

## ANNEX 2A KEY EXISTING, PROPOSED AND POTENTIAL FACILITIES, UTILITIES AND INFRASTRUCTURE IN THE VICINITY OF THE STUDY AREA

### 2A.1 Key Existing Facilities, Utilities and Infrastructure

There are a number of key existing facilities, utilities and infrastructure in the vicinity of the Study Area which are shown in **Figure 2A.1**, with detailed descriptions provided below.

#### 2A.1.1 Improvement Dredging for Lamma Power Station Navigation Channel

The Lamma Power Station Navigation Channel is located adjacent to the Lamma Power Station (LPS) near the West Lamma Channel to facilitate coal delivery to the LPS by ocean going vessels. It has been stipulated by the Marine Department that the minimum channel depth for safe marine passage to be no less than -15.5 mCD. To meet the operational requirements for safe access of coal vessels, improvement dredging has been conducted periodically to maintain sufficient clearance from seabed. An environmental impact assessment (EIA) study was undertaken in 2017 for such improvement dredging at Lamma Power Station Navigation Channel. The recent dredging works commenced in February 2020 and completed in 2021. To account for the worst case scenario of potential cumulative impacts with the Contaminated Sediment Disposal Facility at West of Lamma Island (WL Facility), this project has been considered in the water quality modelling assessment (see **Annex 3A** for details).

#### 2A.1.2 Wave Recorders at West Lamma Channel and Kau Yi Chau

The Port Works Division of the Civil Engineering and Development Department (CEDD) has set up a long-term wave monitoring programme in the harbour near Kau Yi Chau (KYC) and at the West Lamma Channel since 1994. The collected wave data are used to set up wave models for predictions of extreme wave conditions in the harbour for the design of marine structures.

#### 2A.1.3 South of Cheung Chau Sediment Disposal Area

The open sea floor mud disposal area at South of Cheung Chau is currently used for disposal of uncontaminated sediments suitable for open sea disposal from various projects in Hong Kong. This area is located to the south of Shek Kwu Chau and Cheung Chau. The mud disposal ground was gazetted in 1982, with further extensions in 1988 and in the early 1990s (1992-1993). No formal EIA was carried out in relation to either of these series of extensions. This area has been using by both the public and private sectors as the primary disposal facility for uncontaminated sediment since 1990s<sup>(1)</sup>. Its role as a primary disposal facility for Hong Kong will be remained so for coming years due to its close proximity to urban area and subjected to less influence of monsoon. To account for the worst case scenario of potential cumulative impacts with the WL Facility, sediment disposal at South of Cheung Chau has been considered in the water quality modelling assessment (see **Annex 3A** for details).

#### 2A.1.4 Providing Sufficient Water Depth for Kwai Tsing Container Basin and its Approach Channel

This project involves the deepening of seabed level at the Kwai Tsing Container Basin, the northern and western fairways to -17.5 mCD (Chart Datum). The dredging works under CEDD Contract No. CV/2013/04 "Dredging Works in Kwai Tsing Container Basin and its Approach Channel" commenced in 2014 and completed in 2020. As mentioned in the approved EIA report, maintenance dredging might be required, though at less frequent intervals and with a much smaller volume of material to be removed than in the past. To account for the worst case scenario of potential cumulative impacts with

(1) Scott Wilson Ltd (2003). Strategic Environmental Assessment Report for Extension of Existing Landfills and Identification of Potential New Waste Disposal Sites. Prepared for EPD.

