

13. Environmental Monitoring and Audit

13.1 Introduction

This section describes the need for EM&A during the construction and operation phases of the Project in accordance with the requirements as stipulated in Annex 21 of the EIAO-TM.

The purpose of the EM&A programme is to ascertain and verify the assumptions implicit to, and accuracy of, EIA study predictions. The EM&A programme includes the scope of the EM&A requirements for the Project to ensure compliance with the EIA study recommendations, to assess the effectiveness of the recommended mitigation measures and to identify any further need for additional mitigation measures or remedial action.

13.2 Project Organisation

A project organisation consisting of the Project Proponent (i.e., OPC), the Engineer or Engineer's Representative (ER), Independent Environmental Checker (IEC), Environmental Team (ET), and Contractor will be established to take on the responsibilities for environmental protection for the Project.

13.3 Environmental Monitoring and Audit Manual and Implementation Schedule

EM&A is an important aspect in the EIA process which specifies the timeframe and responsibilities for the implementation of environmental mitigation measures. The requirements on environmental monitoring (including baseline and impact monitoring) is given in a stand-alone EM&A Manual.

The EM&A Manual includes the following:

- Organisation, hierarchy and responsibilities of OPC, the Contractor, ER, ET and IEC with respect to the EM&A requirements during construction and operation phases of the Project;
- Information on project organisation and programming of construction activities;
- Requirements with respect to the construction schedule and necessary EM&A programme to track the varying environmental impacts;
- Details of methodologies to be adopted, including all field, laboratory and analytical procedures, and details on quality assurance;
- Procedure for undertaking on-site environmental audits;
- Definition of Action and Limit Levels;
- Establishment of Event and Action Plans (EAPs);
- Requirements of reviewing pollution sources and working procedures required in the event of non-compliance of environmental criteria and complaints;

- Requirements for reviewing the implementation of mitigation measures, and effectiveness of environmental protection and pollution control measures adopted; and
- Presentation of requirements for EM&A data and appropriate reporting procedures.

An Implementation Schedule has been prepared and included in **Chapter 15** and the EM&A Manual summarises all the required mitigation measures that need to be implemented during the construction and operation phases of the Project. The implementation responsibilities are also identified in the Implementation Schedule. The EM&A Manual will present the requirements for EM&A (e.g. monitoring locations, monitoring and audit frequency).

13.4 Environmental Monitoring and Audit Programme

The following measurements and activities for each environmental aspect (where applicable) has been identified:

- Baseline monitoring;
- Impact monitoring;
- Compliance monitoring / auditing;
- Remedial actions in accordance with the EAP within the timeframe in case the specified criteria in the EM&A Manual were exceeded;
- Logging and keeping records of monitoring results; and
- Preparation and submission of Monthly and Final EM&A Reports.

Detailed requirements of the EM&A programme will be described in the stand-alone EM&A Manual.

13.5 Summary of Environmental Monitoring and Audit Requirements

13.5.1 Air Quality Impact

13.5.3.1 Construction Phase

With implementation of the recommended mitigation measures, no significant dust impact is expected and regular dust monitoring is therefore not considered necessary during the construction phase of the Project. However, regular site audits are suggested to ensure the dust control measures are properly implemented. Details of the EM&A programme will be presented in the stand-alone EM&A Manual.

13.5.3.1 Operation Phase

No ASRs are predicted to exceed the relevant criteria under the AQOs. No monitoring during operation is required.

13.5.2 Hazard to Life

Hazard to life to evaluate the potential hazard is not required. No EM&A requirements are therefore expected.

13.5.3 Noise Impact

13.5.3.1 Construction Phase

With the recommended mitigation measures, no residual impacts exceeding the relevant noise criteria are predicted at all representative NSRs during the construction phase. However, EM&A is recommended to ensure the mitigation measures and good site practice have been implemented properly, and to minimise the potential noise impact during the construction phase. Details are given in the standalone EM&A Manual.

13.5.3.1 Operation Phase

No adverse noise impact exceeding the relevant noise criteria is anticipated from off-site road traffic and fixed plants, therefore no environmental monitoring and audit is proposed. Prior to the operation phase of the Project, a commissioning test on all major fixed noise sources including open air entertainment activities should be conducted to ensure compliance of the operational airborne noise levels with the EIAO-TM noise criteria. Details are given in the standalone EM&A Manual.

13.5.4 Water Quality Impact

Adverse water quality impact was not predicted during the construction and operation phases of the Project. Nevertheless, appropriate mitigation measures are recommended to minimise potential water quality impacts. Water quality monitoring is not considered necessary. However, regular audit of the implementation of the recommended mitigation measures during construction phase at the work areas should be undertaken to ensure the recommended mitigation measures are properly implemented.

13.5.5 Sewerage and Sewage Treatment Implications

According to the assessment, the existing public sewerage system would be sufficient to cater for the sewage flows from the Project. No unacceptable impacts on sewerage and sewage treatment would be expected. Nevertheless, in order to prevent septicity problems during operation phase, it is recommended that a detailed sewerage design report be submitted to DSD for approval prior to installation of the rising mains.

13.5.6 Waste Management Implications

It will be the Contractor's responsibilities to ensure that all wastes produced during the construction of the Project are handled, stored and disposed of in accordance with good waste management practices and the relevant regulations and requirements. The recommended mitigation measures shall form the basis of the Waste Management Plan to be developed by the Contractor in the construction phase.

During construction phase, regular site inspection as part of the EM&A procedures should be carried out to determine if various types of waste are being managed in accordance with approved procedures and the

Waste Management Plan. It should cover different aspects of waste management including waste generation, storage, recycling, treatment, transport and disposal.

13.5.7 Land Contamination

According to the desktop appraisal and the site reconnaissance survey results, bulk excavation of soil for land remediation is not expected at this stage. As such, any environmental monitoring in relation to land remediation is not required.

During the construction phase, EM&A is to be carried out in the form of regular site inspection. All the related procedures and facilities for handling or storage of chemicals and chemical waste will be audited to make sure they are in order and intact and reported in the EM&A reports.

13.5.8 Ecology Impact

The implementation, monitoring and audit of the ecological mitigation measures should be conducted as presented in the standalone EM&A Manual, which include baseline monitoring for plant species of conservation interest, inspection to confirm no active ardeid nest or Short-nosed Fruit Bat prior to construction works, and monitoring of woodland compensation and reinstatement area, and the enhancement area. In addition, the mitigation measures for air, noise, water and waste management aspects proposed in respective sections which are indirectly beneficial to the local ecology shall be checked as part of the EM&A procedures during construction period as presented in the standalone EM&A Manual.

13.5.9 Fisheries Impact

The implementation and audit of the water quality mitigation measures will be conducted as presented in the standalone EM&A Manual. Such measures are indirectly beneficial to the local fisheries and will be checked. There are no significant fisheries impacts predicted from the construction and operation phases and therefore no other fisheries-specific monitoring and audit are considered necessary.

13.5.10 Landscape and Visual Impact

The implementation of the landscape and visual impact mitigation measures should be checked as part of the EM&A procedures as presented in the standalone EM&A Manual.