

Civil Engineering and Development Department

Reclamation at Lung Kwu Tan

Project Profile

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.

Arup - Atkins Joint Venture

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1. Basic Information

1.1 Project Title

1.1.1 Reclamation at Lung Kwu Tan (hereinafter named as the Project).

1.2 Purpose and Nature of the Project

1.2.1 According to the Report of the Task Force on Land Supply (TFLS) submitted to the Government in December 2018 and accepted in full by the Government in February 2019, Lung Kwu Tan (LKT) reclamation and re-planning of Tuen Mun West (TMW) area (including development of River Trade Terminal (RTT) site) are worthy of study and implementation with priority as two of the medium-to-long term land supply recommendations. These two recommendations were subsequently included in the Government's Final Report of "Hong Kong 2030+: Towards a Planning Vision and Strategy Transcending 2030" promulgated in October 2021 to boost land supply for meeting development needs and build up land reserve. In the "10-year Supply Forecast of Developable Land" announced by the Government in October 2023, LKT reclamation and the re-planning of TMW area are to provide "developable land" to meet development needs starting in 2030-2031.

1.2.2 The land and transport developments in the northwest New Territories in recent years have placed LKT and TMW areas in strategic positions. LKT area leads north to Pak Nai, Lau Fau Shan, Tsim Bei Tsui and Hung Shui Kiu/ Ha Tsuen New Development Area, which is the "high-end professional services and logistics hub" of the Northern Metropolis connecting with Qianhai in Shenzhen. Located in close proximity to multiple existing and planned transport infrastructure facilities, and coupled with the current annual utilisation rate of the berths in the RTT of only one-fifth of their overall capacity, TMW area is considered of re-planning potential to make the best use of the land at the area.

1.2.3 Taking on board the aforesaid land supply recommendations, Civil Engineering and Development Department (CEDD) and Planning Department (PlanD) jointly commenced a consultancy agreement "Planning and Engineering Study for Lung Kwu Tan Reclamation and the Re-planning of Tuen Mun West Area - Investigation" (the Study) in December 2023. The Study is to formulate land use proposals for LKT and TMW areas for meeting part of the medium-to-long-term land requirements in Hong Kong, taking into consideration in fully leveraging the unique geographical advantages of LKT and TMW areas and making use of their connectivity with the Northern Metropolis, the Hong Kong International Airport and other areas to bring development opportunities to the areas.

1.2.4 The major components of the proposed development at LKT and TMW areas include the followings:

- (i) Reclamation at LKT and associated works;
- (ii) Potential Reclamation at RTT site and associated works; and
- (iii) Land use/ top-side developments on the newly reclaimed lands and existing lands in the vicinity and associated infrastructural works.

- 1.2.5 This Project Profile (PP) covers Environmental Impact Assessment (EIA) Study of Reclamation at LKT (i.e. the Project), which focuses on the potential environmental impacts and corresponding mitigation measures in relation to the reclamation works at LKT, including but not limited to those on marine ecology, fisheries, water quality, etc. only and is prepared to provide the Director of Environmental Protection (DEP) with sufficient information in determining the scope of the EIA Study together with the technical and procedural requirements that the EIA Study for the Project shall meet.
- 1.2.6 Separate EIA Study(ies) will be prepared for the potential reclamation at RTT site, LKT and TMW developments upon the reclaimed land and existing land in the vicinity, or other proposed works that may require such under the Study in due course, to be carried out by the respective project proponents in accordance with the implementation timeframes of the reclamation and development works at LKT and TMW areas, subject to the Study and land lease conditions of existing facilities.

1.3 Name of Project Proponent

- 1.3.1 The Project Proponent is Port Works Division, Civil Engineering Office, CEDD of the Government of the Hong Kong Special Administrative Region.

1.4 Location and Scale of Project and History of the Site

Location and Scale of Project

- 1.4.1 The Project covers the bay area with shallow water depth at the north of LKT and a few patches of existing lands along the coast. It abuts Black Point headland in the north, industrial/ brownfield sites in the east, village settlements including Pak Long and Sha Po Kong in the southeast, as well as Urmston Road from south to north. The approximate location of the Project is shown in **Figure 1.1**.
- 1.4.2 In accordance with the latest design, the potential reclamation extent of the Project is about 145 ha, which is tentative and indicative only and is subject to further review throughout the Study. While non-dredged method will be adopted as far as practicable in order to minimise impacts on ecology, fisheries and water quality, dredging may still be required for the provisioning of marine facilities (e.g. berthing facilities) along the west coast of the reclamation where the existing water depth is considered inadequate. Dredging activities may also be inevitable during enabling works for ground treatment for seawall construction and at areas with site constraints.
- 1.4.3 For interfacing with the existing land, land-based works including site clearance and site formation works, etc. will also be required along the coastal areas adjacent to the proposed reclamation.
- 1.4.4 An existing submarine outfall carrying treated effluent from sewage treatment works in North West New Territories (NWNT) and treated leachate from the West New Territories (WENT) Landfill to Urmston Road for discharge is identified and falls partially in the Project Site. Subject to further investigation with respect to planning constraints, environmental considerations and engineering feasibility, the submarine outfall may be retained or rearranged (either nearshore or offshore). If rearrangement of the submarine outfall to offshore is considered necessary, the associated pipe laying works will involve minimal dredging.

History of the Site

- 1.4.5 With reference to the aerial photographs, the shoreline of the northern LKT where the Project is proposed remained largely undisturbed until 1990s, with only small clusters of rural settlements in the form of agricultural land and village houses noted in its vicinity. Between 1991 and 1993, the shoreline within the north-eastern portion of the Project was modified in association with reclamation works for the formation of a barging point. This included the construction of a sloping rubble mound seawall along the reclamation boundary.
- 1.4.6 To discharge the treated effluent from sewage treatment works in NWNT and treated leachate from the WENT Landfill to Urmston Road, a submarine outfall has been constructed running across the Project Site from northeast to southwest in 1993 and is still in operation. No further modification of the shoreline was observed since then.

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

- 1.5.1 The Project would consist of various Schedule 2 Designated Projects (DPs) under the EIAO (Cap. 499) as listed in **Table 1.1**. The list may not be exhaustive and is subject to further review and update in the course of the EIA Study.

