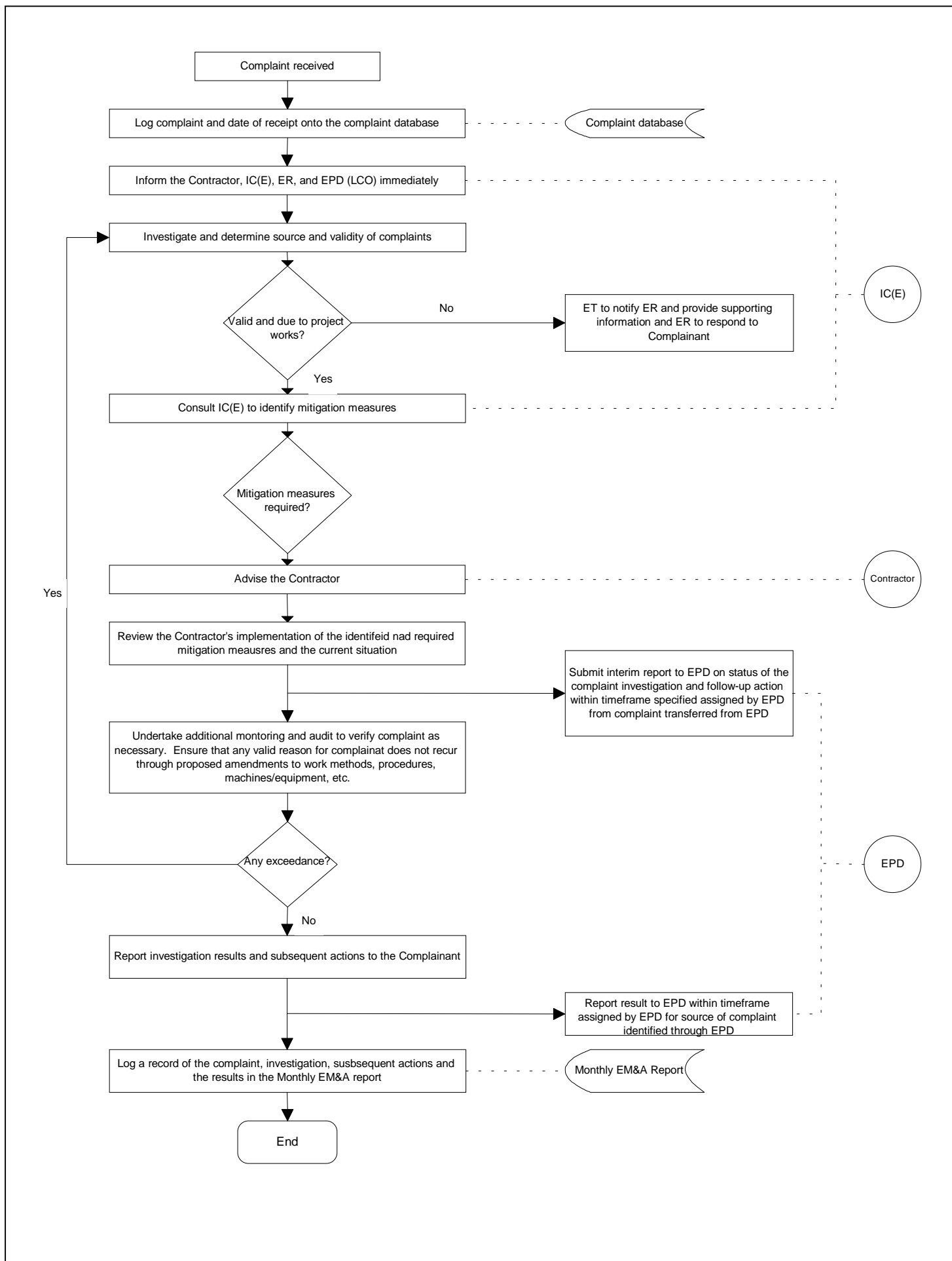
## PROPOSED NOISE MONITORING LOCATIONS

Figure 5.1

Drawn	LYI	Checked	RBR
Scale	1 : 4000	Date	November 2005







# **Appendix 1.1**

## **IMPLEMENTATION SCHEDULE**



## APPENDIX 1.1 IMPLEMENTATION SCHEDULE

**Table 1** *Air Quality – Implementation Schedule of Recommended Mitigation Measures*

EIA Ref.	EM&A Ref.	Recommended Environmental Protection Measures / Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures	What requirements or standards for the measures to achieve?
S.3.5.1	S.4.2.3	All the dust control measures as recommended in the Air Pollution Control (Construction Dust) Regulation, where applicable, should be implemented.	Air Quality During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	EIAO-TM, Air Pollution Control (Construction Dust) Regulation
S.3.5.1	S.4.2.2	Typical dust control measures include: <ul style="list-style-type: none"> <li>Restricting heights from which materials are dropped, as far as practicable to minimise the fugitive dust arising from unloading / loading.</li> </ul>	Air Quality During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	EIAO-TM, Air Pollution Control (Construction Dust) Regulation
S.3.5.1	S.4.2.2	<ul style="list-style-type: none"> <li>All stockpiles of excavated materials or spoil of more than 50 m<sup>3</sup> should be enclosed, covered or dampened during dry or windy conditions.</li> </ul>	Air Quality During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	EIAO-TM, Air Pollution Control (Construction Dust) Regulation
S.3.5.1	S.4.2.2	<ul style="list-style-type: none"> <li>Effective water sprays should be used to control potential dust emission sources such as unpaved haul roads and active construction areas.</li> </ul>	Air Quality During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	EIAO-TM, Air Pollution Control (Construction Dust) Regulation
