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Consultancy Agreement No. C1502

Environmental Impact Assessment Study for Tuen Mun South Extension

Environmental Impact Assessment Report
Executive Summary

May 2022

A16 Station

Tuen Mun South Station

Tuen Mun
Station

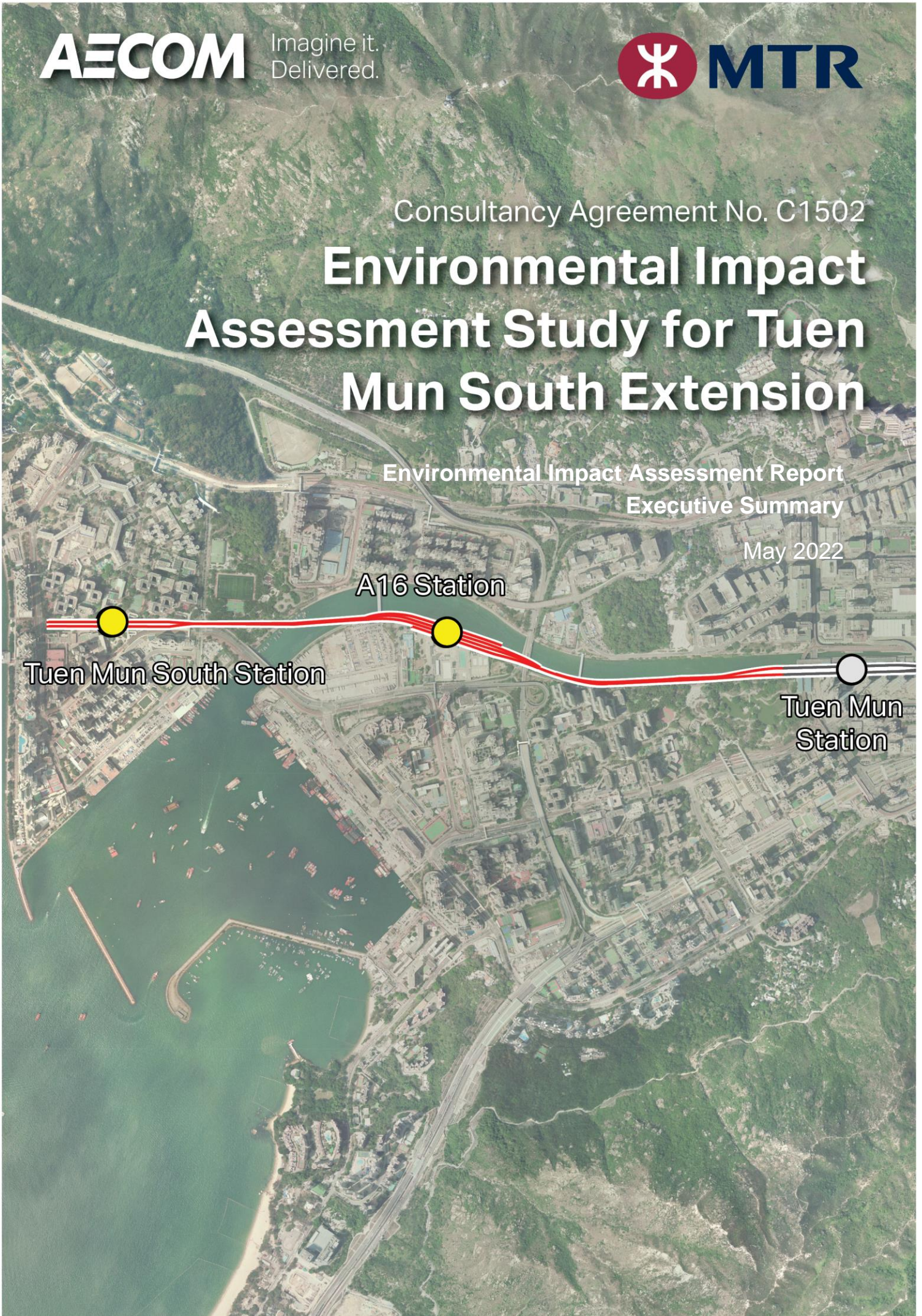


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1 INTRODUCTION

1.1 Background

1.1.1 The Tuen Mun South Extension (TME) (hereinafter referred to as “the Project”) is one of the seven recommended railway schemes in the Railway Development Strategy 2014 (“RDS-2014”). The Project will extend the Tuen Ma Line (TML), from Tuen Mun (TUM) Station southwards by about 2.4 km, terminating at a new station near Tuen Mun Ferry Pier (i.e. Tuen Mun South (TMS) Station) with an intermediate station at Tuen Mun Area 16 (i.e. A16 Station).

1.1.2 The Project will improve railway access for the community south of the current Tuen Mun town centre and connectivity to Tuen Mun Ferry Pier.

1.1.3 A Project Profile (No. PP-604/2020) for the Project was submitted to Environmental Protection Department (EPD) for application of an EIA Study Brief, which was subsequently issued on 23 July 2020 (No. ESB-332/2020).

1.1.4 The alignment of the Project is shown in **Figure No. [C1502/C/TME/ACM/M50/101](#)**, while the proposed works areas/works sites are shown in **Figure Nos. [C1502/C/TME/ACM/M50/102](#) and [103](#)**.

1.2 Scope of Project

1.2.1 The Project as presented in **Figure No. [C1502/C/TME/ACM/M50/101](#)** comprises the following key elements:

- i. Construction and operation of 2.4-km extension of the viaduct structure from TUM Station to the new TMS Station;