Table 1.1 List of Designated Projects

Item No.	Designated Project	Remarks
Schedule 2 of the EIAO		
C.1	Reclamation works (including associated dredging works) more than 5 ha in size.	<ul style="list-style-type: none"> Tentative reclamation extent of the Project is approximately 145 ha in size.
C.12	A dredging operation that is— (a) with a dredging volume of more than 500 000 m ³ .	<ul style="list-style-type: none"> Provisioning of marine facilities (e.g. berthing facilities), enabling works for ground treatment for seawall construction and pipe laying works of the rearranged submarine outfall (if necessary) as discussed in Section 1.4 would potentially require dredging operation of more than 500 000 m³.
F.5	A submarine sewage pipeline with a diameter of 1 200 mm or more and a length of 1 km or more.	<ul style="list-style-type: none"> The existing submarine sewage outfall which discharges treated effluent from sewage treatment works in NWNT and treated leachate from the WENT Landfill to Urmston Road may potentially be rearranged, subject to further investigation.
F.6	A submarine sewage outfall.	

Note:

Any Schedule 2 and Schedule 3 DPs under the EIAO identified for the potential reclamation at RTT site, land use/ top-side developments on the newly reclaimed lands and existing lands at LKT and TMW areas as well as associated infrastructural works (including but not limited to possible road link(s) and railway(s)) are to be covered in separate PP(s) as discussed in **Section 1.2**. They will be submitted to DEP to apply for the respective EIA Study Brief(s).

1.6 Name and Telephone Number of Contact Person

- 1.6.1 All enquiries regarding the Project can be addressed to:
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Port Works Division
Civil Engineering Office
Civil Engineering and Development Department
4/F, Civil Engineering and Development Building
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2. Outline of Planning and Implementation Programme

2.1 Project Implementation

2.1.1 The Project Proponent, subject to the final recommendation of this Study, will be responsible for implementing the proposed reclamation and associated works, together with all the environmental mitigation measures and environmental monitoring and audit (EM&A) requirements as specified in the EIA Report of the Project. The scope of the EIA Study includes the following:

- Reclamation works at LKT;
- Site clearance and site formation works, etc. on the existing lands adjacent to the proposed reclamation; and
- Possible rearrangement of submarine outfall at Urmston Road (subject to further investigation).

2.1.2 As mentioned in **Section 1.4**, non-dredged method will be adopted as far as practicable for reclamation. However, subject to further review and project design under the Study, the following dredging activities may be carried out:

- Provisioning of marine facilities (e.g. berthing facilities);
- Enabling works for ground treatment for seawall construction;
- Pipe laying works of the rearranged submarine outfall (if necessary); and
- At areas with site constraints.

2.1.3 The Consultants of the Study are responsible for undertaking the EIA Study according to the Study Brief to be issued by DEP and responding to issues related to the EIA on behalf of the Project Proponent.

2.1.4 The construction works of the proposed reclamation at LKT and associated works will be carried out in phases by contractors to be appointed under various works contracts.

2.2 Project Timetable

2.2.1 The Study has commenced in December 2023 for completion within a study period of 30 months. Subject to the necessary statutory procedures and results of the Study, reclamation at LKT and associated works of the Project are tentatively intended to commence in 2027 the soonest with a view to provide first piece of “developable land” to meet development needs starting from 2030-2031.

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. Some of these projects are under implementation or planning of which are yet to be approved. This list should be revisited during the EIA Study to ensure all the latest projects available from the respective stakeholders are incorporated.

- Potential reclamation at RTT site, land use/ top-side developments on the newly reclaimed lands and existing lands at LKT and TMW areas as well as associated infrastructural works (see **Section 1.2.6**);
- Developments of Tuen Mun East and Adjacent Green Belt Cluster;
- Tuen Mun Bypass;
- Development of Integrated Waste Management Facilities Phase 2 (I-PARK2);
- West New Territories (WENT) Landfill Extensions;
- Nim Wan Road (South); and
- Upgrading of Nim Wan Road (North).

3. Possible Impacts on The Environment

3.1 General

- 3.1.1 All the prevailing legislative requirements would be considered in the EIA Study to assess the possible environmental impacts.
- 3.1.2 The EIA Study would assess the environmental impacts on the existing, committed and planned sensitive receivers during construction phase of the reclamation and associated works. The construction activities associated with the Project will be mainly marine-based, potentially including sand blanket laying, ground improvement works, seawall construction, reclamation filling, etc., whereas site clearance and site formation works, etc. on the existing lands adjacent to the proposed reclamation will also be required. Subject to further investigation, the existing submarine outfall at the Project Site may be rearranged. The newly reclaimed land may have some potential dust (due to wind erosion), water quality, ecology, fisheries and visual impacts during post-construction stage while the operation of the rearranged submarine outfall (if necessary) may result in water quality, ecology and fisheries impacts and these would be addressed in this EIA Study.
- 3.1.3 As the future land use is yet to be formulated, the environmental impacts caused by and imposed on the proposed land use/ top-side developments on the reclaimed land would be subsequently assessed under another separate EIA Study.

3.2 Air Quality

Construction Phase

- 3.2.1 Dust arising from the construction activities on land and above sea level including excavation works, backfilling, wind erosion of exposed area, temporary storage of spoil on site, transportation and handling of spoil, etc., as well as emissions induced by constructional plants, construction vessels and construction vehicles are expected to be the major sources of air quality impact during construction phase. With the implementation of mitigation measures specified in the Air Pollution Control (Construction Dust) Regulation, proposed dust suppression measures and good site practices to be checked by regular site environmental audits, potential air quality impact on the air sensitive receivers (ASRs) in the vicinity of the construction site is anticipated to be minimised and shall be assessed in the EIA Study.
- 3.2.2 Sediments generated from dredging activities could be a potential source of odour impact. However, considering that non-dredged method for reclamation works will be employed as far as practicable and odour control measures will be properly implemented, such as transporting away the dredged sediment from the site on daily basis as well as covering the dredged sediment by tarpaulin or impervious sheets at all times, potential odour impact due to the construction of the Project is expected to be minimised and shall be assessed in the EIA Study.
- 3.2.3 Cumulative air quality impacts due to any concurrent projects including those within the assessment area will also be reviewed and assessed.

Post-construction Phase

- 3.2.4 The unpaved reclaimed land during the post-construction phase will induce potential dust impact due to wind erosion. However, potential dust impact on nearby ASRs is expected to be minimised with appropriate mitigation measures provided and shall be assessed in the EIA Study.

