Civil Engineering and Development Department

Tung Chung New Town Development Extension

Project Profile

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1 Basic Information

1.1 Project Title

1.1.1
Tung Chung New Town Development Extension

1.2 Purpose and Nature of Project

1.2.1
According to the 2007 Revised Concept Plan for Lantau, Tung Chung New Town is to accommodate a population of 220,000. The engineering infrastructure works for Phases 1, 2 and 3A of Tung Chung New Town development have been completed to support a population capacity of about 108,000 (the current population of Tung Chung New Town is about 78,400). At present, the various plans already made for Tung Chung are being implemented by phases. Examples include public rental housing in Areas 39 and 56, private residential development in Area 55 near the waterfront and the North Lantau Hospital in Area 25. At the same time, there are several adjoining large-scale infrastructure projects in the pipeline. For example, the Hong Kong-Zhuhai-Macao Bridge (HZMB) scheduled to complete by end 2016, the Tuen Mun-Chek Lap Kok Link as well as other related projects in the vicinity of Tung Chung including the adoption of a three runway system being planned for the Airport. Given the strategic location of Tung Chung, such infrastructure would bring about the so-called "Bridgehead Economy" benefits and there are potentials to develop Tung Chung into an attractive regional shopping and tourism node. Also, as part of the Government's enhanced efforts to increase housing land supply, there is a need to review and establish the planning and engineering aspects of expanding the Tung Chung New Town to Tung Chung East and Tung Chung West to meet the long-term housing need of our community and the aspirations of Tung Chung residents for more commercial and public facilities.

1.2.2
PlanD and CEDD jointly commissioned the Tung Chung New Town Development Extension Study (the Study) in January 2012. The Study will explore the development potential and opportunities of Tung Chung and its adjacent areas (in the form of fallow land, foreshore and sea-bed), determine the scope of Tung Chung extension and improve the community and regional facilities. The overall objective is to recommend a preferred development scheme for the continued development of Tung Chung New Town to meet the territorial long-term housing, social, economic and environmental needs. Specifically, through the Study, we hope to further increase land supply to meet housing and other development needs, enhance community facilities and provide more job opportunities.

1.2.3
Adjoining the tentative potential new town development extension area at Tung Chung East there lies a possible site of about 40 ha for a

theme park/major recreational uses for long term planning purpose as indicated on the Revised Concept Plan. This Project would however only include the reclamation for the possible theme park/major recreational uses. The construction and operation of the possible theme park/major recreational uses would be done by other project proponents. Hence, the future operator would need to apply for the respective EP under the EIAO. However, the Study will assess in broad terms the nature and technical feasibility of the possible theme park/major recreational uses and their compatibility/interface with developments in the vicinity. The environmental and technical feasibility of reclaiming this possible site together with the tentative potential New Town extension area at Tung Chung East in one go will also be examined in the Study as a separate scenario.

1.3 Name of Project Proponent

1.3.1 The Project Proponent is Hong Kong Island and Islands Development Office, Civil Engineering and Development Department (CEDD) of the Government of the Hong Kong Special Administrative Region.

1.4 Location and Scale of Project and History of the Site

1.4.1 The tentative potential Tung Chung new town development extension areas are shown in **Figure 1.1**.

1.4.2 The existing edges of the Tung Chung New Town are fronting sea at the east and the estuary of Tung Chung River at the west. At its southern and western sides, the New Town is surrounded by the Lantau North (Extension) Country Park. The total area of the tentative potential new town development extension (245 ha) and the possible theme park/major recreational uses (about 40 ha) is about 285 ha. The potential new town development extension areas in Tung Chung East and West (about 175 ha and 70 ha respectively) comprise about 120 ha is reclamation area and 125 ha existing land. Including about 40 ha for the possible theme park/major recreational uses, the total reclamation is about 160 ha. It should be emphasised that the scale of reclamation is indicative only and subject to the outcome of the Study. The fallow land interspersed with existing villages at Tung Chung West is also included as part of the study site for the tentative potential new town development extension areas.

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

1.5.1 To achieve the target population capacity of 220 000 for the Tung Chung New Town, it is proposed to accommodate a total population of about 110,000 within the tentative potential new town development extension areas. In terms of both the indicative reclamation scale as

stated in paragraph 1.4.2 above and the population size aforementioned, the Project falls within the definition of the Item 1 of Schedule 3 under EIA Ordinance, i.e. a Schedule 3 Designated Project, as an engineering feasibility study of urban development projects with a study area covering more than 20 hectares or involving a total population of more than 100 000, requiring an EIA report.

1.5.2 The Project may also consist of various Schedule 2 Designated Projects under the EIAO that may be identified in the course of the Study. The following elements of the Project, which are not exhaustive and are identified as Schedule 2 Designated Projects, are also included in this Project Profile:-

(i) Construction of primary distributor roads and district distributor roads [under Schedule 2, Part I, A.l];

(ii) Reclamation works (including associated dredging works) more than 5 ha in size [under Schedule 2, Part I, C.l];

(iii) Possible dredging operation exceeding 500,000m^3 [under Schedule 2, Part I, C.12]; and

(iv) Construction of sewage pumping stations with capacity of more than 2000m^3/d [under Schedule 2, Part I, F.3]

1.6 Name and Telephone Number of Contact Person

All queries regarding the Project can be addressed to:

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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 undertake the planning and engineering feasibility study, preliminary design, detailed design, tender and supervision of construction phase of the Project.

