FORM
5

Application No. :
Reference No. :
(For official use)

FORM 5
ENVIRONMENTAL IMPACT ASSESSMENT ORDINANCE
(CHAPTER 499)
SECTION 13(1)

Application for Variation of an Environmental Permit

PART A PREVIOUS APPLICATIONS

☐ No previous application for variation of an environmental permit.

☑ The environmental permit was previously amended.

Application No. : VEP-589/2021

PART B DETAILS OF APPLICANT

B1. Name : (person or company)

CLP Power Hong Kong Limited

[Note : In accordance with section 13(1) of the Ordinance, the person holding an environmental permit or a person who assumes responsibility for the designated project may apply for variation of the environmental permit.]

B2. Business Registration No. : (if applicable) [redacted]

B3. Correspondence Address :

[redacted]

B4. Name of Contact Person : [redacted]

B5. Position of Contact Person : [redacted]

B6. Telephone No. : [redacted]

B7. Fax No. : [redacted]

B8. E-mail Address : (if any) [redacted]

PART C DETAILS OF CURRENT ENVIRONMENTAL PERMIT

C1. Name of the Current Environmental Permit Holder :

CLP Power Hong Kong Limited

C2. Application No. of the Current Environmental Permit : FEP-01/341/2009/A

C3. The Current Environmental Permit was Issued in : month / year

0 4 2 0 2 1

Important Notes : Please submit the application together with

(a) 3 copies of this completed form; and

(b) appropriate fee as stipulated in the Environmental Impact Assessment (Fees) Regulation

to the Environmental Protection Department at the following address :

The EIA Ordinance Register Office,
27th floor, Southorn Centre,130 Hennessy Road,
Wan Chai, Hong Kong.

RECEIVED
12 AUG 2022
EIAO Register Office, E.P.D.

☐ Tick (✓) the appropriate box

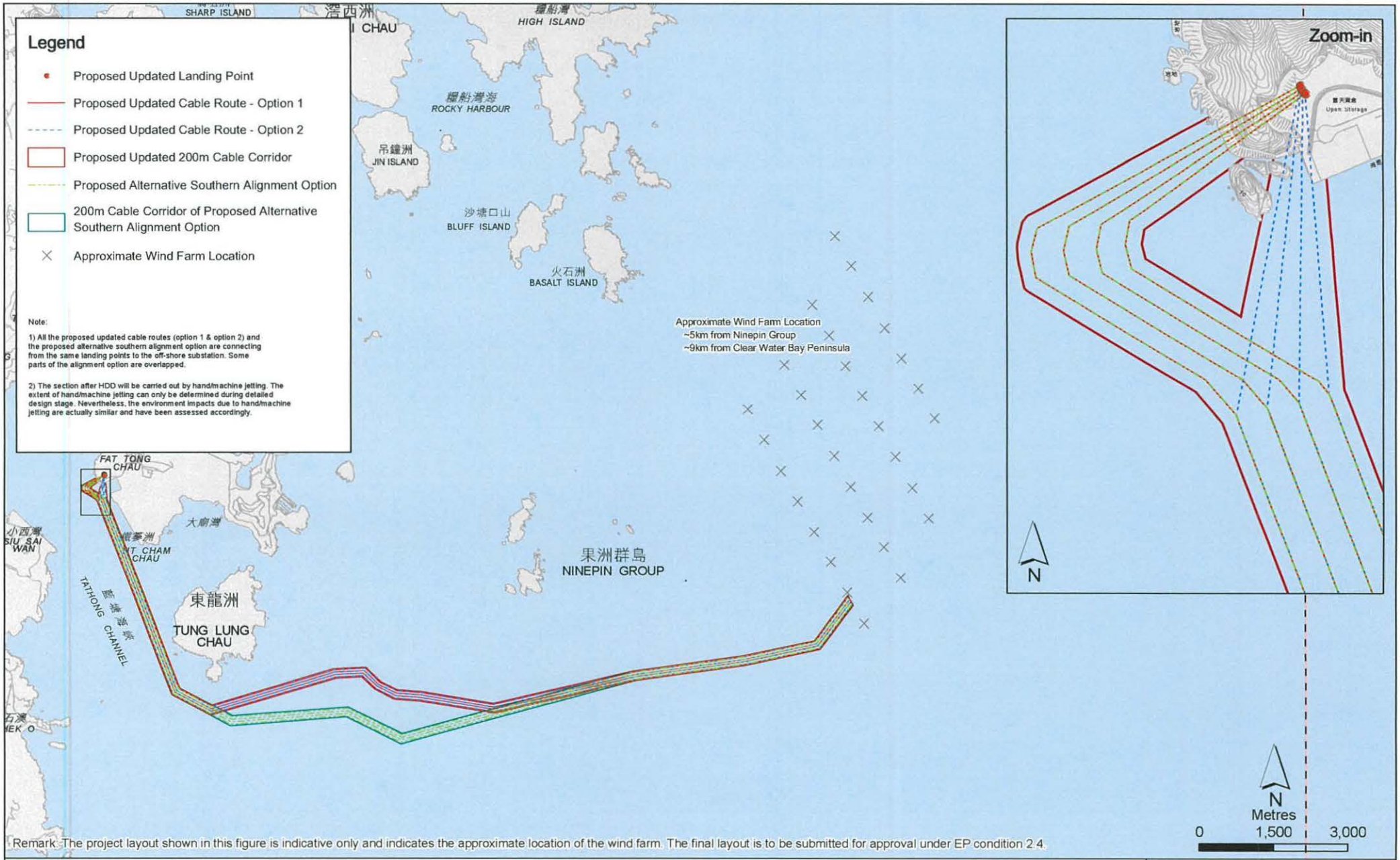
PART D PROPOSED VARIATIONS TO THE CONDITIONS IN CURRENT ENVIRONMENTAL PERMIT

D1. Condition(s) in the Current Environmental Permit :	D2. Proposed Variation(s) :	D3. Reason for Variation(s) :	D4. Describe the environmental changes arising from the proposed variation(s) :	D5. Describe how the environment and the community might be affected by the proposed variation(s) :	D6. Describe how and to what extent the environmental performance requirements set out in the EIA report previously approved or project profile previously submitted for this project may be affected :	D7. Describe any additional measures proposed to eliminate, reduce or control any adverse environmental impact arising from the proposed variation(s) and to meet the requirements in the Technical Memorandum on Environmental Impact Assessment Process :
Please see attached table	Please see attached table	Please see attached table	Please refer to Section 3 of the supporting document (i.e. Environmental Review Report) for this VEP application.	Please refer to Section 3 of the supporting document (i.e. Environmental Review Report) for this VEP application.	An Environmental Review has been carried out to assess the potential environmental impacts associated with the proposed changes. The assessment indicates that no adverse environmental impacts are anticipated from the proposed changes. Please refer to Section 3 of the supporting document (i.e. Environmental Review Report) for this VEP application.	Please refer to the supporting document (i.e. Environmental Review Report) for this VEP application.

PART D PROPOSED VARIATIONS TO THE CONDITIONS IN CURRENT ENVIRONMENTAL PERMIT

Condition	D1 Condition(s) in the Current Environmental Permit:	D2 Proposed Variation(s):	D3 Reason for Variation(s):
Figure 1	Location Plan	To be replaced with **Figure A**.	Following the proposed changes in scale and scope described below.
Condition 2.4	The Permit Holder shall submit to the Director for approval, at least six months before the commencement of construction of the Project, three hard copies and one electronic copy of the final layout of the wind farm turbines with demonstrations that the final layout, among the possible alternative layouts, has minimized the footprint of the project and maximized the distance of the turbines from Ninepin Group and Ung Kong Group.	The Permit Holder shall submit to the Director for approval, at least six months before the commencement of construction of the Project, three hard copies and one electronic copy of the final layout of the wind farm turbines, cable alignment and location of cable landing site with demonstrations that the final layout, among the possible alternative layouts, has minimized the footprint of the project and maximized the distance of the turbines from Ninepin Group and Ung Kong Group.	The final wind farm layout; cable alignment and cable landing site shall be confirmed by the Project Proponent at detailed design stage prior to the commencement of construction of the Project.
Condition 3.2 and Figure 3	Transmission power cables and collection power cables shall be installed by jetting only, with the exception of the section located at Junk Bay which may require dredging for anchor protection measures. The dredging zone is shown in Figure 3 of this Permit. Dredging can only be carried out with no more than two grab dredgers deployed and operated at the same time with a minimum separation of 100m at each dredging point. Total dredging rate should not exceed 6,300m³/day for two dredgers together. Closed grab dredgers shall be used and maintained to minimize spillage of sediment.	Transmission power cables and collection power cables shall be installed by jetting and Horizontal Directional Drilling (HDD) only. ~~with the exception of the section located at Junk Bay which may require dredging for anchor protection measures. The dredging zone is shown in Figure 3 of this Permit. Dredging can only be carried out with no more than two grab dredgers deployed and operated at the same time with a minimum separation of 100m at each dredging point. Total dredging rate should not exceed 6,300m³/day for two dredgers together. Closed grab dredgers shall be used and maintained to minimize spillage of sediment.~~ Figure 3 to be deleted	Dredging works within Junk Bay is no longer required and cable system at Fat Tong Chau would be laid by HDD. Figure 3 showing the dredging zone within Junk Bay is no longer required.
Condition 3.4 and Figure 5	Silt curtains shall be provided, in accordance with Figure 5 attached to this Permit, closely surrounding the dredging point at all time throughout the dredging operation to minimize dispersion of sediment plumes.	This Condition is proposed to be deleted as the original condition is no longer applicable. Figure 5 to be deleted	Dredging works within Junk Bay is no longer required. Figure 5 showing the silt curtain arrangement for dredging operation is not required.
Figure 4	Jetting Speed Control Zone for Cable Laying Operation	Figure 4 to be revised (to be replaced with **Figure B**)	Jetting speed control zone revised based on the changes in the cable alignment and location of cable landing site.
Figure 6	Locations of Marine Water Quality Monitoring Stations	Figure 6 to be revised (to be replaced with **Figure C**)	Monitoring stations of M1 to M3 are not required as the cable route will not go inside Junk Bay.

Condition	D1 Condition(s) in the Current Environmental Permit:	D2 Proposed Variation(s):	D3 Reason for Variation(s):
-	-	Proposed New Condition: Submission of a monitoring proposal for AMO's agreement prior to the commencement of construction works.	The Fat Tong Chau SAI is located directly above HDD section of the proposed cable alignment.



Remark: The project layout shown in this figure is indicative only and indicates the approximate location of the wind farm. The final layout is to be submitted for approval under EP condition 2.4.

Figure A

Location Plan

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Date: 4/8/2022

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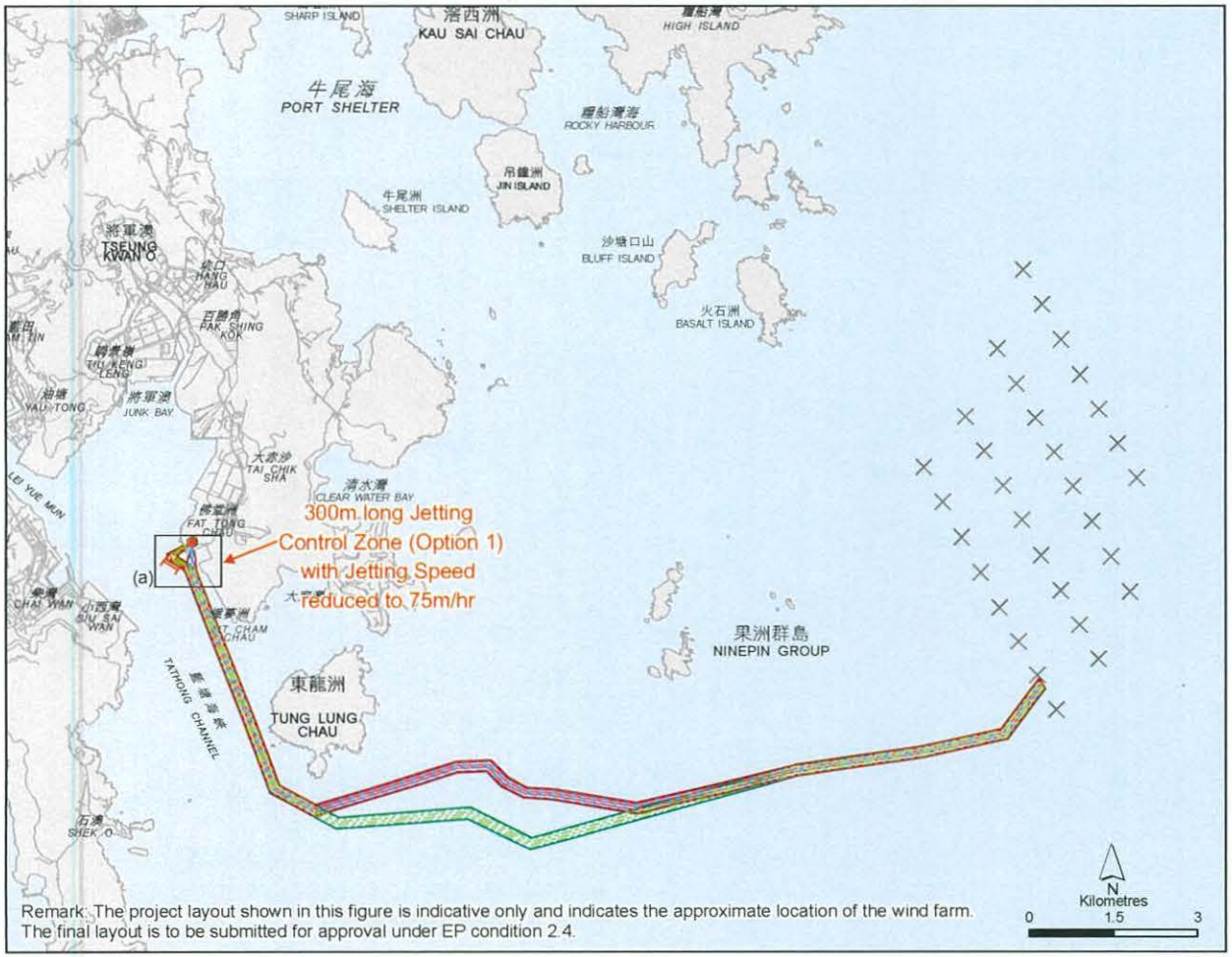

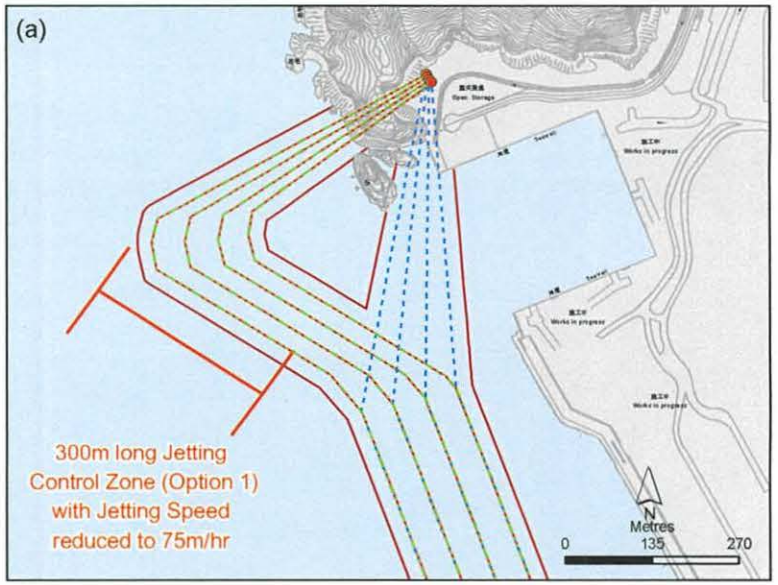

Remark: The project layout shown in this figure is indicative only and indicates the approximate location of the wind farm. The final layout is to be submitted for approval under EP condition 2.4.