3.3 Noise

Construction Phase

- 3.3.1 The potential sources of noise impacts during construction phase will mainly be noise generated from the use of powered mechanical equipment (PME), such as backhoes, cranes, generators, construction vessels, construction vehicles, etc., for various construction activities including but not limited to sand blanket laying, ground improvement works, seawall construction, reclamation filling, site clearance, site formation, rearrangement of submarine outfall (if necessary), etc. With implementation of mitigation measures, adverse construction noise impact on nearby Noise Sensitive Receivers (NSRs) during construction phase of the Project is not expected.
- 3.3.2 Cumulative construction noise impacts contributed by any concurrent projects will be reviewed and assessed where appropriate.

Post-construction Phase

- 3.3.3 No post-construction noise impact is associated with the bare reclaimed land upon the completion of all the reclamation works and associated works.

3.4 Water Quality

Construction Phase

- 3.4.1 The Project would involve both marine-based and land-based works. During construction phase, release of suspended solid (SS) and contaminants associated with marine works including sand blanket laying, ground improvement works, seawall construction, reclamation filling, rearrangement of submarine outfall (if necessary), etc. are identified as the major potential sources of water quality impacts.
- 3.4.2 While non-dredged method for reclamation will be adopted as far as practicable, dredging works for ground treatment prior to seawall construction, provisioning of marine facilities (e.g. berthing facilities) and rearrangement of submarine outfall (if necessary) may also be required. To control the water quality impacts on nearby Water Sensitive Receivers (WSRs), adequate mitigation measures such as optimisation of construction phasing, provision of sufficient leading seawall in advance of reclamation filling, deployment of silt curtains, etc. will be considered and implemented as far as practicable.
- 3.4.3 Induced marine transportation of material, construction site runoff and drainage, wastewater generated by construction activities, sewage arising from on-site construction workforce and accidental spillage may also contribute to water pollution. Appropriate mitigation measures and good site practices will be recommended to minimise the potential water quality impacts. For works in the vicinity of watercourses, construction methods will be properly designed and disturbance will be avoided as far as practicable.

- 3.4.4 Cumulative water quality impacts arising from any concurrent projects in the vicinity will be reviewed and assessed where appropriate.

Post-construction Phase

- 3.4.5 Upon completion of the reclamation, the hydrodynamic regime of the nearby water bodies of the reclaimed land will be permanently altered, which in turn may potentially affect the associated water quality. Taking into account the future developments under other projects, cumulative impacts on hydrodynamic and water quality will be assessed in the EIA Study.

Operational Phase (for Possible Rearrangement of Submarine Outfall)

- 3.4.6 Subject to further investigation, the existing submarine outfall lying across the Project Site may be rearranged. Potential water quality impacts due to release of treated effluents from sewage treatment works in NWNT and treated leachate from the WENT Landfill (and potentially WENT Landfill Extensions) at the new discharge location will be assessed in the EIA Study if necessary.

3.5 Waste Management

Construction Phase

- 3.5.1 Non-dredged reclamation method will be adopted as far as practicable and it is anticipated that no marine sediments will be dredged from the proposed reclamation works. Nevertheless, marine sediments will inevitably be dredged for the provisioning of marine facilities (e.g. berthing facilities), the ground treatment for seawall construction and the rearrangement of submarine outfall (if necessary).
- 3.5.2 Construction and demolition (C&D) materials and chemical waste will be generated from the construction activities for reclamation and associated works, and may pose environmental hazards if not handled properly. On the other hand, the construction workforce will generate general refuse comprising food scraps, waste paper, empty containers etc., which may give rise to adverse environmental impacts such as odour generation, windblown litter and vermin. Relevant waste management implications will be addressed in the EIA Study.
- 3.5.3 Floating refuse generated during construction phase may also wash up onto the reclamation boundary through the effect of currents and wind and will then be trapped and accumulated near the constructed artificial seawall. Adverse waste management implication is not expected with proper implementation of mitigation measures.

Post-construction Phase

- 3.5.4 Floating refuse will potentially be generated and accumulated along the shoreline of the reclaimed land during the post-construction phase. However, any associated waste management implications could be minimised by appropriate shoreline design and proper implementation of mitigation measures.

3.6 Land Contamination

- 3.6.1 There is no land contamination potential associated with the proposed reclamation and other marine-based works as they are located in open sea.

3.6.2 However, for the site areas where land-based works will be carried out, a site appraisal will be undertaken to further review the concerns in land contamination and if any, site investigation and necessary remediation works shall be completed prior to the commencement of the construction works.

3.7 Landfill Gas Hazard

3.7.1 Considering that the proposed reclamation and the associated works are not located within the Consultation Zones of either existing WENT Landfill or planned WENT Landfill Extension, no potential landfill gas hazard is anticipated.

3.8 Ecology

3.8.1 Apart from the proposed reclamation and associated marine works, potential land-based works including site clearance and site formation, etc. along the existing land adjacent to the proposed reclamation is anticipated.

3.8.2 The potential terrestrial and marine ecological impacts induced by the proposed reclamation and the associated works will be associated with:

Construction Phase

- Permanent and/ or temporary habitat loss, habitat degradation and habitat fragmentation induced during the construction phase;
- Disturbance to nearby wildlife due to possible air pollution, water pollution, noise and glare, arising from reclamation activities/ related vessel traffic, especially to the ecological sensitive receivers (e.g. intertidal, subtidal and benthic habitats);
- Impact to flora and fauna species of conservation importance, e.g. coral communities, horseshoe crabs, marine mammals;
- Increased sediment load; and
- Pollutants from construction works, including but not limited to construction site runoff and accidental spillage of chemicals.

Post-construction Phase

- Permanent habitat loss and habitat fragmentation, gradually accumulated since the commencement of reclamation; and
- Potential impacts arising from change of water flow, hydrodynamic regime, water quality, erosion and sedimentation patterns due to reclamation and the consequential impacts to ecological sensitive receivers.

Operational Phase (for Possible Rearrangement of Submarine Outfall)

- Subject to further investigation, the existing submarine outfall lying across the Project Site may be rearranged. Potential water quality impacts due to the release of treated effluents from sewage treatment works in NWNT and treated leachate from the WENT Landfill (and potentially WENT Landfill Extensions) (refer to **Section 3.4.6**) might result in indirect impacts to marine ecological resources. The impacts will be assessed in the EIA study if necessary.

3.9 Fisheries

- 3.9.1 According to the Port Survey 2021 by Agriculture, Fisheries and Conservation Department (AFCD)¹, the potential reclamation site at LKT supports low fisheries production (>0 – 100 kg/ha) and low to moderate fishing operation (>50 – 400 vessels), dominated by sampans.

