### Sha Lo Tung Development Company Limited

## Shuen Wan Golf Course

### **Project Profile**

256383 00-REP-002-00

September 2017

This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party. Job number 256383 00

Ove Arup & Partners Ltd Level 5 Festival Walk 80 Tat Chee Avenue Kowloon Tong Kowloon Hong Kong www.arup.com

## ARUP

### Contents

Racia I	nformation	1
		1
1.1	Project Title Durness and Nature of the Project	1
1.2	Nome of Project Dropoment	1
1.5	Name of Project Proponent	1
1.4 1.5	Number and Types of Designated Projects to be Covered by the Project Profile	2 9y 2
1.6	Name and Telephone Number of Contact Person	2
Outlin	e of Planning and Implementation Programme	3
2.1	Project Implementation	3
2.2	Project Time Table	3
2.3	Interaction with Other Projects	3
Possib	le Impacts on the Environment	4
3.1	General	4
3.2	Air Quality	4
3.3	Noise	5
3.4	Water Quality	5
3.5	Waste	6
3.6	Ecology	6
3.7	Fisheries	7
3.8	Land Contamination	8
3.9	Landfill Gas	8
3.10	Potential Hazard	8
3.11	Landscape and Visual Impact	8
Major	Elements of the Surrounding	9
4.1	General	9
4.2	Air Quality	9
4.3	Noise	9
4.4	Water Quality	10
4.5	Ecology	10
4.6	Fisheries	11
4.7	Potential Hazard	11
4.8	Landscape and Visual Impact	12
Enviro	onmental Protection Measures to be Incorporated In the	10

5.1	General	13		
5.2	Air Quality	13		
5.3	Noise	14		
5.4	Water Quality	15		
5.5	Waste	16		
5.6	Ecology	17		
5.7	Fisheries	18		
5.8	Land Contamination	19		
5.9	Landfill Gas	19		
5.10	Potential Hazard	20		
5.11	Landscape and Visual Impact	20		
5.12	Severity, Distribution and Duration of Environmental Effects			
	and Further Implications	20		
Use of	Use of Previously Approved EIA Reports 2			

6

Figures Figure 1.1 Site Location Plan

### **1 Basic Information**

### **1.1 Project Title**

**1.1.1** The project title is Shuen Wan Golf Course.

### **1.2 Purpose and Nature of the Project**

- **1.2.1** In June 2017, The Chief Executive in Council has agreed in principle to the government proposal to grant a piece of land in Tai Po to the Project Proponent in exchange for its private land in Sha Lo Tung which has high ecological values. Under the non-in-situ land exchange proposal, the piece of land at the Shuen Wan Restored Landfill in Tai Po will be granted to the Project Proponent and the Sha Lo Tung site would be considered by government for active conservation management to avoid degradation and damage for long-term public enjoyment. This land exchange proposal is a unique, exceptional and isolated case, adding the idea is technically feasible as the private land ownership is largely unified under one entity and both Sha Lo Tung and the land at the landfill site, which has been planned for golf course development, are located in Tai Po.
- **1.2.2** The Project Proponent will have to conduct studies and technical assessments to support its proposal to build a golf course, and seek government approvals for its proposed development. The Government will continue to manage the residual landfill gas and leachate at the site. Figure 1.1 shows the demarcation of the proposed Shuen Wan Golf Course.
- **1.2.3** The Project comprises the following:
  - Construction and operation of a golf course and its ancillary facilities;
  - Other infrastructure such as drainage system to support the daily operations (including temporary storage system as required).

### **1.3** Name of Project Proponent

**1.3.1** The Project Proponent is Sha Lo Tung Development Company Limited.

# 1.4 Location and Scale of Project and History of the Site

- **1.4.1** The tentative location of the Project is shown in Figure 1.1, with an area of approximately 50 ha. It is located at Ting Kok Road and adjoins the Tai Po Industrial Estate (TPIE).
- **1.4.2** This Project Site was once the Shuen Wan Landfill Site, which commenced its operation in Year 1973 and ceased operation in Year 1995. Subsequent to the closure of the previous landfill site, restoration works were implemented and the closed landfill now serves as a 145-bay golf driving range for public use since Year 1999. EPD has been operating the management system for landfill gas and leachate system and will continue after the operation of the proposal development.

# **1.5** Number and Types of Designated Projects to be Covered by the Project Profile

- **1.5.1** The Project consists of a Designated Project (DP) under Item O.1, Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO) for outdoor golf course and all managed turf areas. Other potential Schedule 2 designated projects may also be identified in the course of the Study.
  - Outdoor Golf Course and all managed turf areas (Item O.1).
- **1.5.2** According to the current design, there will not be any marine works (such as dredging, reclamation, marine piling etc.) or marine traffic during both construction and operational phases. The Project would be closed during night-time (i.e. 2300 to 0700) and most of the lighting and public address system including loudspeakers would not be operating during night-time as well.