Legend

- Proposed Updated Landing Point
- Proposed Updated Cable Route - Option 1
- Proposed Updated Cable Route - Option 2
- Proposed Updated 200m Cable Corridor
- Proposed Alternative Southern Alignment Option
- 200m Cable Corridor of Proposed Alternative Southern Alignment Option
- Approximate Wind Farm Location

Note:
1) All the proposed updated cable routes (option 1 & option 2) and the proposed alternative southern alignment option are connecting from the same landing points to the off-shore substation. Some parts of the alignment option are overlapped.

2) The section after HDD will be carried out by hand/machine jetting. The extent of hand/machine jetting can only be determined during detailed design stage. Nevertheless, the environment impacts due to hand/machine jetting are actually similar and have been assessed accordingly.

Figure B

Jetting Speed Control Zone for Cable Laying Operation

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Date: 4/8/2022

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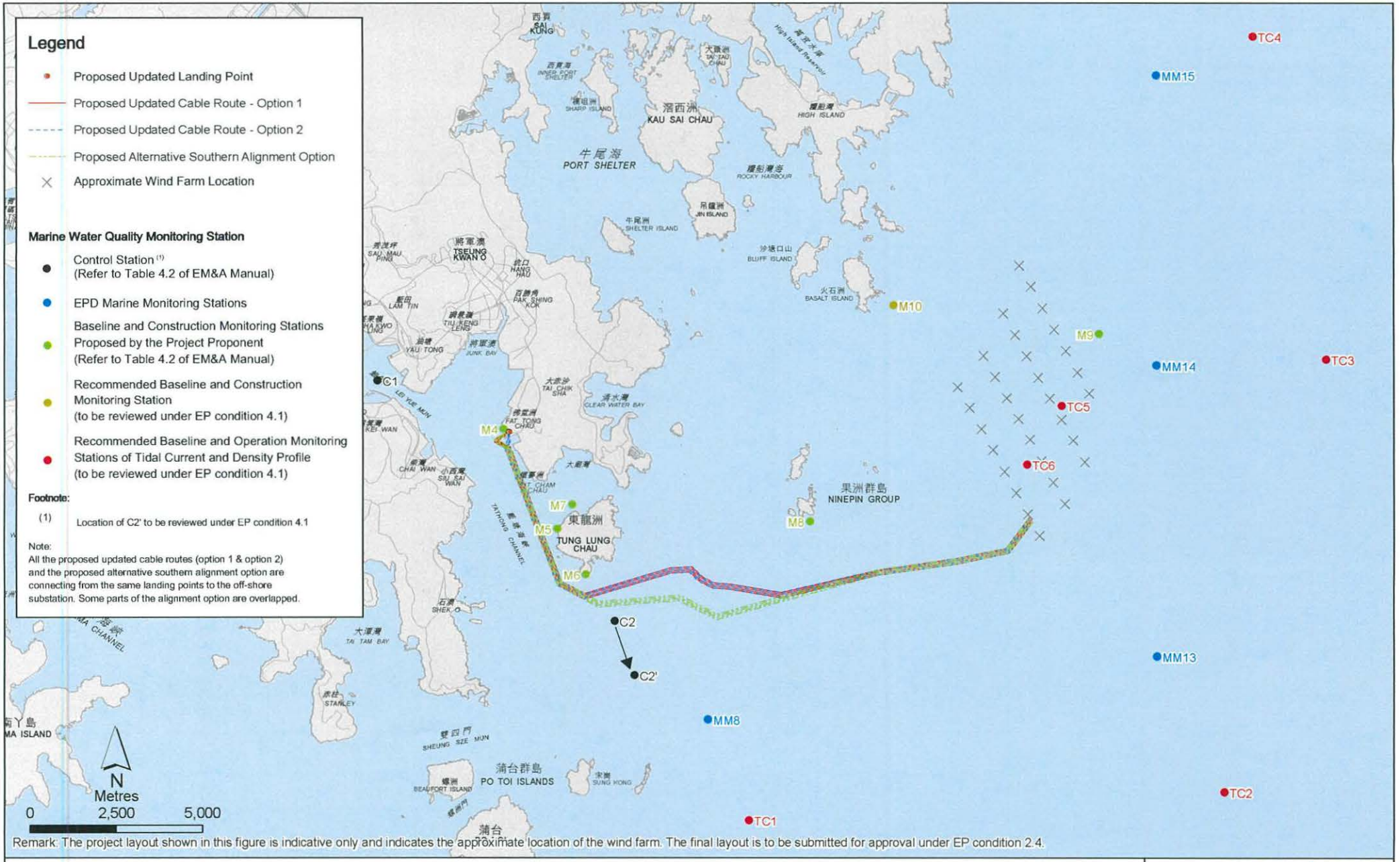

Remark: The project layout shown in this figure is indicative only and indicates the approximate location of the wind farm. The final layout is to be submitted for approval under EP condition 2.4.

Figure C

Locations of Marine Water Quality Monitoring Stations

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Date: 4/8/2022

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PART E DECLARATION BY APPLICANT

E1. I hereby certify that the particulars given above are correct and true to the best of my knowledge and belief. I understand the environmental permit may be suspended, varied or cancelled if any information given above is false, misleading, wrong or incomplete.

[redacted] [redacted] [redacted]

Signature of Applicant | Full Name in Block Letters | Position

on behalf of CLP Power Hong Kong Limited 12 Aug 2022

Company Name and Chop (as appropriate) | Date

NOTES :

1. A person who constructs or operates a designated project in Part I of Schedule 2 of the Ordinance or decommissions a designated project listed in Part II of Schedule 2 of the Ordinance without an environmental permit or contrary to the permit conditions commits an offence under the Ordinance and is liable to a maximum fine of $5,000,000 and to a maximum imprisonment for 2 years.

2. A person for whom a designated project is constructed, operated or decommissioned and who permits the carrying out of the designated project in contravention of the Ordinance commits an offence and is liable to a maximum fine of $5,000,000 and to a maximum imprisonment for 2 years.

Hong Kong Offshore Wind Farm in Southeastern Waters

Environmental Review Report for Proposed Cable Route

12 August 2022

Project No.: 0559424

The business of sustainability

Document details	
Document title	Hong Kong Offshore Wind Farm in Southeastern Waters
Document subtitle	Environmental Review Report for Proposed Cable Route
Project No.	0559424
Date	12 August 2022
Version	6.0
Author	various
Client Name	CLP Power

Document history

				ERM approval to issue		
Version	Revision	Author	Reviewed by	Name	Date	Comments
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Revised	2.0	various	Terence Fong	Robin Kennish	7.4.2022	Comments from AFCD, EPD, AMO
Revised	3.0	various	Terence Fong	Robin Kennish	20.5.2022	Comments from AMO and EPD
Revised	4.0	various	Terence Fong	Robin Kennish	17.6.2022	-
Revised	5.0	various	Terence Fong	Robin Kennish	20.7.2022	Comments from EPD and AMO
Revised	6.0	various	Terence Fong	Robin Kennish	12.8.2022	Comments from EPD

Signature Page

12 August 2022

Hong Kong Offshore Wind Farm in Southeastern Waters

Environmental Review Report for Proposed Cable Route

Dr Robin Kennish
Partner

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18 Tak Fung Street,
Hunghom, Kowloon
Hong Kong

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1. INTRODUCTION

1.1 Background

Following the approval of the Hong Kong Offshore Wind Farm in Southeastern Waters (the Project) Environmental Impact Assessment (EIA) Report (Register No.: AEIAR-140/2009) (approved EIA Report) under the Environmental Impact Assessment Ordinance (EIAO) on 3 August 2009, an Environmental Permit (EP-341/2009) was granted for the Project on 4 August 2009. The EP was surrendered and a Further Environmental Permit (FEP) (FEP-01/341/2009) was issued to CLP Power Hong Kong Limited on 24 November 2014. FEP-01/341/2009 was replaced by FEP-01/341/2009/A on 13 April 2021 regarding the changes in the turbine design and hence varying relevant conditions and figures in the FEP. An Environmental Review Report (ERR) dated March 2021 was prepared to support the variations proposed for the FEP-01/341/2009/A.

CLP Power has recently reviewed the proposed cable route that was presented in the approved EIA Report, and following further design optimisation, intends to utilise an alternative cable landing site (CLS) and cable alignment. Details of the proposed variations versus those presented in the approved EIA Report are given in **Section 2**.

The plan showing the indicative Project layout and proposed cable route from Figure 1 of the FEP is given in **Figure 1.1**. The changes in the cable landing site and cable alignment are shown in **Figure 1.2**. Overlays of the updated cable landing site and cable alignment and that from FEP are shown in **Figure 1.3**.

1.2 Purpose of this Report

This *Environmental Review Report* (this *Report*) provides information to describe the potential impacts on the environment due to the proposed variations and provides an evaluation of the potential impacts. The information presented herein will form part of the submission to the EPD for an Application for Variation of an Environmental Permit (VEP). In accordance with Section 13(5) of the EIAO, a VEP application has to demonstrate:

(a) no material change to the environmental impact of the project with mitigation measures in place; and

(b) the project complies with the requirements described in the *Technical Memorandum on Environmental Impact Assessment Process* (EIAO-TM).

The purpose of this *Report* is to demonstrate that there is no material change to the environmental impact as stipulated in Schedule 1 of the EIAO and Section 6.2 of the EIAO-TM.

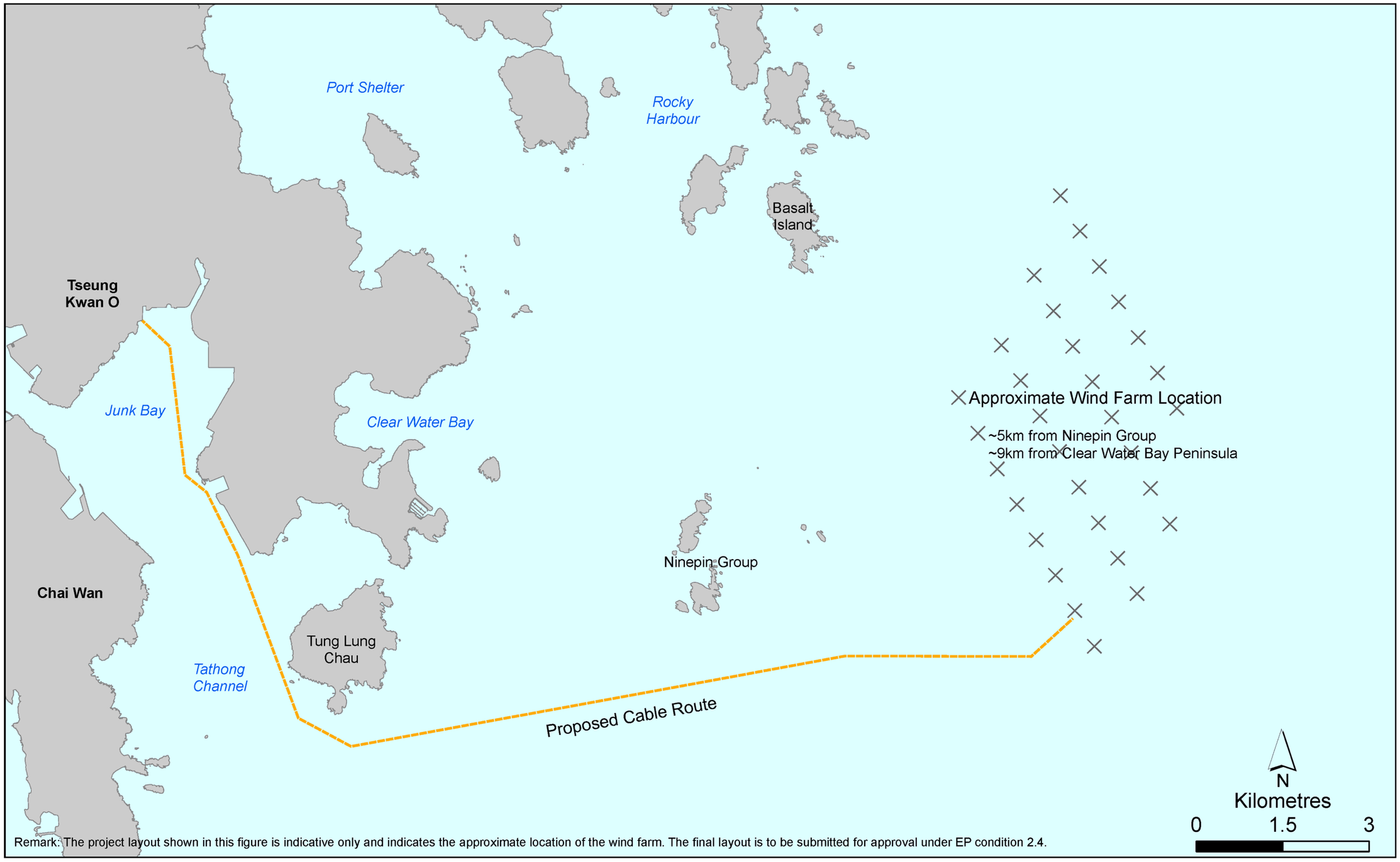

Figure 1.1

Project Layout and Proposed Cable Route from Figure 1 of the FEP

File: T:\GIS\CONTRACT\0559424\mxd\Cable_VEP_ERR\0559424_Proposed_Layout_and_Cable_FEP.mxd
Date: 26/11/2021