S.3.5.1	S.4.2.2	<ul style="list-style-type: none"> <li>All spraying of materials and surfaces should avoid excessive water usage.</li> </ul>	Air Quality During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	EIAO-TM, Air Pollution Control (Construction Dust) Regulation
S.3.5.1	S.4.2.2	<ul style="list-style-type: none"> <li>Vehicles that have the potential to create dust while transporting materials should be covered, with the cover properly secured and extended over the edges of the side and tail boards.</li> </ul>	Air Quality During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	EIAO-TM, Air Pollution Control (Construction Dust) Regulation

EIA Ref.	EM&A Ref.	Recommended Environmental Protection Measures / Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures	What requirements or standards for the measures to achieve?
S.3.5.1	S.4.2.2	<ul style="list-style-type: none"> <li>Materials should be dampened, if necessary, before transportation.</li> </ul>	Air Quality During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	EIAO-TM, Air Pollution Control (Construction Dust) Regulation
S.3.5.1	S.4.2.2	<ul style="list-style-type: none"> <li>Travelling speeds should be controlled to reduce traffic induced dust dispersion and re-suspension from the operating haul trucks.</li> </ul>	Air Quality During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	EIAO-TM, Air Pollution Control (Construction Dust) Regulation
S.3.5.1	S.4.2.2	<ul style="list-style-type: none"> <li>Vehicle washing facilities will be provided to minimise the quantity of material deposited on public roads.</li> </ul>	Air Quality During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	EIAO-TM, Air Pollution Control (Construction Dust) Regulation
S.3.5.1	S.4.2.2	<ul style="list-style-type: none"> <li>Erection of hoarding not less than 2.4m high from ground level along the site boundary.</li> </ul>	Air Quality During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	EIAO-TM, Air Pollution Control (Construction Dust) Regulation