2.1.2 The construction works of the proposed reclamation/land formation and infrastructure works to serve the Project will be carried out in phases by contractors to be appointed under various works contracts.

2.2 Project Time-Table

2.2.1 The Study has commenced in January 2012 for completion within a study period of approximately 30 months. The outline implementation programme of the possible developments and infrastructure will be determined in the Study. Detailed design of the Tung Chung New Town Development Extension will follow.

2.3 Interactions with Other Projects

2.3.1 Potential projects that would have interface with the Project have been identified and are listed below. Implementation of some of these projects has yet to be approved. This list should be revisited during the subject 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, including but not limited to the following, would need to be identified and addressed as appropriate.

1. Construction of additional sewage rising mains and rehabilitation of the existing sewage rising main between Tung Chung and Siu Ho Wan
2. Salt water supply for Tung Chung, Lantau
3. Hong Kong - Zhuhai - Macao Bridge Hong Kong Boundary Crossing Facilities (HZMB HKBCF, being constructed)
4. Hong Kong - Zhuhai - Macao Bridge Hong Kong Link Road (HZMB HKLR, being constructed)
5. Tuen Mun - Chek Lap Kok Link (TM-CLKL)
6. Proposed New Contaminated Mud Marine Disposal Facility at Airport East / East Sha Chau Area
7. Siu Ho Wan Water Treatment Works Extension
8. Upgrading works for North Lantau Refuse Transfer Station

9. Organic Waste Treatment Facilities Phase 1
10. Possible Lantau Logistics Park
11. Integration of Siu Ho Wan and Silver Mine Bay Water Treatment Works
12. North Lantau Hospital Development
13. Planned Third Runway of Hong Kong International Airport
14. Further Landscape Enhancement to North Lantau Highway
15. All the planned and committed public housing developments in Tung Chung Area
16. Feasibility Study on Increasing Land Supply by Reclamation and Rock Cavern Development cum Public Engagement
17. Preliminary feasibility study for Container Terminal 10 at Southwest Tsing Yi
18. Greening Master Plans for New Territories South West – Investigation, Design and Construction
19. Review and Update of the Second Railway Development Study (RDS-2U)
20. Development of the Integrated Waste Management Facilities Phase 1 at Tsang Tsui Ash Lagoons Site and Artificial Island near Shek Kwu Chau
21. Black Point Gas Supply Project
22. Sludge Treatment Facilities at Tsang Tsui
23. Emissions Control Project at Castle Peak Power Station "B" Units

3 Possible Impacts On The Environment

3.1 General

3.1.1 All the prevailing legislative requirements would be considered in the EIA to assess the possible environment impacts.

3.2 Air Quality

Construction Impacts

3.2.1 Dust generated from the construction activities including reclamation, excavation works, backfilling, wind erosion of exposed area, temporary storage of spoil on site, transportation and handling of spoil etc. is expected to be the major source of impact during the construction phase.

Operational Impacts

3.2.2 The major permanent sources of air pollutants are the vehicular emissions from traffic on roads. Cumulative air quality impact should take into account neighbouring roads / portals / ventilation building and other sources (e.g. HZMB HKBCF, HZMB HKLR, TM-CLKL, NLH, planned Third Runway of Hong Kong International Airport, Castle Peak and Black Point Power Plants etc.) and other emission sources (e.g. industrial emissions including, but not limited to, incinerator at Shek Kwu Chau, sludge incinerator in Tsang Tsui, etc) in the region as necessary. Odour from sources such as any sewage pumping stations would need to be considered.

3.3 Noise

Construction Impacts

3.3.1 Potential noise impacts on noise sensitive receivers (NSRs) will be associated with construction activities and powered mechanical equipment. The key construction activities which would create noise impacts are reclamation, excavation, concreting and piling etc.

Operational Impacts

3.3.2 The future noise sources arising from the Project include new distributor roads and fixed noise sources such as any proposed sewage pumping stations. The possible theme park and recreational uses may also be a potential noise source to be considered. Cumulative noise impacts including neighbouring roads (e.g, HZMB HKBCF, HZMB HKLR, TM-CLKL, NLH, planned Third Runway of Hong Kong International Airport etc.), aircraft noise due to existing flight paths and the planned third runway, existing and new contours of NEF 25 from the development of airport, current and new flight paths fly above Lantau Island, noise impact during construction and increased aircraft traffic and other fixed noise sources (such as rail station,

ventilation systems, other existing and planned noise sources on HKIA) for day-time and night-time periods as appropriate on both existing and possible developments would need to be considered where appropriate.

3.4 Water Quality

Construction Impacts

3.4.1 Potential major sources of water quality impacts may arise from dredging, reclamation and construction of seawall, construction site runoff and wastewater generated from construction activities. The potential impact on the existing rivers/streams (including but not limited to Tung Chung River and its estuary at Tung Chung West etc) and the surface runoff due to the construction works may need to be addressed.

Operational Impacts

3.4.2 Local flow pattern would be changed in the vicinity of reclamation area which may have effect on water quality. Other potential water pollution sources would include the surface runoff from the reclaimed land and accidental chemical spillage. Cumulative water quality impact on the existing rivers/streams (including but not limited to Tung Chung River and its estuary at Tung Chung West etc) due to other projects in the vicinity will be taken into account.

