

13 Site Environmental Audit

13.1 Site Inspection

Site inspection provides a direct means to initiate and enforce specified environmental protection and pollution control measures. These shall be undertaken routinely to inspect construction activities in order to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented. Site inspection is one of the most effective tools to enforce the environmental protection requirements at the works area.

The ET shall be responsible for formulating the environmental site inspection programme as well as the deficiency and action reporting system, and for carrying out the site inspections. The proposal for rectification, if any, should be prepared and submitted to the ET Leader, IEC and ER by the Contractor.

Regular site inspections shall be carried out and led by the ER and attended by the Contractor, ET and IEC at least once per week during the construction phase. The areas of inspection shall not be limited to the environmental situation, pollution control and mitigation measures within the site. It should also review the environmental situations outside the works area which is likely to be affected, directly or indirectly, by the construction site activities of the Project. The ET and IEC shall make reference to the following information in conducting the inspection. During the inspection, the following information should be referred to:

- (i) EIA Report recommendations on environmental protection and pollution control mitigation measures;
- (ii) works progress and programme;
- (iii) individual works methodology proposals (which shall include the proposal on associated pollution control measures);
- (iv) contract specifications on environmental protection;
- (v) relevant environmental protection and pollution control legislations; and
- (vi) previous site inspection results.

The Contractor shall keep the ER, IEC and ET Leader updated with all relevant environmental related information on the construction contract necessary for him to carry out the site inspections. Site inspection results and associated recommendations for improvements to the environmental protection and pollution control efforts should be recorded and followed up by the Contractor in an agreed time-frame. The Contractor shall follow the procedures and time-frame as stipulated in the environmental site inspection, and the deficiency and action reporting system formulated by the ET, to report on any remedial measures subsequent to the site inspections.

The ER, IEC, ET and the Contractor should also carry out ad-hoc site inspections if significant environmental problems are identified. Inspections may also be required subsequent to receipt of a valid environmental complaint, or as part of the investigation work, as specified in the Event and Action Plan for the EM&A programme.

13.2 Compliance with Legal and Contractual Requirements

There are contractual environmental protection and pollution control requirements as well as environmental protection and pollution control laws in Hong Kong with which construction activities must comply.

In order that the works comply with the contractual requirements, all works method statements submitted by the Contractor to the ER for approval shall be sent to the ET Leader for vetting to ensure sufficient environmental protection and pollution control measures have been included. A copy shall also be sent to IEC for reference and providing comments on needed basis. The implementation schedule of mitigation measures is summarised in **Appendix 2-2**.

The ET Leader shall also 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 laws can be prevented.

The Contractor shall regularly copy relevant documents to the ET Leader and IEC so that works checking could be carried out effectively. The document shall at least include the updated Works Progress Reports, updated Works Programme, any application letters for different licence / permits under the environmental protection laws, and copies of all valid licences / permits. The site diary shall also be available for the ET Leader's inspection upon his request.

After reviewing the document, the ET Leader shall advise the IEC and Contractor of any non-compliance with contractual and legislative requirements on environmental protection and pollution control for them to take follow-up actions. If the ET Leader's review concludes that the current status on licence / permit application and any environmental protection and pollution control preparation works may result in potential violation of environmental protection and pollution control requirements, he shall also advise the Contractor, ER and IEC accordingly.

Upon receipt of the advice, the Contractor shall undertake immediate action to correct the situation. The ER shall follow up to ensure that appropriate action has been taken in order to satisfy contractual and legal requirements.

13.3 Environment Complaints

The following procedures should be undertaken upon receipt of any environmental complaint:

- (i) The Contractor to log complaint and date of receipt onto the complaint database and inform the ER, ET and IEC immediately;
- (ii) The Contractor to investigate, with the ER and ET, the complaint to determine its validity, and assess whether the source of the problem is due to construction works of the Project with the support of additional monitoring frequency and stations, if necessary;
- (iii) The Contractor to identify remedial measures in consultation with the IEC, ET and ER if a complaint is valid and due to the construction works of the Project;

- (iv) The Contractor to implement the remedial measures as required by the ER and to agree with the ET and IEC any additional monitoring frequency and stations, where necessary, for checking the effectiveness of the remedial measures;
- (v) The ER, ET and IEC to review the effectiveness of the Contractor's remedial measures and the updated situation;
- (vi) The ET to undertake additional monitoring and audit to verify the situation if necessary, and oversee that circumstances leading to the complaint do not recur;
- (vii) If the complaint is referred by the EPD, the Contractor to prepare interim report on the status of the complaint investigation and follow-up actions stipulated above, including the details of the remedial measures and additional monitoring identified or already taken, for submission to EPD within the time frame assigned by the EPD; and
- (viii) The ET to record the details of the complaint, results of the investigation, subsequent actions taken to address the complaint and updated situation including the effectiveness of the remedial measures, supported by regular and additional monitoring results in the monthly EM&A reports.