**Table 2 Noise – Implementation Schedule of Recommended Mitigation Measures**

EIA Ref.	EM&A Ref.	Recommended mitigation measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures	What requirements or standards for the measures to achieve?
-	S.5.9.2	Use of silenced plant, or plant equipped with mufflers or dampers in substitute of ordinary plant.	Noise During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period.	Annex 5 of EIAO-TM
-	S.5.9.2	Movable noise barriers positioned as close as possible to PMEs such that none of the PMEs will be visible when viewed from any noise sensitive façades.	Noise During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period.	Annex 5 of EIAO-TM
S.4.5.7	S.5.9.2	Adopt good working practices in order to minimise construction noise as far as possible: <ul style="list-style-type: none"> <li>Noisy equipment and noisy activities should be located as far away from the NSRs as is practical.</li> </ul>	Noise control during construction	Contractors	At all construction work sites, throughout the whole duration of the construction period.	Annex 5 of EIAO-TM
S.4.5.7	S.5.9.2	<ul style="list-style-type: none"> <li>Unused equipment should be turned off.</li> </ul>	Noise control during construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	Annex 5 of EIAO-TM
S.4.5.7	S.5.9.2	<ul style="list-style-type: none"> <li>Number of powered mechanical equipment (PME) should be kept to minimum and the parallel use of noisy equipment / machinery should be avoided.</li> </ul>	Noise control during construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	Annex 5 of EIAO-TM
S.4.5.7	S.5.9.2	<ul style="list-style-type: none"> <li>Regular maintenance of all plant and equipment.</li> </ul>	Noise control during construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	Annex 5 of EIAO-TM
S.4.5.7	S.5.9.2	<ul style="list-style-type: none"> <li>Observe and comply with the statutory requirements and guidelines.</li> </ul>	Noise control during construction	Contractors	At all construction work sites, throughout the whole duration of the	Annex 5 of EIAO-TM

EIA Ref.	EM&A Ref.	Recommended mitigation measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures	What requirements or standards for the measures to achieve?
					construction period	
S.4.6.33	-	<ul style="list-style-type: none"> <li>Use of quieter helicopter type EC155 B1 in priority.</li> </ul>	Noise control during operation	GFS	At all time during operations	-
S.4.6.34	-	<ul style="list-style-type: none"> <li>Reduce the angle of the helicopter flight path from the standard 150 degrees to 80 degrees for the 'EC155 B1' and to 70 degrees for the 'Super Puma AS332 L2' helicopter</li> </ul>	Noise control during operation	GFS	At all time during operations	-
S.1.2.3	-	<ul style="list-style-type: none"> <li>The helipad will be solely for emergency use.</li> </ul>	Noise control during operation	GFS/HAD	At all time during operations	-

**Table 3 Waste Management – Implementation Schedule of Recommended Mitigation Measures**

EIA Ref.	EM&A Ref.	Recommended mitigation measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures	What requirements or standards for the measures to achieve?
S.5.8.1	S.6.1.2	Ensure that proper handling, storage, transportation and disposal of materials is implemented at the outset and throughout the construction phase of the helipad.	Waste Management During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period.	Annex 7 of EIAO-TM
S.5.8.1	S.6.2.2	In line with Government's position on waste minimization, the practice of avoiding and minimizing waste generation and waste recycling should be adopted as far as practicable.	Waste Management During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period.	Annex 7 of EIAO-TM
S.5.8.2	-	Recommended mitigation measures to be implemented include: <ul style="list-style-type: none"> <li>An on-site environmental co-ordinator should be identified at the outset of the works. The co-ordinator shall prepare a Waste Management Plan.</li> </ul>	Waste Management During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	Environmental, Transport and Works Bureau Technical Circular (ETWBTC) No. 15/2003
S.5.8.2	S.6.2.2	<ul style="list-style-type: none"> <li>Spoil generated from the piling activities will need to be properly handled to minimize contamination to the marine water and any exposed ground areas due to leakage or improper storage (i.e. onto bare ground instead of into tanks).</li> </ul>	Waste Management During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	Environment, Transport and Works Bureau Technical Circular (Works) (ETWBTCW) No. 34/2002
S.5.8.2	S.6.2.2	<ul style="list-style-type: none"> <li>The reuse/recycling of all materials on site shall be investigated prior to treatment/disposal off site.</li> </ul>	Waste Management During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	ETWBTCW No. 33/2002, ETWBTC No. 15/2003
S.5.8.2	S.6.2.2	<ul style="list-style-type: none"> <li>Good site practices shall be adopted from the commencement of works to avoid the generation of waste and to promote waste minimization practices.</li> </ul>	Waste Management During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	ETWBTCW No. 33/2002