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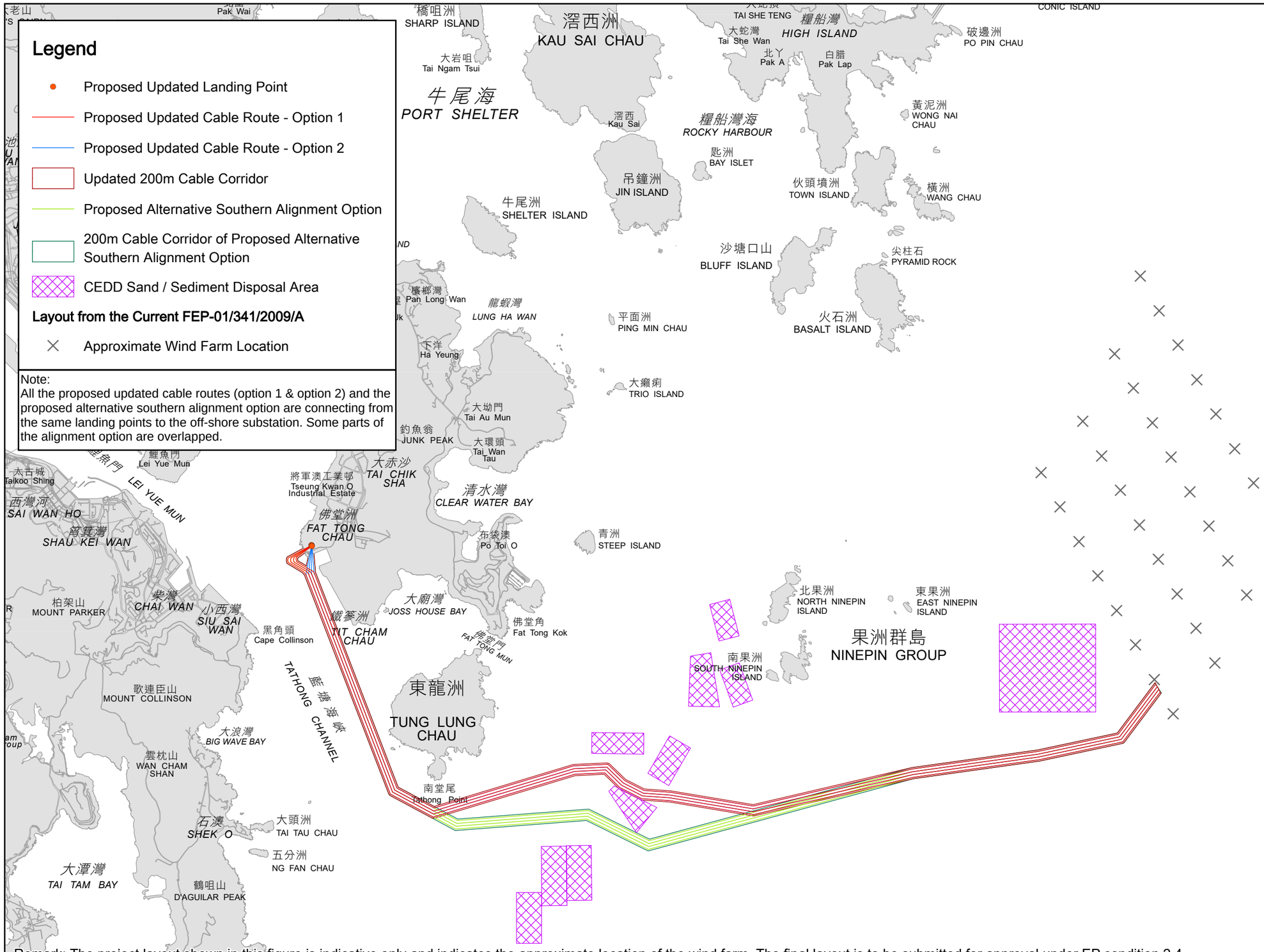
Legend

- Proposed Updated Landing Point
- Proposed Updated Cable Route - Option 1
- Proposed Updated Cable Route - Option 2
- Updated 200m Cable Corridor
- Proposed Alternative Southern Alignment Option
- 200m Cable Corridor of Proposed Alternative Southern Alignment Option
- CEDD Sand / Sediment Disposal Area

Layout from the Current FEP-01/341/2009/A

- Approximate Wind Farm Location

Note:
All the proposed updated cable routes (option 1 & option 2) and the proposed alternative southern alignment option are connecting from the same landing points to the off-shore substation. Some parts of the alignment option are overlapped.



Remark: The project layout shown in this figure is indicative only and indicates the approximate location of the wind farm. The final layout is to be submitted for approval under EP condition 2.4.

Figure 1.2

Proposed Updated Cable Alignment and Landing Point

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Date: 15/6/2022

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Legend

- Proposed Updated Landing Point
- Proposed Updated Cable Route - Option 1
- Proposed Updated Cable Route - Option 2
- Updated 200m Cable Corridor
- Proposed Alternative Southern Alignment Option
- 200m Cable Corridor of Proposed Alternative Southern Alignment Option

Layout from the Current FEP-01/341/2009/A

- Approximate Wind Farm Location
- Proposed Cable Route
- 200m Cable Corridor

Note:
All the proposed updated cable routes (option 1 & option 2) and the proposed alternative southern alignment option are connecting from the same landing points to the off-shore substation. Some parts of the alignment option are overlapped.

糧船灣海 *CKY HARBOUR*
黃泥洲 WONG NAI CHAU
匙洲 BAY ISLET
伙頭墳洲 TOWN ISLAND
橫洲 WANG CHAU
沙塘口山 BLUFF ISLAND
尖柱石 PYRAMID ROCK
火石洲 BASALT ISLAND
平面洲 PING MIN CHAU
大癩痢 TRIO ISLAND
LUNG HA WAN
藍田 LAM TIN
百勝角 PAK SHING KOK
下洋 Ha Yeung
調景嶺 TIU KENG LENG
油塘 YAU TONG
將軍澳 JUNK BAY
大坳門 Tai Au Mun
釣魚翁 HIGH JUNK PEAK
大環頭 Tai Wan Tau
鯉魚門 Lei Yue Mun
大赤沙 TAI CHIK SHA
將軍澳工業邨 Tseung Kwan O Industrial Estate
清水灣 CLEAR WATER BAY
LEI YUE MUN
佛堂洲 FAT TONG CHAU
布袋澳 Po Toi O
青洲 STEEP ISLAND
柴灣 CHAI WAN
小西灣 SIU SAI WAN
大廟灣 JOSS HOUSE BAY
鐵箏洲 TIT CHAM CHAU
佛堂角 Fat Tong Kok
佛堂門 FAT TONG MUN
黑角頭 Cape Collinson
北果洲 NORTH NINEPIN ISLAND
東果洲 EAST NINEPIN ISLAND
果洲群島 NINEPIN GROUP
南果洲 SOUTH NINEPIN ISLAND
歌連臣山 UNT COLLINSON
TATHONG CHANNEL 藍塘海峽
東龍洲 TUNG LUNG CHAU
大浪灣 BIG WAVE BAY
雲枕山 WAN CHAM SHAN
南堂尾 Tathong Point
石澳 SHEK O
大頭洲 TAI TAU CHAU
五分洲 NG FAN CHAU
D'AGUILAR PEAK

N
Metres
0 1,500 3,000

Remark: The project layout shown in this figure is indicative only and indicates the approximate location of the wind farm. The final layout is to be submitted for approval under EP condition 2.4.

Figure 1.3

Overlay of the Updated Cable Alignment and Landing Point and that from the FEP

File: T:\GIS\CONTRACT\0559424\mxd\Cable_VEP_ERR\0559424_Overlay_Proposed_Cable_and_Landing_Point_and_FEP.mxd
Date: 15/6/2022

Environmental Resources Management

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2. PROPOSED VARIATIONS

2.1 Reasons for Variations

2.1.1 Cable Landing Site

Following the issuance of the EP for the Project (granted by EPD in 2009), the area near the originally proposed landing site in the west of Junk Bay in Tseung Kwan O has been approved for the development of the Tseung Kwan O – Lam Tin Tunnel, associated Road P2 and Cross Bay Link. References have been made to the Environmental Permits for the Tseung Kwan O – Lam Tin Tunnel and Associated Work (EP-458/2013/C) and Cross Bay Link, Tseung Kwan O (EP-459/2013) for locations of the planned road development. To avoid crossing the road development and the existing and planned submarine cables in Tseung Kwan O and Junk Bay area, an alternative cable landing site has been proposed at Fat Tong Chau (**Figures 1.2** and **2.1**).

2.1.2 Cable Route

Consultation has been sought with CEDD in 2020 on the gazetted boundary reserved for sand/sediment disposal. The cable route has subsequent to this been adjusted taking into consideration the latest information provided by CEDD. The proposed adjusted cable route and an overlay showing the changes against the original cable route are shown in **Figures 1.2** and **1.3** respectively. The transmission cables will be buried within a 200m corridor along the cable route.

2.2 Proposed Variations and Comparison with the Approved EIA Report

A high-level comparison of the assumptions in the approved EIA Report and the latest design is provided in **Table 2.1**.

Legend

- Proposed Updated Landing Point
- Proposed Updated Cable Route - Option 1
- Proposed Updated Cable Route - Option 2
- Updated 200m Cable Corridor
- Proposed Alternative Southern Alignment Option
- 200m Cable Corridor of Proposed Alternative Southern Alignment Option
- HDD Section
- Declared Monument
- Fish Culture Zone
- Seawater Intake & 100m Boundary
- Landfill Gas Consultation Zone Boundary
- TKO Industrial Estate Boundary

Outline Zoning Plan (OZP)

- Coastal Protection Area (CPA)
- Commercial / Residential (C/R)
- Comprehensive Development Area (CDA)
- Country Park (CP)
- Government / Institution / Community (G/IC)
- Green Belt (GB)
- Industrial (I)
- Open Space (O)
- Other Specified Uses (OU)
- Other Specified Uses (OU) - Deep Waterfront Industry
- Recreation (REC)
- Residential (Group A) (R(A))
- Residential (Group B) (R(B))
- Residential (Group E) (R(E))

Zoom-in

GB

OU

Site of Chinese Customs Station, Fat Tau Chau

清水灣半島 CLEAR WATER BAY PENINSULA

新界東南堆填區 South East New Territories Landfill

第137區- 施工中 AREA 137 - Works in Progress

Tung Lung Chau Fish Culture Zone

N

Metres

0 450 900

Figure 2.1

Proposed Landing Point and the Surrounding Environment

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Date: 15/6/2022

Environmental Resources Management

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Table 2.1 Comparison of Assumptions in Approved EIA Report and Proposed Changes

	Approved EIA Report	Proposed Changes
Changes in Project Design		
Cable Landing Site (CLS)	West of Junk Bay (Tseung Kwan O), which is a small area of reclaimed land free from existing services and from which access can be gained to the existing CLP network. (**Figure 1.1** - from Figure 1 of the FEP, and Figures 2.24 & 2.25 of the approved EIA Report)	Fat Tong Chau, an open area at the north-western-most corner of the Tseung Kwun O Area 137 Fill Bank, at the south of Fat Tong Chau (see **Figures 1.2** and **2.1**)
Cable Route	The total length of transmission cable between the CLS and the south-western edge of the Hong Kong Offshore Wind Farm is approximately 24km: • Transmission cable in Tseung Kwan O requiring additional protection is approximately 3km long (S2.8.5.2 of the approved EIA Report). • Remaining offshore transmission cable is approximately 21km long (S2.8.6.2 of the approved EIA Report). (**Figure 1.1** - from Figure 1 of the FEP and Figures 2.24 & 2.25 of the approved EIA Report)	With the cable landing site moved to Fat Tong Chau, the total length between the CLS and the south-western edge of the Hong Kong Offshore Wind Farm reduced to approximately 20 km: • Transmission cable shore-end section at Fat Tong Chau, using hand jetting technique, requiring additional protection is approximately 500m long (see **Figures 1.2** and **3.2**)
Cable Voltage and Number	Offshore Collection/Array cable: 33kV@ around 12-15cm in diameter Transmission cable: 132kV x 2 @ around 20cm in diameter (S2.1.4 of the approved EIA Report)	Offshore Collection/Array cable: Each offshore collection/ array cable with a power cable up to 132kV with a diameter of not more than 25cm and an associated fibre optic cable with diameter of not more than 5cm Transmission cable: Up to 4 nos. of power cable systems, each with a power cable of up to 230kV with a diameter of not more than 30cm and an associated fibre optic cable with diameter of not more than 5cm