14 Reporting

14.1 General

Reports can be provided in an electronic medium upon agreeing the format with the ER and EPD. This would enable a transition from a paper / historic and reactive approach to an electronic / real time proactive approach. All the monitoring data (baseline and impact) shall also be submitted on diskettes or other approved media. The formats for air quality, noise and water quality monitoring data to be submitted shall be separately agreed.

The ET is responsible for establishing and maintaining a dedicated website throughout the entire construction period for publishing all the real-time relevant environmental monitoring data (for construction noise monitoring) and reporting (including but not limited to the baseline and impact monitoring). The ET shall propose the format and functionality of the website for agreement with the ER and IEC prior to publishing of data. Once the monitoring data are available (e.g. noise, dust, water quality etc) and vetted by the IEC, the ET is responsible to upload the relevant data to the dedicated website.

Types of reports that the ET shall prepare and submit include baseline monitoring report, monthly EM&A report (for both construction and operational phase) and final EM&A review report. In accordance with Annex 21 of the EIAO-TM, a copy of the monthly, quarterly and final review EM&A reports shall be made available to the Director of Environmental Protection.

14.2 Baseline Monitoring Report

The ET should prepare and submit a Baseline Environmental Monitoring Report at least one month before commencement of construction of the Project. Copies of the Baseline Environmental Monitoring Report should be submitted to the IEC, ER and EPD. The ET should liaise with the relevant parties on the exact number of copies require.

The baseline monitoring report shall include at least the following:

- (i) up to half a page executive summary;
- (ii) brief project background information;
- (iii) drawings showing locations of the baseline monitoring stations;
- (iv) monitoring results (in both hard and diskette copies) together with the following information:
 - monitoring methodology;
 - name of laboratory and types of equipment used and calibration details;
 - parameters monitored;
 - monitoring locations;
 - monitoring date, time, frequency and duration; and
 - quality assurance (QA) / quality control (QC) results and detection limits;

- (v) details of 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 monitoring results;
- (vi) determination of the Action and Limit Levels for each monitoring parameter and statistical analysis of the baseline data;
- (vii) revisions for inclusion in the EM&A Manual; and
- (viii) comments, recommendations and conclusions.

14.3 Monthly Monitoring Reports

The results and findings of all EM&A work required in the Manual shall be recorded in the monthly EM&A reports prepared by the ET and endorsed by the IEC. The EM&A report shall be prepared and submitted to EPD within 10 working days of the end of each reporting month, with the first report due the month after construction commences. Copies of each monthly EM&A report shall be submitted to the following parties: the IEC, the ER and EPD. Before submission of the first EM&A report, the ET shall liaise with the parties on the required number of copies and format of the monthly reports in both hard copy and electronic medium.

The ET shall review the number and location of monitoring stations and parameters every six months, or on as needed basis, in order to cater for any changes in the surrounding environment and the nature of works in progress.

First Monthly EM&A Report

The first monthly EM&A report shall include at least the following:

- (i) Executive summary (1-2 pages):
 - breaches of Action and Limit levels;
 - compliant log
 - notifications of any summons and successful prosecutions;
 - reporting changes; and
 - future key issues.
- (ii) Basic project information:
 - project organization including key personnel contact names and telephone numbers;
 - construction programme with fine tuning of construction activities showing the inter-relationship with environmental protection/mitigation measures for the month;
 - major activities being carried out on site during the month;
 - weather conditions that may affect the results;

