15 Conclusion

15.1 General

15.1.1.1 This Environmental Impact Assessment (EIA) Report has been prepared for Proposed Shuen Wan Golf Course in accordance with the requirements set out in the EIA Study Brief (ESB-303/2017) and the Technical Memorandum of Environmental Impact Assessment Ordinance (TM-EIAO).

15.1.1.2 This EIA study mainly comprises the following works: (i) construction and operation of a golf course and its ancillary facilities; (ii) other infrastructure such as drainage system, sewer system, irrigation system to support the daily operations of the golf course.

15.1.1.3 Assessments of the potential environmental impacts associated with the construction and operation of the Project in various technical aspects have been conducted. The environmental aspects covered in this EIA study include:

- Air quality;
- Hazard to life;
- Noise;
- Water quality;
- Waste management implications;
- Land contamination;
- Landfill gas hazards;
- Ecological impact;
- Fisheries impact; and
- Landscape and visual impact.

15.1.1.4 This section summarises the assessment results of each technical aspect and concludes the acceptability of the overall environmental performance of the Project.

15.1.1.5 The key assessment assumptions, limitation of assessment methodologies and all related prior agreements with Environmental Protection Department (EPD) on assessment of different environmental aspects are given in **Appendix 15.1**.

15.1.1.6 A summary of environmental impacts identified in this EIA is provided in **Appendix 15.2** and the conclusions of technical chapters are described in the following sections.

15.2 Air Quality

15.2.1.1 The air quality assessment studies the potential air quality impacts on Air Sensitive Receivers (ASRs) due to construction and operational of the Project, including dust, gaseous emissions and odour. Consideration is given to assessing the air quality impacts during construction and operational phases of the Project on the planned and existing ASRs in the vicinity.

15.2.1.2 Construction dust would be potentially generated mainly from the land-based construction works including site formation, site reprofiling, backfilling, and wind erosion of open sites. With the implementation of the mitigation measures as stipulated in the Air Pollution Control (Construction Dust) Regulation, dust control measures, including watering once per hour on exposed worksites and haul road, and good site practices, as well as the 3-m high hoarding proposed at the northern boundary of the Project, the predicted 1-hour Total Suspended Particulate (TSP), 24-hour and annual Respirable Suspended Particulate (RSP) / Fine Suspended Particulate (FSP) concentrations on area in the vicinity of the construction sites would comply with the respective criteria. Hence, adverse residual air quality impacts during construction phase are not anticipated.

15.2.1.3 Quantitative operational air quality assessment has been conducted taking into account the industrial emissions from Tai Po Industrial Estate (TPIE), vehicular emission impacts associated with the Project and nearby existing road network, marine emissions associated with the operational of the cement depot cum concrete batching plants at Yu On Street. Cumulative impacts from far-field source contributions, including territory wide vehicular emission, power plants, marine emissions as well as regional emissions from Pearl River Delta (PRD), have also been taken into account. The modelled assessment results suggest that the air quality during the operational phase would comply with the Air Quality Objectives (AQO) at the assessment year. Quantitative odour assessment has been conducted taking into account contribution from Tai Po Sewerage Treatment Works (TPSTW), the committed Food Waste Pre-treatment Facilities (FWPF). The assessment results showed that odour concentrations at the Project Site would comply with the 5OU criterion. An onsite sewage pumping station (SPS) of 500m^3/day have been proposed. Given the

implementation of appropriate mitigation measures, such as installation of deodourising units of at least 99.5% odour removal efficiencies, adverse odour impacts from the proposed SPS would not be anticipated.

15.3 Hazard to Life

15.3.1.1 Only about 1/3 of the Project site partially falls within the 1000m Consultation Zone (CZ) of Tai Po Gas Production Plant (TPGPP). In order to minimise the hazard-to-life, the indicative layout of the golf course has been proactively adjusted to locate the future ancillary facilities such as office, changing rooms, restaurants, access road etc. outside the CZ. The area within the CZ would only include the turf area, tee, bunkers, landscape area etc. Based on the latest planning, the following arrangement is made for the population within the Project:

- No permanent working / residential population within the CZ;
- Maximum 50 construction workers within the CZ during construction phase of the Golf Course;
- Daily average of 20 transient staff within the CZ; and
- Daily average of 20 transient visitors within the CZ during the operational phase. The Golf Course operator will implement a booking system such that the operator would be able to monitor the daily average and make sure it would not be exceeded.