3.4.3 The implications of increased nutrient loading from storm discharges, and increased domestic loading on the sewage treatment works and the capacity of the submarine outfall at Siu Ho Wan will also be considered. The capacity of the sewerage network (including local sewers and pumping stations) and the sewage treatment plant should be assessed.

3.4.4 The potential hydraulic impact and change of hydrodynamics due to reclamation would also be addressed.

3.5 Waste

Construction Phase

3.5.1 The construction work including site formation, construction of roads and drainage, construction of possible developments and associated infrastructures will generate a large amount of C&D materials. Other than C&D materials, solid waste such as C&D waste, chemical waste, general refuse etc would also be generated. Sediments, either dredged or excavated, would also be generated. The quantities of wastes to be generated during construction of the possible developments and infrastructure will largely depend on the future land use options 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 materials, if any.

Operational Phase

3.5.2 The amount of municipal solid waste that will be generated during operation of the Project will depend on the size of population of the future land use options. The storage and handling of this waste may have the potential to cause environment impact.

3.6 Ecology

3.6.1 The potential terrestrial and marine ecological impacts on Tung Chung River and its estuary at Tung Chung West arising from the Project will be associated with:

Construction Phase

(i) Direct habitat loss and habitat fragmentation;

(ii) Disturbance to wildlife and vegetation due to possible air pollution, water pollution, noise and glare, reclamation activities/related vessel traffic;

(iii) Disturbance to sensitive species (e.g. *Acrossocheilus beijiangensis*, *Alligator Pipefish*, *Horseshoe Crab*, *Romer's Tree Frog* and *Golden Birdwing* etc.);

(iv) Increased sediment load;

(v) Toxic pollutants from construction and operation;

(vi) Temporary habitat loss and habitat degradation; and

(vii) Soil compaction.

Operational Phase

(i) Ecological barrier;

(ii) Potential impacts arising from change of water flow due to reclamation, and diversion of natural river and stream courses (if any);

(iii) Habitat loss/ disturbance (e.g. Chinese White Dolphins) due to reclamation/site formation;

(iv) Change of hydrohynamic regime, erosion and sedimentation patterns;

(v) Disturbance to wildlife due to increased human activities; and

(vi) Disturbance to wildlife and vegetation due to possible air pollution, water pollution, noise and glare.

3.7 Fisheries

Construction Phase

3.7.1 During construction phase, reclamation may lead to potential temporary and permanent loss of fishing ground, spawning ground and nursery ground for commercial species. The associated dredging work may also cause impacts (e.g. increase in suspended solids) to water and hence fisheries. It may also lead to potential disturbance on fishing operation. The marine works and any subsequent water quality

deterioration will potentially affect the fisheries resources as well as spawning and nursery grounds nearby the Project Site. There may also be a potential risk of accidental chemical spillage to the surrounding water during offshore and coastal construction, which may affect fishing resources nearby the Project Site.

Operational Phase

3.7.2 During operational phase, the reclamation may change the local hydrodynamic regime and affect spawning and nursery ground. The fisheries resources as well as spawning and nursery grounds nearby the Project Site may also be affected.

3.8 Cultural Heritage

Construction Phase

3.8.1 The sites of archaeological interest, area of archaeological potential and potential offshore marine archaeological remains, which have not been investigated and/or adequately studied previously, may be affected. Construction works may result in damage to or loss of buried archaeological sites by:

(i) Disturbance through excavation at or near a site of archaeological interest, topsoil stripping and the passage of heavy machinery on exposed and buried deposits;

(ii) Change in the watertable due to construction and development activities;

(iii) Burial of areas resulting in limitation on accessibility for future archaeological investigations (including surface survey and remote sensing technique) and obscuring visible surface evidence;

(iv) Ground compaction due to construction activities may cause damage or distortion to buried archaeological remains;

(v) Impacts caused by reclamation on any remains of cultural significance buried in the seabed; and

(vi) Indirect impacts such as visual and vibration intrusion on the setting and amenity of archaeological resources.

3.8.2 The construction works may also have some direct and indirect impacts on graded historic buildings within and in the vicinity of the boundary of the new town development extension. Direct impacts would be avoided as much as practical but may include physical damage, direct disturbance etc and indirect impacts include dust, visual etc.

Operational Phase

3.8.3 Historic buildings, temples, shrines, woodland, field systems are mostly retained in their original state. The need for salvage of artefacts or preservation of heritage resource in-situ (including those for terrestrial archaeology and built heritage) and preservation of Fung Shui elements will be considered.

3.8.4 Direct and indirect cultural heritage impacts during the operation phase are not expected.

3.9 Landscape and Visual

3.9.1 The expected sources of landscape and visual impacts arising from the Project would include, but not limited to, the following:

Construction Phase

(i) Loss of landscape elements, e.g. woodland, marshland/ wetland, trees, small ponds and natural topography;

(ii) Loss of visual amenity through removal of landscape elements e.g. trees;

(iii) Visual appearance of any temporary use prior to the new development;

(iv) Construction activities on the existing available land;

(v) Obstruction of or intrusion into views by the new development; and

(vi) Land reclamation works and associated activities at sea.

Operational Phase

(i) Visual intrusion and obstruction created by the new development;

(ii) Visual quality of the new development;

(iii) Landscape impact arising from road works and related infrastructure facilities;

(iv) Permanent loss of landscape and visual amenity of the sea and natural environment due to the new development; and

(v) Narrowing the sea between BCF and North Lantau due to reclamation.