### **1.6** Name and Telephone Number of Contact Person

**1.6.1** All enquiries regarding the Project can be addressed to:

#### Sha Lo Tung Development Company Limited

Ms. Lai Ka Yan Tel: 2525 6071

### 2 Outline of Planning and Implementation Programme

### 2.1 **Project Implementation**

**2.1.1** It is proposed to implement the Project by employing consultants to conduct the preliminary engineering feasibility study and Environmental Impact Assessment (EIA) for the Project. The consulting team comprises of architects, a golf course design specialist, engineers, landscape architects and environmental specialists.

### 2.2 **Project Time Table**

**2.2.1** The detailed design of the Works is targeted to commence in late 2018 for completion in 2019. The construction work for the proposed golf course is anticipated to be completed by late 2021.

### **2.3** Interaction with Other Projects

- **2.3.1** Potential projects that would have interface with the Project have been identified and are listed below.
  - Shuen Wan Landfill Restoration Contract;
  - Food Waste Pre-treatment Facilities for Food Waste/ Sewage Sludge Anaerobic Co-Digestion Pilot Trial in Tai Po Sewage Treatment Works (TP STW);
  - Columbarium Development at Shuen Wan Landfill, Tai Po; and
  - Development of a Bathing Beach at Lung Mei, Tai Po.
- **2.3.2** Implementation of some of these projects has yet to be approved. This list should be re-visited during the EIA Study to ensure all the latest projects available from the respective stakeholders are incorporated. Any cumulative impacts from these concurrent projects during both construction and operational phases of the Project, would need to be identified and addressed as appropriate.

### **3 Possible Impacts on the Environment**

### 3.1 General

- **3.1.1** Given that the Project is located within the catchment of Tolo Harbour, within which a number of ecological and fisheries resources have been identified, it is proposed to adopt the following strategies to avoid/minimise the potential environmental impacts at the outlet:
  - To implement a suitable Turfgrass Management Plan to minimize the use of agrochemicals, including fertilizers and pesticides, etc.;
  - To avoid marine works;
  - To provide storage system of suitable sizes to collect the surface runoff within the golf course during the normal rainfall conditions which will be reused for irrigation, so as to avoid uncontrolled discharge to marine water, allow retention of residual agrochemicals, and also conserve water resource and minimise discharge to the sea;
  - To provide rainwater harvesting system to make use the surface runoff from golf course, as well as collection of the surface runoff from the catchment outside and upstream of golf course, with temporary storage to minimize the use of fresh water from Water Supplies Department (WSD) for irrigation;
  - To convey the sewage generated to TP STW for treatment without the need for an on-site STW;
  - To carry out bulk earthmoving works in dry season as far as practicable; and
  - To provide electric golf carts and shuttles.

### **3.2** Air Quality

#### **Construction Impacts**

**3.2.1** Dust will be generated from the construction activities during the construction phase including terrain profiling, excavation works, backfilling, wind erosion of exposed area, temporary storage of spoil on site, transportation and handling of spoil etc. The dust impact would cause certain impacts on the neighbouring Air Sensitive Receivers (ASRs) such as Casa Brava, Ha Hang Village, Casa Marina, Fortune Garden etc.

#### **Operational Impacts**

**3.2.2** The Project would not generate any air pollutants, except for the small amount of induced traffic at Ting Kok Road, along which a number of ASRs are located e.g. Fortune Garden, Casa Brava and Casa Marina.

#### 3.3 Noise

#### **Construction Impacts**

**3.3.1** Potential noise impacts on Noise Sensitive Receivers (NSRs) (e.g. Fortune Garden, Casa Brava, Casa Marina) will be associated with construction activities and powered mechanical equipment. The key construction activities which would create noise impacts are terrain profiling, excavation, back filling, road works, concreting and piling for the ancillary facilities, etc.

#### **Operational Impacts**

**3.3.2** The Project would not be a key noise source during its operation, except for a small amount of induced traffic at Ting Kok Road, along which a number of NSRs are located e.g. Fortune Garden, Casa Brava and Casa Marina. Most of the E&M facilities and public address system within the Project Site would be shut down during night-time. Any impacts during night-time caused would not be significant. However, these noise sources would operate during day-time.

### **3.4 Water Quality**

#### **Construction Impacts**

**3.4.1** Major potential sources of water quality impacts may arise from construction site runoff and wastewater generated from construction activities. The cumulative water quality impact on the existing Water Sensitive Receivers (WSRs) (e.g. seawater abstraction point, non-gazetted beach, Fish Culture Zones at Yim Tin Tsai, coral communities, Ting Kok SSSI etc.) and the surface runoff due to the construction works may need to be addressed.