- management structure; and
 - works undertaken during the month.
- (iii) Environmental status:
- advice on the status of statutory environmental compliance such as the status of compliance with the environmental permit (EP) conditions under the EIAO, submission status under the EP and implementation status of mitigation measures;
 - works undertaken during the month with illustrations (such as location of works, daily excavation rate, etc.); and
 - drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations (with co-ordinates of the monitoring locations).
- (iv) A brief summary of EM&A requirements including:
- all monitoring parameters;
 - environmental quality performance limits (Action and Limit levels);
 - Event-Action Plans;
 - environmental mitigation measures, as recommended in the project EIA study final report; and
 - environmental requirements in contract documents.
- (v) Implementation status
- advice on the implementation programme, impact prediction review procedures, implementation status of environmental protection and pollution control / mitigation measures, as recommended in the project EIA Report, summarised in the updated implementation schedule.
- (vi) Monitoring results (in both hard and diskette copies) together with the following information:
- monitoring methodology;
 - name of laboratory and types of equipment used and calibration details;
 - monitoring parameters;
 - monitoring locations;
 - monitoring date, time, frequency, and duration;
 - weather conditions during the period;
 - any other factors which might affect the monitoring results; and
 - QA / QC results and detection limits.
- (vii) Report on non-compliance, complaints, and notifications of summons and successful prosecutions:

- record of all non-compliance (exceedances) of the environmental quality performance limits (Action and 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 notification of summons and successful prosecutions for breaches of current environmental protection / pollution control legislation, including locations and nature of the breaches, investigation, follow-up actions taken, results and summary;
- review of the reasons for and the implications of non-compliances, 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.

(viii) Others

- an account of the future key issues as reviewed from the works programme and work method statements;
- advice on the solid and liquid waste management status;
- submission of implementation status proforma, proactive environmental protection proforma, regulatory compliance proforma, site inspection proforma, data recovery schedule and complaint log summarizing the EM&A reporting period;
- record of any project changes from the originally proposed as described in the EIA (e.g. construction methods, mitigation proposals, design changes, etc.); and
- comments (for examples, comparison of project impact predictions with actual impacts for the purpose of assessing the accuracy of predictions, the assessment of the effectiveness of the environmental management systems, practices and procedures, effectiveness and efficiency of the mitigation measures), recommendations (for examples, any improvement in the EM&A programme) and conclusions.

(ix) Appendices

- Action and Limit levels;
- graphical plots of trends of the monitoring parameters at key stations over the reporting periods for representative monitoring stations annotated against the following:
 - a) major activities being carried out on site during the period;
 - b) weather conditions during the period; and
 - c) any other factors that 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.

Subsequent monthly EM&A Reports

Subsequent monthly EM&A reports shall include at least the following:

- (i) Executive summary (1-2 pages):
 - breaches of Action and Limit levels;
 - compliant log
 - notifications of any summons and successful prosecutions;
 - reporting changes; and
 - future key issues.
- (ii) Basic project information:
 - project organization including key personnel contact names and telephone numbers;
 - construction programme with fine tuning of construction activities showing the inter-relationship with environmental protection/mitigation measures for the month;
 - major activities being carried out on site during the month;
 - weather conditions that may affect the results;
 - management structure;
 - works undertaken during the month; and
 - any updates as needed to the scope of works and construction methodologies.
- (iii) Environmental status:
 - advice on the status of statutory environmental compliance such as the status of compliance with the environmental permit (EP) conditions under the EIAO, submission status under the EP and implementation status of mitigation measures;
 - works undertaken during the month with illustrations (such as location of works, daily excavation rate, etc.); and
 - drawings showing the project are, any environmental sensitive receivers and the locations of the monitoring and control stations.
- (iv) Implementation status
 - advice on the implementation programme, impact prediction review procedures, implementation status of environmental protection and

pollution control / mitigation measures, as recommended in the project EIA Report, summarised in the updated implementation schedule.