- ii. Construction and operation of two new stations, namely TMS Station and A16 Station;
- iii. Construction and operation of Stations associated facilities; and
- iv. Construction and operation of a railway siding adjacent to A16 Station.

1.1.5 The Project will comprise the following Designated Projects (DPs) under Part I, Schedule 2 of the EIA Ordinance (EIAO):

- Item A.2 – A railway and its associated station;
- Item A.4 – A railway siding, depot, maintenance workshop, marshalling yard or goods yard; and
- Item A.8 – A railway bridge more than 100m in length between abutments.

1.3 Environmental Impact Assessment Study

1.1.6 An environmental impact assessment (EIA) study was conducted for the Project in accordance with the requirements of the EIA Study Brief (No. ESB-332/2020) and the *Technical Memorandum on Environmental Impact Assessment Process* (EIAO-TM). The purpose of this EIA study is to provide information on the nature and extent of environmental impacts arising from the construction and operation of the Project. The information obtained in the EIA Study will contribute to decisions by Director of Environmental Protection on:

- i. the overall acceptability of any adverse environmental consequences that are likely to arise as a result of the Project;

- ii. the conditions and requirements for the detailed design, construction and operation of the Project to mitigate against adverse environmental consequences wherever practicable; and
- iii. the acceptability of residual impacts after the proposed mitigation measures are implemented.

1.4 Purpose of this Executive Summary

- 1.4.1 This Executive Summary (ES) highlights the key information and findings of the EIA study.