#### **Operational Impacts**

**3.4.2** As discussed in Section 3.1, the Turfgrass Management Plan will minimize the use of agrochemicals as far as practicable. There will be storage system to accommodate surface runoff from turf areas to avoid uncontrolled discharge to marine water. Besides, the sewage generated from the operation of the Project will be conveyed to TP STW. All these would help minimise potential water quality impacts on WSRs. The possible impact on the nearby environment including

existing sewage infrastructure would be addressed and sewage updating/connection works would be proposed and implemented, if necessary.

### 3.5 Waste

#### **Construction Impacts**

**3.5.1** The construction works including terrain profiling, excavation, back filling, site formation, construction of drainage, and associated infrastructures will generate a certain amount of construction and demolition (C&D) materials. The existing soil cap would be largely maintained. Other than C&D materials, solid waste such as C&D waste, chemical waste, general refuse etc would also be generated. Sediments is unlikely to be generated given the history of the site. The quantities of wastes to be generated during construction of the Project and possible infrastructure will largely depend on the terrain profile and the construction methods. Proper solid waste management would be maintained and considerations would also need to be given to the disposal of spoil and any contaminated spoil, if any.

#### **Operational Impacts**

**3.5.2** The amount of municipal solid waste that will be generated during operation of the Project would be relatively small given the number of users. The waste would be properly sorted, handled and recycled as appropriate.

### 3.6 Ecology

#### **Construction Impacts**

**3.6.1** Construction phase impacts to ecology could arise from loss or disturbance of terrestrial man-made habitats within the Project Site and their associated flora and fauna; silt-laden runoff from works areas to adjacent water bodies; and disturbance to nearby habitats from construction activities. These will be addressed in the EIA. There will be no marine works or marine transportation of materials for the Project and bulk earthmoving works will be carried out in dry season as far as practicable.

#### **Operational Impacts**

**3.6.2** Without proper control, operation of the golf course and its ancillary facilities could potentially impact on nearby habitats or other ecological resources in Tolo Harbour such as coral communities and Ting Kok SSSI. These potential impacts include surface runoff from

the golf course and light glare. These will be addressed in the EIA. The operating hours of the golf course would be restricted to daytime (i.e. 0700 to 1900) while only the practice driving range will be open in the evening (i.e. 1900 to 2300). Limited lighting installation will be required. The Turfgrass Management Plan will minimize the use of agrochemicals as far as practicable. There will be storage system to accommodate surface runoff from turf areas to avoid uncontrolled discharge to marine water. Besides, all sewage generated will be conveyed to TP STW for treatment and the treated effluent will not be discharged inside Tolo Harbour. All these would help minimise potential ecological impacts.

### **3.7** Fisheries

#### **Construction Impacts**

**3.7.1** Construction phase impacts to fisheries resources could arise from silt-laden runoff from works areas to adjacent water bodies. These will be addressed in the EIA. No marine works or marine transportation of materials would be proposed, and therefore there will be no fisheries impact aroused from increased marine traffic during construction phase.

#### **Operational Impacts**

3.7.2 If without proper control, operational phase impacts to fisheries resources such as Yim Tin Tsai Fish Culture Zone, Yim Tin Tsai (East) FCZ, fishing grounds for capture fisheries at Tolo Harbour area, nursery ground of commercial fisheries resources in the eastern waters of Hong Kong, and proposed fisheries protection area within Tolo Channel and Long Harbour may arise from surface runoff of the golf These will be addressed in the EIA. The Turfgrass course. Management Plan will minimize the use of agrochemicals as far as practicable. There will be storage system to accommodate surface runoff from turf grass to avoid uncontrolled discharge to marine water. Besides, all sewage generated will be conveyed to TP STW for treatment and the effluent will not be discharged inside Tolo Harbour. All these would help minimise potential fisheries impacts. No marine traffic for golf course users would be proposed during operational phase, and therefore there will be no fisheries impact aroused from increased marine traffic.

### **3.8 Land Contamination**

**3.8.1** As discussed in Section 1, the site was originally a landfill site which was closed in Year 1995 and restored as the current golf driving range since Year 1999. Hence, there is no evidence that the site has accommodated any industrial activities that would cause potential land contamination to the Project Site. However, the existing operation of the driving range may have applied agrochemicals which are also considered as potentially polluting activities. Land contamination assessment would be carried out during the EIA Study in accordance with relevant guidelines.

### **3.9 Landfill Gas**

**3.9.1** EPD has adopted a number of restoration works over the last two decades such as landfill capping, landfill gas management system and leachate management system. Any landfill gas remained in the landfill should have diminished significantly. Nevertheless, the closed landfill is still a persistent source for landfill gas and hence would need to be properly addressed. It is understood the EPD would maintained the landfill gas and leachate management system during the operational phase of the Project.

