12 Noise Impact

12.1 Introduction

12.1.1 This Section provides an evaluation of the potential noise impacts arising from the construction and operation of the proposed Project. Appropriate mitigation measures have been recommended, where necessary, in order to mitigate any unacceptable impacts.

12.2 Environmental Legislation, Standards and Criteria

Construction Phase

12.2.1 The principal legislation relating to the control of construction noise of the Project is the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499). The Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM), issued under the EIAO, provides guidelines and noise criteria for evaluating noise impacts. The assessment criteria are defined in Annex 5 of the EIAO-TM. The guidelines for noise assessment are provided in Annex 13 of the EIAO-TM.

12.2.2 The Noise Control Ordinance (NCO) (Cap. 400) also provides means to assess construction noise impacts. A number of Technical Memoranda (TMs) have been issued under the NCO to stipulate control approaches and criteria. The Technical Memorandum on Noise from Construction Work Other than Percussive Piling (GW-TM) provides the guidelines for controlling the construction noise from powered mechanical equipment (PME) in general construction works during the restricted hours. The Technical Memorandum on Noise from Construction Works in Designated Areas (DA-TM) provides the guidelines for controlling the use of Specified Powered Mechanical Equipment (SPME) and the undertaking of Prescribed Construction Work (PCW) during the restricted hours in designated areas.

General Construction Works during Normal Working Hours

12.2.3 Under the EIAO, potential noise impact arising from general construction works during normal working hours (i.e. 0700 to 1900 hours on any day not being a Sunday or general holiday) at 1 m from the external façade of the noise sensitive uses, which rely on opened windows for ventilation, is to be assessed in accordance with the noise criteria specified in the EIAO-TM. The EIAO-TM noise standards are presented in **Table 12.1**.

Table 12.1 EIAO-TM Day-time Construction Noise Standards

Noise Sensitive Uses	Noise Standard 0700 to 1900 hours on any day not being a Sunday or general holiday $L_{eq, 30\ min}$ (dB(A))
• All domestics premises including temporary housing accommodation	75
• Hotels and hostels	75
• Educational Institutions including kindergartens, nurseries and all others where unaided voice communication is required	70 (During normal periods) 65 (During examination periods)

Notes:
(1) The above standards apply to uses which rely on opened windows for ventilation.
(2) The above standards shall be viewed as the maximum permissible noise levels assessed at 1m from the external façade.

General Construction Works during Restricted Hours

12.2.4 The NCO provides statutory controls on general construction works during restricted hours (i.e. 1900 to 0700 hours or any time on Sundays or general holidays). The use of PME for carrying out construction works during these restricted hours would require a Construction Noise Permit (CNP). The Noise Control Authority will assess all CNP applications on a case-by-case basis and, in doing so the authority advises that they will be guided by the GW-TM.

12.2.5 When assessing an application for CNP for the use of PME during restricted hours, the Noise Control Authority will compare the Acceptable Noise Levels (ANLs) specified in the GW-TM with the Corrected Noise Levels (CNLs) (i.e. after accounting for factors such as barrier effects and reflections) associated with the proposed PME operations. The NCO requires that noise levels from construction at affected Noise Sensitive Receiver (NSR) be less than the specified ANL. The ANLs are related to the inherent noise sensitivity of the noise receiver areas in question. Different Area Sensitivity Ratings (ASRs), i.e. A, B or C (see **Table 12.2**), have been established to reflect the background characteristics of different areas. Each noise receiver area is assigned an ASR based on its predominant land use and the presence, if any, of Influencing Factors (IFs) such as nearby industrial areas, major roads or airports. The appropriate ASR for the NSR is determined with reference to **Table 12.2**.