EIA Ref.	EM&A Ref.	Recommended mitigation measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures	What requirements or standards for the measures to achieve?
S.5.8.2	S.6.2.2	<ul style="list-style-type: none"> <li>All waste materials shall be sorted on site into inert and non-inert C&amp;D materials, and where the materials will be recycled or reused, these shall be further segregated. The Contractor shall be responsible for identifying which materials can be recycled/reused, whether on site or off site. In the event of the latter, the Contractor shall make arrangements for the collection of the recyclable materials. Any remaining non-inert waste shall be collected and disposed of to the refuse transfer station whilst any non-inert C&amp;D material shall be re-used on site as far as possible. If no use of the material can be found on site, the inert C&amp;D material can be delivered to a public filling area, public barging point or public stockpile area after obtaining the appropriate licence.</li> </ul>	Waste Management During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	ETWBTCW No. 33/2002, ETWBTCW No. 34/2002
S.5.8.2	S.6.2.2	<ul style="list-style-type: none"> <li>A trip ticket system should be established at the outset of the construction of the helipad to monitor the disposal of C&amp;D and solid wastes from the site to public filling facilities and landfills.</li> </ul>	Monitor the disposal of C&D and solid wastes from the site	Contractors	At the outset of the construction of the helipad	ETWBTC (W) No.31/2004
S.5.8.2	S.6.2.2	<ul style="list-style-type: none"> <li>The Contractor shall register with EPD as a Chemical Waste Producer if there is any use of chemicals on site including lubricants, paints, diesel fuel, etc. Only licensed chemical waste collectors shall be employed to collect any chemical waste generated at site. The handling, storage, transportation and disposal of chemical wastes shall be conducted in accordance with the relevant guidelines as published by Government.</li> </ul>	Waste Management During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	Waste Disposal (Chemical Waste) (General) Regulation, Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes, Guide to the Chemical Waste Control Scheme
S.5.8.2	S.6.2.2	<ul style="list-style-type: none"> <li>A sufficient number of covered bins shall be provided on site for the containment of general refuse to prevent visual impacts and nuisance to sensitive receivers. These bins shall be cleared daily and the collected waste disposed of to the refuse transfer station. Further to the</li> </ul>	Waste Management During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	ETWBTCW No. 6/2002A, ETWBTC No. 15/2003

EIA Ref.	EM&A Ref.	Recommended mitigation measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures	What requirements or standards for the measures to achieve?
		issue of Environment, Transport and Works Bureau Technical Circular (Works) No. 6/2002A, Enhanced Specification for Site Cleanliness and Tidiness, the Contractor is required to maintain a clean and hygienic site throughout the Project works.				
S.5.8.2	S.6.2.2	<ul style="list-style-type: none"> <li>All chemical toilets shall be regularly cleaned and the nightsoil collected and transported by a licensed contractor to a Government Sewage Treatment Works facility for disposal.</li> </ul>	Waste Management During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	ETWBTCW No. 6/2002A, ETWBTC No. 15/2003
S.5.8.2	S.6.2.2	<ul style="list-style-type: none"> <li>Tool box talks shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycling.</li> </ul>	Waste Management During Construction	Contractors	Throughout construction period	ETWBTCW No. 15/2003
S.5.8.3	S.6.2.3	Contractor shall comply with all relevant statutory requirements and guidelines and their updated versions.	Waste Management During Construction	Contractors	Throughout construction period	EIAO - TM
S.2.2.33	-	The helipad shall be constructed by using small diameter pre-bored piling instead of dredging and reclamation.	Construction method	Contractors	At all construction work sites, throughout construction period	-
S.5.6.30	-	The helipad will only be used for emergency purposes. No equipment will be placed on the landing pad or along the EVA. Helicopters will not be parked at the landing pad and all repair and maintenance works (on the helicopters) will be conducted off site. As such the only source of waste generation during the operation of the helipad is anticipated to be from the long-term maintenance of the pad.	Operation	GFS/HAD	At all time during operations	-