2 PROJECT DESCRIPTION

2.1 Description and Objective of the Project

- 2.1.1 The Project earned significant support from the local residents during the public engagement exercise of the “Review and Update of the Second Railway Development Strategy 2000” (RDS-2U) as the Project could facilitate them to use the TML as the main mode of transport. In the same public engagement exercise, there was strong public demand for an intermediate station near Tuen Mun Swimming Pool (TMSP) and the same requests from local stakeholders persisted after the announcement of “Railway Development Strategy 2014” (RDS-2014).
- 2.1.2 The RDS-2014 had recommended an extension from TUM to a new terminal station, namely TMS Station, near Tuen Mun Ferry Pier, which is a densely populated area with both public and private housing. In consideration of the clusters of residential estates between TUM and TMS Stations, which are outside the walk-in catchment of both stations, an intermediate station was proposed midway between the two stations to serve the existing communities and future population. The inclusion of this additional intermediate station would encourage the use of railway over a wider catchment area.
- 2.1.3 The Project alignment commences from the end of the existing TML overrun tracks south of TUM Station. The two single-track viaducts merge together shortly after leaving the station to form a twin-track viaduct that runs parallel to Tuen Mun Park in the Tuen Mun River Channel towards Area 16. The alignment then continues southward to A16 Station which is located at the site of the existing TMSP. The alignment from A16 Station runs across Tuen Mun River Channel and connects TMS Station which is located on Wu King Road to the north of Tuen Mun Ferry Pier.
- 2.1.4 The Project is envisaged to improve railway accessibility for the community south of the Tuen Mun Town Centre. Upon the completion of the Project, it will offer an alternative commuting choice to the residents living or working in the area and divert more commuters to rail-based transport, which may help relieve the congestion of the existing roads in Tuen Mun area, which in turns reducing the vehicular emissions and road traffic noise due to reduced road traffic. Instead of using Light Rail Transit (LRT) or buses for access to TUM Station, residents can enjoy a direct railway service within walking distance.

2.2 Benefits of the Project

- 2.2.1 The Project aspires to extend railway service to the existing and future communities in Tuen Mun South, which aims to enhance the railway accessibility and unleash the development potential of the region. The following local and strategic benefits could be derived by implementing the Project:
- Enhance the local transport connectivity and mobility across the territory by extending the railway network to Tuen Mun South;
 - Help relieve road traffic congestion, reduce air pollution, noise nuisance and carbon emissions in the region; and
 - Enhance the sustainability in the local community by providing a sustainable and convenient railway service with energy efficiency.

2.3 Consideration of Alternatives/Options

- 2.3.1 The Project alignment has a number of pre-determined items which include the preferred station locations (i.e. A16 and TMS Stations) and the starting point (i.e. TUM Station) for the rail extension, and these requirements fix both the vertical and horizontal alignments at these locations. These, along with the fundamental system

and railway design criteria, such as minimum horizontal curves, design speed requirements to be adopted for the whole route and vertical change limits, resulted in the formulation of several alternatives/options during the preliminary design stage.

2.3.2 Station locations were strategically planned to alleviate road congestion by providing more direct and convenient access to railway services, thereby reducing the number of road trips that are required to bring existing and planned residents from where they live to the nearest railway station. The alignment was selected based on engineering factors such as interface with existing or planned facilities, constructability, construction and operational safety, flexibility and maintenance requirement; environmental factors such as minimisation of construction dust, noise impact, and water quality impact to Tuen Mun River, as well as avoidance of impact and minimisation of disturbance to general public and sensitive ecological area. The bridge design considered the most appropriate option that achieves the requirements of design, construction, cost effectiveness and operation perspectives, which could also provide the biggest return to the public in terms of the aesthetic enhancement afforded to the community. The preferred scheme for the Project to be taken forward for design and construction was selected according to various engineering and environmental factors.

2.3.3 For minimisation of potential environmental impacts arising from the construction of the Project, temporary steel platforms proposed for the phased construction of piers and viaduct structures along the embankment edge of Tuen Mun River Channel will be built during dry seasons. In addition, quieter construction method, i.e. bored pile foundation system rather than percussive piling, will be adopted for supporting the construction of viaduct and stations. Design for Manufacture and Assembly (DfMA) approaches will also be adopted for the construction of the piers, viaduct and station structures as far as practicable. Precast pile cap shell and segments for the viaduct, as well as the building elements such as beams and slabs of the stations, will be prefabricated off-site to minimise the potential environmental impacts compared with the traditional construction method. Adoption of DfMA approaches could enable a clean, dry and tidy working environment such that the potential environmental impacts (e.g. dust, noise, water quality and waste generation) could be minimised.