Table 12.2 Area Sensitivity Ratings (ASRs)

Type of Area Containing NSR	Degree to which NSR is affected by Influencing Factor		
	Not Affected	Indirectly Affected	Directly Affected
Rural area, including country parks or village type developments	A	B	B
Low density residential area consisting of low-rise or isolated high-rise developments	A	B	C
Urban area	B	C	C
Area other than those above	B	B	C

Notes:
The following definitions apply:
(a) "Country Park" means an area that is designated as a country park pursuant to section 14 of the Country Parks Ordinance;
(b) "directly affected" means that the NSR is at such a location that noise generated by the IF is readily noticeable at the NSR and is a dominant feature of the noise climate of the NSR;
(c) "indirectly affected" means that the NSR is at such a location that noise generated by the IF, whilst noticeable at the NSR, is not a dominant feature of the noise climate of the NSR;
(d) "not affected" means that the NSR is at such a location that noise generated by the IF is not noticeable at the NSR; and
(e) "urban area" means an area of high density, diverse development including a mixture of such elements as industrial activities, major trade or commercial activities and residential premises.

12.2.6 The relevant ANLs for each ASR are shown in **Table 12.3**.

Table 12.3 Acceptable Noise Levels (ANLs) for General Construction Works to be carried out during Restricted Hours (GW-TM)

Time period	Area Sensitivity Rating $L_{eq, 5\ min}$ (dB(A))		
	A	B	C
All days during the evening (i.e. 1900-2300 hrs) and general holidays (including Sundays) during the day and evening (i.e. 0700-2300 hrs)	60	65	70
All days during the night-time (i.e. 2300-0700 hrs)	45	50	55

Note:
(1) The above standard applies to uses which rely on opened windows for ventilation.

12.2.7 The Noise Control Authority will consider a well-justified CNP application for construction works within restricted hours as guided by the relevant Technical Memorandum issued under the NCO. The Noise Control Authority will take into account adjoining land uses and any previous complaints against construction activities at the site before making a decision. Factors influencing the outcome of a CNP application, such as the assigning of ANLs, would be determined by the Noise Control Authority at the time of the application review based on the prevailing site conditions which may change from time to time.

Percussive Piling

12.2.8 Percussive piling is prohibited between 1900 and 0700 hours on any days not being a general holiday and at any time on Sunday or general holiday. A CNP is required for the carrying out of percussive piling between 0700 and 1900 hours on any day not being a general holiday. Technical Memorandum on Noise from Percussive Piling (PP-TM) sets out the requirements for working and determination of the permitted hours of operations for the CNP applications. The permitted hours of operations would be 3, 5 or 12 hours per day depending on the types of percussive piling and the predicted noise impact at NSRs.

Operational Phase

12.2.9 Fixed plant noise associated with the operation of a project is controlled under Section 13 of the NCO, and the Technical Memorandum for the Assessment of Noise from Places Other than Domestic Premises, Public Places or Construction Sites (IND-TM).

12.2.10 The noise criteria, in terms of ANLs, stipulated in the IND-TM apply for all days and general holidays. The ANLs are dependent on the ASR of the NSRs and the time of the day and are presented in **Table 12.4**.

Table 12.4 Acceptable Noise Level for Fixed Plant Noise

Time Period	ANL $L_{eq\ 30\text{-}min}$, dB(A)		
	ASR A	ASR B	ASR C
Day (0700 to 1900 hours)	60	65	70
Evening (1900 to 2300 hours)	60	65	70
Night (2300 to 0700 hours)	50	55	60

12.2.11 In any event, the above Area Sensitivity Ratings are for indicative assessment only. It should be noted that the fixed noise sources are controlled under Section 13 of the NCO. At the time of investigation, the Noise Control Authority shall determine the noise impact from the concerned fixed noise sources on the basis of prevailing legislation and practices being in force, and taking

into account the existing adjoining land uses. Nothing in the EIA Report shall bind the Noise Control Authority in the context of law enforcement against all the fixed noise sources being assessed.