**Table 4** *Water Quality – Implementation Schedule of Recommended Mitigation Measures*

EIA Ref.	EM&A Ref.	Recommended mitigation measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures	What requirements or standards for the measures to achieve?
S.6.7.2	S.7.2.3	Silt curtain to be installed surrounding the whole of the piling site.	Water Quality During Construction	Contractors	Around the whole works area , prior to commencement of the piling works.	Water Pollution Control Ordinance (Cap. 358), Water Quality Objectives for Southern WCZ if direct discharge to sea is adopted.
S.6.7.3	S.7.2.4	The following good site practices are recommended: <ul style="list-style-type: none"> <li>The holding tank should be fitted with a tight fitting seal to prevent sediment leakage.</li> </ul>	Water Quality During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period.	Not applicable (good practice only)
S.6.7.3	S.7.2.4	<ul style="list-style-type: none"> <li>Ensure that excavator grab seal is tightly closed and the hoist speed is suitably low.</li> </ul>	Water Quality During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	Not applicable (good practice only)
S.6.7.3	S.7.2.4	<ul style="list-style-type: none"> <li>The holding tank should not be filled to a level which will cause overflow of sediment during loading and transportation.</li> </ul>	Water Quality During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	Not applicable (good practice only)
S.6.7.3	S.7.2.4	<ul style="list-style-type: none"> <li>Large objects should be removed from the excavator grab to avoid sediment spills.</li> </ul>	Water Quality During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	Not applicable (good practice only)
S.2.2.33	-	<ul style="list-style-type: none"> <li>The helipad shall be constructed by using small diameter pre-bored piling instead of dredging and reclamation.</li> </ul>	Construction method	Contractors	At all construction work sites, throughout construction period	-



**Table 5 Ecology – Implementation Schedule of Recommended Mitigation Measures**

EIA Ref.	EM&A Ref.	Recommended mitigation measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures	What requirements or standards for the measures to achieve?
S.7.6.1	S.8.2.3	Sub-tidal Ecology Silt curtain to be installed surrounding the whole of the piling site.	Ecology During Construction	Contractors	Around the whole works area prior to commencement of the piling works.	Animals & Plants Ordinance (Protection of Endangered Species) (Cap. 187)
S.7.6.2	S.8.2.4	Good practice measures to control water quality-induced ecological impacts: <ul style="list-style-type: none"> <li>Particular care should be taken when demolishing the existing concrete planter to ensure no waste enters the water column.</li> </ul>	Ecology During Construction	Contractors	At the existing concrete planter, throughout the whole duration of the construction period.	Not applicable (good practice only)
S.7.6.2	S.8.2.4	<ul style="list-style-type: none"> <li>Particular care should be taken when decommissioning the silt curtain to avoid sudden dispersion of muddy water which may cause adverse impact to the nearby marine life;</li> </ul>	Ecology During Construction	Contractors	Along the western side of the Project boundary, on the completion of piling.	Not applicable (good practice only)
S.7.6.2	S.8.2.4	<ul style="list-style-type: none"> <li>Materials storage areas should be located well away from the seawall, and any such areas should be covered during the works.</li> </ul>	Ecology During Construction	Contractors	At all construction work sites, throughout the whole duration of the construction period	ProPECC Note PN 1/94 on <i>Construction Site Drainage</i>
S.7.6.2	S.7.2.4	<ul style="list-style-type: none"> <li>The holding tank for sediment excavated from within the pile casing should be fitted with a tight fitting seal to prevent leakage.</li> </ul>	Ecology During Construction	Contractors	At the piling areas, throughout the whole duration of the piling period	Not applicable (good practice only)
S.7.6.2	S.7.2.4	<ul style="list-style-type: none"> <li>Ensure that excavator seal is tightly closed and the hoist speed is suitably low.</li> </ul>	Ecology During Construction	Contractors	At the marine areas, throughout the whole duration of the construction period	Not applicable (good practice only)