3.10 Land Contamination

3.10.1 Since the Tung Chung East development area would be formed by reclamation, it is unlikely to have land contamination impact for the pre-construction phase. The possibility of land contamination for Tung Chung West development area would need to be examined further.

3.11 Potential Hazard

3.11.1 It is not intended to have any Potential Hazardous Installation (PHI) or dangerous goods (DG) stores within the tentative potential new town development extension areas at Tung Chung East and Tung Chung West. Should there be a need for DG store or PHI identified during the Study, the potential hazard should be assessed to fulfil the legislative requirements in the TM-EIAO.

4 Major Elements Of The Surrounding Environment

4.1 General

4.1.1 The existing Tung Chung New Town was reclaimed in the 90's and is situated on the northern side of Lantau Island to the south of the Hong Kong International Airport. Lantau North (Extension) Country Park and Countryside Conservation Areas bound the existing New Town to the south and to the west. These areas are generally of steep gradient and are well vegetated. On the plain to the west of Tung Chung where the Tung Chung streams flow across, there are a number of existing rural settlements interspersed with some patches of fallow land. The upper reaches of the Tung Chung streams are classified as Ecologically Important Streams. The estuary of the Tung Chung River has a mudflat next to the existing built environment.

4.1.2 The engineering infrastructure works for the Phases 1, 2 and 3A of Tung Chung New Town development have been completed to support a population capacity of about 108,000 (at present, the population of Tung Chung New Town is about 78,400). The built environment in these locations comprises residential, open spaces, associated commercial and supporting institutional developments around the current terminus of the MTR Tung Chung Line and the bus terminus.

4.1.3 The existing environment of the site and its surroundings have been reviewed. The existing and planned 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 Tung Chung is one of the airshed identified. Existing fugitive dust sources include the stockpiling areas in Tung Chung East. This would have contribution on the cumulative fugitive dust impacts.

4.2.2 The air quality impacts due to vehicular emissions from roads, including those new roads for the new town development extension and existing/ new roads being implemented need to be addressed in the EIA study.

4.2.3 There are no major industrial activities nearby. Possible air pollution sources further away from the possible developments include the sewerage treatment works and Phase I of organic waste treatment facilities in Siu Ho Wan, and Black Power and Castle Peak Power Stations, planned Third Runway of Hong Kong International Airport and other regional pollutant sources in Pearl River Delta etc.

4.2.4 Subject to updating by the EIA study, the representative air sensitive receivers (ASRs) in vicinity of the possible developments may include

domestic premises, hotels, hospitals, clinics, schools, offices, shopping centre, places of public worship, as stipulated in Annex 12 of TM-EIAO. Existing ASRs include the residential developments and schools etc in Tung Chung areas. Planned ASRs including but not limited to those in Area 56 and TCTL 36 & 37 would be considered.

4.3 Noise

4.3.1 The planned and committed construction work to be conducted in Tung Chung Area would be one of the possible construction noise sources to be considered.

4.3.2 The existing noise environment is dominated by the traffic noise from the distribution road network within Tung Chung and North Lantau Highway, the railway noise from the Tung Chung Line and Airport Express Line, and aircraft noise from the operation at the Hong Kong International Airport. The HZMB HKBCF, HZMB HKLR, TM-CLKL and the planned Third Runway of Hong Kong International Airport will also influence the noise environment of the possible developments.

4.3.3 The helicopter noise from the helicopter holding areas in the vicinity of Tung Chung, flight paths along the north coast of Lantau and the helicopter landing points may also cause noise impacts. Any noise impacts from the possible Theme Park/ major recreational uses should also be considered.

4.3.4 Subject to updating by the EIA study, the representative NSRs in vicinity of the possible developments include domestic premises, hotels, hospitals, clinics, schools, places of public worship. Existing NSRs include the residential developments and schools etc in Tung Chung areas. Planned NSRs including but not limited to those in Area 56 and TCTL 36 & 37 would be considered.

4.4 Water Quality

4.4.1 The marine zone of the possible development site is located within the North Western Water Control Zone (WCZ) in a water body where oceanic and estuarine waters interchange. Consequently, the major factors influencing the water quality in the North Western WCZ are the discharges from the Pearl River estuaries and the local effluent discharges mainly contributed from the 3 sewage outfalls at Siu Ho Wan, Pillar Point and Northwest New Territories.

4.4.2 The possible cumulative impacts on local hydrodynamic regime from the HZMB HKBCF, HZMB HKLR, TM-CLKL and the planned Third Runway of Hong Kong International Airport need to be observed.

4.4.3 Potential water sensitive receivers would be:

(i) Mangroves, seagrass, horseshoe crabs nursery sites within the Airport Channel and Tung Chung Bay and estuary;

(ii) Tung Chung River and its tributaries;

(iii) San Tau Beach Site of Special Scientific Interest (SSSI) and Tai Ho Stream SSSI;

(iv) Chinese White Dolphin habitat;

(v) Existing or planned seawater/cooling water intakes in Tung Chung, HZMB HKBCF island, Lantau Logistics Park and Hong Kong International Airport; and

(vi) Proposed Marine Park at Brothers Islands.