	Approved EIA Report	Proposed Changes
Construction Works		
Cable Installation, Protection and Burial	Construction of a small underground cable connection pit of dimension approximately 2m wide, 3m long and 1m deep and then underground cabling to the appropriate CLP grid connection.	Construction of an underground cable connection pit of dimension approximately 25m(L) x 8m(W) x 2.6m(D). Horizontal Directional Drilling (HDD) method will be adopted to construct four separate landing ducts connecting the exit points in the sea and the CLS for up to 4 sets of transmission power cable systems of each up to 230kV. (see **Figure 2.1**)
	• Additional protection (with 100 width corridor) for the section (approximately 3km long) of the transmission cable in Tseung Kwan O is required, as shown in Figure 2.38 of the approved EIA Report.	• Additional protection to be provided at transmission cable shore-end sections at Fat Tong Chau, with shallow burial by using hand jetting technique, requiring additional protection is approximately 500m long.
	• For the remaining transmission cable, burial of 3m and 5m was proposed by jetting.	• Pre-lay Grapnel Run (PLGR) and Route Clearance (RC) are typically required prior the cable installation – PLGR is designed to clean all seabed debris, and RC operation is designed to remove debris and all out of service (OSS) cables found on the route, and this will be done by with purpose-designed grapnels towed along the whole cable route • Updated to 3-10m below seabed for the transmission cables and up to 5m below seabed for the array cables, subject to the seabed and marine traffic conditions
	• Two transmission cables will be buried approximately 50m apart within the 200m surveyed corridor, except in the area within TKO and rock anchor protection where they will be buried in the same trench. (S2.8.5 of the approved EIA Report)	• Four transmission cables will be buried within a 200m corridor
Construction Programme and Logistics		
Construction Programme	• Two years, focusing in Spring and Summer months, avoid Winter with increased wind speeds and associated wave heights, giving an approximate construction window of 6 months in a year (S2.9 of the approved EIA Report)	• Two years, avoid Winter (where practical) with increased wind speeds and associated wave heights, targeting to complete the installation of transmission cable within one year if possible (excluding HDD works).
	• Rock Amour Protection or Concrete Slab Protection will be adopted for the installation of transmission cable with extra protection. Either method will take approximately 4 months. (S2.8.5 of the approved EIA Report)	• Articulated Pipe and Concrete Slab Protection will be adopted for the installation of shore-end transmission cable with extra protection, approximately 4 months remain.

	Approved EIA Report	Proposed Changes
Construction Programme and Logistics (con't)		
	• HDD Works at Tsueng Kwan O landing site was not mentioned in the approved EIA Report	• HDD work at Fat Tong Chau is expected to take up to 2 years.
Operational Activities		
Operational Activities	• No minor and scheduled maintenance for the transmission cables and cable landing site was mentioned in the approved EIA Report.	Potential requirement for maintenance work, i.e. cable repair at particular fault location due to unexpected damage.

2.3 Details of Variations

2.3.1 Cable Specification

In accordance with the results of the review and in order to meet the technical requirements of the latest offshore windfarm design, up to 4 sets of transmission power cable system connecting the off-shore substation to CLS, each with a power cable up to 230kV with a diameter of not more than 30cm and an associated fibre optic cable with diameter of not more than 5cm, while cable system each with a power cable up to 132kV with diameter of not more than 25cm and an associated fibre optic cable with diameter of not more than 5cm will be used for the offshore collection/ array cables connecting the off-shore substation and individual wind turbines.

2.3.2 Shore-end Cable Installation

Horizontal Directional Drilling (HDD) method will be adopted to construct four separate landing ducts for up to 4 sets of transmission power cable system at the Fat Tong Chau Cable Landing Site (CLS). HDD is a trenchless technique which would avoid impact on the environment that would arise by open trench method.

The zoning of the surrounding environment extracted from the Draft Tseung Kwan O Outline Zoning Plan (OZP) S/TKO/27 dated 20 June 2020 is shown in **Figure 2.1**. The entry points of the HDDs at the land side are within "OU" zone, cable within "Green Belt" zone is all underground. No construction work is required within the "Green Belt" zone. The exit points of the HDDs at the sea side shall have at least 5m or with extra protection if less than 3m of soil cover to provide necessary cable protection by in-situ burial. Based on this, they are set at least 150m away from the coastline and approximately 330m on plan from the western boundary of the CLS. A conceptual vertical alignment of the proposed HDD cable landing route is shown in **Figure 2.2**.

The HDD process is summarised in the following:

1) Drilling from entry points at the CLS.
2) Enlarge the HDD bores by a reamer or hole opener, up to the diameter of the HDD borehole (4 boreholes each of about 1.2m in diameter).
3) Duct/pipe/conduit installation by pulling from the offshore exit points into the entry points at the CLS.
4) Post grouting of the annulus area between the ducts and HDD bore hole.

The HDD will tunnel through rock mass. Potential settlement and vibrations generation are expected to be negligible. To handling of spoils during the drilling process, drilling fluids will be used during conduit construction to maintain the shape and stability of the duct, to remove rock cuttings and to lubricate the rotating drill bit. Water-based drilling fluid will be created by mixing freshwater with bentonite clay or Xanthan gum to create a slurry. A closed-loop system will be adopted for handling drilling fluids used during HDD operation. The drilling fluid will be pumped through the drill, acting as a lubricant for the drilling process, and brings the rock cuttings back to the surface. At Fat Tong Chau

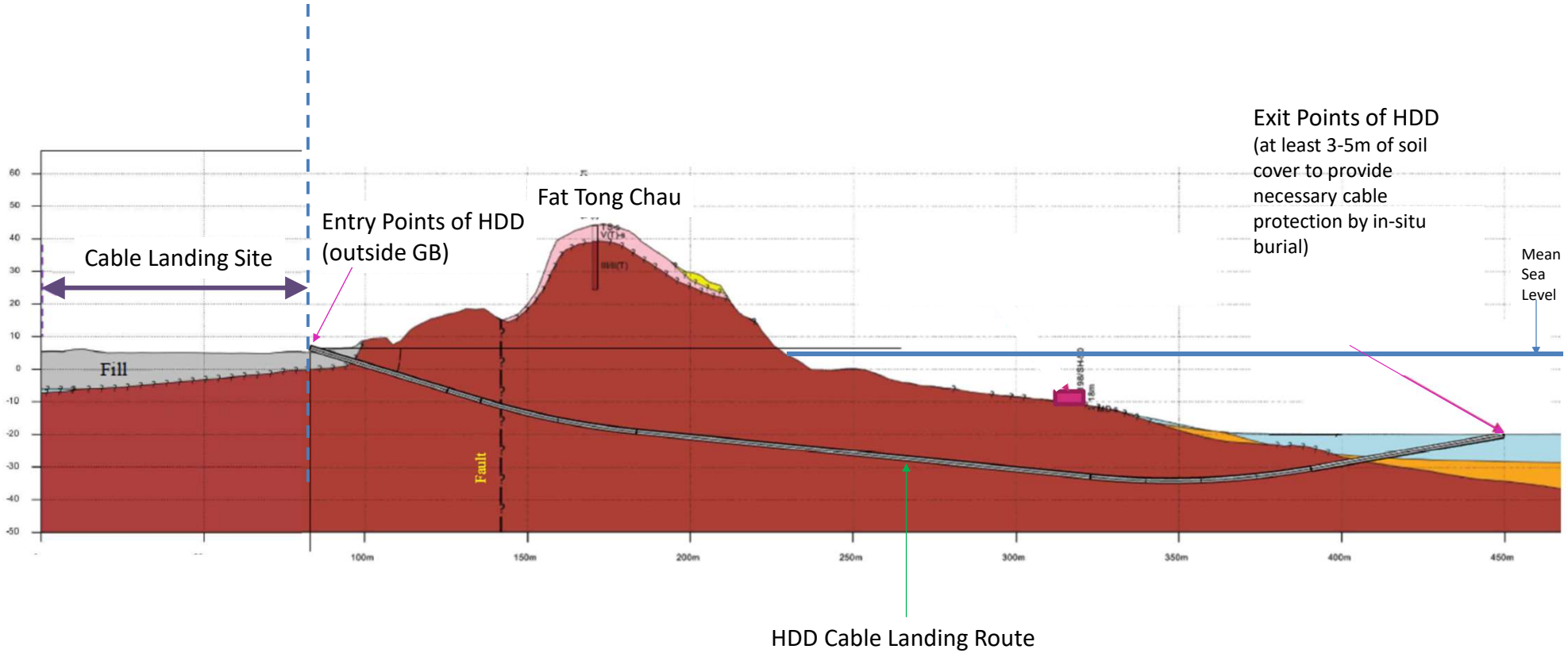

Figure 2.2

Conceptual Vertical Alignment of Proposed HDD Cable Landing Route

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cable landing site, rock cuttings in the returning drilling fluid will be removed from the fluid by a centrifuge for disposal. The cleaned drilling fluid will be recirculation back down the drill pipe and reused in the HDD process.

To avoid any potential leakage of the drilling fluid into the marine environment when the drill head breaks through the bedrock into the marine mud on the seabed, drilling will stop 5m before exiting the seabed and the drill hole will be purged and freshwater will be used as drilling fluid for the final 5m of drilling. This process has been adopted by other HDD works in Hong Kong and proven to be effective in controlling potential water quality impact during the HDD operation.

2.3.3 Offshore Cable Installation

2.3.3.1 Cable Landing Options

Option 1 – connecting to CLS from the west of Fat Tong Chau

In Option 1, the cable route runs from the CLS and exits in the west of Fat Tong Chau. To avoid the cable route entering the Tathong Channel, the cable route turns south beyond the HDD exit points and runs parallel along the navigation channel (**Figure 2.1**).

Option 2 – connecting to CLS from the south of Fat Tong Chau

In Option 2, the cable route runs from the CLS and exits in the south of Fat Tong Chau, same landing points as Option 1 (**Figure 2.1**).

2.3.3.2 Proposed Alternative Southern Alignment Option

This proposed alternative southern alignment option will be located in areas with less dumping material. It is considered as a fall back if cable laying by jetting is found to be unfeasible in the proposed updated route. The proposed alternative southern alignment and the proposed cable routing option 1 are approximately 20 km in length (**Figure 1.2**).

2.3.3.3 Additional Protection

Diver-assisted cable burial is required along the cable route section immediately beyond the cable exit points. Cable protection, such as covering the cables with articulated pipe and concrete slab protection will be required along this shore-end section due to the limited burial depth by diver-assisted methods which is up to 2-3m below seabed. The HDD conduit can be pulled either from land-to-sea or sea-to-land, subjected on the contractor's preferred method of works and availability of plant.

2.3.4 Cable Operation, Maintenance and Repair

During operation (after installation), there may be a potential requirement for maintenance work (i.e. cable repair at particular fault location due to unexpected damage) to be carried out. These works will be similar in nature to transmission cable installation works described in **Sections 2.3.2** and **2.3.3**. Should repair operation be required, applicable mitigation measures proposed for the construction phase will be implemented as outlined in Section 11 of the approved EIA Report.

For the transmission cable repairs, equipment and methods would again be similar to those outlined in **Section 2.3.3** but not along the full alignment and generally be smaller scale, i.e. with the potential to use smaller equipment such as Remotely Operated Vehicles (ROVs) equipped with injector tool and divers with hand held tools.

All cable installation/ repair works are expected to be undertaken during non-restricted working hours, i.e. between 0700 and 1900 hours on any day not being a general holiday or a Sunday. If works during restricted hours are later found to be necessary, a Construction Noise Permit (CNP) will be applied for.

Duration of any cable repair work during operation of the wind farm project is anticipated to be of shorter duration than cable installation during construction and only likely to occur should a fault occur (e.g. by damage to the buried cables).

2.4 Proposed Variations to the Conditions of the Current FEP

In view of the proposed changes to the Project, a number of condition(s) in the current Further Environmental Permit (FEP-01/341/2009/A) shall be varied; these conditions, the proposed variations and the reason for variation are summarised in **Table 2.2**.

Table 2.2 Proposed Variations to Conditions of the FEP

Condition	Current FEP	Proposed Variation	Reason for Variation
Figure 1	Location Plan (see **Figure 1.1** of the Environmental Review Report (ERR))	To be replaced with **Figure 1.2** of the ERR.	Following the proposed changes in scale and scope described below.
Condition 2.4	The Permit Holder shall submit to the Director for approval, at least six months before the commencement of construction of the Project, three hard copies and one electronic copy of the final layout of the wind farm turbines with demonstrations that the final layout, among the possible alternative layouts, has minimized the footprint of the project and maximized the distance of the turbines from Ninepin Group and Ung Kong Group.	The Permit Holder shall submit to the Director for approval, at least six months before the commencement of construction of the Project, three hard copies and one electronic copy of the final layout of the wind farm turbines, cable alignment and location of cable landing site with demonstrations that the final layout, among the possible alternative layouts, has minimized the footprint of the project and maximized the distance of the turbines from Ninepin Group and Ung Kong Group.	The final wind farm layout; cable alignment and cable landing site shall be confirmed by the Project Proponent at detailed design stage prior to the commencement of construction of the Project.
Condition 3.2 and Figure 3	Transmission power cables and collection power cables shall be installed by jetting only, with the exception of the section located at Junk Bay which may require dredging for anchor protection measures. The dredging zone is shown in Figure 3 of this Permit. Dredging can only be carried out with no more than two grab dredgers deployed and operated at the same time with a minimum separation of 100m at each dredging point. Total dredging rate should not exceed 6,300m^3/day for two dredgers together. Closed grab dredgers shall be used and maintained to minimize spillage of sediment.	Transmission power cables and collection power cables shall be installed by jetting and Horizontal Directional Drilling (HDD) only. ~~with the exception of the section located at Junk Bay which may require dredging for anchor protection measures. The dredging zone is shown in Figure 3 of this Permit. Dredging can only be carried out with no more than two grab dredgers deployed and operated at the same time with a minimum separation of 100m at each dredging point. Total dredging rate should not exceed 6,300m^3/day for two dredgers together. Closed grab dredgers shall be used and maintained to minimize spillage of sediment~~. Figure 3 to be deleted	Dredging works within Junk Bay is no longer required and cable system at Fat Tong Chau would be laid by HDD. Figure 3 showing the dredging zone within Junk Bay is no longer required.
Condition 3.4 and Figure 5	Silt curtains shall be provided, in accordance with Figure 5 attached to this Permit, closely surrounding the dredging point at all time throughout the dredging operation to minimize dispersion of sediment plumes.	This Condition is proposed to be deleted as the original condition is no longer applicable. Figure 5 to be deleted	Dredging works within Junk Bay is no longer required. Figure 5 showing the silt curtain arrangement for dredging operation is not required.
Figure 4	Jetting Speed Control Zone for Cable Laying Operation	Figure 4 to be revised (see **Figure 3.2** of the ERR)	Jetting speed control zone revised based on the changes in the cable alignment and location of cable landing site.