2.4 Construction Programme

2.4.1 Construction of TME is anticipated to commence in 2023 with a target to complete in 2030.

2.5 Public Consultation

2.5.1 MTRCL values the views of stakeholders and considers that the support of the community is important in the development of railway extension project. MTRCL engages the community through various activities and channels to introduce the Project and exchange views with the community. Consultation activities with Tuen Mun District Council (TMDC) and local communities commenced since July 2020, while proactive consultation with Green Groups also commenced since January 2021 to obtain views and understand their interests.

2.5.2 Feedback received during public consultation related to environmental were mainly issues on construction noise and air quality, ecology, operational noise and visual impact to the nearby community. Public views were taken into consideration during the design of the Project with an aim to avoid and minimise potential environmental impacts with adoption of appropriate mitigation measures.

3 KEY FINDINGS OF ENVIRONMENTAL IMPACT ASSESSMENT

3.1 Approach to the EIA

3.1.1 The EIA process provides a means of identifying, assessing and reporting the environmental impacts associated with the construction and operation of the Project based on the engineering design information available at this stage. It is an iterative process that has been followed in parallel with the design process to identify the potential environmental issues of various design options, and develop alternatives as well as appropriate mitigation measures to be incorporated into the design, construction and operation of the Project. Public views have also been considered and incorporated into the design and EIA process where appropriate. Mitigation measures have been recommended to avoid some potential environmental impacts, while others are minimized or mitigated to acceptable levels.

3.1.2 The findings of this EIA study have determined the likely nature and extent of the following environmental impacts predicted to arise from the construction and operation of the Project:

- Air Quality;
- Noise;
- Water Quality;
- Waste Management;
- Land Contamination;
- Ecological Impact (Terrestrial);
- Landscape and Visual;
- Cultural Heritage; and
- Hazard to life.

3.2 Air Quality Impact

Assessment Scope and Key Criteria

3.2.1 Assessment of potential air quality impacts on air sensitive receivers (ASRs) arising from the construction of the Project were conducted in accordance with the criteria and guidelines as stated in Annexes 4 and 12 of the EIAO-TM as well as the requirements given in Clause 3.4.4 of the EIA Study Brief. The assessment for construction dust impact is within 500m study area from the Project boundary including works sites and works areas.

3.2.2 The rail system to be employed in the Project will be electric-powered, and air-emission free during normal operation. Exhaust for general ventilation and smoke extraction facilities will be carefully positioned to avoid causing any nuisance to the ambient. The potential air quality impact during operation phase is thus considered insignificant and assessment is deemed unnecessary.

Construction Phase

3.2.3 Potential air quality impacts from the construction works for the Project would mainly be related to construction dust from excavation, construction of bored pile foundation and pile caps, demolition of existing TMSP, Community Green Station (CGS) and nearby structures, site formation, vehicles on haul road, and wind erosion. Background concentrations from pollutants and the pollutant-emitting activities in immediate neighbourhood of the Project Site including open road traffic, industrial activities, and marine emissions from Tuen Mun Ferry Pier and Tuen Mun Typhoon

Shelter have been included to evaluate the cumulative dust impact. With the implementation of mitigation measures in the Air Pollution Control (Construction Dust) Regulation such as proposed dust suppression measures, regular watering once every two hours on heavy construction work areas and good site practices, the predicted dust impact at ASRs would comply with the hourly, daily and annual particulate criteria stipulated in the Air Quality Objectives (AQOs) and EIAO-TM. No adverse dust impact on the ASRs is anticipated. A summary of the predictions for representative air pollutants related to construction dust impact after implementation of mitigation measures is given **Table 3.1**.