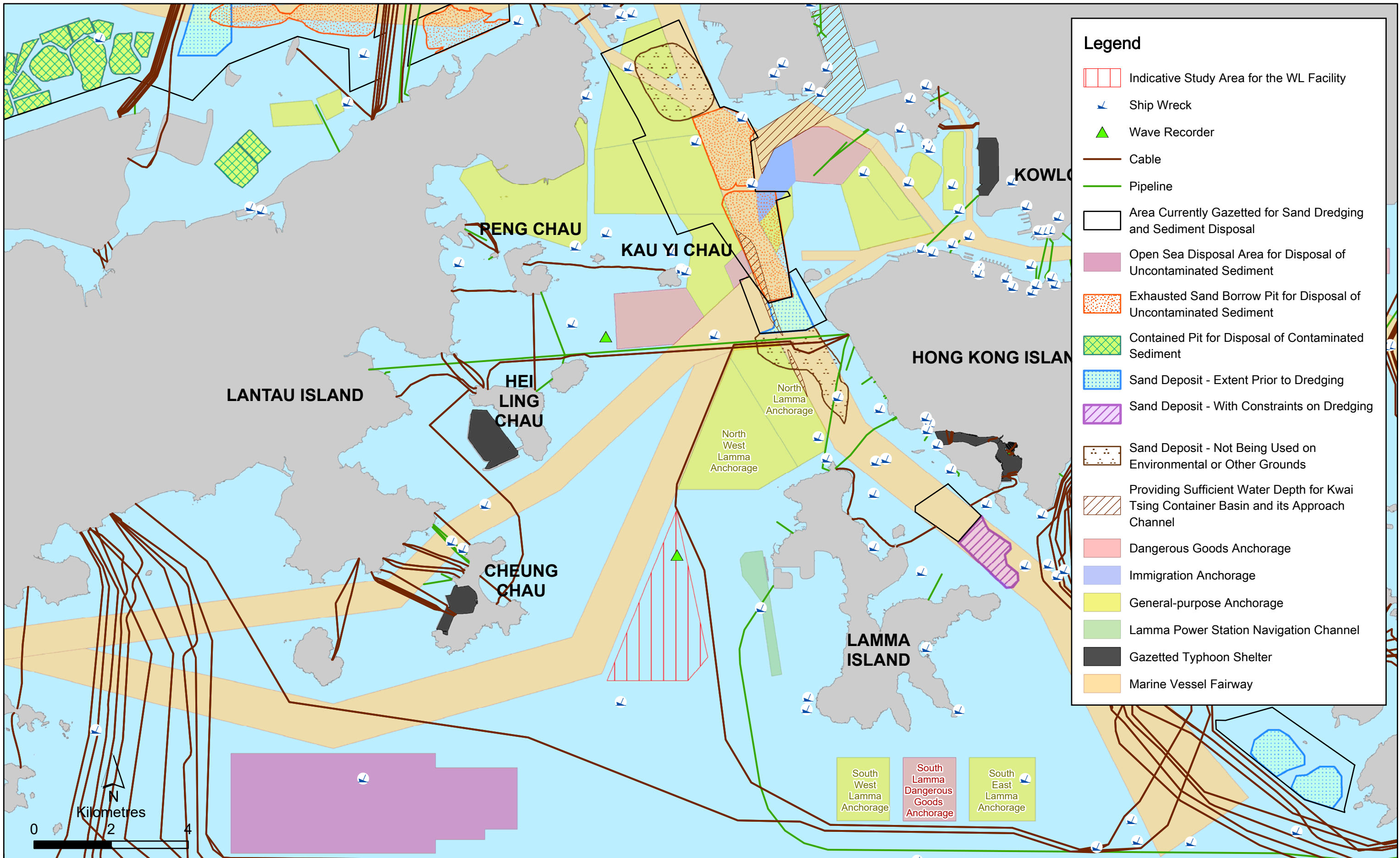


Figure 2A.1

Existing Development and Infrastructure Projects in the vicinity of the Study Area

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Environmental  
Resources  
Management



the WL Facility, this project has been considered in the water quality modelling assessment (see **Annex 3A** for details).

### 2A.1.5 Submarine Cables and Pipelines

No pipeline or submarine cables are identified within the Study Area. The nearest submarine cable is running in the north-south direction, located at approximate 200m to the east of the Study Area owned by Wharf T&T Limited. There is a subsea gas pipeline connecting the Lamma Power Station and the Guangdong LNG Terminal in Dapeng Bay in Shenzhen, with the closest distance of 750 m from the boundary of the Study Area.