4.4.4 The potential new town development extension area at Tung Chung East is situated in front of urbanised area and hence has no issue for groundwater resources. For the potential new town development extension area at Tung Chung West, groundwater resources would be considered if large underground facilities are confirmed to be implemented during the Study.

4.5 Ecology

4.5.1 The tentative potential new town development extension areas encompass coastal and lowland zones on North Lantau with built up area in Tung Chung Central. The possible development sites are bounded by the two bays of Tung Chung and Tai Ho and adjacent floodplains and coastal zones. At Tung Chung West, there are natural and rural habitats ranging from coastal mudflats and mangroves to upland streams and woodlands. Part of the existing coastline in Tung Chung West are formed artificially by reclamation with rock armoured seawall and vertical concrete blockwork seawall.

4.5.2 The possible developments should avoid infringement onto areas of high ecological importance as far as possible.

4.5.3 Potential ecological sensitive receivers would include but not limited to the following:

Marine

- Mangrove, mudflat, corals and seagrass habitats, horseshoe crabs nursery sites within the Airport Channel, and Tung Chung Bay;
- Mangrove and seagrass habitat at Tai Ho Wan;
- Tung Chung River and its tributaries;
- Wong Lung Hang Stream;
- San Tau Beach SSSI and Tai Ho Stream SSSI;
- Chinese White Dolphin habitat; and
- Proposed Marine Park at Brothers Islands.

Terrestrial

- Lantau North Country Park and Lantau North (Extension) Country Park;
- Pok To Yan and Por Kai Shan SSSI;

- Fung shui woods near the villages of Sheung Ling Pei, Ha Ling Pei, San Tau, Ngau Au, Mok Ka, Pak Mong and Shek Mun Kap;
- Butterfly habitats from San Tau to San Shek Wan;
- Bat roost in Tai Ho Wan;
- Romer's tree frogs on Airport Island and Tung Chung West;
- Woodlands above Wong Lung Hang and above San Tau; and
- Species of conservation interest in the region, such as fish; vertebrates: mammals including bats; marco-invertebrates: butterflies; inter-tidal benthic communities; avi fauna etc.

4.6 Fisheries

4.6.1 The possible reclamation at Tung Chung East and West is located in the western estuarine zone of Hong Kong waters, to the west of the transitional central and oceanic eastern waters. The seabed off north Lantau is shallow, usually less than -20m CD. Lying on the east side of the Pearl River Estuary, north Lantau waters are also heavily influenced by the Pearl River and have a predominantly sandy substrate. There are no Fish Culture Zones (FCZs) within the possible reclamation area for the Project. Ma Wan FCZ is the nearest FCZ to the Project area and is located some 10 km to the east.

4.6.2 Fishing areas in the vicinity of the possible developments would be:

- Fishing grounds in North Lantau waters; and
- Spawning grounds of commercial fisheries species in North Lantau waters

4.6.3 The artificial reefs deployed within the Chek Lap Kok Marine Exclusion Zone 3 might be affected by the possible developments.

4.7 Cultural Heritage

4.7.1 The traditional villages at both Tung Chung and Tai Ho have evolved over time in response to the natural landscape, cultural beliefs and community needs. Historic buildings, temples, shrines, bridges and woodland are found outside Tung Chung Centre Area.

4.7.2 Cultural heritage resources within and nearby the Project Site include:

(i) Tung Chung Battery - Declared Monument;
(ii) Tung Chung Fort - Declared Monument;
(iii) Tung Chung Game Board Carving – Site of Archaeological Interest;
(iv) Hau Wong Temple (Tung Chung) – Grade 2;
(v) Tin Hau Temple (Tung Chung) – Grade 2;
(vi) Watchtower, Pak Mong Tsuen – Grade 2;
(vii) Entrance Gate, Pak Mong – Grade 3;

(viii) Entrance Gate, Shek Mun Kap – Grade 3;
(ix) Ma Wan Chung Site of Archaeological Interest;
(x) Sha Tsui Tau Site of Archaeological Interest;
(xi) Pak Mong Site of Archaeological Interest;
(xii) Tai Ho Site of Archaeological Interest;
(xiii) Fu Tei Wan Kiln (Relocated to Tung Chung)
(xiv) Ha Law Wan Site of Archaeological Interest; and
(xv) San Tau Site of Archaeological Interest.

4.8 Landscape and Visual

4.8.1 There is a distinct visual envelope framed by natural topographical hill range to its southwest (Nei Lak Shan), south (Lantau Peak/Pak Kung Au), southeast (Wo Liu Tun/Shek Sze Shan/Pok To Yan/Por Kai Shan) and east (Lo Fu Tau). Yet, on other direction, it is framed by open seawater body. To the north of the study area across Tung Chung Bay is the extensive area of reclaimed land forming the platform of HKIA which, together with the transport route containing the NLH, AEL and TCL. Other key landscape character areas include the villages and agricultural land within the floor of Tung Chung Valley.

4.8.2 There are an extensive number of elevated viewpoints within the visual envelope given the mountainous terrain which adds to the areas high visual quality. Potential landscape and visual sensitive receivers would include, but not limited to, the following:

Landscape Sensitive Receivers

- Hillside landscape;
- Urban landscape;
- Rural landscape and special landscape features;
- Significant landscape elements;
- Bay landscape including marshland and wetland;
- Coastal landscape (artificial and natural);
- Inshore water landscape in the vicinity; and
- Island landscape at Tai Mo To.