Table 3.1 Summary of Construction Dust Impact after Implementation of Mitigation Measures

| Assessment Scenario | TSP Conc. ($\mu\text{g}/\text{m}^3$) | RSP Conc. ($\mu\text{g}/\text{m}^3$) | | FSP Conc. ($\mu\text{g}/\text{m}^3$) | | AQO / EIAO-TM Compliance |
|---------------------|--|--|-------------|--|-------------|--------------------------|
| | Max. 1-hour (500) | 10 th highest 24-hour (100) | Annual (50) | 36 th highest 24-hour (50) | Annual (25) | |
| 2023 - 2025 | 143 – 497 | 71 – 91 | 29 – 47 | 27 – 31 | 17 – 20 | Yes |
| 2026 - 2030 | 143 – 497 | 71 – 84 | 29 – 36 | 27 – 30 | 17 – 19 | Yes |

Note: Respective criterion is given in bracket.

3.3 Noise Impact

Assessment Scope and Key Criteria

3.3.1 Assessment of potential noise impacts on noise sensitive receivers (NSRs) arising from the construction and operation of the Project were conducted in accordance with the criteria and guidelines as stated in Annexes 5 and 13 of the EIAO-TM and the Noise Control Ordinance (NCO), as well as the requirements given in Clause 3.4.5 of the EIA Study Brief. The assessment covers the NSRs within 300m study area from the Project boundary including works sites and works areas.

Construction Phase

3.3.2 Construction noise associated with the use of powered mechanical equipment (PME) during construction phase were assessed. With the implementation of practical mitigation measures including good site management practices, use of noise barrier, noise insulating fabric, noise enclosure, soundproof hammer bracket for the hydraulic breakers, use of quiet plant, quiet construction method and proper scheduling and arrangement of construct activities and avoidance of using particular noisy PMEs during examination period, the maximum predicted construction noise impact would comply with the noise criteria set out in EIAO-TM. Hence, no unacceptable impact arising from the construction of the Project is anticipated.

Operational Phase

3.3.3 The noise impact associated with cumulative airborne rail noise from TME and Light Rail Transit (LRT), and operation of the fixed plant noise sources were assessed. The predicted fixed plant noise levels at the representative NSRs would comply with the stipulated noise criteria based on the calculated maximum allowable SWLs for the planned equipment. There would be no residual fixed plant noise impact with the adoption of the proposed maximum permissible sound power levels for the planned fixed plant.

3.3.4 With the implementation of the recommended noise mitigation measures, the predicted railway noise levels at the representative NSRs would comply with the noise criteria, and no residual impact is anticipated. A summary of the predicted cumulative rail noise levels and summary of cumulative operational noise impact are presented in **Tables 3.2** and **3.3** respectively.

Table 3.2 Summary of Cumulative Rail Noise Levels at Representative NSRs

| Mitigated Overall Noise Levels, $L_{eq\ 30min}$ dB(A) Daytime /Evening (Night-time) | Criteria, $L_{eq\ 30min}$ dB(A) Daytime /Evening (Night-time) |
|--|--|
| ≤57 (≤55) | 65 - 70 (55 - 60) |

Table 3.3 Summary of Cumulative Operational Noise Levels at Representative NSRs

| Predicted Cumulative Operational Overall Noise Levels, $L_{eq\ 30min}$ dB(A) Daytime /Evening (Night-time) | Criteria, $L_{eq\ 30min}$ dB(A) Daytime /Evening (Night-time) |
|---|--|
| ≤60 (≤55) | 65 - 70 (55 - 60) |

3.3.5 Based on the findings of cumulative operational noise impact assessment, the mitigated noise levels at all representative NSRs would comply with the noise criteria as stipulated in Technical Memorandum on Noise From Places Other than Domestic Premises, Public Places or Construction Sites (IND-TM).

3.4 Water Quality Impact

Assessment Scope and Key Criteria

3.4.1 The potential water quality impacts have been identified and analysed for compliance with the prevailing Water Quality Objectives (WQOs) stipulated under the Water Pollution Control Ordinance (WPCO), the criteria and guidelines stated in Annexes 6 and 14 of the EIAO-TM.

3.4.2 The assessment area basically covers 500m from the Project boundary including works sites and works areas, including Tuen Mun River Channel and Tuen Mun Typhoon Shelter, inland watercourses and relevant Water Sensitive Receivers (WSRs) within the North Western Water Control Zone (WCZ).