Condition	Current FEP	Proposed Variation	Reason for Variation
Figure 6	Locations of Marine Water Quality Monitoring Stations (see **Figure 2.3** of the ERR)	Figure 6 to be revised (to be replaced with **Figure 2.4** of the ERR)	Monitoring stations of M1 to M3 are not required as the cable route will not go inside Junk Bay.
-	-	Proposed New Condition: Submission of a monitoring proposal for AMO's agreement prior to the commencement of construction works.	The Fat Tong Chau SAI is located directly above HDD section of the proposed cable alignment.

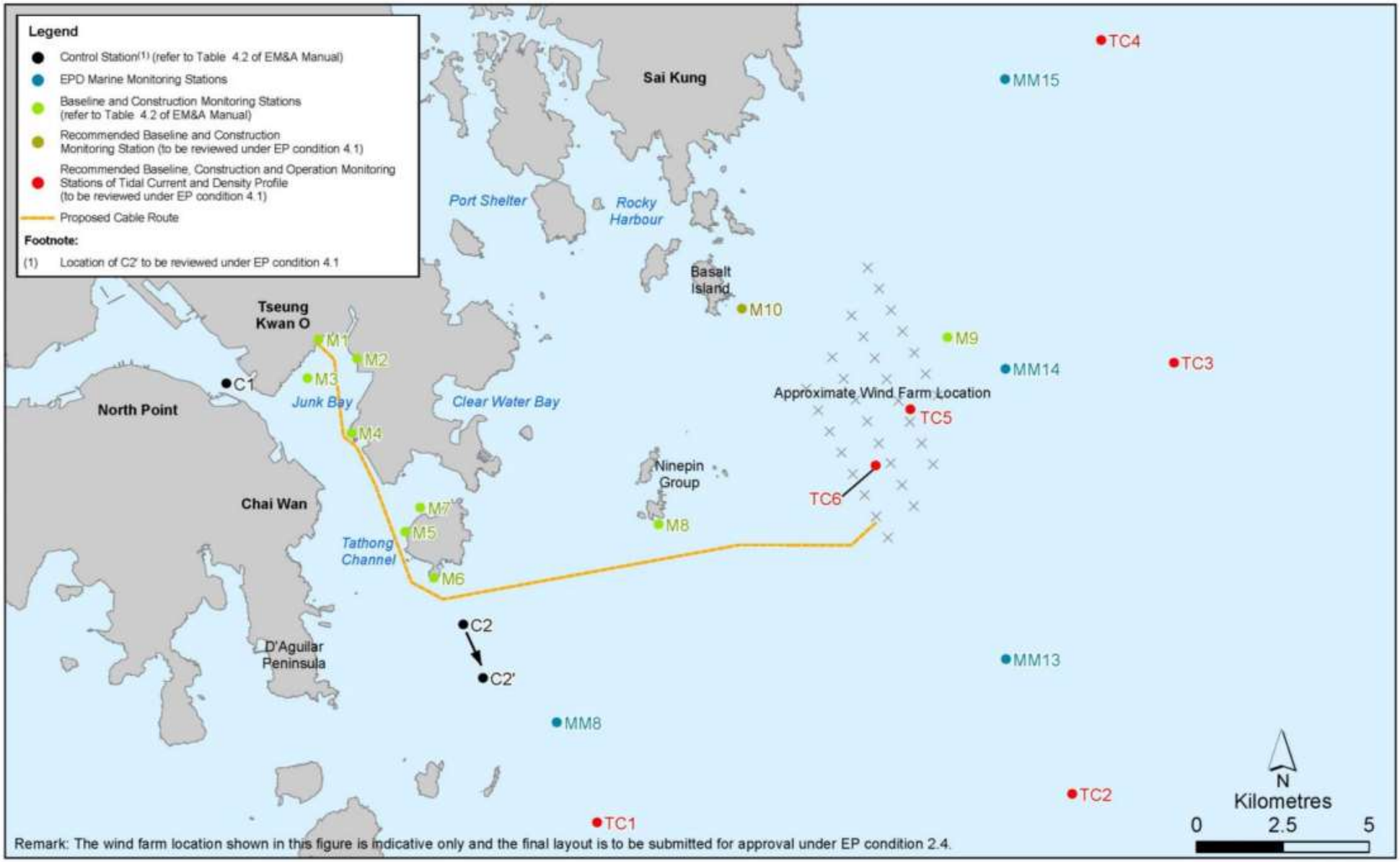

Figure 2.3

Locations of Marine Water Quality Monitoring Stations
from Figure 6 of the FEP

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Legend

- Proposed Updated Landing Point
- Proposed Updated Cable Route - Option 1
- Proposed Updated Cable Route - Option 2
- Proposed Alternative Southern Alignment Option

Layout from the Current FEP-01/341/2009/A

- Approximate Wind Farm Location

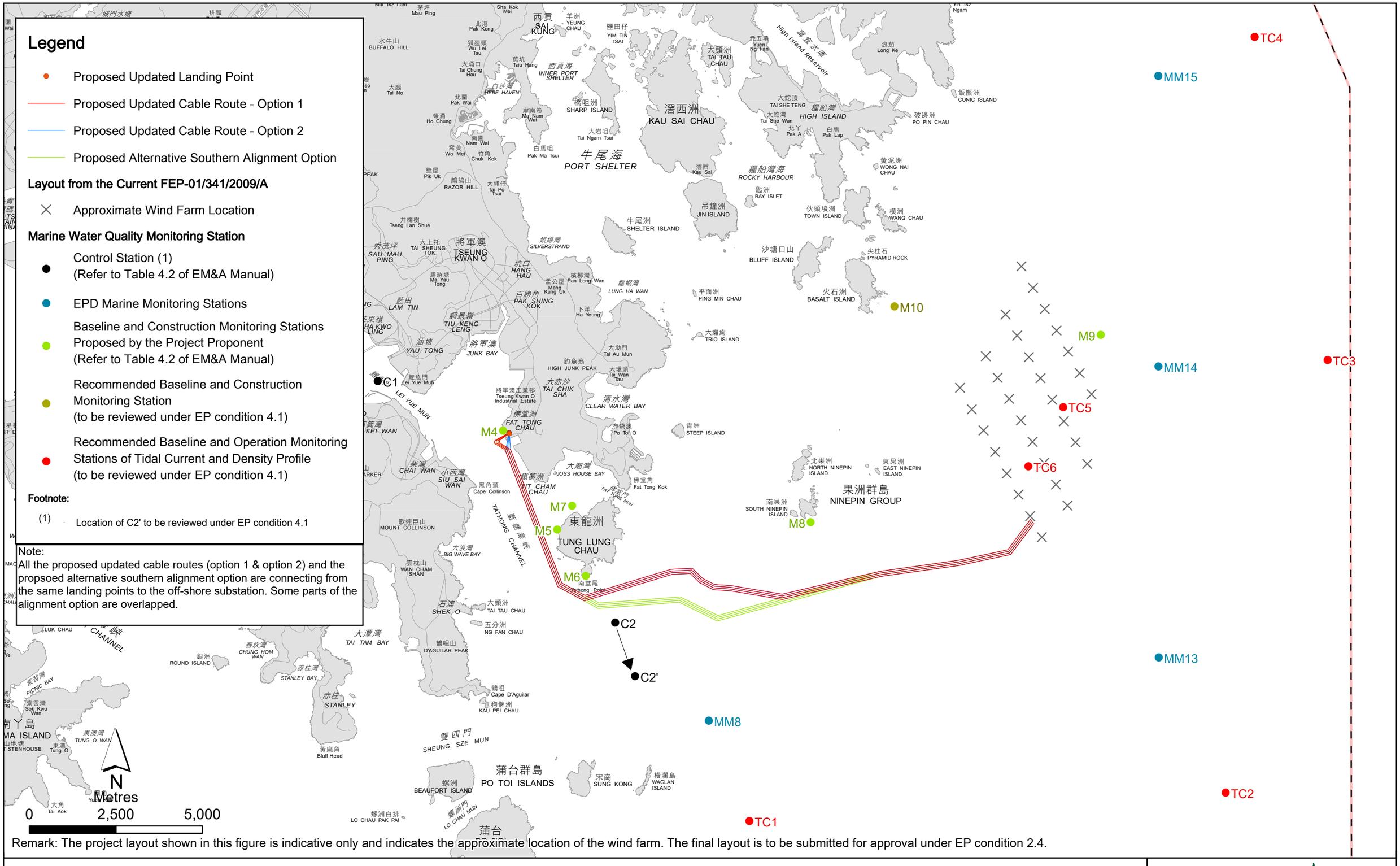
Marine Water Quality Monitoring Station

- Control Station (1)
  (Refer to Table 4.2 of EM&A Manual)
- EPD Marine Monitoring Stations
- Baseline and Construction Monitoring Stations Proposed by the Project Proponent
  (Refer to Table 4.2 of EM&A Manual)
- Recommended Baseline and Construction Monitoring Station
  (to be reviewed under EP condition 4.1)
- Recommended Baseline and Operation Monitoring Stations of Tidal Current and Density Profile
  (to be reviewed under EP condition 4.1)

Footnote:

(1) Location of C2' to be reviewed under EP condition 4.1

Note:
All the proposed updated cable routes (option 1 & option 2) and the propsoed alternative southern alignment option are connecting from the same landing points to the off-shore substation. Some parts of the alignment option are overlapped.



Remark: The project layout shown in this figure is indicative only and indicates the approximate location of the wind farm. The final layout is to be submitted for approval under EP condition 2.4.

Figure 2.4

Locations of Marine Water Quality Monitoring Stations

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3. POSSIBLE IMPACT ON THE ENVIRONMENT

3.1 Water Quality Impact

The key concern on water quality impacts during the installation of the power transmission cables identified in the approved EIA Report are sediment dispersion from dredging and jetting. Sediment release rates adopted in the sediment dispersion modelling were estimated based on the selected working rate for dredging and jetting speed of the jetting machine.

According to the water quality assessment in the approved EIA Report, 5 modelling assessments were conducted, each featuring different combinations of dredging in Junk Bay (near different water sensitive receivers), jetting at different section of power transmission cable (again near different water sensitive receivers), as well as the water pumping at three turbines deemed as worst case locations. Water sensitive receivers near the power transmission cable (shown in **Figure 3.1** below) includes:

- Location of amphioxus occurrence: AO1, AO8
- Seawater intake: SWI3
- Coral community: CC26, CC27, CC11, CC8, CC7
- Fish culture zone: FCZ6

As discussed under *Section 3.2*, the silty bottom substrate near the proposed alignment is not considered to be major habitat for amphioxus. Therefore, AO1 and AO8 is as well as other amphioxus WSRs are not further considered.

Figure 3.1 Water Sensitive Receivers near the Cable Alignment (Extract from Figure 4.3a of the approved EIA)

Among the above, SWI3, CC11, CC26, CC27 and AO8 (not further considered as discussed above) were predicted to have detectable level of SS elevation, dissolved oxygen depletion and sedimentation deposition according to the sediment dispersion modelling exercise conducted under the EIA. Note that given the change in cable landing location from West of Junk Bay to Tseung Kwan O Area 137 as shown in **Figure 3.2** below, there will be an increase in distance (at least 1700 m) from the sensitive receivers identified at the western end of the original alignment, including CC26, CC27 and SWI3. For CC11, its distance from the updated power transmission cable alignment is over 60 m longer for the updated alignment than that of the assessed alignment in the approved EIA.

Also, for both of Options 1 and 2 as well as the Proposed Alternative Southern Alignment of the proposed cable route, the initial section from the land point would be started with horizontal directional drilling (HDD), which is expected to have very limited disturbance on sediment. As shown in **Figure 3.2**, the distance from the coral CC11 to corridor of the original cable alignment is about 132 m. Under Option 1, the distance from coral CC11 to the exiting points of HDD in the sea (where sediment disturbance of HDD and subsequently diver hand jetting) is about 301 m. The distance from the corridor of machine jetting section under Option 2 to coral CC11 is around 600 m. This means all marine works would be significantly further away from CC11, and marine works closest to CC11 (HDD and diver hand jetting) would have minimal impact. As shown in Figures 4.7 and 4.9 of the approved EIA, the predicted SS elevation at CC11 is highly transient, where elevation that exceeds the assessment criterion for only a few hours for one day in wet season. Given the adoption of HDD and diver hand jetting at section close to CC11, it is expected that the level of SS elevation at CC11 would be minimal, and any elevation would be very transient in nature. Other cable installation projects in southeastern Hong Kong waters [(1)(2)(3)] also indicated the distance of transport for suspended sediments from cable installation works would be localized and sediment would typically settle onto the seabed in a few minutes (in all of the referenced past direct-to-permit submission the estimate settling time was 200 second and travel distance of disturbed sediment was up to 180 m [(4)]). Given the similar nature of works (i.e. cable laying using jetting machine) as well as similar location (i.e. south eastern water), the referred past direct-to-permit submissions are deemed suitable surrogates for assessing the potential sediment impact due to the proposed change for this Project. **Table 3.1** shows the distances from the three nearest WSRs to the cable route as well as to the cable corridor under various alignments. As shown, the distances from these nearest WSRs are generally longer under the proposed alternatives for Option 1, 2 or the Proposed Alternative Southern Alignment than that of the alignment under FEP-01/341/2009/A, and the distances from all the proposed alternative alignments all exceed the typical 180 m travel distances from referred nearby assessment. The associated elevation in sedimentation flux and depletion of dissolved oxygen are therefore considered to be minimal as well.