- (v) Monitoring results (in both hard and diskette copies) together with the following information:
- monitoring methodology;
 - name of laboratory and types of equipment used and calibration details;
 - monitoring parameters;
 - monitoring locations;
 - monitoring date, time, frequency, and duration;
 - weather conditions during the period;
 - any other factors which might affect the monitoring results; and
 - QA / QC results and detection limits.
- (vi) Report on non-compliance, complaints, and notifications of summons and successful prosecutions:
- record of all non-compliance (exceedances) of the environmental quality performance limits (Action and 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 notification of summons and successful prosecutions for breaches of current environmental protection / pollution control legislation, including locations and nature of the breaches, investigation, follow-up actions taken, results and summary;
 - review of the reasons for and the implications of non-compliances, 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.
- (vii) Others
- an account of the future key issues as reviewed from the works programme and work method statements;
 - advice on the solid and liquid waste management status;
 - submission of implementation status proforma, proactive environmental protection proforma, regulatory compliance proforma, site inspection proforma, data recovery schedule and complaint log summarizing the EM&A reporting period;

- record of any project changes from the originally proposed as described in the EIA (e.g. construction methods, mitigation proposals, design changes, etc.); and
- comments (for examples, comparison of project impact predictions with actual impacts for the purpose of assessing the accuracy of predictions, the assessment of the effectiveness of the environmental management systems, practices and procedures, effectiveness and efficiency of the mitigation measures), recommendations (for examples, any improvement in the EM&A programme) and conclusions.

(viii) Appendices

- Action and Limit levels;
- graphical plots of trends of the monitoring parameters at key stations over the past four reporting periods for representative monitoring stations annotated against the following:
 - d) major activities being carried out on site during the period;
 - e) weather conditions during the period; and
 - f) any other factors that 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.

14.4 Quarterly EM&A Report

A quarterly EM&A summary report shall be produced and shall contain at least the following 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.

- (i) Executive summary (1 - 2 pages):
- breaches of Action and Limit levels;
 - compliant log
 - notifications of any summons and successful prosecutions;
 - reporting changes; and
 - future key issues.
- (ii) Basic project information:
- project organization including key personnel contact names and telephone numbers;

- construction programme with fine tuning of construction activities showing the inter-relationship with environmental protection/mitigation measures for the quarter;
 - major activities being carried out on site during the quarter;
 - weather conditions that may affect the results;
 - management structure;
 - works undertaken during the quarter; and
 - any updates as needed to the scope of works and construction methodologies.
- (iii) Environmental status:
- advice on the status of statutory environmental compliance such as the status of compliance with the environmental permit (EP) conditions under the EIAO, submission status under the EP and implementation status of mitigation measures;
 - works undertaken during the month with illustrations (such as location of works, daily excavation rate, etc.); and
 - drawings showing the project are, any environmental sensitive receivers and the locations of the monitoring and control stations.
- (iv) Implementation status
- advice on the implementation programme, impact prediction review procedures, implementation status of environmental protection and pollution control / mitigation measures, as recommended in the project EIA Report, summarised in the updated implementation schedule.
- (v) Monitoring results (in both hard and diskette copies) together with the following information:
- monitoring methodology;
 - name of laboratory and types of equipment used and calibration details;
 - monitoring parameters;
 - monitoring locations;
 - monitoring date, time, frequency, and duration;
 - weather conditions during the quarter;
 - any other factors which might affect the monitoring results; and
 - QA / QC results and detection limits.
- (vi) Report on non-compliance, complaints, and notifications of summons and successful prosecutions:
- record of all non-compliance (exceedances) of the environmental quality performance limits (Action and 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 notification of summons and successful prosecutions for breaches of current environmental protection / pollution control legislation, including locations and nature of the breaches, investigation, follow-up actions taken, results and summary;
- review of the reasons for and the implications of non-compliances, 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.

(vii) Others

- an account of the future key issues as reviewed from the works programme and work method statements;
- advice on the solid and liquid waste management status;
- submission of implementation status proforma, proactive environmental protection proforma, regulatory compliance proforma, site inspection proforma, data recovery schedule and complaint log summarizing the EM&A reporting quarter;
- record of any project changes from the originally proposed as described in the EIA (e.g. construction methods, mitigation proposals, design changes, etc.); and
- comments (for examples, comparison of project impact predictions with actual impacts for the purpose of assessing the accuracy of predictions, the assessment of the effectiveness of the environmental management systems, practices and procedures, effectiveness and efficiency of the mitigation measures), recommendations (for examples, any improvement in the EM&A programme) and conclusions.

(viii) Appendices

- Action and Limit levels;
- graphical plots of trends of the monitoring parameters at key stations over the past four reporting periods for representative monitoring stations annotated against the following:
 - g) major activities being carried out on site during the period;
 - h) weather conditions during the quarter; and
 - i) any other factors that might affect the monitoring results.
- monitoring schedule for the present and next reporting quarter;

- cumulative statistics on complaints, notifications of summons and successful prosecutions; and
- outstanding issues and deficiencies.