Construction Phase

3.4.3 Construction of the viaduct structure of the Project would involve installation of new piers in Tuen Mun River, which would be constructed within a dry working environment through the use of cofferdams and precast pile cap shell. It is anticipated that any local water quality impact would expect to be transient. Other source of potential water quality impact is from the land-based construction activities. With the implementation of mitigation measures and good site practices, no adverse residual water quality impact is anticipated.

Operational Phase

3.4.4 The key potential source of water quality impact during operational phase would be related to non-point source stormwater runoff, sewage and wastewater effluents from stations, and potential hydrodynamic and water quality impact on Tuen Mun River due to the installation of pier structure. Adequate drainage system would be provided to collect the stormwater runoff. All sewage and wastewater generated from the Project would be properly collected and diverted to public sewers for proper treatment and disposal. With proper design of drainage and sewerage systems and implementation of the recommended mitigation measures, the associated water quality impacts are expected to be minimal and acceptable. The change in flow regime and water quality associated with the proposed piers is expected to be insignificant.

3.5 Waste Management Implications

Assessment Scope and Key Criteria

- 3.5.1 The potential wastes management implications have been assessed in accordance with the criteria and guidelines stated in Annexes 7 and 15 of the EIAO-TM, and the requirements given in Clause 3.4.7 of the EIA Study Brief.

Construction Phase

- 3.5.2 Different types of waste generated from the Project during construction phase would include Construction and Demolition (C&D) materials (from demolition works, excavation and piling works, site formation and construction of facilities and station), land-based and river-based sediments, general refuse from workforce, and chemical wastes from the maintenance of construction plant and equipment.
- 3.5.3 The C&D materials comprise both inert (e.g. rocks, soil, broken concrete, building debris) and non-inert components (e.g. vegetation and wood). Based on preliminary design information, it was estimated that the total volume of C&D materials to be approximately 97,202 m³ of inert materials and approximately 27,930 m³ of non-inert materials. It is also expected that there would be approximately 228 kg of general refuse generated daily and small to a few hundred litres of chemical wastes generated monthly during the construction period. With the implementation of the mitigation measures recommended, no unacceptable environmental impacts arising from storage, handling, collection, transport and disposal of wastes are expected.
- 3.5.4 The total volume of land-based and river-based sediment to be excavated from the Project is estimated to be approximately 2,840 m³, including approximately 2,088 m³ for Type 1 – Open Sea Disposal, 433 m³ for Type 1 – Open Sea (Dedicated Sites) Disposal and 319 m³ for Type 2 – Confined Marine Disposal in accordance with PNAP No. 252 (ADV-21). With the implementation of the recommended mitigation measures and the requirements of PNAP No. 252 (ADV-21), no unacceptable environment impacts would be expected from excavation, transportation and disposal of land-based and river-based sediment.

Operational Phase

- 3.5.5 The main waste types generated during the operation of the Project would be general refuse and chemical waste from the staff, commercial operators and maintenance activities. The handling, collection, transportation and disposal practices of the identified waste generated would follow the current practices at other operating railway lines. It is anticipated that no unacceptable impacts would arise if the mitigation measures are strictly followed.

3.6 Land Contamination

Assessment Scope and Key Criteria

- 3.6.1 Potential of land contamination at the Project boundary including works sites and works areas have been examined. A land contamination assessment was completed in accordance with the guidelines stated in the Annex 19 of the EIAO-TM, other relevant guidance note and practice guide, and the requirements given in Clause 3.4.8 of the EIA Study Brief.