### 2A.1.6 Port Operations

#### *Anchorage Areas*

There are 24 anchorage areas in Hong Kong which have been designated for the purposes of immigration, dangerous goods or are general-purpose anchorages. They provide temporary berthing spaces for vessels. The areas and water depths of the anchorages are differentiated in order to provide vessels of various sizes and drafts. Some of them are located in the vicinity of the Study Area, including North Lamma Anchorage and North West Lamma Anchorage to the north of the Study Area, as well as South West Lamma Anchorage, South Lamma Dangerous Goods Anchorage and South East Lamma Anchorage to the south of the Lamma Island.

#### *Typhoon Shelters*

In Hong Kong, there are 14 public-use typhoon shelters, occupying about 419 hectares of sheltered space <sup>(2)</sup>. The nearest typhoon shelters in the vicinity of the Study Area are Cheung Chau and Hei Ling Chau typhoon shelters. Vessels over 50 m and over 75 m long are allowed to berth at Cheung Chau typhoon shelter and Hei Ling Chau typhoon shelter, respectively.

### 2A.1.7 Existing and Closed Sites for Disposal of Sediments

A number of gazetted areas in Hong Kong waters have been maintained by CEDD, for sand and mud borrowing and disposal purposes. Within these areas, designated specific marine fill/disposal uses have been issued. These are classified as:

- Areas gazetted for sand dredging and sediment disposal;
- Allocated sand deposits (extent prior to dredging, with constraints on dredging and those not being used for environmental and other grounds);
- Open sea disposal area for disposal of uncontaminated sediments;
- Exhausted sand borrow pit for disposal of uncontained sediments; and,
- Contained pits for disposal of contaminated sediments.

In the vicinity of the Study Area, apart from the South of Cheung Chau Sediment Disposal Area, there are existing and closed sites for sediment disposal located to the north of the Study Area, including:

Existing Site:

- Exhausted sand borrow pit for disposal of uncontaminated sediment at South of Tsing Yi;

Closed Sites:

- Sand deposit – extent prior to dredging at West of Sulphur Channel; and
- Sand deposit – not being used on environmental or other grounds at North of Lamma Island.

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(2) Hong Kong Maritime and Port Board. HK Port.

### 2A.1.8 EPD Routine Sediment Monitoring Stations

The Environmental Protection Department (EPD) carry out routine monitoring of marine sediments throughout Hong Kong waters at a territory-wide scale. There are 45 stations located in open waters while 15 stations are located in typhoon shelters. Higher levels of heavy metals were detected in Victoria Harbour and Junk Bay and this might be related to historical industrial discharges from electroplating and printed circuit board industries as well as metal refining factories in Tsuen Wan and Kwun Tong<sup>(3)</sup>. In the vicinity of the Study Area, there are two EPD sediment quality monitoring stations SS3 and SS4 and the data showed that the sediments had high Particle Size Fraction (<63 µm) (average of 74-86%), indicating the sediments are likely to be cohesive with high silt and clay content. Metal contents of the sediments around the two areas were generally lower than the Lower Chemical Exceedance Level (LCEL), but with a moderate chemical oxygen demand. Recent sediment sampling within the Study Area (see details in **Section 6**) showed that the surface sediments were all classified as uncontaminated sediments under ETWB TCW No. 34/2002 Management of Dredged/Excavated Sediment.

## 2A.2 Key Proposed and Potential Facilities, Utilities and Infrastructure

Based on the information available at the time of preparing this EIA study for the Project, there are a number of key proposed and potential facilities and infrastructure in the vicinity of the Study Area which are shown in **Figure 2A.2**, with detailed descriptions provided below.