Visual Sensitive Receivers

- Residents of nearby residential buildings and dwellings in Tung Chung and Tai Ho;
- Travellers along North Lantau Highway, MTR Tung Chung Line and Airport Express Line, the proposed infrastructure connecting the HZMB;
- Visitors on Ngong Ping Cable Car;
- Visitors to monuments and historical building such as Lo Hon Monastery, Hau Wong Temple, Tung Chung Battery and Tung Chung Fort;

- Workers and visitors on Chek Lap Kok Airport Island and the HZMB Hong Kong Boundary Crossing Facilities;
- Hikers of the Lantau Trail and other major country trails;
- Recreational users of major parks, open spaces and waterfront promenades;
- Hillside landscape at Pok To Yan etc.

4.9 Potential Hazard

4.9.1 There are 5 dangerous goods stores including the Siu Ho Wan Water Treatment Works (SHW WTW) and the aviation fuel tank farm on the airport island respectively in the vicinity of the Study. The SHW WTW is identified as a PHI with a consultation zone of 1km. Both the new town development extension areas at Tung Chung East and West are located at more than 2km away and hence will not encroach onto this consultation zone. The aviation fuel tank farm on the airport is not a PHI. In addition, the separation distance from the fuel tank farm to the new town development extension areas will be more than 1km and 630m for the Tung Chung East and West respectively. Hence, it is anticipated that these 2 facilities will not cause issues on hazard-to-life for the proposed development.

4.9.2 In addition, there is an LPG / diesel / petrol filling station and a diesel bus filling station located on Chung Wai Street approximately 500m outside the proposed development area. An existing LPG / diesel / petrol filling station is also found located on Hei Tung Street approximately 170m outside the proposed development area. Hence it is anticipated that these 3 facilities will not cause hazard for the proposed development.

5 Environmental Protection Measures To Be Incorporated In The Design And Any 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 the appropriate mitigation measures with the intention 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, 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.

(i) Stockpiles of dusty material will not extend beyond site boundaries.

(ii) 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.

(iii) Any vehicles/marine vessels with an open load compartment used for transferring dusty materials off-site will be properly fitted with side and tail boards and cover.

(iv) 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

(v) The site will be frequently cleaned and watered to minimise fugitive dust emissions.

(vi) 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.

(vii) Use of appropriate dust suppression measures.

Operational Phase

5.2.2 Subject to investigation, the proposed mitigation measures to improve the air quality within the possible developments and infrastructure are to be considered as follows :

(i). Adequate buffer distance is recommended to separate the ASRs and roads.

(ii). Odour Impact from possible Sewage Pumping Stations (SPS)

Proposed SPS for the possible developments:-

- design will be in accordance with DSD's Standard Design on Sewage Pumping Station, with all pumps located underground and enclosed within a structure/building;
- deodorization system would be installed and good housekeeping practice will be adopted; and
- identification of appropriate mitigation measures for prevention of septicity of sewage due to the operation of any proposed sewage pumping station and the associated rising mains and avoidance of septic sewage discharged from the possible developments into public sewerage system which might cause odour nuisance to the public.

5.3 Noise

Construction Noise

5.3.1 Subject to investigation, the following measures will be considered during construction period to minimize construction noise impacts on nearby NSRs.

- 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 route of the construction vehicles on public roads should be planned as far as practicable in a way to minimize the noise impacts to NSRs.

Operational Phase

5.3.2 For the potential impacts arising from highways, existing rail noise sources, other fixed noise sources including utilities services in the vicinity, and aircraft noise, the following mitigation measures and appropriate building design should be considered.

- For the NSRs, proper arrangement of landuses and the use of direct noise mitigation measures such as noise barriers along roads as appropriate, and the use of special building design including noise insulation as appropriate.
- The possibility of implementing noise barriers / enclosures on existing / planned highway infrastructures, and railway lines.
- For fixed noise sources, careful sitting of noisy machinery within the site; by enclosing the noisy machinery within building structures; by use of acoustic louver, silencer for ventilating fan, acoustic door and absorptive wall lining; and any opening 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 1194 "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) CTCW) 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;

- During dredging (if necessary) and filling works, appropriate construction methods will be selected to control the generation of sediment plumes;
- Proper construction techniques will be employed to prevent sediment release during construction. Stringent site sediment control and mitigation measures will be implemented to prevent elevation of suspended solid.
- Open stockpiles of materials on site will be avoided or where unavoidable covered with tarpaulin or similar fabric during rainstorms.
- Silt curtains or sand bag barriers will be used to confine the disturbed area during sediment removal activities.
- Where possible, works entailing soil excavation will be minimised during the rainy season.
- To minimize the impacts of concrete washings, infiltration/sedimentation pits will be used to settle out the washings before treatment/re-use/discharge. If necessary, treatment units with pH adjustment will be adopted.
- 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.
- For 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.

Operational Phase

5.4.2 The following general mitigation measures are to be considered:

- Provision of 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 North Western Water Control Zone.
- Construction of drainage works to prevent increased risk of flooding.
- Adopting proper sewerage system to treat sewage flows from the possible developments.
- Connection of the proposed sewerage system for the possible developments with the sewerage network in the region.
- Provision of suitable measures to minimise the risk of emergency discharges of untreated sewage and to ensure timely repair.
- Connection of the possible development's stormwater drainage system to the natural river and stream course to be avoided as

far' as practicable to prevent possible polluted surface runoff from affecting natural habitats.