(1) ERM (2020). Project Profile for H2H Express Submarine Cable (DIR-273/2020).
(2) ERM (2018). Project Profile for HKA Submarine Cable – Chung Hom Kok (DIR-265/2018).
(3) ERM (2013). Project Profile for Asia Pacific Gateway (APG) – Tseung Kwan O (DIR-233/2013).
(4) Also note that the assumed current velocity of 0.9 m/s in these quoted direct-to-permit submissions under EIAO is highly conservative. According to the Hong Kong Tidal Stream Prediction System website operated by the Marine Department (https://current.hydro.gov.hk/en/map.html), the current velocity at around the project site is typically below 1 knot (0.514 m/s), even under spring tide condition.

Legend

- Proposed Updated Landing Point
- Proposed Updated Cable Route - Option 1
- Proposed Updated Cable Route - Option 2
- Proposed Updated 200m Cable Corridor
- Proposed Alternative Southern Alignment Option
- 200m Cable Corridor of Proposed Alternative Southern Alignment Option
- Coral Recipient Site from Construction of Lei Yue Mun Public Landing Facility

Construction Method

- HDD Section
- Hand Jetting Section
- Machine Jetting Section

Water Sensitive Receivers

- Coral Community
- Fish Culture Zone
- Location of Amphioxus Occurrence
- Seawater Intake
- Seawater Intake of the TKO Desalination Plant

Layout from the Current FEP-01/341/2009/A

- Proposed Cable Route
- 200m Cable Corridor

Note:
1) All the proposed updated cable routes (option 1 & option 2) and the proposed alternative southern alignment option are connecting from the same landing points to the off-shore substation. Some parts of the alignment option are overlapped.

2) The section after HDD will be carried out by hand/machine jetting. The extent of hand/machine jetting can only be determined during detailed design stage. Nevertheless, the environment impacts due to hand/machine jetting are actually similar and have been assessed accordingly.

CC27
CC26
SWI3
CC11
AO1
FCZ6
CC8
CC7
AO8
300m long Jetting Control Zone (Option 1) with Jetting Speed reduced to 75m/hr
清水灣半島 CLEAR WATER BAY PENINSULA
將軍澳 JUNK BAY (TSEUNG KWAN O)
調景嶺 TIU KENG LENG
小赤沙 SIU CHIK SHA
大赤沙 TAI CHIK SHA
佛堂洲 FAT TONG CHAU
佛堂澳 FAT TONG O
大廟灣 JOSS HOUSE BAY (TAI MIU WAN)
東龍洲 TUNG LUNG CHAU
藍塘海峽 TATHONG CHANNEL
小西灣 SIU SAI WAN
銀灣 NGAN WAN
鯉魚門 LEI YUE MUN
大浪灣 BIG WAVE BAY
石澳 SHEK O
N
Metres
0 800 1,600

Zoom-in
CC11
Distance: 132m
Distance: 123m
Distance: 232m
Distance: 301m
Distance: 598m
300m long Jetting Control Zone (Option 1) with Jetting Speed reduced to 75m/hr
N

Figure 3.2

Key Water Sensitive Receivers and the Original and Updated Cable Alignment

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Table 3.1 Summary of Distances from Identified Key WSRs to Various Alignments

WSR	Distance (m) from							
	Layout from the Current FEP-01/341/2009/A		Proposed Updated Cable Route - Option 1		Proposed Updated Cable Route - Option 2		Proposed Alternative Southern Alignment Option	
	Proposed Cable Route	200m Cable Corridor	Proposed Cable Route	200m Cable Corridor	Proposed Cable Route	200m Cable Corridor	Proposed Cable Route	200m Cable Corridor
CC11	232	132	301 (1)	295 (1)	598 (1)	598 (1)	301 (1)	295 (1)
CC7	424	324	505	480	505	480	505	480
CC8	344	244	422	397	422	397	422	397

Note: (1) Distances measured from the section from the farther end of the HDD section.

For the cable alignment to the east of Tung Lung Island, the proposed alternatives are in general farther away from the Ninepin Group where clusters of coral sensitive receivers are located. This means the potential impact from SS elevation, sedimentation flux and dissolved oxygen depletion at this group of coral WSRs at the Ninepin Group are not expected to be worse than that in the approved EIA. For the marine mammal WSRs identified in the approved EIA, review of latest AFCD marine mammal monitoring data indicated no Finless Porpoises were sighted along the proposed updated cable route during 2016-2020. Therefore, these marine mammal WSRs are not further considered for this Study.

It should be noted that there are also coral colonies translocated to near the project alignment under the Lei Yue Mun Waterfront Enhancement Project (also shown in **Figure 3.2**). As shown, the original cable corridor encroaches into the coral recipient site. While the updated cable corridor also overlapped with the coral recipient site, the overlapped section involves only HDD and would have no material impact on the coral recipient site. The distance from the coral recipient site to the diver hand jetting section of the updated cable alignment is over 120 m and that to machine jetting is around 390 m. This means the potential sediment elevation as well as the associated elevation in sedimentation flux and depletion of dissolved oxygen under the updated alignment would be less significant than under the original alignment. Disturbance to bottom sediment at the HDD exit points are expected to be minimal. Based on the revised cable alignment and cable landing site, the jetting speed control zone for 75 km/hr has been updated for Cable Landing Option 1. The 300m jetting speed control zone will be started from the HDD exit points. The jetting portion of Cable Landing Option 2 and Southern Alignment Option is located much farther away from the coral location CC11 and thus no jetting speed control zone is needed.

3.2 Benthic Ecology

As HDD will be adopted for the shore-end cable installation, direct impacts to intertidal and subtidal hard-bottomed habitats near the cable landing site at Fat Tong Chau is not anticipated. A desktop review has been conducted on the existing conditions of benthic ecological resources in the vicinity of the cable route under the proposed variation and a summary is provided in ***Table 3.2***.

Table 3.2 Summary of Desktop Review

Source	Key Findings
Coral Baseline Survey Report and Post-translocation Coral Survey Report for Lei Yue Mun Waterfront Enhancement Project	Low species number of common corals with low coral coverage (<5%) were recorded at Fat Tong Chau.

Source	Key Findings
(Environmental Permit No. EP-564/2018)	A total of 47 common octocoral colonies (*Echinomuricea* sp. and *Menella* sp.) were translocated from the dredging area of Lei Yue Mun Waterfront to Fat Tong Chau in May 2021.
EIA Report for Desalination Plant at Tseung Kwan O – Feasibility Study (Register No.: AEIAR-192/2015)	An individual of amphioxus was recorded near Tit Chan Chau but no gonad development was observed. Low species number of corals with low coral coverage (<5%) were recorded at Fat Tong Chau, Tit Chan Chau and north of Tung Lung Chau. The overall ecological value for the subtidal hard bottom and soft bottom habitats were assessed to be low to moderate.
Project Profile for TKO Connect Cable System (DIR-268/2019)	Results showed that very sparse colonies of locally common, widespread hard coral species are present in the vicinity of the Tseung Kwan O Industrial Estate and Fat Tong Chau, and their abundance and diversity were considered to be very low in the context of subtidal coral assemblages in Hong Kong. The benthic assemblages are typical of Hong Kong waters and similar to benthic assemblages in majority of other subtidal habitats in Hong Kong. Surveys carried out in both the summer and winter did not identify any species of conservation concern.
Project Profile for Hong Kong – Guam Submarine Cable Project (HK-G) (DIR-266/2019)	Results showed that very sparse colonies of locally common, widespread hard coral species are present in the vicinity of the Tseung Kwan O Industrial Estate and Fat Tong Chau, and their abundance and diversity were considered to be very low in the context of subtidal coral assemblages in Hong Kong. The benthic assemblages are typical of Hong Kong waters and similar to benthic assemblages in majority of other subtidal habitats in Hong Kong. Surveys carried out in both the summer and winter did not identify any species of conservation concern.
Project Profile for Ultra Express Link (DIR-255/2017)	Results showed that very sparse colonies of locally common, widespread hard coral species are present in the vicinity of the landing site at Tseung Kwan O Industrial Estate and Fat Tong Chau, and their abundance and diversity were considered to be very low in the context of subtidal coral assemblages in Hong Kong. The benthic assemblages are typical of Hong Kong waters and similar to benthic assemblages in majority of other subtidal habitats in Hong Kong. Surveys carried out in both the summer and winter did not identify any species of conservation concern.
Project Profile for Tseung Kwan O Express – Cable System (DIR-243/2015)	Results showed that very sparse colonies of locally common, widespread hard coral species are present in the vicinity of the Tseung Kwan O Industrial Estate and Fat Tong Chau, and their abundance and diversity were considered to be very low in the context of subtidal coral assemblages in Hong Kong. The benthic assemblages are typical of Hong Kong waters and similar to benthic assemblages in majority of other subtidal habitats in Hong Kong. Surveys carried out in both the summer and winter did not identify any species of conservation concern.
Project Profile for Asia Pacific Gateway (APG) – Tseung Kwan O (DIR-233/2013)	The subtidal hard bottom habitats at Fat Tong Chau and Tseung Kwan O Industrial Estate supported very sparse colonies of locally common, widespread hard coral species (<5% coverage) and their abundance and diversity were considered to be very low in the context of subtidal coral assemblages in HKSAR.

The desktop review showed that the benthic ecological resources around the proposed cable route remain similar to those assessed in the approved EIA Report of the Project. Therefore, the previous

ecological findings were sufficient for the purpose of this environmental review. No additional marine ecological surveys are considered necessary.

With the proposed variation, HDD will be adopted for the initial section of the shore-end cable installation work at Fat Tong Chau and the construction works for cable installation are not expected to affect any subtidal hard bottom habitats in the vicinity where coral communities are present. Direct impacts to coral communities due to the cable installation works are not anticipated. As the proposed submarine cable will land at Fat Tong Chau instead of the west of Junk Bay, the coral communities at west of Junk Bay, which are located more than 2 km away from the proposed cable corridor, is not expected to be adversely impacted by the construction of the cable. For the coral communities and the recently translocated coral colonies at Fat Tong Chau, the proposed construction works have been designed to minimize possible impact on the coral communities by selecting exit points of the HDDs far away from the coastline (> ~120 m from the nearest coral colonies). In addition, the jetting works near Fat Tong Chau will be conducted by hand jetting by divers and sediment dispersion from jetting is expected to be localized. Unacceptable impacts to these coral communities at Fat Tong Chau are not anticipated. Other coral communities outside Junk Bay (e.g. Cape Collinson, Tung Lung Chau) are generally located further away from the proposed cable route when compared to the original cable route presented in the approved EIA Report and the minimum separation distance between the cable and the coral communities are > 500 m. With reference to other cable installation projects in southeastern Hong Kong waters [5][6][7], the distance of transport for suspended sediments from cable installation works would be localized and these would settle onto the seabed in a few minutes. Unacceptable water quality impacts are not anticipated as discussed in ***Section 3.1***. Therefore, these coral communities will not be expected to experience unacceptable disturbance during cable installation works.

For subtidal soft bottom assemblages, benthic assemblages in the vicinity of the proposed cable route are generally typical of Hong Kong waters and similar to benthic assemblages in the majority of other subtidal habitats in Hong Kong.

It is understood that amphioxus was recorded at some locations of the proposed cable route from previous surveys [8][9][10] and it has been consistently reported that low density of amphioxus was present at Tit Cham Chau, south of Tung Lung Chau and south of Ninepins. With reference to the amphioxus studies conducted in Hong Kong, high abundance of amphioxus was recorded in Tai Long Wan and Pak Lap Wan and sediment analysis indicated that amphioxus was only confined to sediments containing a high percentage of sand, low organic content and low moisture content. Clear oceanic water combined with sand sediment with low organic content are the most important habitat requirements for amphioxus [11][12]. As such, the silty sediments of the seabed in the vicinity of the proposed cable route is not considered as important habitat for amphioxus. The cable installation works involving jetting along the entire alignment is scheduled to last for about 6-9 months.

It is expected that the soft bottom assemblages will recolonize relatively quickly given that the works programme is short and that the jetting activities will only disturb the seabed within the close vicinity of the alignment. Unacceptable impacts to amphioxus and other soft bottom assemblages during cable installation works are, therefore, not anticipated. Following the completion of cable installation works, it is expected that the benthic assemblages at the affected areas will recolonize.

With the implementation of the mitigation measures recommended in the approved EIA Report, unacceptable impacts to benthic ecology are not anticipated. In addition, water quality monitoring will be conducted during jetting works to ensure no adverse water quality impacts on the water sensitive receivers throughout the construction period. Coral monitoring will also be conducted during

(5) ERM (2020). Project Profile for H2H Express Submarine Cable (DIR-273/2020).
(6) ERM (2018). Project Profile for HKA Submarine Cable – Chung Hom Kok (DIR-265/2018).
(7) ERM (2013). Project Profile for Asia Pacific Gateway (APG) – Tseung Kwan O (DIR-233/2013).
(8) B&V (2015). EIA Report for Desalination Plant at Tseung Kwan O – Feasibility Study (Register No.: AEIAR-192/2015).
(9) BMT (2009). EIA Report for Hong Kong Offshore Wind Farm in Southeastern Waters (Register No.: AEIAR-140/2009).
(10) CityU (2007). Hong Kong Offshore Windfarm in SE Water. Provision of Services for Marine Benthic Infauna Study, Final Report. Department of Biology & Chemistry, City University of Hong Kong. April 2007.
(11) CityU (2007). Op cit.
(12) CHEN Y (2007). The ecology and biology of amphioxus in Hong Kong. PhD thesis. City University of Hong Kong.

construction of the Project to ensure no adverse impact would occur to coral communities at Tung Lung Chau South, South Ninepins and Victor Rock. Overall, as the proposed variations will not generate an adverse impact on benthic ecology that is worse than that assessed in the approved EIA Report, the ecological impact due to the proposed variations are considered acceptable.