### **3.10 Potential Hazard**

**3.10.1** The Project will not introduce any plant or equipment that are qualified as Potentially Hazardous Installation (PHI).

### 3.11 Landscape and Visual Impact

#### **Construction Impacts**

- **3.11.1** The expected sources of landscape impacts arising from the Project would be the site formation works of the proposed 18-holes golf course development. The cut and fill works will unavoidably affect the existing trees within the project site during construction.
- **3.11.2** The expected sources of visual impacts arising from the Project would be the site formation works of the proposed development. The existing trees will be unavoidably affected which will cause temporary loss of the visual screen along the edge of the project site.

#### **Operational Impacts**

**3.11.3** The potential landscape impact will be the shortfall of greenery within the Project Site, and it will also cause visual impact due to the loss of greening background.

### 4 Major Elements of the Surrounding

### 4.1 General

**4.1.1** The existing environment of the site and its surroundings have been reviewed. The sensitive receivers are discussed below. Any other sensitive receivers to be identified during the EIA study will also be considered.

### 4.2 Air Quality

- **4.2.1** The nearest residential uses are Casa Brava, Ha Hang Village, Casa Marina, Fortune Garden etc., which span across the northern to eastern side of Project Site. Fortune Garden and Ha Hang Village are low rise residential buildings of 3-4 storeys high. Other residential uses including Casa Marina, are located at a distance of around 250m north of the Project Site. These low-rise residential uses along Lo Fai Road are located at a terrain of approximately 40m above the Project Site.
- 4.2.2 The major permanent sources of air pollutants are the industrial emissions from the nearby TPIE, as well as vehicular emissions from traffic nearby open roads, i.e. Ting Kok Road. Besides, odour source from the nearby TP STW should also be addressed. To the west of the Project Site is TPIE, where a number of industrial establishments and TP STW are located. There are a number industrial chimneys within the industrial estate which would have certain amount of emissions. Cumulative air quality impacts from these industrial emissions should also take into account neighbouring roads and other sources (e.g. Chimneys in TPIE). The TP STW on the other hand would be an odour source in the vicinity and a number of mitigation measures have been implemented to reduce its odour impact (ref AEIAR-081/2004 and EP-265/2007/A). Other emission sources such as marine emissions from the nearby concrete batching plant along Yu On Street would need to be considered.

### 4.3 Noise

**4.3.1** The nearest residential uses are Fortune Garden, Casa Brava, Casa Marina, Ha Hang Village etc., which span across the northern to eastern side of Project Site. Fortune Garden and Ha Hang Village are low rise residential buildings of 3-4 storeys high. Other residential uses including Casa Marina, are located at a distance of around 250m north of the Project Site. These low-rise residential uses along Lo Fai

Road are located at a terrain of approximately 40m above the Project Site. The major noise source group in the vicinity is these industrial operations within TPIE.

### 4.4 Water Quality

- **4.4.1** The marine zone of the Project is located within the Tolo Harbour and Channel Water Control Zone (WCZ) in a water body where oceanic and estuarine waters interchange. Consequently, the major factors influencing the water quality in the Tolo Harbour and Channel WCZ are mainly discharges from urbanized catchment, as well as from industrial sources. The water quality in Tolo Harbour and Channel WCZ is eutrophic and with high algal growth. The average retention time in the inner harbour is about 35 days, according to Pollution studies on Tolo Harbour, Hong Kong (Hodgkiss and Chan 1983).
- **4.4.2** Potential water sensitive receivers would be:
  - (i) Seawater abstraction point outside TPIE;
  - (ii) Non gazetted beach at Fortune Garden;
  - (iii) Fish culture zones at Yim Tin Tsai
  - (iv) Coral communities; and
  - (v) Ting Kok SSSI.

### 4.5 Ecology

- **4.5.1** The Project Site was previously a landfill site (i.e. the Shuen Wan Landfill Site) with operation commenced in 1973 and ceased in 1995. Subsequent to the closure of the landfill site, restoration works were implemented and the closed landfill currently serves as a golf driving range. Currently it is mainly composed of restoration planting dominated by exotic species including *Acacia confusa* and *Casuarina equisetifolia* of about 20 years in age and turfs regularly maintained for recreational purposes.
- **4.5.2** About 30% of the population of Collared Crow, which is a bird species of conservation importance, in Hong Kong has been recorded in the 'Shuen Wan Landfill' (HKBWS 2016<sup>1</sup> and Leader et al. 2016<sup>2</sup>). Shuen Wan is known to be a pre-roosting site of the species.
- **4.5.3** Scattered coral colonies were reported within Tolo Harbour and Tolo Channel, while one species of hard coral *Oulastrea crispata* was previously recorded on the coastline of the current Project Site and the

adjacent Tai Po Industrial Estate<sup>3</sup>. This species is commonly found in Hong Kong waters especially in turbid water.