EIA Ref.	EM&A Ref.	Recommended mitigation measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures	What requirements or standards for the measures to achieve?
S.7.6.2	S.7.2.4	<ul style="list-style-type: none"> <li>The holding tank should not be filled to a level that will cause overflow of sediment during loading and transportation.</li> </ul>	Ecology During Construction	Contractors	At the marine areas, throughout the whole duration of the construction period	Not applicable (good practice only)
S.7.6.2	S.7.2.4	<ul style="list-style-type: none"> <li>Large objects should be removed from the excavator grab to avoid sediment spills.</li> </ul>	Ecology During Construction	Contractors	At all construction work areas, throughout the whole duration of the construction period	Not applicable (good practice only)
S.2.2.33	-	<ul style="list-style-type: none"> <li>The helipad shall be constructed by using small diameter pre-bored piling instead of dredging and reclamation.</li> </ul>	Construction method	Contractors	At all construction work sites, throughout construction period	-

## **Appendix 2.1**

# **CONSTRUCTION SCHEDULE**

## APPENDIX 2.1 - Construction Schedule

					Period																							
No.	Activity Description	Duration (days)	Start Date	Finish Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	Site Clearance				##### - 23-May-06	##### - 9-Jun-06	##### - 27-Jun-06	##### - 18-Jul-06	19-Jul-06 - 22-Jul-06	23-Jul-06 - 23-Jul-06	24-Jul-06 - 16-Aug-06	##### - 19-Aug-06	##### - 23-Aug-06	##### - 28-Aug-06	##### - 30-Aug-06	##### - 2-Oct-06	9-Oct-06 - 14-Nov-06	##### - 17-Nov-06	##### - 21-Nov-06	##### - 23-Dec-06	##### - 27-Jan-07	##### - 28-Feb-07	1-Mar-07 - 29-May-07	##### - 6-Jun-07	7-Jun-07 - 22-Jun-07	##### - 3-Jul-07	4-Jul-07 - 5-Jul-07	6-Jul-07 - 30-Jul-07
a	Site Clearance	08 days	15-May-06	23-May-06	#####	#####	#####	#####	#####																			
b	Erection of Office/Hoarding/Fencing	60 days	24-May-06	22-Jul-06																								
2	Mobilization																											
a	Plant set up	03 days	24-May-06	28-May-06	#####	#####	#####	#####	#####	#####	#####																	
b	Construction of working platform	58 days	28-May-06	22-Jul-06	#####	#####	#####	#####	#####	#####	#####																	
c	Mobilizing & Assembling of drilling machine/Ground Investigation	29 days	19-Jul-06	18-Aug-06																								
3	Pile installation																											
a	Preliminary pile installation (1 nr)																											
b	Pre-drilling	03 days	17-Aug-06	19-Aug-06								#####	#####															
c	Drilling and installing casing	03 days	21-Aug-06	23-Aug-06																								
d	Installing H-pile	03 days	24-Aug-06	26-Aug-06																								
e	Grouting	03 days	28-Aug-06	30-Aug-06																								
f	Preliminary pile test (1 nr)	33 days	31-Aug-06	2-Oct-06																								
g	Pile installation (23 nr)																											
h	Pre-drilling	83 days	24-Aug-06	14-Nov-06																								
i	Drilling and installing casing	82 days	28-Aug-06	17-Nov-06																								
j	Installing H-pile	83 days	31-Aug-06	21-Nov-06																								
k	Grouting	82 days	3-Oct-06	23-Dec-06																								
l	Main pile test (2 nr - tension and compression)	33 days	29-Dec-06	27-Jan-07																								
4	Helipad construction																											
a	Construction of beams and slabs (Helipad)/(EVA)	121 days	29-Jan-07	29-May-07																								
b	Construction wave return walls (Helipad)/(EVA)/Road & Drainage Works	24 days	30-May-07	22-Jun-07																								
5	E&M Works																											
a	E&M Installation	35 days	30-May-07	3-Jul-07																								
b	E&M Testing & commissioning	02 days	4-Jul-07	5-Jul-07																								
6	Demobilization																											
a	Demobilization of working platform and plants	25 days	6-Jul-07	30-Jul-07																								