12.2.12 The EIAO-TM recommends that the level of the intruding noise at the façade of the nearest sensitive use should be at least 5 dB(A) below the appropriate ANL or, in the case of background noise being 5 dB(A) lower than the ANL, the predicted noise level arising from the operation of the proposed Project at the façade of the nearest sensitive use should not exceed the background noise level. The closest NSRs are village type developments located to the north and northeast of Tai Po Industrial Estate (TPIE) outside 500m from the Project site. It is not necessary to assign the Area Sensitive Rating for these NSRs.

12.3 Description of Environment

12.3.1 The existing Tai Po Sewage Treatment Works (TPSTW) and the proposed expansion site are located at the south-eastern side of TPIE as shown in **Figure 12.1**. To the east of the Project site is Shuen Wan Restored Landfill, whereas the south, west and north are industrial buildings. The prevailing noise climate of assessment area is dominated by the local traffic and industrial activities within Tai Po Industrial Estate.

12.4 Noise Sensitive Receivers

12.4.1 Representative noise sensitive receivers (NSRs) were identified according to the criteria set out in the EIAO-TM. The assessment area for noise impact assessment area for noise impact assessment is defined by a distance of 300m from the Project boundary as specified in the Environmental Impact Assessment (EIA) Study Brief. The assessment boundary is shown in **Figure 12.1**.

12.4.2 The 300 m study area is within the Tai Po Outline Zoning Plan (OZP) No. S/TP/30. The relevant OZP, Development Permission area Plans, Outline Development Plans and Layout Plans published by Lands Department and the land use and development applications approved by the Town Planning Board have been reviewed. Site survey has also been conducted for identifying NSRs.

12.4.3 Based on the review and site visit, no existing, committed or planned NSR was identified within 300m from the boundary of the Project Area and works of the Project. The staff quarters of TPSTW as identified in approved EIA Report for TPSTW Stage V (Register No. AEIAR-081/2004) is no longer in use as confirmed by the Drainage Services Department (DSD). The planned residential development at Ting Kok, which is located over 500m away to the north-east of the Project site, is identified as the nearest representative NSR as shown in **Figure 12.1**. Other NSRs such as Casa Brava to the north and Fortune Garden to the east do not have direct line of sight to the Project site (as they are blocked by existing buildings or topography).

12.5 Assessment Methodology

12.5.1 Since no existing, committed and planned NSR was identified within 300m from the boundary of this Project, quantitative noise assessments for the construction and operation of the proposed Project are considered not necessary. Qualitative assessment on construction noise and fixed noise sources impact assessments have been conducted for the Project.

12.6 Identification and Evaluation of Noise Impacts

Construction Phase

12.6.1 Potential source of noise impact during construction phase of the Project would be the use of PME for various construction activities. Major construction works of the Project would include demolition of existing facilities of TPSTW, foundation and superstructure works for the upgraded TPSTW. The construction of this Project is tentatively scheduled to commence in mid-2025 for completion in 2036. Since no NSR was identified within the 300m assessment area of this Project, no unacceptable construction noise impact would be expected due to this Project. Percussive piling and general construction works using power mechanical equipment during restricted hours are not required for the construction of the Project.

12.6.2 Relevant projects near the Project site are the Shuen Wan Golf Course (EIAO Register No. AEIAR-221/2019), the Tolo Harbour Effluent Export Scheme (THEES) upgrading proposed under "Agreement No. CE 13/2015 (DS)" and the Development of Organic Waste Pre-treatment Centre (New Territories East) proposed under "Agreement No. CE 5/2021 (EP)".

12.6.3 The proposed Shuen Wan Golf Course (SWGC) mainly involves the development of an 18-hole golf course within the existing Shuen Wan Restored Landfill (SWRL) to the east of the Project site. Location of the SWRL is shown in **Figure 12.1**. The construction of the proposed SWGC is scheduled for completion by 2023 and therefore would not contribute any cumulative construction noise impact with this Project.