### 2A.2.1 Hong Kong Offshore Liquefied Natural Gas (LNG) Terminal

To support the increased use of natural gas in Hong Kong, Castle Peak Power Company Limited (CAPCO) and The Hongkong Electric Co., Ltd. (HK Electric) have identified that the development of an offshore LNG receiving terminal in Hong Kong using Floating Storage and Regasification Unit (FSRU) technology presents a viable additional gas supply option that will provide energy security through access to competitive gas supplies from world markets. The Hong Kong Offshore LNG Terminal project involves the construction and operation of an offshore LNG import facility to be located in the southern waters of Hong Kong, a double berth jetty, and subsea pipelines that connect to the gas receiving stations (GRS) at the Black Point Power Station (BPPS) and the LPS. The proposed subsea pipeline connecting between the offshore LNG import facility and the LPS is located about 200 m outside the Study Area. An EIA study for the Hong Kong Offshore LNG Terminal was completed in 2018. The construction works commenced in September 2020 for completion by 2022. As the marine construction works of this project are not expected to coincide with the construction and operation activities of the WL Facility, unacceptable cumulative impacts are not anticipated.

### 2A.2.2 1,800MW Gas-fired Power Station at Lamma Extension

HK Electric proposed to develop a new 1,800MW power station. The Project includes the construction and operation of six new gas-fired combined cycle gas turbine (CCGT) units at the Lamma Extension, which is about 2.1km from the Key Area of the WL Facility. An EIA study for the 1,800MW CCGT units was completed in 1999. Two of the six units (L9 and L10) have been constructed and are currently under operation. Another two units (L11 and L12) are currently under construction and are scheduled for commercial operation in 2022 and 2023 respectively. One of the unit (L13) is scheduled for commercial operation after 2023 while there is no implementation schedule for the last unit (L14). As the project is mainly land-based works locating >2.5 km away from the Study Area, unacceptable cumulative impacts are not anticipated.

### 2A.2.3 Re-provision of Open Cycle Gas Turbines at Lamma Power Station

HK Electric operates the Lamma Power Station (LPS) with a number of power generating units currently in active operation. The project involves demolishing five aging gas turbines located within

(3) <https://www.epd.gov.hk/epd/english/environmentinhk/water/hkwqrc/waterquality/metal.html>