Construction Phase

- 3.9.2 Reclamation and potential dredging works may lead to temporary and permanent loss of and/ or temporary disturbance to fishing grounds, fisheries habitats, oyster culture activities in Deep Bay (locations and extents to be covered in the assessment will be agreed with EPD and AFCD) and recognised spawning ground for commercial fisheries resources at North Lantau waters. There may also be potential risk of accidental spillage to the surrounding water during marine construction, which may affect fisheries sensitive receivers near the Project Site. Potential impact on fishing grounds and oyster culture activities in Deep Bay (locations and extents to be covered in the assessment will be agreed with EPD and AFCD), fishing and aquaculture activities as well as fisheries resources and habitats due to the Project and the related changes in water quality or hydrodynamics regime near the Project Site will be assessed in the EIA Study.

Post-construction Phase

- 3.9.3 The proposed reclamation will lead to a permanent loss of fishing grounds and fisheries habitats which may affect fisheries resources/ production and fishing operation within and adjacent to the proposed reclamation area.
- 3.9.4 The proposed reclamation may also change the local hydrodynamic regime and affect fisheries resources, oyster culture activities in Deep Bay (locations and extents to be covered in the assessment will be agreed with EPD and AFCD) and important spawning ground at North Lantau waters. Potential impact on fisheries will be assessed in the EIA Study.

Operational Phase (for Possible Rearrangement of Submarine Outfall)

- 3.9.5 Subject to further investigation, the existing submarine outfall lying across the Project Site may be rearranged. Potential water quality impacts due to the release of treated effluents from sewage treatment works in NWNT and treated leachate from the WENT Landfill (and potentially WENT Landfill Extensions) (refer to **Section 3.4.6**) may result in indirect impacts to fisheries. The impacts would be assessed in the EIA study if necessary.

3.10 Landscape and Visual

- 3.10.1 Significant impacts are expected within the Project Site due to the loss of existing landscape resources (LRs) and the change of landscape setting in the natural coastal shoreline. The major landscape and visual impacts of the proposed works would be associated with the proposed reclamation works in LKT.

¹ Agriculture, Fisheries and Conservation Department (2022) Port Survey 2021. Agriculture Fisheries and Conservation Department. The Government of the Hong Kong Special Administrative Region.

Construction Phase

- 3.10.2 During construction phase, landscape impacts would be anticipated from aboveground construction sites and construction traffics, etc. The main landscape resources in LKT are natural shore and seawater body, which would suffer from landscape impacts. It is anticipated that the potential landscape impact due to the associated seawall structure of the reclamation would cause the loss of natural shore and the associated vegetation along the shoreline as well as the seawater body.

Post-construction Phase

- 3.10.3 During post-construction phase, there would be landscape impacts due to the associated seawall structure of the reclamation, as well as visual impacts due to the reclamation works.
- 3.10.4 The potential sources of landscape and visual impacts which will be assessed in the EIA Study include the following:
- Potential permanent loss of LRs/ Landscape Character Areas (LCAs) (e.g. natural coastal shoreline, sea waterbody and maritime landscape character).
 - Permanent loss of visual amenity of the sea and natural environment due to the reclaimed land, which would have effects on some public viewers, such as the visitors and operators in Lung Kwu Sheung Tan, travellers to The Emperor's Cave, Lung Kwu Tan Chinese White Dolphin Lookout and Lung Kwu Tan Village, etc.
 - Visual quality, intrusion and obstruction created by the reclaimed land.
- 3.10.5 Landscape impact on LRs and LCAs, and visual impact arising from the Project as well as associated residual impacts, if any, will be assessed in the EIA Study. Landscape and visual impacts from the possible arrangement of submarine outfall (if necessary) which is located under sea are not anticipated.

3.11 Cultural Heritage

Construction Phase

Terrestrial Archaeology & Built Heritage

- 3.11.1 The reclamation will be located at open sea. Nevertheless, for interfacing the reclaimed area with the existing land, there may be land-based works along the coastal areas adjacent to the proposed reclamation, which will fall partially within Lung Kwu Sheung Tan Site of Archaeological Interest (SAI) during the construction phase of the Project. An archaeological impact assessment (AIA) as part of cultural heritage impact assessment (CHIA) will be conducted to ascertain the terrestrial archaeological impact arising from the proposed works. If the areas within Lung Kwu Sheung Tan SAI are to be affected, an archaeological field survey in agreement with Antiquities and Monuments Office (AMO) will be required prior to the construction phase followed by proposing mitigation for consideration and agreement of AMO if significant archaeological findings are observed.
- 3.11.2 There is no built heritage site or other item adjacent to the reclamation area and thus impacts on built heritage are not anticipated.

Marine Archaeology

- 3.11.3 A marine archaeological investigation (MAI) in agreement with AMO will be conducted to identify the archaeological potential of the affected seabed and to ascertain the archaeological impact arising from the Project.
- 3.11.4 Subject to the findings of the MAI, if there are any engineering works affecting any identified marine archaeological assets, including impacts caused by reclamation and rearrangement of submarine outfall (if necessary), appropriate mitigation measures, if required, should be proposed for consideration and agreement by AMO, and implemented by the project proponent to the satisfaction of AMO.

Post-construction

Terrestrial Archaeology & Built Heritage

- 3.11.5 During post-construction phase, adverse impact on terrestrial archaeology and built heritage is not anticipated.

Marine Archaeology

- 3.11.6 Adverse impact on marine archaeology during post-construction phase is not anticipated.

3.12 Hazard to Life

- 3.12.1 The reclamation and the associated works will not run close to either existing Potentially Hazardous Installation (PHI) or dangerous goods store. The Project is located approximately 5km from the Consultation Zone of its nearest PHI, i.e., Exxon Mobil Liquefied Petroleum Gas Store in Tuen Mun Area 44, and more than 500m away from facilities with potential dangerous goods risk, including Black Point Power Station, Castle Peak Power Station, WENT Landfill, EcoPark and Permanent Aviation Fuel Facility. In view of the large separation distances, potential risk associated with the aforesaid installation and facilities are not anticipated.
- 3.12.2 With no explosive and significant amount of dangerous goods to be used for the reclamation and associated works, potential risk due to the Project is also not anticipated.