Potential Land Contamination Issues

- 3.6.2 Potentially contaminated land within the Project boundary has been identified in the Contamination Assessment Plan (CAP) through the site appraisal exercise. Based on the site appraisal results, four facilities / areas (i.e. TME-S1, TME-S2, TME-S3 and TME-S4) were identified as potentially contaminated and require further site

investigation. Since the concerned areas are still in operation and undertaking the SI works at this stage is not feasible; therefore, the SI works are recommended to be carried out after decommissioning of concerned facilities but prior to construction works at the concerned areas to confirm any contaminated area. The remediation works, if required, should be completed and RR(s) demonstrating the completion of remediation works at the area(s) (if any) confirmed with contamination will be prepared and submitted to EPD for approval prior to the commencement of construction works at the contaminated areas. After completion of remediation for any identified contaminated areas, no residual impact in respect of land contamination on the future users is anticipated.

3.7 Ecological Impact (Terrestrial)

Assessment Scope and Key Criteria

- 3.7.1 The potential ecological impact was evaluated based on available information from relevant literature and field surveys conducted for the purposes of the EIA, and assessed in accordance with the criteria and guidelines stated in Annexes 8 and 16 of the EIAO-TM and the requirements given in Clause 3.4.9 of the EIA Study Brief. The assessment area covers 500m from the Project boundary including works sites and works areas.

Construction Phase

- 3.7.2 Direct impacts arising from the Project mainly include the loss of man-made habitats (modified watercourse and developed area), which is anticipated to be of minor impacts considering the ecological values of these habitats. Aside from habitat loss, potentially minor to moderate ecological impact on the ardeid night roost in Tuen Mun Park may arise from the indirect disturbance from construction activities, and potential flight line obstruction. With the implementation of mitigation measures (e.g. avoidance of direct impact on species of conservation importance, minimisation of disturbance impact through establishment of buffer zone and control of works hour, etc), no unacceptable residual ecological impact is anticipated from the construction of the Project.

Operational Phase

- 3.7.3 Given the urbanised nature of the area along the proposed rail alignment, the existing wildlife are subject to regular human activities and have showed tolerance to such disturbance. Considering the generally high mobility and adaptability of wildlife recorded within the Assessment Area, wildlife in the area is anticipated to acclimatise to the new urban structures during operational phase. With the implementation of mitigation measures such as adoption of bird-friendly design (e.g. non-transparent / non-reflective panels) and provision of panel at the viaduct adjoining ardeid night roost, no unacceptable residual ecological impact is anticipated from the operation of the Project.

3.8 Landscape and Visual

Assessment Scope and Key Criteria

- 3.8.1 The assessment evaluated the impacts to landscape resources and visual sensitive receivers (VSRs) according to EIAO GN 8/2010 and the criteria and guidelines stated in the Annexes 10 and 18 of EIAO-TM respectively, and the requirements given in Clause 3.4.10 of the EIA Study Brief.

Construction Phase

- 3.8.2 There is no old and valuable trees (OVT) identified within the Project boundary including works sites and works areas. Based on a broad brush tree survey,

approximately 1,234 nos. of existing trees, would be affected by the Project. Two trees of particular interest (TPI) would be affected and transplanted. Compensatory tree planting would be provided in accordance with relevant Technical Circulars where applicable to compensate for felled trees.

- 3.8.3 During construction phase, mitigation measures including tree transplantation, protection of retained trees, and erection of decorative screen hoarding will be implemented. With the implementation of mitigation measures, there would be substantial residual impact on VSRs of recreational users along the riverside promenade, including the users in Tuen Mun River (Eastern Bank) Garden, Tuen Mun Road Safety Town and along the riverside promenade, adjacent to Wu Shan Cycle Park, Wu King Road Garden, and along the Tuen Mun Promenade close to the Tuen Mun Pier; and VSRs of travellers along Wu King Road as they would oversee TMS Station / Tuen Mun River Bridge / the viaduct at pedestrian level in a relatively close distance, and the proposed engineering structures have significantly altered the visual context of the area. It is predicted that the residual impact during construction phase for remaining identified VSRs is considered as insubstantial to moderate due to the longer distance from the works sites / works areas.
- 3.8.4 Landscape area in TMSP, CGS, and a small portion of HKIC – Tuen Mun Training Ground would be permanently alienated due to the construction and operation of the Project. Upon the completion of construction works, the works site at Area A16 will be handed over to others for the construction of the planned Sports Ground and future topside property development. The alienation of the landscape area is proposed to compensate under the Project.