- **4.5.4** No other terrestrial or aquatic ecological sensitive receivers are identified within the Project Site or area within 500m from the Site. Other ecological sensitive receivers in Shuen Wan area but outside the 500m distance include:
  - Fung Yuen Valley SSSI (> 1km);
  - Shuen Wan Egretry SSSI (> 1km); and
  - Ting Kok SSSI (>1.5 km).
- **4.5.5** Yim Tin Tsai & Ma Shi Chau SSSI (>1.5km from Project Site) is designated for its geological interest and therefore is not included as one of the ecological sensitive receivers.

### 4.6 Fisheries

- **4.6.1** There are two active Fish Culture Zones (FCZs) near the Project Site. They are:
  - Yim Tin Tsai FCZ (~1.1 km)
  - Yim Tin Tsai (East) FCZ (~ 1.9 km from the Project Site, but separated by land mass in between)
- **4.6.2** Other fisheries resources that could be affected by project construction or operation include:
  - fishing grounds for capture fisheries (i.e. coastal waters) in Tolo Harbour area (all accessible marine waters in Tolo Harbour)
  - nursery ground of commercial fisheries resources in the proposed fisheries protection area within Tolo Channel and Long Harbour (exact boundary to be determined, but > 4.8 km to Tolo Channel)

### 4.7 **Potential Hazard**

**4.7.1** Tai Po Gas Production Plant (TPGPP) operated by Hong Kong and China Gas Company within Tai Po Industrial Estate is a registered PHI, and has a Consultation Zone (CZ) of 1000m. Hence, about half of the Project Site area falls within the CZ of TPGPP, and therefore the potential risks to the workers in construction phase and staff and visitors during operational phase of the Project should be properly addressed. However, it is anticipated the Project is likely to accommodate a similar population as the existing golf driving range. Hence, the additional societal risk level should not be significant. Besides, it is anticipated that the percentage of additional population

introduced to the CZ of TP GPP would be minimal during weekdays since the visitors would tend to be higher during weekends and holiday. As such, TPIE shall remain the dominant contributor to the societal risks of the TPGPP. The Project will not increase the individual risks of TPGPP during both construction and operational phases.

### 4.8 Landscape and Visual Impact

- **4.8.1** Based on the latest aerial photos and field surveys, the major landscape resources (LRs) are the dense mature trees surrounding the edge of project site and the existing open grass area. The landscape character area (LCA) of the entire project site shall be identified as golf course character. The landscape impact on the LRs and LCAs would be assessed in the EIA study.
- **4.8.2** The site is largely shielded by existing industrial buildings to its west and Shuen Wan Typhoon Shelter to its east. The key visually sensitive receivers (VSRs) will be the residents with elevated views facing Tolo Harbour, as well as that in adjoining recreational users at Tai Po Waterfront Park. The visual impact on the key VSRs would be assessed in the EIA study.

<sup>&</sup>lt;sup>1</sup> HKBWS 2016. Hong Kong Bird Report 2014

<sup>&</sup>lt;sup>2</sup> Leader P.J., Stanton D.J., Lewhwaite R.W. and Martinez J. 2016. A review of the distribution and population of the Collared Crow Corvus torquatus. Forktail 32: 41-53

<sup>&</sup>lt;sup>3</sup> AECOM 2009. Sediment Removal at Yim Tin Tsai, Tim Tin Tsai East Fish Culture Zones and Shuen Wan Typhoon Shelter. Project Profile submitted to EPD.

### 5 Environmental Protection Measures to be Incorporated In the Design and Further Environmental Implications

### 5.1 General

**5.1.1** The EIA study will investigate those environmental impacts (both cumulative impacts and those arising from the Project) and propose appropriate mitigation measures to ensure that all development and infrastructure proposals recommended by the Project would be environmentally acceptable and cost effective. Reference would be made to the relevant legislation and other requirements including but not limited to the EIAO, Hong Kong Planning Standards and Guidelines (HKPSG) etc. The residual impacts, if any, would be confined within the allowable limits. Environmental monitoring and auditing of potential impacts that may arise from implementation of the works proposed by the Project will be provided for the construction and operational phases. Subject to the findings of the EIA Study, the following mitigation measures would be incorporated in the design and construction of the Project.