### Construction activity will be carried out during the assessment period

# **Appendix 5.1**

## **EVENT/ACTION PLAN**

**APPENDIX 5.1 – Event / Action Plan for Construction Noise**

Event	ACTION			
	ET Leader	IC (E)	ER	Contractor
Action Level	<ol style="list-style-type: none"> <li>1. Notify IC(E) and Contractor</li> <li>2. Carry out investigation</li> <li>3. Report the results of investigation to the IC(E) and Contractor</li> <li>4. Discuss with the Contractor and formulate remedial measures</li> <li>5. Increase monitoring frequency to check mitigation effectiveness</li> </ol>	<ol style="list-style-type: none"> <li>1. Review the analysed results submitted by the ET</li> <li>2. Review the proposed remedial measures by the Contractor and advise the ER accordingly</li> <li>3. Supervise the implementation of remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing</li> <li>2. Notify Contractor</li> <li>3. Require Contractor to propose remedial measures for the analysed noise problem</li> <li>4. Ensure remedial measures are properly implemented</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit noise mitigation proposal to IC(E)</li> <li>2. Implement noise mitigation proposals</li> </ol>
Limit Level	<ol style="list-style-type: none"> <li>1. Notify IC(E), ER, EPD and Contractor</li> <li>2. Identify source</li> <li>3. Repeat measurement to confirm findings</li> <li>4. Increase monitoring frequency</li> <li>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented</li> <li>6. Inform IC(E), ER and EPD the causes &amp; actions taken for the exceedances</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results</li> <li>8. If exceedance stops, cease additional monitoring</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst ER, ET, and Contractor on the potential remedial actions</li> <li>2. Review Contractor's remedial actions whenever necessary to assure their the ER accordingly</li> <li>3. Supervise the implementation of remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing</li> <li>2. Notify Contractor</li> <li>3. Require Contractor to propose remedial measures for the analysed noise problem</li> <li>4. Ensure remedial measures are properly implemented</li> <li>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance</li> <li>2. Submit proposal for remedial actions to IC(E) within 3 working days of notification</li> <li>3. Implement the agreed proposals</li> <li>4. Resubmit proposals if problem still not under control</li> <li>5. Stop the relevant portion of works as determined by the ER until the exceedance is abated</li> </ol>

# **Appendix 10.1**

## **RECORD FORMS**

## APPENDIX 10.1 RECORD FORMS

### IMPLEMENTATION STATUS PROFORMA

Ref: \_\_\_\_\_

Ref**	Environmental Protection Measures *	Implementation Status

\* All recommended and requirements resulted during the Course of EIA/EA Process including ACE and/or accepted public comment to the proposed project.

\*\* EIA Ref / EM&A Log Ref / Design Document Ref.

Signed by Environmental Team Leader:

Date:

Audited by Independent Checker (Environment):

Date:



## APPENDIX 10.1 RECORD FORMS

### DATA RECOVERY SCHEDULE

Ref: \_\_\_\_\_

Date	Air Quality Monitoring					Noise Monitoring					Water Quality Monitoring				
	Monitoring Station *					Monitoring Location *					Monitoring Location *				
	A1	A2	A3	A4	A5	N1	N2	N3	N4	N5	W1	W2	W3	W4	W5
1															
2															
3															
4															
5															
6															
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24															
25															
26															
27															
28															
29															
30															
31															
% or R															

\* Remark type of parameters.