4. Major Elements of the Surrounding Environment

4.1 General

4.1.1 The Project is located at the north of LKT, surrounded by hillslopes, industrial/ brownfield sites, village settlements including Pak Long and Sha Po Kong, as well as water bodies of Urmston Road. The majority of the existing shoreline abutting the Project is natural and rocky, with a section of engineered artificial seawall at the northeastern side. Lung Kwu Tan Road is the main vehicular access connecting to the Project Site.

4.1.2 The major existing, committed and planned sensitive receivers and sensitive parts of the natural environment relating to respective environmental aspects that may be affected by the Project are given below. The identified sensitive receivers are not exhaustive and indicative only, and are subject to further review and update in the course of the EIA Study.

4.2 Air Sensitive Receivers

4.2.1 Potential ASRs located within 500m of the Project are identified as follows:

- Offices and workshops along Lung Kwu Tan Road and Nim Wan Path which might have been relocated under land use/ top-side developments at LKT and TMW areas;
- Village houses at Pak Long, Sha Po Kong, etc.; and
- Places of worship including Tin Hau Temple at Pak Long as well as ancestral hall near Lung Kwu Tan Road.

4.3 Noise Sensitive Receivers

4.3.1 Potential NSRs located within 300m of the Project are identified as follows:

- Village houses at Pak Long, etc.; and
- Places of worship including Tin Hau Temple at Pak Long.

4.4 Water Sensitive Receivers

4.4.1 Potential WSRs that maybe affected by the Project are identified as follows:

- Gazetted and non-gazetted beaches in Tuen Mun District;
- Existing and planned water abstractions for cooling, flushing and/ or other industrial purposes along the coast near LKT;
- Tuen Mun Typhoon Shelter and Marina near Gold Coast;
- Secondary Contact Recreational Subzones in North Lantau waters;
- Watercourses;
- Coral communities in North Lantau waters;
- Artificial reefs in Sha Chau and Lung Kwu Chau Marine Park, Chek Lap Kok Marine Exclusion Zone and The Brothers Marine Park;
- Chinese White Dolphins in North Lantau waters;

- Horseshoe crabs at LKT;
- Sha Chau and Lung Kwu Chau Marine Park, The Brothers Marine Park and the Proposed North Lantau Marine Park;
- The important spawning ground for commercial fisheries resources at North Lantau waters; and
- Locations of oyster culture activities in Deep Bay (locations and extents to be covered in the assessment will be agreed with EPD and AFCD).

4.5 Landfill Gas Hazard

4.5.1 There is no potential landfill gas hazard anticipated during both construction and post-construction phases of the Project.

4.6 Ecological Sensitive Receivers

4.6.1 Potential ecological sensitive receivers that may be affected by the Project are identified as follows:

- Sha Chau and Lung Kwu Chau Marine Park;
- Proposed North Lantau Marine Park;
- The Brothers Marine Park;
- Chinese White Dolphins in North Lantau waters;
- Coral communities in North Lantau waters;
- Intertidal, subtidal and benthic habitats;
- Horseshoe crabs at LKT;
- Lung Kwu Tan Valley Sites of Special Scientific Interest (SSSI);
- Lung Kwu Chau, Tree Island & Sha Chau SSSI;
- Pak Long and Nam Long Fung Shui Woodland; and
- White-bellied Sea Eagle nesting site at Lung Kwu Chau.

4.7 Fisheries Sensitive Receivers

4.7.1 Potential fisheries sensitive receivers that may be affected by the Project are identified as follows:

- The important spawning ground for commercial fisheries resources at North Lantau waters;
- Locations of oyster culture activities in Deep Bay (locations and extents to be covered in the assessment will be agreed with EPD and AFCD); and
- Artificial reefs deployed in Sha Chau and Lung Kwu Chau Marine Park, Chek Lap Kok Marine Exclusion Zone and The Brothers Marine Park.

4.8 Landscape Elements and Public Viewing Points

- 4.8.1 No country park, coastal protection area, conservation area, wetland, hilltops, ridgeline, river, historic landscapes, site of cultural heritage, nature reserves and SSSI are identified within the Project.
- 4.8.2 No registered Old and Valuable Trees (OVT) or stone wall trees (SWT) are identified within the Project. Nevertheless, there might be potential sensitive LRs such as Trees of Particular Interest (TPIs), rare and precious endangered and protected plants of Hong Kong.
- 4.8.3 The major visual resources enjoyed by the public within the Project mainly comprise the ridgelines from Castle Peak and the seascape in Urmston Road. The composition of existing LCAs within the Project consists of foothill fringe landscape, village landscape, maritime landscape, etc.
- 4.8.4 Potential landscape elements and public viewing points that may be affected by the Project are identified as follows:

Landscape Elements

- Hillside plantation;
- Shrubland/ grassland;
- Village settlement;
- Natural shore; and
- Seawater body.

Public Viewing Points

- Lung Kwu Sheung Tan;
- Emperor's Cave;
- Lung Kwu Tan Chinese White Dolphin Lookout;
- Lung Mun Trail;
- Tin Hau Temple;
- Lung Kwu Tan Village (Nam Long);
- Lung Kwu Chau;
- Urmston Road;
- Lung Kwu Tan (the beach);
- Visitors (pedestrian, cyclists and drivers) along LKT Road;
- Visitors (pedestrian, cyclists and drivers) along Lung Mun Road;
- Lau Ancestral Hall next to Lung Kwu Tan Road;
- Fei Kei Ping;
- Tip Shek Teng; and
- Lung Kwu Tan Promenade.

4.9 Cultural Heritage Resources

4.9.1 The known cultural heritage resources and other identified items that may be affected by the Project are identified as follows:

Terrestrial Archaeology, Built Heritage and Other Identified Items

- Lung Kwu Sheung Tan SAI falls partially within the Project;
- Lung Kwu Tan SAI is located about 240m from the Project;
- The nearest graded historic building, Lau Ancestral Hall (Tuen Mun Lung Kwu Tan) (Grade 3), is located at Tuk Mei Chung over 600m from the Project; and
- A Tin Hau Temple, constructed pre-1898, is situated in Pak Long about 190m to the southeast of the Project.

Marine Archaeology

- The presence of marine archaeological resources will be established during the MAI, under which a review of previous MAI studies in the vicinity will also be completed.

4.10 Hazard to Life

4.10.1 There is no potential hazard to life anticipated during both construction and post-construction phases of the Project.