15.3.1.2 It is understood that the hazard-to-life assessment for TPGPP has included all existing population / planned developments within the CZ, including the working population of some 80 industrial premises in TPIE, the existing golf driving range, residential population in Ha Hang Village, Tin Sam Village, Fu Shin Estate etc., the popularly used Tai Po Waterfront Park, transient population at major roads (Ting Kok Road) and cycle track within the area, etc.. The additional population induced by the Project should only constitute a relatively small population at the eastern edge of CZ. Hence, the Project should not induce a significant deviation from the prevailing hazard-to-life assessment findings and the Project is considered acceptable from the aspect of hazard-to-life.

15.4 Noise

15.4.1.1 The noise assessment studies the potential noise impacts on Noise Sensitive Receivers (NSRs) due to the construction and operation of the Project, including construction noise impacts and fixed noise sources impacts.

15.4.1.2 Construction noise impact assessment associated with the use of Powered Mechanical Equipment (PME) for different phases of construction has been conducted. With the implementation of practical mitigation measures including good site management practices, use of movable noise barrier, use of "quiet" plant and working method, the construction noise impacts at all representative existing residential noise sensitive uses would be controlled to acceptable levels.

15.4.1.3 Fixed noise sources assessment has been conducted. Noise impacts from planned fixed noise sources could be effectively mitigated by implementing noise control measure at source during project implementation stage. With the adoption of the proposed maximum permissible sound power levels for the proposed fixed noise sources, the noise levels at representative existing NSRs due to both the existing and planned fixed noise sources complies with the relevant noise criteria.

15.5 Water Quality

15.5.1.1 Construction site runoff and sewage arising from the on-site construction workforce are the key identified environmental impacts. According to the current design, the construction works would be land-based and there would not be any marine works. Water storage tanks of total volume of 30,000m^3 will be constructed in phases underneath the access road and temporary sedimentation tanks will be installed to intercept the surface runoff. Once one of these water storage tanks are available, they would be used to intercept any surface runoff for sedimentation. Good site practices in accordance with Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN 1/94) would be implemented and proper temporary sanitary facilities (e.g. portable chemical toilet) would be provided to properly collect the on-site sewage generated from the construction workers. With the proper implementation of those good practices and mitigation measures, it is anticipated that there would be no residual adverse water quality impact.

15.5.1.2 During the operational phase, the stormwater from the surface runoff, sewage effluent and wastewater from ancillary facilities are the key identified environmental impacts. Drainage system and water storage tanks with a total volume of 30,000m^3, together with a proper location of outfall sited away from the Water Sensitive Receivers (WSRs) are designed to reduce the water quality impact by stormwater bypass. The

sewage from the proposed development would be collected by the proposed SPS and conveyed to TPSTW for treatment. Additional provisions will be considered for the design of SPS in order to avoid the occurrence for emergency bypass. Discharge license and discharge standards according to Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems Inland and Coastal Waters (TM-DSS) will be applied for the wastewater from ancillary facilities to comply with Water Pollution Control Ordinance (WPCO). With the mitigation measures implemented, residual adverse water quality impacts are not anticipated.

15.6 Waste Management Implication

15.6.1.1 Potential waste management implications from the generation of waste during the construction phase have been evaluated. Strategic mitigation measures, including the opportunity for on-site sorting, reusing construction and demolition (C&D) materials, etc., are devised to minimise the surplus materials to be disposed. Recommendations have been made for implementation by the Contractor during the construction period to minimise waste generation and off-site disposal. With the proper implementation of the recommended mitigation measures, adverse environmental impacts from waste management during construction phase are not anticipated.

15.6.1.2 The types of waste that would be generated during the operational phase would be general refuse from golf course staff, users and visitors, chemical waste and grass clips from golf course management, as well as food waste produced from canteens at the golf course. Recommendations have been made to ensure proper treatment and disposal of these wastes. With the proper implementation of the recommended mitigation measures, adverse environmental impacts from waste management during operational phase are not anticipated.