Waste

5.5.1 The construction work including site formation, construction of roads and drainage, construction of possible developments and associated infrastructures will generate a large amount of C&D materials. 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.

5.5.3 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".
- 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
- 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.

5.5.4 For handling of dredged sediment, ETWB TCW No. 34/2002 will be followed.

5.6 Ecology

5.6.1 The mitigation measures that are to be implemented to minimize the impacts on air quality, noise and water quality will also help to minimize any impacts on ecological resources.

5.6.2 As regards ecological impact, the best mitigation is avoidance and will be used wherever possible. For impact which is considered unavoidable, mitigation measures will be adopted to minimize such impact, e.g. translocation of important species, confining works in specific area/season, minimizing reclamation size, alternative design/construction methods, good site practices etc. Compensation will be provided for the loss of important species or habitats, if any.

5.6.3 Any residential development proposal should be compatible with the surrounding land uses and rural setting. Mitigation measures should also be devised in the operational phase when necessary.

5.7 Fisheries

5.7.1 Subject to investigation, the following mitigation measures during construction phase will be considered to minimize the impact.

- The water quality impact mitigation measures proposed in **Section 5.4.1**.

5.7.2 The following mitigation measures will be considered to minimize the impact during operational phase.

- The water quality impact mitigation measures proposed in **Section 5.4.2**.

5.8 Cultural Heritage

5.8.1 A cultural heritage impact assessment (includes built heritage impact assessment, archaeological impact assessment and marine archaeological investigation) will be carried out under the EIA study. Impacts on cultural heritage sites will be avoided as far as practicable. If unavoidable, mitigation measures to the direct and indirect impacts on built heritage and archaeological resources will be implemented.

5.8.2 Archaeological Impact Assessment (AlA) and Marine Archaeological Investigation (MAl) will be conducted by qualified archaeologists/marine archaeologists to identify the impacts on any known and unknown site(s) of archaeological interest nearby the

Project site. For AIA, investigation will include field walking, augering and test trenching. For MAI, investigation where necessary will include geophysical survey and diver inspection. Preservation in-situ should be considered to avoid the impact on archaeological deposits as far as practicable. If unavoidable, appropriate mitigation measures will be designed and implemented.

5.9 Land Contamination

5.9.1 Subject to EIA findings, the following mitigation measures will be considered during the construction phase to minimise any potential exposure to contaminated soils or groundwater:

- Site workers should wear gloves, masks and other protective clothing where exposure to vapour or contaminated soil may be encountered.
- Contaminated materials should be removed with bulk earth movers to prevent human contact.
- Adequate washing facilities should be provided and smoking/eating should be prohibited in the area.
- Any contaminated sediments that may need stockpiling or need to be transported should be covered with tarpaulin.
- Leakage of pollutants or leaching from excavated soil should be prevented by storing on an impermeable surface.
- Only licensed waste hauliers should be used to collect and transport any contaminated material to an appropriate disposal site and procedures should be developed to ensure that illegal disposal of wastes does not occur.
- The necessary waste disposal permits should be obtained, as required, from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap 354), Waste Disposal (Chemical Waste) (General) Regulation (Cap 354), as required.

5.10 Landscape and Visual

5.10.1 The following measures are to be considered during the design stage to minimize the landscape and visual impacts, including, but not limited to:

- the urban design principles such as the density of the development and focusing the development around certain functions;
- controlling building height profiles and providing stepped building heights;
- responsive building massing;
- preserving and establishing visual and open space links, including provision of view and breeze corridors; and

- landscape design principles such as avoid or minimize disturbance to significant landscape resources.

5.10.2 The following general mitigation measures will be considered to alleviate the impacts for the construction phase, including, but not limited to:

- erosion control measures should be implemented for protection of construction works and the landscape if heavy rains occur;
- measures should be taken to store and use construction equipment and building materials where they are not visually intrusive, or easily washed away or where they produce less dust;
- tree transplanting and compensatory planting will be considered to mitigate the impact on the existing tree/woodland.

5.10.3 The following general mitigation measures are to be considered for the operational phase, including, but not limited to:

- roadside planting is proposed alongside all roads within the possible developments. It will enhance local identity, if theme planting is used, and reduce visual impact through screening;
- amenity strips will be provided to local roads, wherever practicable, to mitigate their visual appearance;
- road structures, such as pedestrian bridges, will be designed to improve the visual appearance of the road corridor;
- the visual impact of any noise mitigation measures will be mitigated by appropriate detailed design, including use of transparent panels, provision of at-grade planting of trees, shrubs and/or climbers camouflage to the barriers, appropriate colour selection of panels and supporting structure as well as design of supporting structures to incorporate a high level of quality and aesthetics. Sufficient space shall be allocated for greening provision in planning and designing of noise barriers. Relevant technical documents WBTC No. 25192 - Allocation of Space for Urban Street Trees, WBTC No. 7/2002 - Tree Planting in Public Works, and Guidelines on Design of Noise Barriers by HyD and EPD in 2003 shall be observed;
- the landscape treatment of road embankments and soil slopes will be provided to enhance their visual appearance. Relevant technical document GEO Publication No. 1/2011 Technical Guidelines on Landscape Treatment for Slopes by CEDD in 2011 shall be observed;
- landscape treatment will be provided to any sewage pumping stations, refuse collection points, where practicable, to enhance their visual appearance. Relevant technical document Technical Circular (Works) No. 3/2012 Site Coverage of Greenery for Government Building Projects by Development Bureau in 2011 shall be observed;

- landscape treatment on the open drainage channel, if applicable, will be provided; and
- the provision of the identified urban design measures as identified in the design stage.

