

CONTENTS

10. ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS	10-1
10.1 Introduction.....	10-1
10.2 Objectives of the EM&A Requirements	10-1
10.3 Air Quality.....	10-1
10.4 Noise	10-2
10.5 Water Quality	10-2
10.6 Waste Management	10-2
10.7 Ecology.....	10-3
10.8 Cultural Heritage.....	10-4
10.9 Landscape and Visual.....	10-5
10.10 Implementation Schedule	10-5

10. ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS

10.1 Introduction

10.1.1 This section provides a summary of the requirements of Environmental Monitoring and Audit (EM&A) for the construction and operation phases of the Project based on the assessment results of the various environmental issues in the preceding sections. Details of the EM&A requirements are provided in a stand-alone EM&A Manual.

10.2 Objectives of the EM&A Requirements

10.2.1 The objectives of the EM&A requirements include:

- Providing baseline information against which any short- or long-term environmental impacts of the Project can be determined;
- Providing an early indication should any of the environmental control measures or practices fail to achieve the acceptable standards;
- Monitoring the performance of the Project and the effectiveness of mitigation measures;
- Verifying the environmental impacts identified in the EIA;
- Determining Project compliance with regulatory requirements, standards and government policies;
- Taking remedial action if unexpected results or unacceptable impacts arise; and
- Providing data to enable an environmental audit to be undertaken at regular intervals.

10.2.2 The following sections summarise the recommended EM&A requirements and further details are provided in the EM&A Manual.

10.3 Air Quality

Construction Phase

10.3.1 Adverse air quality impact associated with the construction of the Project is not expected with the implementation of the recommended mitigation measures. Site inspections and audits should be conducted during the construction phase to ensure that the recommended mitigation measures are properly implemented to reduce the air quality impacts from the Project.

10.3.2 Since the recommended mitigation measures can readily mitigate the potential air quality impact, air quality monitoring during the construction phase of the Project is considered not necessary.

Operation Phase

- 10.3.3 Adverse air quality impact associated with the operation of the Project is not expected with the implementation of the recommended mitigation measures. Hence, EM&A will not be required during operation of the Project.

10.4 Noise

Construction Phase

- 10.4.1 Weekly noise monitoring is proposed to be undertaken at the representative NSRs (N3, N7, N11 and N16). Regular site inspections and audits should be conducted to ensure that the recommended mitigation measures are properly implemented during the construction stage.

Operation Phase

- 10.4.2 Commissioning test should be conducted prior to operation of the Project to ensure compliance of the operation noise levels with the stipulated noise standard.

10.5 Water Quality

Construction Phase

- 10.5.1 Construction phase water quality monitoring is recommended to identify if any adverse water quality impact during project construction. Baseline monitoring should be undertaken three times per week for a period of at least four weeks before commencement of the construction works to establish baseline water quality conditions of the area. Impact monitoring should be undertaken three times per week during the construction period to identify adverse change to water quality when compared to the baseline period. Post-construction monitoring should also be undertaken three times per week for four weeks after the completion of construction works. Regular site inspection and audit shall be conducted to ensure the mitigation measures are properly implemented during the construction stage. The detailed EM&A measures are provided in separate EM&A Manual for this Project.

Operation Phase

- 10.5.2 Unacceptable water quality impacts are not expected with appropriate preventive and mitigation measures. Hence, EM&A will not be required during operation of the Project.

10.6 Waste Management

Construction Phase

- 10.6.1 It is recommended that regular site inspections and audit of the waste management practices would be carried out during the construction phase to determine if wastes are being managed in accordance with the recommended good site practices and Waste Management Plan (WMP). The site inspections and audits will investigate all aspects of waste management including waste generation, storage, handling, recycling, transportation and disposal.

Operation Phase

- 10.6.2 As the operation of the Project will generate minimal quantity of waste, EM&A will not be required during the operation phase of the Project.

10.7 Ecology

Construction Phase

- 10.7.1 The assessment presented above indicates that unacceptable construction phase impacts and operation phase impacts are not expected to occur to terrestrial ecological resources. The implementation of the ecological mitigation measures described in Chapter 7 will be inspected and monitored regularly as part of the ecological monitoring programme during the construction period.