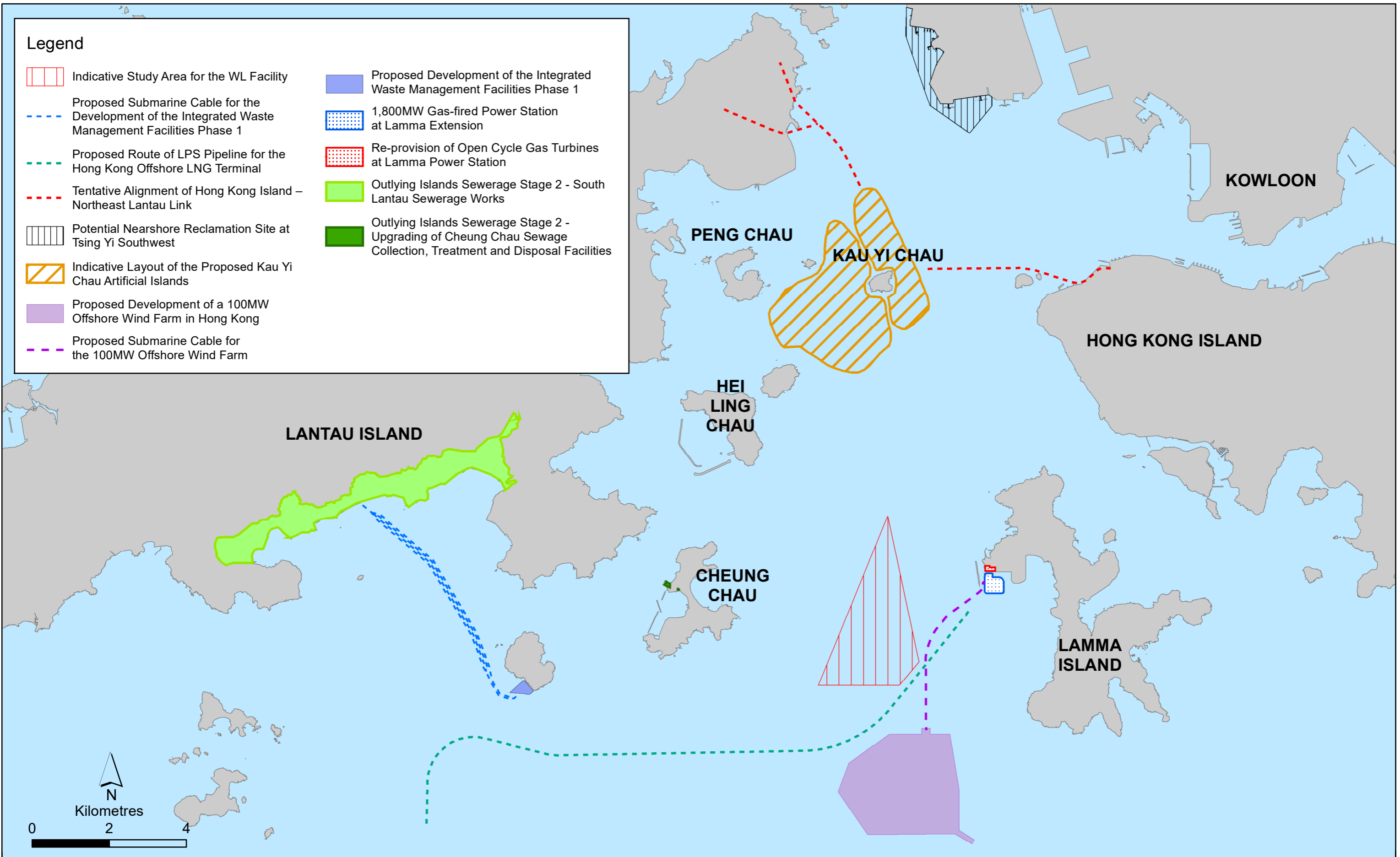


Figure 2A.2

Planned and Proposed Development and Infrastructure Projects in the vicinity of the Study Area

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LPS (about 2.2km from the Key Area of the WL Facility) and re-provide four new open cycle gas turbines (OCGTs) in LPS between 2022 and 2028. As the project is mainly land-based works locating >2.5 km away from the Study Area, unacceptable cumulative impacts are not anticipated.

### 2A.2.4 Development of a 100MW Offshore Wind Farm in Hong Kong

HK Electric proposed to develop an offshore wind farm in the waters between Lamma Island and Cheung Chau, at approximately 4 km southwest of the LPS. Piling works will be conducted for the installation of wind turbine foundation. A submarine cable connecting between the proposed offshore wind farm and the LPS is proposed to be installed by dredging and jetting works. The Study Area does not overlap with the infrastructure of the proposed offshore wind farm. The construction and operation of the offshore windfarm are planned on or after 2024, subject to the development plan to be published by HK Electric. The major potential sources of water quality impact include dredging and jetting from marine construction, scouring and change in flow regime during project operation. As assessed in the EIA report for the project, potential impacts arising from the proposed construction works are predicted to be very localised and transient in nature. No unacceptable adverse impacts to water quality are predicted to occur at the sensitive receivers with the adoption of appropriate mitigation, e.g. silt curtains during dredging works. During the operation phase, adverse impacts to water quality are not expected to occur. In addition, the proposed wind farm will have a negligible effect on hydrodynamics, local erosion and sedimentation patterns. Negligible cumulative impact on water quality would be expected from this project. The effect of this project is thus not considered in the construction phase and operation phase water quality modelling exercise.

### 2A.2.5 Artificial Islands in the Central Waters

The proposal of developing artificial islands in the Central Waters was announced in the 2018 Policy Address. Investigation studies under *Agreement No. CE 15/2020 (CE) Artificial Islands in the Central Waters - Investigation* (“the CW Study”) commenced in June 2021 for completion in 2024. The scope of works for the studies includes <sup>(4)</sup>:

