

3. NOISE IMPACT

Introduction

3.1 In this section, the requirements, methodology, equipment, monitoring locations, criteria and protocols for the monitoring and audit of noise impacts during the construction phase of the Project are presented. Noise levels shall be monitored to evaluate the construction noise impact during the construction phase. The EIA findings confirmed that proper designs of the proposed chlorination plant and dechlorination plant would control the potential noise impacts at noise sensitive receivers within acceptable levels, thus operational phase noise monitoring will not be required.

Noise Parameters

3.2 The construction noise level shall be measured in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}). $L_{eq (30 \text{ minutes})}$ shall be used as the monitoring parameter for the time period between 0700 and 1900 hours on normal weekdays. For all other time periods, $L_{eq (5 \text{ minutes})}$ shall be employed for comparison with the Noise Control Ordinance (NCO) criteria.

3.3 Supplementary information for data auditing, statistical results such as L_{10} and L_{90} shall also be obtained for reference. A sample data record sheet based on the one presented in the *EM&A Guidelines for Development Projects in Hong Kong*, is shown in [Appendix B](#). The ET Leader may modify the data record sheet for this EM&A programme, of which the format should be agreed by the ER and the IEC.

Monitoring Equipment

3.4 As referred to in the Technical Memorandum (TM) issued under the NCO, sound level meters in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications shall be used for carrying out the noise monitoring. Immediately prior to and following each noise measurement, the accuracy of the sound level meter shall be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements shall be accepted as valid only if the calibration levels before and after the noise measurement agree to within 1.0 dB.

3.5 Noise measurements shall not be made in fog, rain, wind with a steady speed exceeding 5 m s^{-1} or wind with gusts exceeding 10 m s^{-1} . The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m s^{-1} .

3.6 The ET is responsible for providing sufficient and suitable noise measuring equipment and associated instrumentation for carrying out the baseline monitoring, regular impact monitoring and ad hoc monitoring. All the equipment and associated instrumentation shall be clearly labelled.

Monitoring Locations

3.7 The EIA Report indicated that unmitigated construction activities would cause noise exceedance at the barrack buildings located to the northeast of the proposed dechlorination plant during the particular construction period. The location designated for construction noise monitoring is listed in **Table 3.1** and illustrated in [Figure 3.1](#). 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 EPD and agreement from the ER and the IEC before baseline monitoring commences.

Table 3.1 Noise Monitoring Stations during Construction Phase

Identification No.	Noise Monitoring Location
NM1	Barrack Buildings

3.8 When alternative monitoring locations are proposed, the monitoring locations shall be chosen based on the following criteria:

- Monitoring at sensitive receivers close to the major site activities which are likely to have noise impacts;
- Monitoring at the noise sensitive receivers as defined in the Technical Memorandum; and

- Assurance of minimal disturbance to the occupants during monitoring.
- 3.9 The monitoring station shall normally be at a point 1 m from the exterior of the noise sensitive facade and be at a position 1.2 m above ground. If there is a problem with access to the normal monitoring position, an alternative position shall be chosen, and a correction to the measurements shall be made. For reference, a correction of +3 dB(A) shall be made to the free field measurements. The ET shall agree with the IEC on the monitoring position and the corrections adopted. Once the positions for the monitoring stations are chosen, the baseline monitoring and the impact monitoring shall be carried out at the same positions.

Baseline Monitoring

- 3.10 The ET shall carry out baseline noise monitoring prior to the commencement of the construction works. The baseline monitoring shall be carried out daily for a period of at least two weeks. Before commencing the baseline monitoring, the ET shall develop and submit to the IEC the baseline monitoring programme such that the IEC can conduct on-site audit to ensure accuracy of the baseline monitoring results.
- 3.11 In exceptional cases, when insufficient baseline monitoring data or questionable results are obtained, the ET Leader shall liaise with the ER, EPD and IEC to agree on an appropriate set of data to be used as a baseline reference and submit to the ER and IEC for agreement and EPD for approval.

Impact Monitoring

- 3.12 Noise monitoring shall be carried out at the designated monitoring station. The monitoring frequency shall depend on the scale of the construction activities. The following is an initial guide on the regular monitoring frequency on a weekly basis when noise generating activities are underway:
- one set of measurement between 0700 and 1900 hours on normal weekdays.
- 3.13 If construction works are extended to include works during the hours of 1900 – 0700 as well as public holidays and Sundays, additional weekly impact monitoring shall be carried out during respective restricted hours periods. Applicable permits under NCO shall be obtained by the Contractor.
- 3.14 In case of non-compliance with the construction noise criteria, more frequent monitoring, as specified in the Action Plan in **Table 3.3**, shall be carried out. This additional monitoring shall be continued until the recorded noise levels are rectified or demonstrated to be unrelated to the construction activities.

Event and Action Plan for Construction Noise

- 3.15 The Action and Limit levels for construction noise are defined in **Table 3.2**. Should non-compliance of the criteria occur, action in accordance with the Event and Action Plan in **Table 3.3** shall be implemented.

Table 3.2 Action and Limit Levels for Construction Noise

Time Period	Action Level	Limit Level
0700 – 1900 hours on normal weekdays	When one documented complaint is received	75 dB(A)

Mitigation Measures

Construction Phase

- 3.16 The EIA report indicated that construction activities at the proposed dechlorination plant would cause noise exceedance at the barrack buildings. Therefore, appropriate mitigation measures and good site practices are recommended to be properly implemented. The mitigation measures recommended in the EIA report are summarised below:
- Use of silenced types of PME, which should be in accordance with BS 5228: Part 1, 1997 during construction
 - Implementation of the following good site practices:

- only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program;
- silencers or mufflers on construction equipment shall be utilised and shall be properly maintained during the construction program;
- mobile plant, if any, shall be sited as far away from NSRs as possible;
- machines and plant (such as trucks) that may be in intermittent use shall be shut down between work periods or throttled down to a minimum;
- plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and
- material stockpiles and other structures shall be effectively utilised, wherever practicable, in screening noise from on-site construction activities.

3.17 The implementation schedule for the recommended mitigation measures is presented in [Appendix A](#).

Operational Phase

3.18 Based on the design information, the pumpsets will be housed in enclosed environment, wherever practicable, to reduce the noise impact. Other noise mitigation measures suggested in the EIA Study will be implemented.

3.19 The implementation schedule for the recommended mitigation measures is presented in [Appendix A](#).

Table 3.3 Event/Action Plan for Construction Noise

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level being exceeded	<ol style="list-style-type: none"> 1. Notify ER, IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the IEC and Contractor on remedial measures required; 5. Increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Review the investigation results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Advise the ER on the effectiveness of the proposed remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC and ER; 2. Implement noise mitigation proposals.
Limit Level being exceeded	<ol style="list-style-type: none"> 1. Inform IEC, ER, Contractor and EPD; 2. Repeat measurements to confirm findings; 3. Increase monitoring frequency; 4. Identify source and investigate the cause of exceedance; 5. Carry out analysis of Contractor's working procedures; 6. Discuss with the IEC, Contractor and ER on remedial measures required; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; 5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC and ER within 3 working days of notification; 3. Implement the agreed proposals; 4. Submit further proposal if problem still not under control; 5. Stop the relevant portion of works as instructed by the ER until the exceedance is abated.