Operational Phase

- 3.8.5 With the implementation of mitigation measures such as tree planting, provision of greening at the proposed structures and amenity area surrounding the aboveground structure, there would be slight to insubstantial residual impact on Landscape Resources (LRs) and Landscape Character Areas (LCAs) in day 1 of operation and Year 10 upon reinstatement of the affected area.
- 3.8.6 In both Day 1 and Year 10 of operation, the residual impact at VSRs during operational phase would be reduced to insubstantial to moderate with the implementation of mitigation measures mentioned in **Section 3.8.5**.
- 3.8.7 As a whole, the residual landscape and visual impacts of the Project is considered acceptable with the implementation of the recommended mitigation measures as discussed above during construction and operation phases.

3.9 Impact on Cultural Heritage

Assessment Scope and Key Criteria

- 3.9.1 The potential impact on cultural heritage was assessed in accordance with relevant guidelines and the criteria stated in Annexes 10 and 19 of the EIAO-TM. The assessment area covers 300m from the Project boundary including works sites and works areas.

Cultural Heritage Resources

- 3.9.2 No cultural heritage resources were identified within the proposed works sites / works areas. One nil-grade built heritage, Hau Kok Tin Hau Temple at Tin Hau Road, is situated within the assessment area. With its considerable distance from the works sites / works area, neither direct nor indirect impact is anticipated during the construction of the Project.

3.10 Hazard to Life

Assessment Scope and Key Criteria

- 3.10.1 The hazard to life assessment is conducted in accordance with the criteria and guidelines as stated in the requirements given in the Clause 3.4.12 of the EIA Study Brief, as well as Annex 4 of the EIAO-TM.

Potential Hazard to Life Issues

- 3.10.2 An existing Liquefied Petroleum Gas store (LPG Store) in Tuen Mun Area 44 is adjacent to the works sites of the Project. Part of the proposed railway alignment will also be within the Consultation Zone of this Potentially Hazardous Installation.
- 3.10.3 Results of the quantitative risk assessment show that criterion of Annex 4 of the EIAO-TM for Individual Risk is met with regards to the hazards to life posed by the LPG Store. The assessment results show that the cumulative societal risk for the impact from the LPG Store partially falls into the “As Low As Reasonably Practicable (ALARP)” region. Specific mitigation measure was found economically unviable based on cost-benefit analysis. Nevertheless, good safety practice during construction phase should be implemented to minimise the risk level.

4 ENVIRONMENTAL MONITORING AND AUDIT

- 4.1.1 The EIA Study of the Project has demonstrated its compliance with the EIAO-TM requirements. Actual impacts during the construction works will be monitored through a detailed EM&A programme. Full details of the programme are presented in a separate EM&A Manual associated with the EIA Report. The EM&A programme will provide management actions and detail the recommended mitigation measures to check the effectiveness of the recommended mitigation measures and compliance with relevant statutory criteria, thereby ensuring the environmental acceptability of the construction and operation of the Project.

5 CONCLUSION

- 5.1.1 This EIA Study assessed the overall acceptability of the environmental impacts likely to arise as a result of the construction and operation of the Project, in accordance with the EIA Study Brief (No. ESB-332/2020), EIAO-TM and other relevant guidelines and criteria. It has demonstrated the protection of the population and environmentally sensitive resources and the acceptability of any possible environmental impacts from the Project. The findings of EIA Study indicated that, with the implementation of the recommended mitigation measures, the Project would be environmentally acceptable and in compliance with the relevant assessment standards / criteria of the EIAO-TM. Where appropriate, EM&A mechanisms have been recommended to verify the environmental acceptability of the Project and to check the effectiveness of the recommended mitigation measures.