### 5.2 Air Quality

#### **Construction Phase**

- 5.2.1 In order to prevent adverse impacts on air quality, the control measures stipulated in the Air Pollution Control (Construction Dust) Regulations should be implemented wherever applicable, to limit the dust emissions from the site. Subject to investigation, the following mitigation measures will be considered during construction period to minimize impacts on air quality on nearby ASRs.
  - Achieve cut-and-balance as much as practicable to minimise the need for transporting spoil off-site.
  - Stockpiles of dusty material will not extend beyond site boundaries.
  - In the process of material handling, any material which has the potential to create dust will be treated with water or sprayed with a wetting agent where practicable.
  - Any vehicles with an open load compartment used for transferring dusty materials off-site will be properly fitted with side and tail boards and cover.
  - Stockpiles of sand and aggregate will be enclosed on three sides and water sprays will be used to dampen stored materials and when receiving raw material.

- The site will be frequently cleaned and watered to minimise fugitive dust emissions.
- Motorised vehicles on the site will be restricted to a maximum speed of 15 km/hr and shall be confined to designated haul routes which will be paved or surfaced with hardcore.
- Use of appropriate dust suppression measures.

- **5.2.2** Subject to investigation, possible mitigation measures to ensure the air quality within the acceptable levels to be considered are as follows :
  - Adequate buffer distance between TP STW and the sensitive uses within the proposed Golf Course;
  - Adequate buffer distance between TPIE and the sensitive uses within the proposed Golf Course; and
  - Optimise the generation of vehicles (e.g. by introducing electric shuttle buses, use of electric golf court, as appropriate).

### 5.3 Noise

#### **Construction Noise**

- **5.3.1** The following measures will be further considered for construction period to minimize construction noise impacts on nearby NSRs.
  - Achieve cut-and-balance as much as practicable to minimise the need for transportation the spoil off-site;
  - Quiet plant will be used to reduce noise generated. Silencers or mufflers on construction equipment will be utilized and will be properly maintained during the works.
  - Movable and temporary barriers will be provided to screen NSRs from particular items of plant or noisy operations.
  - Noise screening structures or purpose-built noise barriers will be provided along the site boundary to provide additional protection to NSRs nearby.
  - Good site practices will be implemented as effective noise mitigation measures. These will include, but not limited to, locating noisy equipment and activities as far from NSRs as practical, scheduling noisy activities to minimise exposure of nearby NSRs to high levels of construction noise, proper maintenance of construction plant and devising methods of working to minimise noise impacts on the surrounding environment.
  - Travelling duly of the construction vehicles on public roads should be planned as far as practicable in a way to minimize the noise impacts to NSRs.

- **5.3.2** The proposed golf course will be closed during night-time period. The following mitigation measures and appropriate building design should be considered.
  - Careful sitting of noisy machinery and design for public address system within the site;
  - Enclose the noisy machinery within ancillary facilities;
  - Use of acoustic louver, silencer for ventilating fan, acoustic door and absorptive wall lining; and
  - Any openings of the building to be located facing away from any NSRs.

### 5.4 Water Quality

#### **Construction Phase**

- **5.4.1** In order to prevent adverse impacts on water quality, the following general mitigation measures would be put in place.
  - Good site practice in accordance with the ProPECC PN 1/94 "Construction Site Drainage" and "Recommended Pollution Control Clauses for Construction Contracts" issued by EPD, and the procedures in the Environment, Transport and Works Bureau (ETWB) Technical Circular (Works) TC(W) No. 5/2005 "Protection of Natural Stream/Rivers from adverse impact arising from construction works";
  - All runoffs arising from the construction site should be properly collected and treated to ensure the effluent comply with Water Pollution Control Ordinance. Silt trap and oil interceptor will be provided to remove the oil, lubricants, grease, silt, grit and debris from the wastewater before being pumped to the public stormwater drainage system. The silt traps and oil interceptors will be cleaned and maintained regularly;
  - Open stockpiles of materials on site will be avoided or where unavoidable covered with tarpaulin or similar fabric during rainstorms.
  - Where possible, works entailing soil excavation will be minimised during the rainy season.
  - Oil interceptors will be provided and properly maintained for collecting spillage or leakages from site workshops. The waste oil removed will be collected by licensed collectors.
  - Mobile toilets or other appropriate means will be provided to store sewage before disposal through licensed collection agent or discharging to main sewerage system.

- Any bore piling operations, the resulting suspension will be settled in sedimentation/infiltration pit until supernatant is clear and the bentonite solids will be disposed appropriately.
- Any marine works would be avoided.

- **5.4.2** The following mitigation measures are to be considered:
  - To implement a suitable Turfgrass Management Plan to minimize the use of agrochemicals, and to reuse the surface runoff for irrigation as far as practicable;
  - To provide a temporary storage system to collect and store the surface runoff from turf areas during normal conditions for reuse on-site;
  - To provide a u-channel system along the site perimeter to minimize uncontrolled discharge of surface runoff;
  - To provide sand/silt and oil/grease traps, porous pavements and detention ponds at suitable locations to prevent ingress of pollutants to the stormwater system, which will serve to reduce the loading from the storm drains to the inland waters of the Tolo Harbour and Channel WCZ;
  - To construct drainage system to reduce the risk of flooding; and
  - To convey all sewage generated to TP STW for treatment.