12.6.4 The proposed THEES upgrading works involve the expansion of the Tai Po Effluent Pumping Station (TPEPS) within the existing TPSTW site, installation of a new submarine pipeline (across the inner Tolo Harbour) by the Horizontal Directional Drilling (HDD) method and laying of a new effluent rising mains (connecting the new TPEPS to the new submarine pipeline). The proposed Organic Waste Pre-treatment Centre (OWPC) involves the re-development of the existing Shuen Wan Leachate Pre-treatment Works and the existing pilot-scale Food Waste Pre-treatment Facilities to the north of the existing TPSTW site into a full-scale OWPC. Locations of the proposed THEES upgrading and OWPC are shown in **Figure 12.1**.

12.6.5 Based on the best available information, the tentative construction period for the proposed THEES upgrading and the proposed OWPC are 2025-2031 and 2025-2029 respectively. The construction works limits for the proposed THEES upgrading and the planned OWPC would be located over 500m from the closest representative NSR of this Project (i.e. the planned residential development at Ting Kok). Due to the large buffer distance, no unacceptable cumulative construction noise impact would arise from the concurrent projects.

Operational Phase

12.6.6 Potential fixed plants noise would be generated from the operation of the pumps, air blowers, motors, ventilation fans and extraction fans of deodorisation units, etc. in the upgraded TPSTW. The pumps, air blowers and motors would be located within reinforced concrete buildings, while ventilation fans would be provided at the ventilation vents of these buildings. The upgraded TPSTW will be operated 24 hours per day, 7 days per week throughout the year. Since no NSR is identified within the 300m assessment boundary of this Project, no unacceptable operational fixed plant noise impact would be expected due to this Project.

12.6.7 The fixed plants of the proposed THEES upgrading and OWPC would be located over 500m from the closest representative NSR of this Project (i.e. the planned residential development at Ting Kok). According to the information presented in the EIA Report for SWGC (EIAO Register No. AEIAR-221/2019), one fixed plant of the proposed SWGC is located about 200m from the closest representative NSR of this Project (i.e. planned residential development at Ting Kok) but this

fixed plant is over 300m from the boundary of this Project. Due to the large buffer distance, unacceptable cumulative operational noise impact would not be expected.

12.6.8 During operational phase of the Project, vehicles from the Project site would pass Dai Cheong Street to Ting Kok Road or Yuen Shin Road. The maximum number of vehicles due to the operation of the upgraded TPSTW is anticipated to be 10 nos. vehicles per hour. Therefore, the increased noise level due to the operation of the upgraded TPSTW at Ting Kok Road and Yuen Shin Road would be insignificant. Unacceptable off-site road traffic impact would not be expected.

12.7 Mitigation Measures

Construction Phase

12.7.1 The following good site practices should be adopted during construction of the Project to minimise noise impact to the surroundings:

- Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction phase;
- Silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction phase;
- Mobile plant should be sited as far away from sensitive uses as possible;
- Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum;
- Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from sensitive uses;
- Material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities. And
- Noisy construction activities such as road surface breaking, should be scheduled to less sensitive hours during the day, e.g. midday, as far as practicable.

12.7.2 The feasibility of adopting quieter construction methods and use of quieter and more environmentally friendly construction equipment listed in EPD website [1] should be considered and explored to minimize the construction noise impact to the surroundings.

Operational Phase

12.7.3 During operation, the noise emitting plants (pumps, air blowers, etc.) would be enclosed within building structures. Since no existing, committed and planned NSR was identified within assessment area of the Project, there would be no adverse noise impact generated from the Project operation. No mitigation measure is proposed.

12.8 Environmental Monitoring and Audit Requirements

12.8.1 Since no existing, committed or planned NSR is identified within the assessment area, noise monitoring and audit is considered unnecessary.

[1] https://www.epd.gov.hk/epd/misc/construction_noise/contents/index.php/en/index.html

12.9 Conclusion

12.9.1 Noise impact generated from the Project has been reviewed. Based on the latest available information, no existing, committed or planned NSR is identified within the 300m assessment area. No unacceptable noise impact would be generated from the construction and operation of the Project.