5.11 Potential Hazard

5.11.1 Mitigation measures will not be required for the SHW STW and the aviation fuel tank farm on the airport island, LPG / diesel / petrol filling station and diesel bus filling station. In case any PHI or DG store is required within the proposed development area, the need for mitigation measures would need to be considered.

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 to acceptable level. 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 There is no EIA report already approved under the EIA Ordinance for this Project. However, the following reports are relevant and will be referred to in the EIA study. Where necessary, other relevant information identified during the Study would also be considered and documented in the EIA.

EIAO Application No.	Title	Date of Approval	Relevant to this Project
EIA-186/2010	Integration of Siu Ho Wan and Silver Mine Bay Water Treatment Works	13 Jan 2011	Information relating to the size of the consultation zone of the Siu Ho Wan Water Treatment Work would be considered.
EIA-176/2009	Organic Waste Treatment Facilities, Phase I	24 Feb 2010	The air emission for OWTF would need to be considered in the EIA.
EIA-174/2009	Tuen Mun - Chek Lap Kok Link	23 Oct 2009	The alignment and construction methodology would need to be considered in the EIA.
EIA-173/2009	Hong Kong - Zhuhai - Macao Bridge Hong Kong Boundary Crossing Facilities	23 Oct 2009	The configuration and construction methodology would need to be considered in the EIA.
EIA-172/2009	Hong Kong - Zhuhai - Macao Bridge Hong Kong Link Road	23 Oct 2009	The alignment and construction methodology would need to be considered in the EIA.
EIA-106/2005	New Contaminated Mud Marine Disposal Facility at Airport East/East Sha Chau Area	1 Sep 2005	The locations and construction methodology would need to be considered in the EIA.
EIA-100/2004	Siu Ho Wan Water Treatment Works Extension	15 Dec 2004	Information relating to the size of the consultation zone of the Siu Ho Wan Water Treatment Work would be considered.
EIA- 90/2003	Tung Chung - Ngong Ping Cable Car Project	9 Jun 2003	The baseline information would be considered as appropriate.
EIA- 006/BC	New Airport Master Plan (NAMP) - Environmental Impact Assessment - Final Report (12/91) & Supplement (10/92)	Accepted before 1 April 1998	The baseline information would be considered as appropriate.
EIA-201/2011	Development of the Integrated Waste Management Facilities Phase 1	17 Jan 2012	The locations and construction methodology would need to be considered in the EIA.

EIAO Application No.	Title	Date of Approval	Relevant to this Project
EIA-178/2009	Black Point Gas Supply Project	27 Apr 2010	The locations and construction methodology would need to be considered in the EIA.
EIA-155/2008	Sludge Treatment Facilities	19 Feb 2009	The locations and construction methodology would need to be considered in the EIA.
EIA-123/2006	Emissions Control Project at Castle Peak Power Station "B" Units	25 Oct 2006	The emission from the power station would need to be considered in the EIA.

HK BOUNDARY CROSSING FACILITIES OF HZMB (BY OTHERS)

POSSIBLE THEME PARK/MAJOR RECREATIONAL USES (ABOUT 40HA) (SUBJECT TO ENGINEERING ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT)

TM-CLK LINK (BY OTHERS)

HONG KONG INTERNATIONAL AIRPORT

POSSIBLE LANTAU LOGISTICS PARK DEVELOPMENT (BY OTHERS) (REF. REVISED CONCEPT PLAN FOR LANTAU)

HK LINK ROAD OF HZMB (BY OTHERS)

NORTH LANTAU HIGHWAY

TAI HO WAN

北大嶼郊野公園（擴建部分）
LANTAU (NORTH) EXTENSION COUNTRY PARK

POTENTIAL NEW TOWN DEVELOPMENT EXTENSION AREA (ABOUT 70HA) (SUBJECT TO ENGINEERING ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT)

TUNG CHUNG BAY

SAN TAU

POR KAI SHAN

TUNG CHUNG

POK TO YAN

北大嶼郊野公園（擴建部分）
LANTAU (NORTH) EXTENSION COUNTRY PARK

CABLE CAR

POTENTIAL NEW TOWN DEVELOPMENT EXTENSION AREA (ABOUT 175HA) (SUBJECT TO ENGINEERING ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT)

WO LIU TUN

TUNG CHUNG ROAD

LANTAU NORTH (EXTENSION) COUNTRY PARK

0 500 1000m

LEGEND

- TENTATIVE POTENTIAL NEW TOWN DEVELOPMENT EXTENSION AREA (SUBJECT TO ENGINEERING ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT)
- POSSIBLE THEME PARK/ MAJOR RECREATIONAL USES (SUBJECT TO ENGINEERING ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT)
- COUNTRY PARK
- TUNG CHUNG TOWN CENTRE AREA (OUTLINE ZONING PLAN NO. S/I-TCTC/18)

Rev	Description	By	Date
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B	SECOND ISSUE	GL	06/12
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Consultant
ARUP

Project title
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Location of Project

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