### 5.5 Waste

- **5.5.1** The construction work including terrain profiling, excavation, back filling, site formation, construction of roads and drainage, construction of the Project and associated infrastructures will generate certain amount of C&D materials. The existing soil cap can would be largely maintained. Other than C&D materials, solid waste such as C&D waste, chemical waste, general refuse etc would also be generated.
- **5.5.2** As the possible developments and infrastructure would require the import of fill material, the inert C&D materials would be considered for reuse. The following measures will be considered to reduce the quantities of C&D materials for disposal off site:
  - All C&D materials will be sorted and re-used wherever possible.
  - Waste haulier should obtain the necessary registration and licences under the Waste Disposal Ordinance and the Waste Disposal (Chemical Waste) (General) Regulation from the Environmental Protection Department.

- Nomination of an approved person to be responsible for good site practice, arrangements for collection and effective disposal to an appropriate facility, of all waste generated at the site.
- Separation of chemical wastes for special handling and appropriate treatment at a licensed facility.
- A recording system for the amount of wastes generated recycled and disposed of (including the disposal sites).
- In order to monitor the management of C&D materials and disposal solid wastes at public filling facilities and landfills, and control fly-tipping, a trip-ticket system shall be implemented by the Contractor, in accordance with the contract and the requirements of DEVB TC(W) No. 6/2010 "Trip Ticket System for Disposal of Construction & Demolition Materials". Additional control measures would be further considered during the EIA.
- A Waste Management Plan (WMP) shall be prepared and this WMP shall be submitted to the Engineer for approval. The WMP will be in accordance with ETWB TC(W) No. 19/2005 "Environmental Management on Construction Sites".
- Segregation and storage of different types of waste in different containers, skips or stockpiles.
- A systematic site management system to be implemented by the resident engineers.
- To enhance reuse of recycling of materials and their proper disposal.
- Any unused chemicals or those with remaining functional capacity shall be recycled.
- Use of reusable non-timber formwork to reduce the amount of C&D materials.
- Proper storage and site practices to minimize the potential for damage or contamination of construction materials.

### 5.6 Ecology

#### **Construction Phase**

**5.6.1** Habitat loss constitutes direct construction phase terrestrial ecological impacts. The proposed golf course will mainly affect man-made habitats including developed area, plantation and turfs. Potential impacts to inhabiting species of conservation importance will be assessed and mitigation and ecological monitoring and audit will be proposed where necessary. The landscape and visual impact assessment of the EIA will separately address potential impacts on tree loss and tree compensation.

**5.6.2** The proposed development is land-based in nature, and there will not be any marine works, such as dredging, reclamation, marine piling, during construction phase. Potential impacts to identified aquatic sensitive areas such as coral communities, mangroves and intertidal habitat are anticipated to be minor. Silt-laden runoff from works areas; and disturbance to nearby marine habitats from construction activities would be minimised by sensitive temporary drainage design, good site practice and implementation of water quality mitigation measures. Environmental monitoring and audit will be implemented during construction phase to safeguard the water quality and hence the ecological sensitive receivers in nearby areas and coastal waters. Good site practice would also minimize potential disturbance to nearly habitats outside the Project Site.

#### **Operational Phase**

5.6.3 A site-specific and environmentally sensitive "Turfgrass Management Plan" will be prepared for the golf course. Minimal agrochemical usage would be part of the major highlights in the Plan and would be achieved through various measures including selection of hardy turfgrass species, sensitive design of irrigation and drainage systems, integrated pest management and judicious fertilizer programme. In addition, during golf course operation, surface runoff from turf areas will be directed to the water storage ponds and tanks to allow sufficient retention time and reuse on irrigation to ensure success in minimizing escape of agrochemicals to the outside environment. Environmental monitoring and audit will be implemented during operational phase to safeguard the water quality and hence the ecological sensitive receivers in nearby areas and coastal waters. All sewage generated will be conveyed to TP STW for treatment and the effluent would not be discharged to Tolo Harbour.

### 5.7 Fisheries

#### **Construction Phase**

**5.7.1** There will not be any marine works, such as dredging, reclamation, marine piling etc., during both construction and operational phases. Potential impacts to identified fisheries sensitive receivers are anticipated to be minor. Silt-laden runoff from construction site to coastal waters would be minimised by sensitive temporary drainage design, good site practice and implementation of water quality mitigation measures. Environmental monitoring and audit will be implemented during construction phase to safeguard the water quality and hence the fisheries resources in nearby coastal waters.