- a detailed planning and engineering (P&E) study for the Kau Yi Chau (KYC) Artificial Islands to establish the reclamation extent, land uses and technical feasibility, including the formulation of detailed land use proposals, preparation of preliminary design of the associated engineering works, and conducting statutory environmental impact assessment (EIA) and other detailed impact assessments (including fisheries impact assessment) as well as public engagement exercise in relation to the formulation of development proposals;
- a transport infrastructure study which covers:
  - an area-wide transport study covering the priority road and rail links as well as the possible road and rail links for longer term, between Hong Kong Island, the artificial islands in the Central Waters, Lantau and coastal areas of Tuen Mun;
  - an engineering study to ascertain the feasibility of the priority road links between Hong Kong Island, the KYC Artificial Islands (KYCAI) and Northeast Lantau, and the priority rail links between Hong Kong Island, the KYCAI, Northeast Lantau and coastal areas of Tuen Mun; and
  - an investigation study for the priority road links between Hong Kong Island and Northeast Lantau, via the KYCAI, including preliminary design, statutory EIA and other detailed impact assessments; and
- collection of information (including ecological, environmental and geological conditions) on waters within and in the vicinity of the possible artificial islands near Hei Ling Chau (HLC) and Cheung Chau South (CCS) for future reference in long-term planning.

(4) <https://www.lantau.gov.hk/filemanager/content/news-and-publications/p19-05e.pdf>

Three Project Profiles were submitted by CEDD under the CW Study in November 2021 and each of them is described below.

- Reclamation for KYCAI: The tentative reclamation area of the KYCAI development is about 1,000 hectares. The reclamation will not encroach upon any existing islands, including KYC, Siu KYC, Peng Chau and Sunshine Island. The reclamation will be conducted in phases and hence requires coordinated planning to interface with the planned developments within the KYCAI and the Hong Kong Island – Northeast Lantau (HKI-NEL) Link. Since the reclamation may encroach upon some of the existing anchorages, rearrangement of anchorages will be required, which may involve certain dredging operation in Kellett Bank. Subject to the necessary statutory procedures, the reclamation works are planned to commence tentatively in Year 2026/2027. The first phase of reclamation will tentatively be completed in Year 2029/2030 with first population intake targeted for Year 2033/2034. It is anticipated that the reclamation works will be carried out in phases and will continue beyond the first population intake.
- KYCAI Development: To support the population and the development of a third Core Business District, a number of associated land uses and infrastructure development would be required, including road & railway system, water & waste treatment, submarine cables and pipelines, etc. The alignments, scale and/ or locations of the land uses and infrastructures would be further investigated under the CW Study. Development on the reclaimed KYCAI will commence after the completion of the first phase of KYCAI reclamation in Year 2029/2030 with first population intake targeted for Year 2033/2034. It is anticipated that the reclamation works will be carried out in phases and will continue beyond the first population intake.
- HKI-NEL Link: The HKI-NEL Link comprises the development of highways connecting HKI, KYCAI and NEL and the associated works (e.g. slip roads, depressed roads, viaducts, tunnels, ventilation structures, administration buildings and/ or tunnel portal facilities). The HKI-NEL Link would tentatively be in operation in Year 2033/2034. It is anticipated that the reclamation works will be carried out in phases and part of the works will be carried out beyond the first population intake.

Based on the information available at the time of preparation of this EIA study for the Project, the tentative reclamation area of the KYCAI development is about 1,000 hectares. The coastline with KYCAI has been considered in the water quality modelling exercise for conservative assessment on the hydrodynamic regime in the Assessment Area <sup>(5)</sup>. The KYCAI development (including the HKI-NEL Link) is currently in early planning stage and detailed construction programme and sequence are not yet available. Potential cumulative impacts with the KYCAI development (including the HKI-NEL Link), in particular on water quality, marine ecology and fisheries, are discussed in the EIA Study.

### **2A.2.6 Shek Kwu Chau Integrated Waste Management Facility (IWMF) Phase 1**

The facility is proposed to be situated on an artificial island formed by reclamation in the southwestern coast of Shek Kwu Chau. Approximately 11.8 hectares of reclaimed land and berth area as well as 4.1 hectares of breakwater protecting the berth area would be developed. The facility would comprise an advanced incineration plant, a mechanical sorting and recycling plant, and ancillary and supporting facilities. Electricity generated during the incineration process will be used for daily operation of the facilities within IWMF Phase 1. Surplus electricity energy will be exported via the submarine cables to the existing power grid <sup>(6)</sup>.