15.7 Land Contamination

15.7.1.1 The land contamination assessment has examined the potential contaminative landuses within the boundary of the Project and the works of the Project and their potential impacts to future use. The assessment involved desktop review, site survey and identification of potentially contaminated site etc.

15.7.1.2 Based on the desktop review findings of selected aerial photos, the information collected during site survey, from the operator of the current Golf Driving Range as well as EPD and Fire Services

Department (FSD), the storage/ workshop area is identified as the only potential contaminated site within the boundary of the Project and the works of the Project. Nevertheless, the land contamination potential at the storage/ workshop area is low.

15.7.1.3 Project Proponent (PP) is recommended to conduct further land contamination assessment at the storage/ workshop area at later stage of the Project after the area within the boundary of the Project and the works of the Project is handed over to the PP. Further land contamination assessment should include site re-appraisal, submission of Land Contamination Review (LCR) or Contamination Assessment Plan (CAP), Site Investigation (SI) and submission of Contamination Assessment Report (CAR), if necessary. If land contamination is confirmed, a Remediation Action Plan (RAP) should be submitted to formulate viable remedial measures. Possible remediation methods include air sparging, biopile, stabilisation / solidification, thermal desorption, etc. The contaminated land should then be remediated according to the approved RAP, and a Remediation Report (RR) should be submitted to demonstrate the land has been remediated adequately.

15.7.1.4 Potential future sources of contamination include application of turfgrass chemicals (pesticides and herbicides) for maintaining the golf course as well as accidental spillage of chemicals to be used. Recommendations have been made to ensure proper management of agrochemicals and measures to be taken in case of accidental chemical spillage. With proper implementation of the recommended mitigation measures, land contamination issues during the operational phase are not anticipated.

15.8 Landfill Gas Hazards

15.8.1.1 The qualitative landfill gas hazard assessment has been conducted. During the construction phase, the risk level from the Project to the construction workers is medium. With the implementation of appropriate protective and precautionary measures, adverse impacts on the targets are mitigated to acceptable level.

15.8.1.2 During the operational phase, the risk levels from the Project to the targets are from low to high. For the high risk targets such as indoor areas with free public access, a combination of active control system, passive control system, gas detection system and good site management should be provided and implemented as appropriate. For the medium risk targets such as indoor areas with limited public access, semi-active control measures, together with passive control systems, gas detection

system and good site management, should be provided. Maintenance staff working in the confined spaces should implement entry safety procedures as stipulated in the Factories and Industrial Undertakings (F&IU) (Confined Spaces) Regulations. By implementing appropriate protective and mitigation measures, the risks of the targets have been reduced to acceptable levels.

15.8.1.3 In addition, the impacts due to the construction and operation of the Project on the landfill restoration facilities have been reviewed. Adverse impacts on these facilities are no anticipated when appropriate precautionary and protective measures are in place.

15.9 Ecological Impact

15.9.1.1 Due consideration of avoidance and minimisation have been taken in the present Project.

15.9.1.2 No marine works is proposed.

15.9.1.3 The Project Site is located in a restored landfill covered with man-made habitats of low ecological value including turfgrass in driving range and restored plantation, and away from recognised sites of conservation importance and other important habitats.

15.9.1.4 The impacts of loss of man-made habitats caused by the Project are thus of limited severity. The future golf course will have a high greening proportion including newly planted tree groups, landscape areas with more native plant species and better ecological functions, besides the turfgrass on golf playing areas.

15.9.1.5 The area size of plantation trees available as the roosting sites for Collared Crow and Black Kite will be temporarily reduced during construction but the golf course layout design has maximised the tree groups to be preserved, including those more frequently used as night roosts, given the small size of the Project Site and other site constraints. Fencing will be erected surrounding the preserved tree groups as protection. Construction works will be implemented in phases to shorten the duration of impacts, to reduce the potential disturbance impacts and to facilitate early tree planting and landscape planting. Heavy standard trees will be incorporated into the soft landscape works to speed up the establishment of the trees to re-provide roost sites. Works hours of construction plants in certain locations will be restricted to halt at least one hour before sunset, to avoid disturbance to the roosting birds. Construction site runoff will be retained using the water storage tanks to avoid indirect impact on marine ecology.