5. Environmental Protection Measures to be Incorporated in the Design and Further Environmental Implications

5.1 General

5.1.1 The EIA Study will determine the significance of environmental impacts (both cumulative impacts and those arising from the Project) and any avoidance or mitigation measures to ensure that all proposals recommended by the Project would be environmentally acceptable. Reference will be made to the relevant legislation and other requirements including but not limited to the EIAO and Hong Kong Planning Standards and Guidelines (HKPSG), etc. EM&A of potential impacts that may arise from implementation of the works proposed by the Project will be provided for the construction, post-construction and operational (for possible rearrangement of submarine outfall only) phases where necessary. Subject to the findings of the EIA Study, the following mitigation measures will be considered in the design, construction, post-construction and operational (for possible rearrangement of submarine outfall only) of the Project.

5.2 Air Quality

Construction Impacts

General Construction Works

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, which are not exhaustive, will be considered during construction period to minimise air quality impacts on nearby ASRs.

- Separation of the site into multiple workfronts and well scheduling and careful planning of the construction activities to avoid carrying out earth works in the entire site simultaneously;
- 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;
- 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;
- 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;
- Implementation of wheel washing facilities at access roads into and out of construction sites; and
- Speed control of vehicles on-site.

5.2.2 To control and reduce the exhaust emissions from Non-road Mobile Machinery (NRMM) and marine vessels, the following mitigation measures, which are not exhaustive, will be considered during construction period to minimise air quality impacts on nearby ASRs.

- Connect construction plant and equipment to main electric supply and avoid use of diesel generators and diesel-powered equipment as far as practicable;
- Restrict the use of exempted NRMMs as far as practicable;
- Deploy electrified NRMMs as far as practicable;
- Control routing of marine vessels to optimise the separation distance from nearby ASRs;
- Minimise the number of trips of marine vessels;
- Use clean fuel for marine vessels as far as practicable; and
- Adopt on-shore power, etc.

5.2.3 The following good site practices shall also be implemented to minimise the potential odour impact from dredged sediment, if any.

- Restrict stockpile of dredged sediment on site overnight and transport away the dredged sediment by barges on a daily basis;
- Cover the dredged sediment by tarpaulin or impervious sheets all the times; and
- Control routing of marine vessels to optimise the separation distance from nearby ASRs.

Post-construction Impacts

5.2.4 In order to control dust impacts associated with wind erosion of exposed reclaimed land, appropriate measures to protect the reclaimed land surface would be explored subject to the EIA findings and to suit development phasing.

5.3 Noise

Construction Impacts

General Construction Works

5.3.1 Subject to EIA findings, the following measures will be considered during construction period to minimise construction noise impacts on nearby NSRs.

- Well scheduling and careful planning of the construction activities to avoid overlapping of noisy construction activities at different workfronts;
- Adoption of quieter construction methods as far as practicable;
- Use of quieter powered mechanical equipment and plant, and/ or fitted with muffler/ silencers/ sound reduction devices;
- Provision of temporary noise barriers and enclosures, where practicable;
- Provision of noise screening structures or purpose-built noise barriers along the site boundary to provide additional protection to NSRs nearby; and

- Implementation of good site practices 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, limiting the use and number of equipment operating close to the NSRs, proper maintenance of construction plant and devising methods of working to minimise noise impacts on the surrounding environment.

Post-construction Impacts

- 5.3.2 Given that no post-construction noise impact would be associated with the bare reclaimed land, no mitigation measure is required.

5.4 Water Quality

Construction Impacts

- 5.4.1 In order to prevent adverse impacts on water quality, the following general mitigation measures will be put in place where appropriate.

General Construction Works

- Good site practice will be adopted in accordance with the ProPECC PN 2/23 “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) No. 5/2005 “Protection of Natural Stream/ Rivers from adverse impact arising from construction works”;
- Provision of adequate construction site drainage according to the established good practices;
- Open stockpiles of materials on site will be avoided or where unavoidable covered with tarpaulin or similar fabric during rainstorms;
- 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;
- Minimisation of impacts of concrete washings, use of infiltration/ sedimentation pits to settle out the washings before treatment/ re-use/ discharge, and adoption of treatment units with pH adjustment if necessary;
- 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;
- 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; and
- Mobile toilets or other appropriate means will be provided to store sewage before disposal through licensed collection agent or discharging to main sewerage system.

Marine-based Works

- Sequencing of works and location of works shall be carefully optimised to minimise adverse impacts on the WSRs;
- Non-dredged reclamation method for the reclaimed land should be considered as far as practicable;
- Silt curtains should be deployed for dredging works (if any) and other major marine works below seawater level (e.g. reclamation filling); and
- Size of vessels should be limited to maintain adequate clearance between vessels and the seabed to avoid undue turbidity generation from turbulence of vessel movement or propeller wash.

Land-based Works

- For works at the vicinity of watercourses, construction methods will be properly designed and disturbance will be avoided as far as practicable; and
- Where possible, works entailing soil excavation will be minimised during the rainy season.

Post-construction Impacts

- 5.4.2 Subject to EIA findings, mitigation measures such as proper design of the shape of the reclaimed land to minimise potential hydrodynamic and water quality impacts will be studied. The design of the reclaimed land should avoid/ minimise embayment or corner zones where entrapment of pollutants (e.g. floating refuse) may occur. The shoreline should be smoothed out in the reclamation configuration as far as practicable.

Operational Impacts (for Possible Rearrangement of Submarine Outfall)

- 5.4.3 If rearrangement of the existing submarine outfall is necessary, the discharge location of the rearranged outfall should be carefully designed to ensure no adverse water quality impacts imposed on nearby WSRs.

5.5 Waste Management

Construction Impacts

- 5.5.1 The following mitigation measures will be considered during the construction phase to minimise waste generation and provide good control on waste management.
- Good site practice and implementation of Waste Management Plan (WMP) will be adopted to minimise any potential waste impacts. The WMP shall be submitted to the Engineer for approval;
 - Careful design, planning and good site management to encourage on-site sorting of C&D materials and minimise their generation during the course of construction;
 - Chemical waste will be properly stored and transported off-site for treatment by a licensed chemical waste collector;

- Refuse will need to be stored in enclosed bins and reputable waste collector should be employed to remove the generated refuse from the site, separately from construction and chemical wastes, on a daily basis to minimise odour, pest and litter impacts;
- A recording system for the amount of wastes generated, recycled and disposed shall be implemented;
- Use of reusable non-timber formwork to reduce the amount of C&D material; and
- Proper storage and site practices to minimise the potential for damage or contamination of construction materials.
- Different reclamation fill options will be examined with a view to promoting beneficial reuse of public fill;
- Treatment measures for dredged sediment shall follow the guidelines in Section 4.2.1, Chapter 4 of Project Administration Handbook for Civil Engineering Works (PAH) and Dumping at Sea Ordinance (Cap. 466);
- Regular inspection and monitoring of floating refuse should be conducted by contractor(s) and waste collection should be arranged for any floating refuse trapped within the site; and
- The shoreline should be properly designed to avoid/ minimise embayment or corner zones and hence trapping of floating refuse as far as practicable.