Translocation of Fauna Species of Conservation Importance

- 10.7.2 An update ecological survey shall be conducted by a qualified ecologist as part of the ET with focus to the presence of the herpetofauna and freshwater community prior to commencement of construction at the affected watercourse(s). Should species of conservation importance be found within the surveyed watercourse section(s), a Translocation Plan should be prepared. Translocation should be conducted to move the individuals from the works area to suitable recipient sites. The Translocation Plan should be prepared by the qualified ecologist as a part of the ET, certified by the IEC and submitted to AFCD within one month upon completion of the update aquatic survey to agree the detailed translocation procedures including the identified receptor site(s). Agreement from relevant authorities (e.g. AFCD and EPD) should be sought prior to conducting the translocation work. The translocation work should be conducted as close to the commencement of the relevant site works as possible, following the agreed Translocation Plan. Upon the completion of the translocation work, post-translocation survey should be conducted at the recipient site to monitor the effectiveness of translocation.

Protection of Identified Night Roosting Site

- 10.7.3 As a precautionary measure, construction works at the works area of stormwater drain near Mui Wo Municipal Services Building during night-time from 17:00 to 07:00 should be avoided to minimize potential disturbance to the Ardeids. In addition, strong artificial lighting should not be used in the area at night to avoid disturbance to the roosting ardeids. Lighting required for safety purpose should keep minimal and pointed inward. Clear signs should be erected on site to alert all site staff and workers about the requirement.

Operation Phase

- 10.7.4 No operational phase monitoring is considered necessary.

10.8 Cultural Heritage

Construction Phase

Archaeology

- 10.8.1 As a precautionary measure, the project proponent and his/her contractor are required to inform AMO immediately when any antiquities or supposed antiquities under the A&M Ordinance (Cap. 53) are discovered during the course of works.

Built Heritage

- 10.8.2 Any vibration and building movement induced from the proposed works adjacent to the seven (7) graded historic sites/ buildings/ structures, which located over 70m from the Project Boundary, should be strictly monitored to ensure no disturbance and/ or physical damages made to them during the course of works. Monitoring proposal for them, including checkpoint locations, installation details, response actions for each of the Alert/ Alarm/ Action (3As) levels and frequency of monitoring should be submitted for AMO's consideration. Installation of monitoring checkpoints shall be carried out in great care and adequate protection shall be provided so as to avoid unnecessary disturbance/ damage to nearby historic fabrics. Photo records of monitoring checkpoints shall be submitted upon installation for AMO's records; Monitoring records should be submitted to AMO on regular basis and alert AMO should the monitoring reach Alert/ Alarm/ Action levels; and pre and post condition survey should be carried out to record conditions of the heritage sites and survey reports should be submitted for AMO's record.
- 10.8.3 Apart from 2 agricultural weirs (HB- 22 and HB-76), potential direct impact to the built heritage items identified and listed in **Chapter 9** is not anticipated due to adequate separate distance between the proposed works and built heritage items. HB-22 and HB-76 are located within works area of the proposed river reprofiling work and fish ladder works at Tai Tei Tong River. Modification of the agricultural weirs and construction of fish ladder are proposed on site in order to achieve beneficial ecological impact like improvement of the river hydraulic performance and fish movement. Although the modification works will bring direct impact to the weirs, the impact would be acceptable with mitigation measures. It is recommended that cartographic and photographic records be conducted to record the weirs prior to commencement of modification works.

Operation Phase

Archaeology

- 10.8.4 No excavation works of the Project will be involved in operational phase. Therefore, no adverse archaeological impact is anticipated, and EM&A will not be required.

Built Heritage

- 10.8.5 No direct and indirect impacts are anticipated from the proposed works in the operational phase. Hence, EM&A is not required during the operation phase of the Project.

10.9 Landscape and Visual

Construction Phase

- 10.9.1 The landscape and visual mitigation measures proposed shall be incorporated in the Construction Contract.
- 10.9.2 Site inspection and audits should be undertaken regularly during the construction phase of the Project to ensure that the proposed mitigation measures and good site practices proposed to manage and mitigate landscape and visual impacts, are implemented.

Operation Phase

- 10.9.3 A specialist landscape subcontractor should be employed for the implementation of tree and landscape works and subsequent maintenance operations during the establishment period.
- 10.9.4 Site audits should be undertaken bi-monthly for 12 months establishment period during the operation phase to check that the proposed landscape and visual mitigation measures are properly implemented and maintained as per their intended objectives.
- 10.9.5 After the 12-months establishment period for soft landscaping, standard maintenance will be required to ensure mitigation measures to retain their full efficacy.

10.10 Implementation Schedule

- 10.10.1 An Implementation Schedule of the environmental mitigation measures recommended in the EIA study has been prepared in form of a checklist. The Implementation Schedule is presented in the EM&A Manual of the Project.