% of R The percentage of data recovery is the actual monitoring over the scheduled monitoring.

Signed by Environmental Team Leader: \_\_\_\_\_

Date: \_\_\_\_\_

Copy to Independent Checker (Environment)

## APPENDIX 10.1 RECORD FORMS

### SITE INSPECTION CORRECTIVE ACTION PROFORMA

Ref: \_\_\_\_\_

Date of Observation	Location	Observation / Deficiency	Mitigation Action and By Whom	Description of Actions Taken	Date of Action

This Proforma is an Environmental Protection Instruction for: \_\_\_\_\_

Issued on: \_\_\_\_\_

Please complete the table as required and submit to the ET Leader with copy to ER.

Signed by the Environmental Team Leader: \_\_\_\_\_

Date: \_\_\_\_\_

## APPENDIX 10.1 RECORD FORMS

### PROACTIVE ENVIRONMENTAL PROTECTION PROFORMA

Ref: \_\_\_\_\_

Ref *	Proposed Construction Method **	Location / Working Period	Anticipated Impacts	Recommended Mitigation Measures

\* EIA Ref / EM&amp;A Ref / Design Document Ref.

\*\* Details of equipment, vehicles, plants, processes technologies for the option of construction method.

Reviewed by Environmental Team Leader:

Date:

Approved by Independent Checker (Environment):

Date:

## APPENDIX 10.1 RECORD FORMS

### REGULATORY COMPLIANCE PROFORMA

Ref: \_\_\_\_\_

Ref **	Environmental License / Permit *	Control Area / Facility / Location	Effective Date

\* Name of Application, Business Corporation, relevant regulation and remark of license / permit conditions.

\*\* File reference of the licensee / permittee.

Recorded by Environmental Team Leader:

\_\_\_\_\_

Date:

\_\_\_\_\_

Signed by Independent Checker (Environment):

\_\_\_\_\_

Date:

\_\_\_\_\_

**APPENDIX 10.1 RECORD FORMS****ENVIRONMENTAL COMPLAINTS LOG**

Ref: \_\_\_\_\_

Log. Ref.	Date/Location	Complaint/Date of Contact	Details of Complaint	Investigation/Mitigation Action	File Closed

Filed by Environmental Audit Team Leader: \_\_\_\_\_

Date: \_\_\_\_\_

**APPENDIX 10.1 RECORD FORMS****INCIDENT REPORT ON ACTION LEVEL OR LIMIT LEVEL NON-COMPLIANCE**

Ref: \_\_\_\_\_

<b>Project</b>	
<b>Date</b>	
<b>Time</b>	
<b>Monitoring Location</b>	
<b>Parameter</b>	
<b>Action and Limit Levels</b>	
<b>Measured Level</b>	
<b>Possible Reason for Action or Limit Level Non-Compliance</b>	
<b>Actions Taken / To Be Taken</b>	
<b>Remarks</b>	

Prepared by: \_\_\_\_\_

Designation: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**APPENDIX 10.1 RECORD FORMS****NOISE MONITORING FIELD DATA SHEET**

Ref: \_\_\_\_\_

<b>Monitoring Location</b>		
<b>Description of Location</b>		
<b>Date of Monitoring</b>		
<b>Measurement Start Time (hh:mm)</b>		
<b>Measurement Time Length (min)</b>		
<b>Noise Meter Model/Identification</b>		
<b>Calibrator Model/Identification</b>		
<b>Measurement Results</b>	<b>L<sub>90</sub> [dB(A)]</b>	
	<b>L<sub>10</sub> [dB(A)]</b>	
	<b>Leq [dB(A)]</b>	
<b>On-Site Calibration</b>	<b>Initial [dB(A)]</b>	
	<b>Final [dB(A)]</b>	
<b>Major Construction Noise Source(s) During Monitoring</b>		
<b>Other Noise Source(s) During Monitoring</b>		
<b>Remarks</b>		

**Name & Designation****Signature****Date**

Recorded by:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Checked by:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_