5.7.2 A site-specific and environmental sensitive "Turfgrass Management Plan" will be prepared for the golf course. Minimal agrochemical usage would be part of the major highlights in the Plan and would be achieved through various measures including selection of hardy turfgrass species, sensitive design of irrigation and drainage systems, and integrated pest management and judicious fertilizer programme. In addition, during golf course operation, surface runoff from turf areas will be directed to the water storage ponds and tanks to allow sufficient retention time and reuse for irrigation to ensure success in minimizing escape of agrochemicals to the outside environment. Environmental monitoring and audit will be implemented during operational phase to safeguard the water quality and hence the fisheries resources in nearby coastal waters. All sewage generated will be conveyed to TP STW for treatment and the effluent would not be discharged to Tolo Harbour.

### **5.8 Land Contamination**

**5.8.1** The existing soil cap would be largely maintained, however, the existing operation of the driving range may have applied agrochemicals which are also considered as potentially polluting activities. Potential land contamination impacts and mitigation measures should be considered during the EIA Study to minimise any potential exposure to any contaminated soils or groundwater.

### 5.9 Landfill Gas

- **5.9.1** During construction phase of the Project, safety procedures should be implemented to minimise the risks of fire and explosions, asphyxiation of workers, and toxicity effects. Trenching, excavation and working at below ground or confined spaces should be conducted with precautions and workers should be equipped with gas detection equipment and appropriate breathing apparatus.
- **5.9.2** It is understood that EPD would maintain the management system for the landfill gas and leachate, nevertheless, building protection design measures should be implemented based on the risks level assessed in the EIA with reference to EPD's "Landfill Gas Hazard Assessment Guidance Note" (Report No. EPD/TR8/97). Mechanical ventilation system, methane gas detection system, routine gas monitoring, gas vents, gas resistance membranes and clear void under structure of at least 500mm would be considered and implemented where appropriate.

### 5.10 Potential Hazard

**5.10.1** While the construction and operation of the Project is not likely to introduce a significant increase in societal risks or individual risks, mitigation measures are unlikely required. Mitigation measures including but not limited to evacuation plan during emergency situation would be further reviewed during the EIA Study.

### 5.11 Landscape and Visual Impact

#### Mitigation Measures to be incorporated in the Detailed Design

**5.11.1** Adverse landscape impacts could be eliminated, reduced or offset as far as possible by considering on the design of golf course layout.

#### **Construction Phase**

- **5.11.2** The following general mitigation measures would be considered to alleviate the impacts for the construction phase:
  - tree protection and preservation measures would be implemented;
  - established trees of value are to be re-located where practically feasible;
  - areas temporarily disturbed by the Project would be reinstated in order to restore the green ambiance or LR as existed before the commencement of the Project to blend in with the new environment as far as practicable;

#### **Operation Phase**

- **5.11.3** The following general mitigation measures are to be considered in the operation phase:
  - compensatory tree planting where loss of plantation trees is unavoidable;
  - off-site compensatory planting, if required;
  - amenity planting for open spaces;
  - amenity planting for pedestrian walkway, roadside; and
  - greening works and contour grading works on cut/fill slopes.

### 5.12 Severity, Distribution and Duration of Environmental Effects and Further Implications

**5.12.1** Subject to the findings of assessments, effective control and mitigation measures will be identified to ensure the impacts are within acceptable levels. The possible severity, distribution and duration of environmental effects such as beneficial and adverse effects; short and long term effects; secondary and induced effects; cumulative effects and transboundary effects will be considered and addressed in the EIA, where applicable. The key results from public consultation etc should also be documented in the EIA.

## **6 Use of Previously Approved EIA Reports**

## **6.1.1** The following EIAs are made references to during the preparation of this Project Profile.

EIAO Application No.	Title	Date of Approval	Relevant to this Project
AEIA-091/2005	Proposed Extension of Public Golf Course at Kau Sai Chau, Sai Kung	14 November 2005	Environmental issues related to construction and operation of a golf course
AEIA-081/2004	Tai Po Sewage Treatment Works Stage V	28 October 2004	Odour impacts
AEIAR-071/2003	The Proposed Submarine Gas Pipelines from Cheng Tou Jiao Liquefied Natural Gas Receiving Terminal, Shenzhen to Tai Po Gas Production Plant, Hong Kong	23 April 2003	Environmental issues in the vicinity of Tai Po.
AEP-229/2005	Development of SkyCity Golf Course	17 October 2005	Environmental issues related to construction and operation of a golf course in the vicinity of ecologically sensitive site.
AEIAR-123/2008	Development of a Bathing Beach at Lung Mei, Tai Po	21 November 2008	Ecological baseline conditions in Tai Po Area.
AEIAR-073/2003	Cement Silos addition work in Tai Po Cement Depot	13 May 2003	Emissions from cement storage and environmental baseline in Tai Po.

Figure 1.1

Site Location Plan



**Site Location Plan**