3.3 Pelagic Ecology

A desktop review of recent marine mammal monitoring data conducted by AFCD [13] has been conducted. The waters around the proposed updated cable route were not the key occurrence habitats for both Indo-Pacific hump-backed dolphins and Finless Porpoises. While Finless Porpoises are generally sighted in eastern and southern Hong Kong waters, with reference to the data collected during 2016-20, no Finless Porpoises were sighted along the proposed updated cable route (***Figure 3.3***) and hence the marine waters along the proposed updated cable route is not considered as important habitats for Finless Porpoises. Based on this, no significant adverse impacts on marine mammals, as well as pelagic ecology, were anticipated during the cable installation works.

3.4 Fisheries

3.4.1 Capture Fishing Operations

A comprehensive Port Survey was conducted by Agriculture Fisheries and Conservation Department (AFCD) from 2016 to 2017[14] to collect updated information on fishing operations and fisheries production in Hong Kong waters. Based on the Port Survey data, there are generally low to moderate numbers of fishing vessels (>0-400 vessels) along the proposed updated cable route (**Figures 3.4a**). The major types of fishing vessels for the potential wind farm development zone are generally sampans among all types of fishing vessels (**Figures 3.4b** and **3.4c**).

3.4.2 Capture Fisheries Production/ Resources

Fisheries production ranges from >0–200 kg per hectare along the proposed updated cable route as shown from the Port Survey 2016/17 results (**Figure 3.5**). The top ten families/ groups of fish catch production recorded in the AFCD Port Survey 2016/17 throughout Hong Kong waters (in terms of weight), are presented in **Table 3.3**. In addition, fishermen survey data presented in the approved EIA showed that the fish composition of the common species included shrimp, crab, tongue sole, flathead, croaker, mackerel, pomfret, golden thread and hairtail.

An updated review of the fisheries resources data could be referred to the monitoring of local fisheries resources from 2010-2015 initiated by AFCD with the implementation of the trawl ban in 2012. Demersal fisheries surveys were conducted using stern and shrimp trawlers across four areas in Hong Kong waters and the results showed that there were signs of recovery of fisheries resources. In the southeastern waters relevant to this Assessment Area, it was reported that the abundance and biomass of seabreams (Sparidae), pomfrets (Stromateidae), threadfin breams (Nemipteridae) and crabs (Portunidae), the abundance of flathead (Platycephalidae) and the biomass of croaker (Sciaenidae) had increased [15].

Table 3.3 Top 10 Families/ Groups of Fish Catch in Hong Kong Waters (Source: AFCD Port Survey 2016/17)

Rank*	Family/ Group	Common Name of Fish Catch
1	Mugilidae	Mullet
2	Clupeidae	Sardine, Shad

(13) AFCD (2021) Monitoring of Marine Mammals in Hong Kong Waters (2020-2021). Prepared by Hong Kong Cetacean Research Project.
(14) Agriculture, Fisheries and Conservation Department (2018). Port Survey Report. *https://www.afcd.gov.hk/english/fisheries/fish_cap/fish_cap_latest/files/common/PS201617_ENG.pdf*
(15) South China Sea Fisheries Research Institute (2017) Report on Survey of Fisheries Resources in Hong Kong (2010-2015). Prepared for AFCD.

Rank*	Family/ Group	Common Name of Fish Catch
3	Carangidae	Scad, Jack
4	Sparidae	Seabream
5	Sciaenidae	Croaker
6	Mixed squid	Squid
7	Mixed crab	Crab
8	Siganidae	Rabbitfish
9	Mixed shrimp	Shrimp
10	Platycephalidae	Flathead

*Note: Ranking is based on the estimated weight of production of each family/group of fish catch.

3.4.3 Culture Fisheries

Based on the latest available information from AFCD, there are currently 920 licensed mariculture operators across 26 fish culture zones in Hong Kong, with these zones collectively occupying a total of sea area of ~209 hectares. Nine of the 26 fish culture zones are located in the vicinity of the proposed updated cable route, which is the same as presented in the approved EIA Report. The nearest fish culture zone is situated at north of Tung Lung Chau with > 1,140 m away from the proposed updated cable route.

3.4.4 Spawning and Nursery Areas

Based on the results of *AFCD Port Survey 2016/17*, fish fry collection was found to be negligible in all waters in Hong Kong [16]. In addition, based on the findings presented in the approved EIA Report, some sections of the proposed updated cable route between east of Tung Lung Chau and the Ninepins are located within the identified spawning grounds in eastern Hong Kong waters. Jetting will cause temporary localized disturbances (mainly displacement of fish) along the cable corridor. The cumulative extent of areas that may be disturbed comprise a very small percentage of spawning grounds in eastern waters as predicted in the approved EIA. It is not anticipated that there will be significant impacts to spawning grounds for this localised and transient operation. The most important nursery areas of commercial species in Hong Kong lie in Northeastern waters, within Port Shelter, south of Lamma Island and south of Lantau. The proposed updated cable route lie far from these identified nursery areas which will not be affected by the Project works. Therefore, the Project is unlikely to affect nursery areas.

3.4.5 Summary

Overall, from the latest AFCD Port Survey 2016/17 data, the areas along the proposed transmission cable are found to be of low to moderate level of fishing operations and fisheries production. The proposed updated cable route lie far from, and will not affect, identified nursery grounds of commercial species. While there are proposed changes in cable number and diameter as well as the duration of construction window from 6 months to one year, only work vessels will be used to support the cable installation and jetting works for about 6-9 months and only a small area in the close vicinity of the installation vessel will be impacted by the cable installation and jetting works at any one time, the impact to fisheries is expected to be similar to and no worse than that assessed in the approved EIA Report. Jetting of the cable route will cause temporary localized disturbances within an identified spawning ground in Eastern waters between East of Tung Lung Chau and the Ninepins, however the total area impacted by this transient operation is extremely small, and impacts will be negligible. Therefore, the findings and conclusions on the fisheries impacts presented in the approved EIA Report remain valid.

(16) Agriculture, Fisheries and Conservation Department (2018) *Op cit.*

Categories of SPSE Values
- 0.1-5.0
- 5.1-10.0
- 10.1-15.0
- 15.1-20.0
- >20

Categories of DPSE Values
- 0.1-20.0
- 20.1-40.0
- 40.1-60.0
- 60.1-80.0
- >80

Legend

- Proposed Updated Cable Route - Option 1
- Proposed Updated Cable Route - Option 2
- Proposed Alternative Southern Alignment Option
- Potential Wind Farm Development Zone
- Boundary of HKSAR

Note:
All the proposed updated cable routes (option 1 & option 2) and the proposed alternative southern alignment option are connecting from the same landing points to the off-shore substation. Some parts of the alignment option are overlapped.

N

Kilometers

0 5 10

Figure 3.3 Density of finless porpoises in southern and eastern waters of Hong Kong during wet season (June to November) using data collected during 2016-20 (SPSE = no. of on-effort porpoise sightings per 100 units of survey effort; DPSE = no. of porpoises per 100 units of survey effort) (Source: AFCD Monitoring of Marine Mammals in Hong Kong Waters (2020-21))

File: T:\GIS\CONTRACT\0559424\mxd\Cable_VEP_ERR\0559424_Proposed_Cable_Landing_Point_and_Finless_propoises_wet.mxd
Date: 15/6/2022

Environmental Resources Management

ERM

Legend

- Proposed Updated Cable Route - Option 1
- Proposed Updated Cable Route - Option 2
- Proposed Alternative Southern Alignment Option
- Potential Wind Farm Development Zone
- Boundary of HKSAR

Number of Vessels

- >0 - 50
- >50 - 100
- >100 - 200
- >200 - 400
- >400 - 600
- >600 - 800

Note:
1) All the proposed updated cable routes (option 1 & option 2) and the the proposed alternative southern alignment option are connecting from the same landing points to the off-shore substation. Some parts of the alignment option are overlapped.

N

Kilometers

0 5 10

Map from Lands Department

Figure 3.4a

Distribution of Fishing Operations (Overall) in HKSAR Waters
(Source: AFCD Port Survey 2016/17)

File: T:\GIS\CONTRACT\0559424\mxd\Cable_VEP_ERR\0559424_Proposed_Cable_Landing_Point_and_Fishing_Operations_Overall.mxd
Date: 20/5/2022

Environmental Resources Management

ERM

Legend

- Proposed Updated Cable Route - Option 1
- Proposed Updated Cable Route - Option 2
- Proposed Alternative Southern Alignment Option
- Potential Wind Farm Development Zone
- Boundary of HKSAR

Number of Vessels

- >0 - 50
- >50 - 100
- >100 - 200
- >200 - 400
- >400 - 600
- >600 - 800

Note:
1) All the proposed updated cable routes (option 1 & option 2) and the the proposed alternative southern alignment option are connecting from the same landing points to the off-shore substation. Some parts of the alignment option are overlapped.

N

Kilometers

0 5 10

Map from Lands Department

Figure 3.4b

Distribution of Fishing Operations (Sampan) in HKSAR Waters
(Source: AFCD Port Survey 2016/17)

File: T:\GIS\CONTRACT\0559424\mxd\Cable_VEP_ERR\0559424_Proposed_Cable_Landing_Point_and_Fishing_Operations_Sampan.mxd
Date: 20/5/2022

Environmental Resources Management

ERM

Legend

- Proposed Updated Cable Route - Option 1
- Proposed Updated Cable Route - Option 2
- Proposed Alternative Southern Alignment Option
- Potential Wind Farm Development Zone
- Boundary of HKSAR

Number of Vessels

- >0 - 50
- >50 - 100
- >100 - 200
- >200 - 400

Note:
1) All the proposed updated cable routes (option 1 & option 2) and the the proposed alternative southern alignment option are connecting from the same landing points to the off-shore substation. Some parts of the alignment option are overlapped.

N

Kilometers

0 5 10

Map from Lands Department

Figure 3.4c

Distribution of Fishing Operations (Other types of Fishing Vessel) in HKSAR Waters
(Source: AFCD Port Survey 2016/17)

File: T:\GIS\CONTRACT\0559424\mxd\Cable_VEP_ERR\0559424_Proposed_Cable_Landing_Point_and_Fishing_Operations_Other_Types.mxd
Date: 15/6/2022

Environmental Resources Management

ERM

Legend

- Proposed Updated Cable Route - Option 1
- Proposed Updated Cable Route - Option 2
- Proposed Alternative Southern Alignment Option
- Potential Wind Farm Development Zone
- Boundary of HKSAR

Production (kg/ha)

- >0 - 50
- >50 - 100
- >100 - 200
- >200 - 300
- >300 - 400
- >400 - 600

Note:
1) All the proposed updated cable routes (option 1 & option 2) and the the proposed alternative southern alignment option are connecting from the same landing points to the off-shore substation. Some parts of the alignment option are overlapped.

N

Kilometers

0 5 10

Map from Lands Department

Figure 3.5

Distribution of Fisheries Production (Overall) (Adult Fish) in HKSAR Waters
(Source: AFCD Port Survey 2016/17)

File: T:\GIS\CONTRACT\0559424\mxd\Cable_VEP_ERR\0559424_Proposed_Cable_Landing_Point_and_Fishing_Operations_Overall_adult_fishes.mxd
Date: 15/6/2022

Environmental Resources Management

ERM

3.5 Avifauna and Terrestrial Ecological Resources

The cable landing site is proposed to be changed from the west of Junk Bay (Tsueng Kwan O) to an open area at the north-western-most corner of the Tseung Kwan O Area 137 Fill Bank at the south of Fat Tong Chau. As the proposed shore-end cable installation method is HDD and there is no disturbance to vegetation at Fat Tong Chau, unacceptable impact to avifauna and other terrestrial ecological resources are not anticipated.

3.6 Cultural Heritage

Considering the alternative CLS at Fat Tong Chau, there is one declared monument, the Site of Chinese Customs Station, Fat Tau Chau, located at more than 440m from the Fat Tong Chau CLS (and more than 500m from the marine works). There are two Site of Archaeological Interest (SAI), namely Fat Tau Chau SAI and Fat Tau Chau House Ruin SAI, located in the vicinity of Fat Tong Chau. The locations of the identified declared monument and SAIs are shown in **Figure 3.6**. Fat Tau Chau SAI is located at more than 420m from the Fat Tong Chau CLS. Fat Tau Chau House Ruin SAI is located 69.5m closest distance from the Fat Tong Chau CLS and on top of the HDD section of the Option 2 alignment on plan and with 19.2m to 29.5m vertical distance from the HDD (see **Figure 3.6**). As mentioned in Section 2, all works of the HDD section will be underground, i.e. there is no above-ground work in the HDD section.

The Site of Chinese Customs Station and Fat Tau Chau SAI are located far away from the proposed works. No impact is anticipated. As a precautionary measure, the project proponent and his/her contractor are required to inform AMO immediately when any antiquities or supposed antiquities under the Antiquities and Monuments Ordinance (Cap. 53) are discovered during the course of excavation works.