During its operation, about 3,000 tonnes per day of municipal solid waste in sealed containers would be transported by marine vessels from the existing refuse transfer stations, including Island East Transfer Station, Island West Transfer Station and West Kowloon Transfer Station, to the IWMF

(5) The coastline of the proposed KYCAI is referenced from the information paper on "Studies related to artificial islands in the Central Waters" discussed on 14 May 2019 for Public Works Subcommittee of Finance Committee (PWSC(2019-20)5)

(6) Legislative Council Secretariat, Information Note for IWMF in Hong Kong (IN06/13-14)

Phase I for further waste treatment. It is anticipated that there will be four (4) round trips per day of refuse container vessel between existing Refuse Transfer Stations and IWMF Phase 1. Another 12 round trips of visitor or staff shuttle ferry between Cheung Chau and IWMF would be made every day. The IWMF Phase 1 is now under construction with the submarine cable expected to be installed by CLP in 2023-2024. The IWMF Phase 1 is expected to be commissioned by 2024 <sup>(7)</sup>. As the marine construction works of this project are not expected to coincide with the construction and operation activities of the WL Facility, unacceptable cumulative impacts are not anticipated.

### **2A.2.7 Outlying Island Sewerage Stage 2 - Upgrading of Cheung Chau Sewage Collection, Treatment and Disposal Facilities**

This project involves the expansion and upgrade of existing sewerage facilities in Cheung Chau. Treated effluent is proposed for non-potable reuse, with remaining portion discharged via an outfall. The construction commenced in 2021 for operation in 2026. As the project is mainly land-based works locating >4 km away from the Study Area, unacceptable cumulative impacts are not anticipated.

### **2A.2.8 Outlying Islands Sewerage Stage 2 - South Lantau Sewerage Works**

This project involves the provision of sewer and sewage treatment at South Lantau. The proposed submarine outfall for treated sewage effluent is located outside San Shek Wan which is over 10 km away from the Study Area. The construction commenced in 2021 for operation in 2026. As the marine construction works are located >10 km away from the Study Area, unacceptable cumulative impacts are not anticipated.

### **2A.2.9 Pier Improvement Works**

CEDD proposed to enhance the structural safety of the piers and improve the existing facilities for public piers. Some proposed pier improvement works include the Pak Kok Pier and Yung Shue Wan Ferry Pier of Lamma Island and Cheung Chau Ferry Pier. The Pak Kok Pier improvement works commenced in 2020 for completion in 2022 while the pier improvement works at Yung Shue Wan and Cheung Chau are not yet scheduled to be undertaken. Current ferry services are anticipated to be maintained throughout the pier improvement works.

### **2A.2.10 Other Potential Reclamations**

There are several pre-longlisted or longlisted sites identified in the vicinity of the Study Area recommended under Enhancing Land Supply Strategy – Reclamation outside Victoria Harbour and Rock Cavern Development in 2011. Apart from the proposal of artificial islands in Central Waters, other potential reclamation sites in the vicinity of the Study Area include Lamma North, Sandy Bay, Lamma Quarry and Tsing Yi Southwest. Amongst these sites, Tsing Yi Southwest reclamation is one of the five potential near-shore reclamations recommended in 2017 <sup>(8)</sup>. However, there is no information on the implementation programme.

(7) Keppel Seghers – Zhen Hua Joint Venture (2018). Works Schedule and Layout Plan. Submitted under Further Environmental Permit No. FEP-01/429/2012/A

(8) Task Force on Land Supply Paper No. 07/2017: Reclamation Outside Victoria Harbour. For discussion on 7 November 2017. Available at: [https://www.devb.gov.hk/filemanager/en/content\\_1054/Paper\\_07\\_2017.pdf](https://www.devb.gov.hk/filemanager/en/content_1054/Paper_07_2017.pdf)