14.5 Final EM&A Review Reports

The EM&A programme should be terminated upon the completion of the construction activities that have the potential to result in significant environmental impacts. The deadline of Final EM&A Review Report shall be submitted to EPD within 2 months after the termination of EM&A programme.

Prior to the proposed termination, it may be advisable to consult relevant local communities. The termination of EM&A programme shall be determined on the following basis:

- (i) Completion of construction activities and insignificant environmental impacts of the remaining outstanding construction works;
- (ii) Trends analysis to demonstrate the narrow down of monitoring exceedances due to construction activities and the return of ambient environmental conditions in comparison with baseline data;
- (iii) No environmental complaint and prosecution; and
- (iv) All the required monitoring works (for construction and operational phase) were completed.

The proposed termination should only be implemented after the proposal has been endorsed by the IEC, the Engineer and the Project Proponent followed by approval from the Director of Environmental Protection.

The final EM&A report should contain at least the following information:

- (i) Executive summary (1-2 pages);
- (ii) Drawings showing the project are, any environmental sensitive receivers and the locations of the monitoring and control stations;
- (iii) Basic project information including a synopsis of the project organization, programme, contacts of key management, and a synopsis of work undertaken during the entire construction period;
- (iv) A brief summary of EM&A requirements including:
 - environmental mitigation measure, as recommended in the project EIA Report;
 - environmental impact hypotheses tested;
 - environmental quality performance limits (Action and Limit levels);
 - all monitoring parameters;
 - Event and Action Plans;

- (v) Advice on the implementation status of environmental protection and pollution control / mitigation measures, as recommended in the project EIA Report, summarized in the updated implementation schedule;
- (vi) Drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations;
- (vii) Graphical plots and the statistical analysis of the trends of monitoring parameter over the course of the project, including the post-project monitoring for all monitoring stations annotated against:
 - the major activities being carried out on site during the period;
 - the return of ambient environmental conditions in comparison with baseline data;
 - weather conditions during the period; and
 - any other factors which might affect the monitoring results;
- (viii) Provide clear-cut decisions on the environmental acceptability of the project with reference to the specific impact hypothesis;
- (ix) Advice on the solid and liquid waste management status;
- (x) A summary of non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);
- (xi) A review of the reasons for and the implications of non-compliance including review of pollution sources and working procedures as appropriate;
- (xii) A description of the actions taken in the event of non-compliance and any follow-up involved;
- (xiii) A summary record of all complaints received (written or verbal) for each media, liaison and consultation undertaken, notifications of summons and successful prosecutions for breaches of the current environmental/pollution control legislations, locations and nature of the breaches, investigation, follow-up actions taken and results;
- (xiv) Compare and contrast the EM&A data with EIA predictions and annotate with explanation for any discrepancies in EIA recommendations;
- (xv) Review the monitoring methodology adopted and with the benefit hindsight;
- (xvi) Comments (for examples, a review of the practicality, effectiveness and efficiency of the mitigation measures and of the performance of the environmental management system, that is, of the EIA process and overall EM&A programme); and
- (xvii) Recommendations and conclusions (for example, a review of practicality and effectiveness of the overall EIA process and EM&A programme (e.g. monitoring methodology adopted) including cost-effectively identify deterioration and to initiate prompt effective mitigatory action when necessary, state the return of ambient and/or the predicted scenario as per EIA findings).

14.6 Data Keeping

No site-based documents (such as monitoring field records, laboratory analysis records, site inspection forms, etc.) are required to be included in the monthly EM&A reports. However, any such 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. Monitoring data shall also be recorded in magnetic media form, and the software copy must be available upon request. Data format shall be agreed with EPD. All documents and data shall be kept for at least one year following completion of the construction contract.

14.7 Interim Notifications of Environmental Quality Limit Exceedances

With reference to the Event and Action Plans, when the environmental quality performance limits are exceeded and if they are proven to be valid, the ET should immediately notify the IEC and EPD, as appropriate. The notification should be followed up with advice to the IEC and EPD on the results of the investigation, proposed actions and success of the actions taken, with any necessary follow-up proposals. A sample template for the interim notification is presented in **Appendix 14-1**.