Post-construction Impacts

5.5.2 Similar to construction phase, mitigation measures such as regular inspection, monitoring and collection of floating refuse by contractor(s) as well as proper design of shoreline shall be adopted to minimise waste management implications arising from floating refuse.

5.6 Land Contamination

5.6.1 The following mitigation measures will be considered during the construction phase to minimise any potential exposure to contaminated soils or groundwater.

- Remediation works on land contamination (if required) will be carried out prior to the commencement of construction works;
- 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 soil 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 will not occur; and
- 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 354C), as required.

5.7 Landfill Gas Hazard

- 5.7.1 Given that no potential landfill gas hazard is anticipated during both construction and post-construction phases of the Project, mitigation measure is not required.

5.8 Ecology

Construction Impacts

- 5.8.1 The mitigation measures that are to be implemented to minimise the impacts on air quality, noise and water quality will also help to minimise any impacts on ecological resources.
- 5.8.2 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 minimise such impact, e.g. translocation of important species, confining works in specific area/ season, minimising reclamation size, avoiding percussive piling, alternative design/ construction methods such as non-dredged reclamation, good site practices etc.

Post-construction Impacts

- 5.8.3 Subject to investigation, effective and feasible mitigation measures to address the permanent loss of habitats due to reclamation, such as provision of eco-shorelines to increase habitat diversity, will be developed and implemented.

Operational Impacts (for Possible Rearrangement of Submarine Outfall)

- 5.8.4 Subject to investigation, mitigation measures proposed under Water Quality (refer to **Section 5.4.3**) will also serve to protect ecological resources.

5.9 Fisheries

Construction Impacts

- 5.9.1 Mitigation measures proposed for minimising the impact to potential water quality mentioned in **Section 5.4** will be considered to minimise the impact on fisheries. Other mitigation measures will also be implemented if considered necessary.

Post-construction Impacts

- 5.9.2 Subject to investigation, effective and feasible mitigation measures to minimise the impacts on fisheries due to reclamation, such as provision of eco-shorelines to enhance fisheries habitat, will be developed. Other possible mitigation measures, if necessary, for enhancement of fisheries resources will be studied in the EIA.

Operational Impacts (for Possible Rearrangement of Submarine Outfall)

5.9.3 Subject to investigation, mitigation measures proposed under Water Quality (refer to **Section 5.4.3**) would also serve to protect fisheries.

5.10 Landscape and Visual

5.10.1 Mitigation measures are proposed to minimise impacts on the landscape and visual amenity of the area within the visual envelope. These measures include strategies for reducing, offsetting and compensating impacts during construction and operational phases.

Construction Impacts

5.10.2 The following mitigation measures with respect to landscape impacts are recommended during the construction phase subject to the investigation:

- Optimisation of reclamation area and minimisation of temporary works area;
- Optimisation of construction period;
- Implementation of good site practices for preservation and protection of the existing landscape resources, including existing natural streams in accordance with ETWB TC(W) No. 5/2005 and existing trees in accordance with DEVB TC(W) No. 4/2020 – Tree Preservation;
- Temporary greening treatment on bare soil surface before construction works of structures take place;
- Screening of works area with hoardings with appropriate colours compatible with the surrounding area;
- Early formation of the planting area and advance planting of vegetation on the concerned landscape sensitive receivers; and
- Control of night-time lighting by hooding all lights and through minimisation of night working periods.

Post-construction Impacts

5.10.3 The following mitigation measures with respect to landscape and visual impacts are recommended during the post-construction phase subject to the investigation:

- Temporary greening treatment on bare soil surface where practicable before construction works of structures take place;
- Tree transplanting and compensatory planting for compensation of the loss of existing vegetation (including trees and shrubs, etc.), if any, in accordance with DEVB TC(W) No. 4/2020 – Tree Preservation and relevant guidelines; and
- Sensitive landscape design of reclamation edge with attractive landscape treatments and incorporation of coastal vegetation into seawalls to improve the compatibility of the new reclaimed land with the existing environment and biodiversity.

5.11 Cultural Heritage

Construction Phase

- 5.11.1 The terrestrial SAIs including Lung Kwu Sheung Tan SAI and Lung Kwu Tan SAI are located within the vicinity of the Project. No impact will occur within Lung Kwu Tan SAI as the Project is located approximately 240m to the northwest separated from the Lung Kwu Tan SAI by hillock. However, partial encroachment of works into Lung Kwu Sheung Tan SAI is expected, and archaeological survey may be required to establish the significance and extent of archaeological deposits along the boundary of the reclamation. If necessary, the fieldworks should be conducted by an archaeologist licensed under Cap. 53 of the Antiquities and Monuments Ordinance prior to the construction phase and in agreement with AMO. Mitigation may be required after the results of the fieldworks are known and may include Archaeological Watching Brief, further survey or rescue excavation.
- 5.11.2 Pak Long Tin Hau Temple is about 190m to the southeast of the Project, but no visual impacts are expected as the Project is primarily located in open sea and limited to coastal areas. No further impact is expected, and no mitigation will be necessary.
- 5.11.3 For marine archaeology, a MAI in agreement with AMO will be conducted by a marine archaeologist to ascertain the archaeological value of the seabed affected by the proposed works. The potential impact on marine archaeology caused by the Project will be assessed during the EIA Study. Direct encroachment onto the archaeological resources, if any, will be avoided and preservation in-situ will be considered as far as practicable for minimising the impacts. If unavoidable, appropriate mitigation measures will be designed and agreed with AMO and implemented to the satisfaction of AMO.

Post-construction Phase

- 5.11.4 There will be no adverse impact on both terrestrial and marine cultural heritage during post-construction phase, and hence no mitigation measure is required.

5.12 Hazard to Life

- 5.12.1 Given that no potential hazard to life is anticipated during both construction and post-construction phases of the Project, mitigation measure is not required.