15.9.1.6 During the operational phase, the surface runoff and residual agrochemicals are the key identified environmental impacts. Drainage system and water storage tanks with a total volume of 30,000m^3, together with a proper location of outfall sited away from the ecologically related WSRs are designed to minimize the water quality impact. The sewage from the proposed development would be conveyed to TPSTW for treatment, and emergency bypass is minimised by the design of the SPS. Residual adverse ecological impacts are not anticipated.

15.10 Fisheries Impact

15.10.1.1 The assessment area for the FIA included areas within 500m from the boundary of the Project and the works of the Project, the Tolo Harbour and Channel Water Control Zones as designated under the Water Pollution Control Ordinance (Cap. 358), and the fisheries sensitive receivers outside the 500m boundary but in the vicinity of the Project.

15.10.1.2 Information from literature has been incorporated, which provided sufficient fisheries information within the assessment area.

15.10.1.3 The importance of fisheries resources within the assessment area are addressed based on the baseline information. Fishing areas within Tolo Harbour and Tolo Channel are generally of moderate fisheries production when compared with other waters in Hong Kong. However, the fishing grounds just outside the Project Site are of low fisheries production. The Tolo Channel from Whitehead to outer Tolo Channel was identified as an important nursery ground of commercial fisheries resources but it is over 4 km from the Project Site. Yim Tin Tsai FCZ is the nearest FCZ to the Project Site and it is about 700m distant, and is not anticipated to be affected with the implementation of water quality mitigation measures. Because there will be no marine works or marine traffic for the Project, no permanent or temporary loss of fishing ground, fisheries habitats or aquaculture sites are expected during construction phase. Construction site runoff will be retained using the water storage tanks to avoid indirect impact on marine water quality and in turn on fisheries resources including fish culture zones. With the approaches for avoidance and minimization of impacts, no unacceptable fisheries impacts on fishing grounds, nursery grounds, and fisheries and mariculture activities due to construction and operation of the Project are anticipated.

15.10.1.4 Since no unacceptable fisheries impact is anticipated, no fisheries-specific mitigation measures are required.

15.11 Landscape and Visual Impact

15.11.1.1 The Project will not lead to a degradation of the landscape setting of the assessment area and the Project Site, which is currently occupied by an ex-landfill site restored with planting and the Golf Park Golf Driving Range (with 2 nos. of driving ranges, access road and offices), following full establishment of the recommended landscape and visual mitigation measures. On the contrary, it is to certain extent an improvement to the landscape setting and quality on the ex-landfill site through the provision of new recreational uses and landscape, an 18-hole golf course. The introduction of high quality and unique recreational landscape and planting proposal within the Project Site will enhance the biodiversity of landscape and ecological context. The Project also fits into the future outlook of Tai Po Industrial and recreational context.

15.11.1.2 Residual impact significance on the affected Landscape Resources (LRs) and Landscape Character Areas (LCAs) during the construction phase will be alleviated to moderate to slight adverse levels with mitigation measures. With the implementation of landscape mitigation measures and full establishment of planting proposals during the operational phase, the residual impact significance on the affected LRs and LCAs would be majority insubstantial and slight adverse on plantation on the ex-landfill site. Proposed golf course will have slight to moderate benefit to the other resources within the Project Site including managed grasslands, seashore and the GPGDR.

15.11.1.3 With the adoption of operational phase landscape and visual mitigation measures, the potential substantial impacts on the Visual Sensitive Receivers (VSRs), who are residents located close to the Project Site and have full or panoramic views of the Project Site will be mitigated to slight level (Year 10). The residual impact to the remaining VSRs will be mitigated to insubstantial upon full establishment of mitigation measures (Year 10). These mitigation measures create high quality and unique recreational and landscaped areas for the enjoyment of future users as well as provide enhanced visual amenity in the wider context of Tai Po waterfront.

15.11.1.4 Detailed tree preservation, transplanting and compensatory planting proposal is required for government approval during detailed design stage. The compliance of landscape design and planting works would

be checked during design phase and upon completion of the softworks. Monitoring the condition of preserved trees required through site auditing programme. No other specific EM&A requirement is considered.

15.11.1.5 In accordance with Annex 10 of the TM-EIAO, the landscape and visual impacts as a result of the proposed golf course would be ‘acceptable with mitigation measures’ that is to say ‘there would be some adverse effects, but these can be eliminated, reduced or offset to a large extent by specific measures’.