5.13 Severity, Distribution and Duration of Environmental Effects and Further Implications

- 5.13.1 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 Study, where applicable. Public consultation regarding the reclamation works and the associated works will be carried out during the EIA Study. The key results from public consultation should also be documented in the EIA Report of the Project.

6. Use of Previously Approved EIA Reports

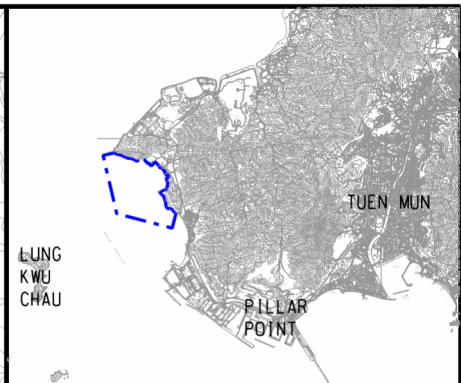
6.1.1 There is no previously approved EIA report covering the full extent of the Project. However, the following EIA Studies are considered relevant and will be referred to in the subsequent EIA Study:

Table 6.1 List of Previously Approved EIA Reports for Reference

Item	Application No./ Register No.	Title
(i)	AEIAR-256/2023	Tuen Mun Bypass
(ii)	AEIAR-218/2018	Hong Kong Offshore LNG Terminal
(iii)	AEIAR-196/2016	Tung Chung New Town Extension
(iv)	AEIAR-185/2014	Expansion of Hong Kong International Airport into a Three-Runway System
(v)	AEIAR-150/2010	Black Point Gas Supply Project
(vi)	AEIAR-106/2007	Liquefied Natural Gas (LNG) Receiving Terminal and Associated Facilities

Figure

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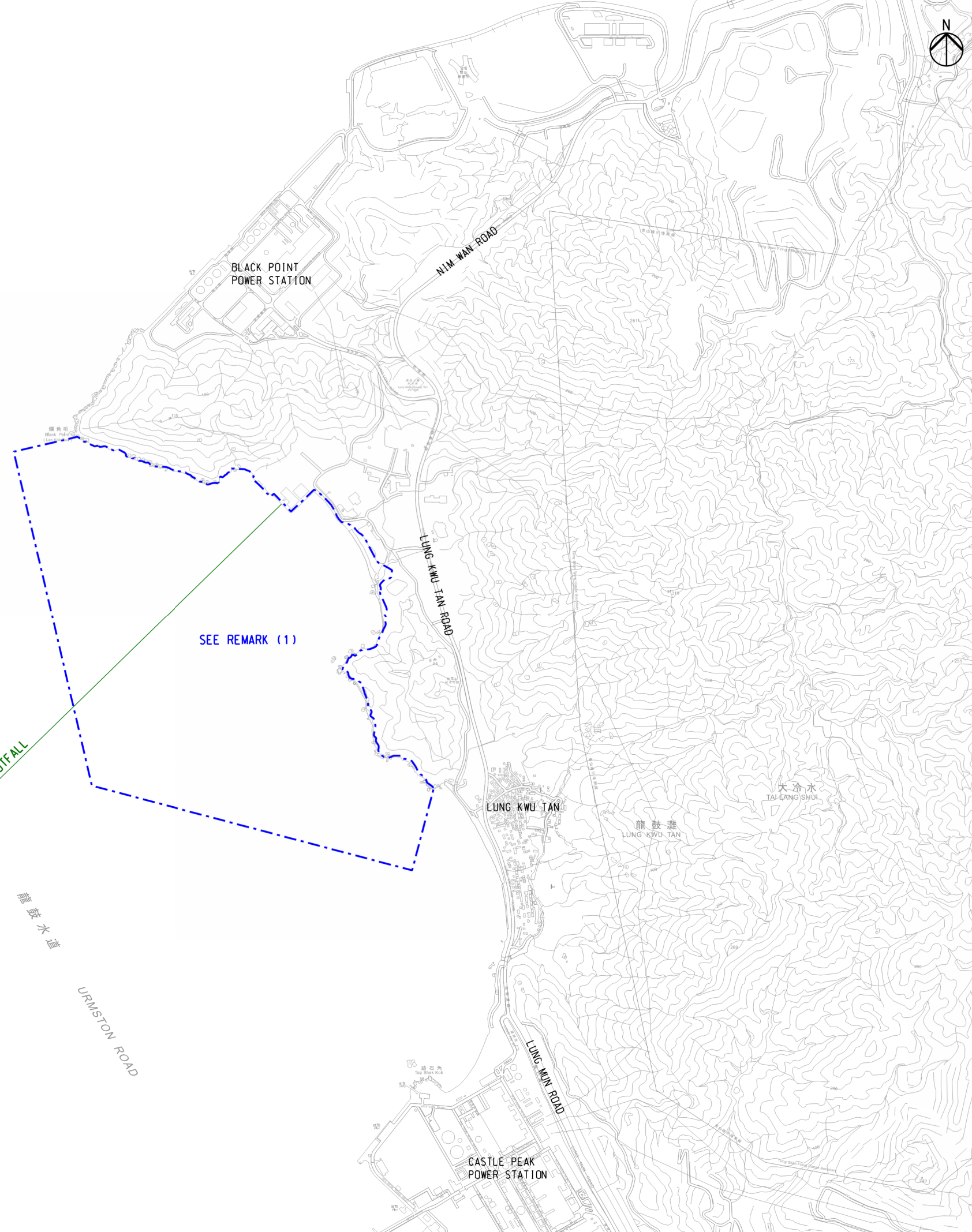


KEYPLAN

REMARKS:

(1) TENTATIVE EXTENT OF POTENTIAL RECLAMATION AREA OF 145HA, DREDGING AREA FOR MARINE FACILITIES (E.G. BERTHING FACILITIES) AND LAND-BASED WORKS ON THE EXISTING LAND.

(2) SUBJECT TO FURTHER INVESTIGATION, THE EXISTING SUBMARINE OUTFALL MAY BE RETAINED OR REARRANGED (EITHER NEARSHORE OR OFFSHORE). DETAILED DESIGN WILL BE FORMULATED AT LATER STAGE IF REARRANGEMENT IS CONSIDERED REQUIRED.



SEE REMARK (1)

EXISTING SUBMARINE OUTFALL
 SEE REMARK (2)

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ARUP **AtkinsRéalis**
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Project Title
 Reclamation at Lung Kwu Tan

Drawing title
 LOCATION OF THE PROJECT

Drawing no. FIGURE 1.1		Rev. A	
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