The shore-end cable installation will adopt the HDD method (trenchless technique) to construct four separate landing ducts for the 4 sets of transmission power cable system of each up to 230kV at the Fat Tong Chau CLS. Other than the HDD works, construction and excavation works at the CLS include construction of the underground cable connection pit (with dimension approximately 25m(L) x 8m(W) x 2.6m(D) for a Transition Joint Box (TJB) and construction of cable trench (4.4m wide and less than 1.5m deep) to connect to the HDD. No piling works are required. Although Fat Tau Chau House Ruin SAI locates 69.5m from the Fat Tong Chau CLS on plan, it is located at a higher level and only minor construction work activities will be involved as discussed above, potential settlement and vibrations generation are expected to be negligible. Although the SAI is located on top of the HDD section of the Option 2 alignment on plan, it has a vertical distance between 19.2m and 29.5m from the HDD section which will all be underground at Fat Tong Chau with the exit points of the HDD set at least 150m away from the coastline and approximately 330m on plan from the western boundary of the CLS (see **Figure 3.6**). The HDD will tunnel through rock mass. Potential settlement and vibrations generation are expected to be negligible. As a precautionary measure, monitoring points (e.g. vibration and settlement) should be provided to ensure no adverse impacts to the SAI during the course of the HDD works. Monitoring proposal for the heritage site, including checkpoint locations, installation details, response actions for each of the Alert/ Alarm/ Action (3As) levels and frequency of monitoring should be submitted for the Antiquities and Monuments Office (AMO)'s agreement prior to the commencement of the HDD works. Recommended 3As levels for SAI are as below:

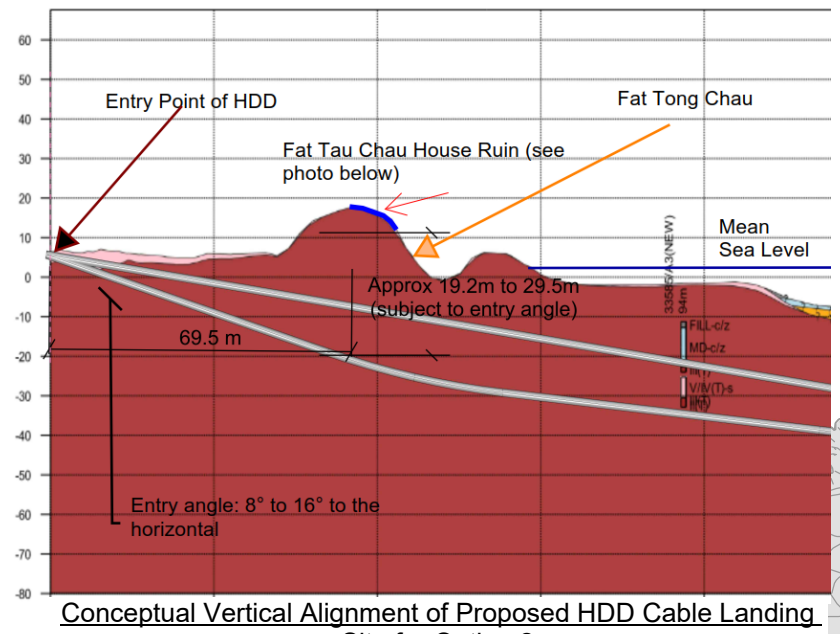
Table 3.4 Recommended Alert/Alarm/Action Levels for SAI

Type of Monitoring for	Alert	Alarm	Action
Vibration (PPV)	5mm/s	6mm/s	7.5mm/s
Settlement	6mm	8mm	10mm

(Note: Monitoring criteria would be subjected to review upon updates of grading status of heritage sites.)

Legend

- Proposed Updated Landing Point
- Proposed Updated Cable Route - Option 1
- Proposed Updated Cable Route - Option 2
- Updated 200m Cable Corridor
- Targets of Archaeological Potential
- Declared Monument
- Site of Archaeological Interest
- Layout from the Current FEP-01/341/2009/A
- Proposed Cable Route (FEP-01/341/2009/A)



Conceptual Vertical Alignment of Proposed HDD Cable Landing Site for Option 2

Note:
(1) The entry angle for the HDD cable is preliminary designed with range of 8°-16°. Conceptual vertical alignment of proposed HDD cable alignments with entry angle of 8° and 16°are presented. The final design of the HDD cable will not with entry angle less than 8°.

(2) The Fat Tau House Ruin was indicative only.

Photos of the Fat Tau Chau House Ruin (Source from Geographical Informatin System of Hong Kong Heritage)

Fat Tau Chau Site of Archaeological Interest

Site of Chinese Customs Station, Fat Tau Chau

佛堂洲 FAT TONG CHAU

佛堂澳 FAT TONG O

Fat Tau Chau House Ruin

69.5 m

A8 42m

N

Metres
0 150 300

Figure 3.6

Target with Archaeological Potential Identified along with the Proposed Cable Route in the Approved EIA Report

File: T:\GIS\CONTRACT\0559424\mxd\Cable_VEP_ERR\0559424_Cultural_Heritage.mxd
Date: 15/7/2022

Environmental Resources Management

In accordance with the marine archaeological impact assessment presented in the approved EIA Report, one target, A8, with archaeological potential was identified in the vicinity of the proposed updated cable route (see **Figure 3.6**). As it is located in active trawling zone, it was concluded in S9.8.1.7 of the approved EIA Report that no significant direct or indirect impacts were anticipated due to the installation of the proposed transmission cable jetting. The change in cable routing result in having the Target A8 locates ~42m from the boundary of the updated 200m cable corridor (see **Figure 3.6**). Due to the separation distance, potential impact is not anticipated. Therefore, the impact assessment and the EM&A recommendations presented in the approved EIA Report is still valid.

According to Condition 2.5 of the further environmental permit FEP-01/341/2009/A for the Project, further marine geophysical survey comprising seismic and magnetic surveys will be conducted before commencement of any marine construction works across the Study Area. Therefore, during detailed design stage of the Project, the further marine geophysical survey will be conducted according to the latest design. In case the proposed marine construction works are located outside the area not covered by previous side-scan sonar survey as shown in Figure 9.3 of the approved EIA report, the further geophysical survey will include additional side-scan sonar survey that was not previously covered and further marine archaeological investigation (MAI) is required to supplement the assessment of the new alignment that is not covered by the MAI of the original cable route.

3.7 Landscape and Visual Impact

The CLS was not identified as one of the potential sources of landscape and visual impacts associated with the construction and operation of the Project in accordance with the approved EIA Report.

As stated in **Section 2**, the shore-end cable installation will adopt the HDD method (trenchless technique) to construct four separate landing ducts for the up to 4 sets of transmission power cable system of each up to 230kV at the Fat Tong Chau CLS. The underground cable connection pit of dimension approximately 25m(L) x 8m(W) x2.6m(D) will be constructed at the CLS and the area of the pit and underground cabling will be fully reinstated after installation.

The proposed CLS is located within the zone of Other Specified Uses (OU) – Deep Waterfront Industry of Fat Tong Chau, as illustrated in **Figure 2.1**. It is an open area at the north-western corner of the Tsueng Kwan O Area 137 Fill Bank which is formed by fill material, without any vegetation cover. The cable ducts will be constructed by the HDD method. All above-ground works will be carried out at the CLS which is formed by fill material. Duct drilling works connecting the entry points at Fat Tong Chau and the exit points in the sea within the Green Belt zone of Fat Tong Chau will be all underground. As no natural terrestrial habitat or terrestrial habitat of conservation importance will be lost or affected and no change on visual amenity caused by the proposed CLS, it is expected that the significance of landscape and visual impacts during construction phase caused by the proposed alternative CLS would not be worse than that assessed in the approved EIA Report.

The area of the pit and underground cabling will be fully reinstated after installation. It is anticipated that the landscape and visual impacts brought by the proposed alternative CLS during the operational phase would not be worse than the conclusion in the approved EIA Report.

3.8 Waste & Materials Management

The key sources and types of waste potentially associated with the Project during construction and operational phases as the following:

- Construction and Demolition (C&D) materials associated with the installation of underground cable connection pit and conduit at CLS.
- Chemical waste from off-site fabrication of the turbine and maintenance activities.
- Sewage from the construction and maintenance workforce.
- General refuse associated with construction and maintenance activities, such as food waste and packaging materials.

The C&D materials generated under different cable route options are presented in **Table 3.5** below. The C&D materials may contain a mixture of inert and non-inert materials. The inert portion, such as soil, rock, concrete etc., namely inert C&D materials (or public fills), could be reused on-site as filling materials or off-site as public fill at public fill reception facilities. The non-inert portion, such as timber, paper etc., namely non-inert C&D materials (or C&D waste) should be reused or recycled as far as possible prior to landfill disposal, which should only be considered as the last resort for waste handling. The inert C&D materials will be reused on-site as far as possible and the non-inert C&D materials will be recycled as far as possible prior to off-site options. It is expected that all the C&D materials generated are associated with the installation of underground cable connection pit and conduit at cable landing site (i.e. excavation of rock/soil). Thus, all the C&D materials will be inert C&D materials. The reuse of inert C&D materials on-site has been maximized prior to reuse off-site as public fill at public fill reception facilities. Excavated soil generated from the Project will be reused on-site as far as practicable (e.g. as filling materials for backfilling of pit). As there is no possible use of the excavated rocks generated from the Project, the excavated rocks will need to be sent off-site to the public fill reception facilities (e.g. Tseung Kwan O Fill Bank) for subsequent reuse for other projects.

Besides, according to the latest design of cable installation as discussed in **Section 2.2** and **Table 2.1**, no sediment dredging or disposal would be required by the Project as dredging is no longer required. Also, as the installation of submarine cables in the sea portion will be carried out by hand jetting, removal and disposal of marine sediment would not be required.

Good management and control can prevent the generation of significant amount of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:

- Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance re-use or recycling of waste materials and their proper disposal;
- Encourage collection of aluminium cans and waste paper by individual collectors during construction with separate labelled bins provided to segregate these wastes from other general refuse by the workforce;
- Any unused chemicals, and those with remaining functional capacity, be recycled as far as possible;
- Use of reusable non-timber formwork to reduce the amount of C&D materials;
- Prior to disposal of C&D materials, wood, steel and other metals will be separated, to the extent practical for re-use and/or recycling to reduce the quantity of waste to be disposed in a landfill;
- Proper storage and site practices to reduce the potential for damage or contamination of construction materials; and
- Plan and stock construction materials carefully to reduce amount of waste generated and avoid unnecessary generation of waste.

The comparison of waste quantity between the scheme presented in the approved EIA Report and two proposed cable route options are shown in **Table 3.5** below.

Table 3.5 Comparison of Waste Quantity between Different Options

Waste Type	Approved EIA Report	Proposed Cable Route Option 1	Proposed Cable Route Option 2
Construction and Demolition (C&D) Materials	Not anticipated	About 2,350 m^3	About 3,600 m^3
Dredged Marine Sediment	135,000 m^3	0 (No dredging)	0 (No dredging)

Waste Type	Approved EIA Report	Proposed Cable Route Option 1	Proposed Cable Route Option 2
Chemical Waste	Small quantity	Small quantity	Small quantity
Sewage	Not more than 45m^3/day during peak construction; a smaller volume during maintenance.	No change is anticipated	No change is anticipated
General Refuse	About 290kg/day during peak construction; a smaller quantity during maintenance.	No change is anticipated	No change is anticipated

It was concluded in the approved EIA Report that no adverse waste impacts were associated with the Project construction or maintenance during operational phases. It is anticipated that no unacceptable adverse impact on waste management due to the proposed variations. Therefore, the potential impact will be no worse than that assessed in the approved EIA Report.

3.9 Land Contamination

Site appraisal, through desktop review, was conducted to identify if any potential land contamination issue due to historical and current land uses of the proposed CLS at Fat Tong Chau (FTC) and entry points of HDD.

A review of past land uses of the proposed CLS at FTC were conducted by reviewing the aerial photographs in the years of 1991, 1994, 1997, 2000, 2010 and 2020. The referenced aerial photographs were obtained from the Surveys and Mapping Office of the Lands Department, and are attached in **Appendix A**.

Based on the aerial photographs, the area of the proposed CLS was natural island and sea before year 1997. Reclamation of the area near the CLS was in progress to form part of TKO137 Fill Bank in year 1997. No significant change was observed in the area afterwards. Currently, the area remains as natural open area and very small part of the north-western corner of the TKO137 Fill Bank. Site visit photos are attached in **Appendix B**. It was observed that the CLS at FTC and entry points of HDD is mainly located at natural island.

Review of the current and historical land uses, and site visit photos reveal that no potential land contaminating activities were identified, thus no unacceptable adverse environmental impact in respect of land contamination is anticipated within the proposed CLS at FTC and entry points of HDD.

3.10 Maintenance and Repair

It is considered unlikely that the transmission cable will require maintenance during operation. However, should a cable fault arise that necessitates this, a repair operation will be required. Methods used for cable maintenance and repair at any location along the transmission cable route are anticipated to be as per those used for cable installation during construction, with the potential to use smaller equipment such as Remotely Operated Vehicles (ROVs) equipped with injector tool.

Repair works will be conducted (and repaired cable laid back) along the same proposed alignment as installed cable but duration of any cable repair work is anticipated to be of shorter duration than cable installation during construction, since repair work will generally be conducted at point fault location(s) rather than along the whole cable alignment.

ROVs generally have reduced jetting power compared to installation injector tools (typical injector tools jet around eight times (x8) more litres of water per minute than typical ROVs) and diver hand jetting is even less powerful (ROVs jet around four times (x4) more litres of water per minute than typical diver jetting). Grapnels on the other hand do not use jetting but simply penetrate the sea bed

and are therefore not expected to cause significant sediment plumes. The recovery of any faulty cable using diver, ROV or grapnels could be expected to cause a significantly smaller sediment plume than one generated during installation.

Potential impacts are anticipated to be less during cable maintenance and repair works than those for cable installation during construction. Since cable installation during construction is not considered to cause adverse environmental impacts, therefore no adverse environmental impacts are considered likely should maintenance and repair be required.

4. REVIEW OF ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS

The review of the potential environmental impacts associated with the proposed changes indicated that no unacceptable environmental impacts would be anticipated. Monitoring for water quality should be carried out to ensure no water quality impact to nearby WSRs from the Project in accordance with the Environmental Monitoring and Audit (EM&A) requirements from the approved EIA Report.

Review of potential change in water quality impact due to construction works under *Section 3.4* indicated that notable change in water quality impact is not anticipated due to the updates in the project design and working rate. Therefore, the proposed water quality monitoring requirements (i.e. baseline monitoring and construction phase monitoring) stipulated in the EM&A Manual are still deemed applicable and sufficient, except the water quality monitoring stations of M1 to M3 are omitted as the cable route will not go inside Junk Bay.

Other EM&A measures and requirements listed in the approved EIA Report would be carried out accordingly.

5. REVIEW OF POTENTIAL MATERIAL CHANGE

In accordance with Schedule 1 of the EIAO:

*"**material change**" means a physical addition or alteration to a designated project which results in an adverse environmental impact as defined in the technical memorandum;*

And Section 6.2 of the EIAO-TM:

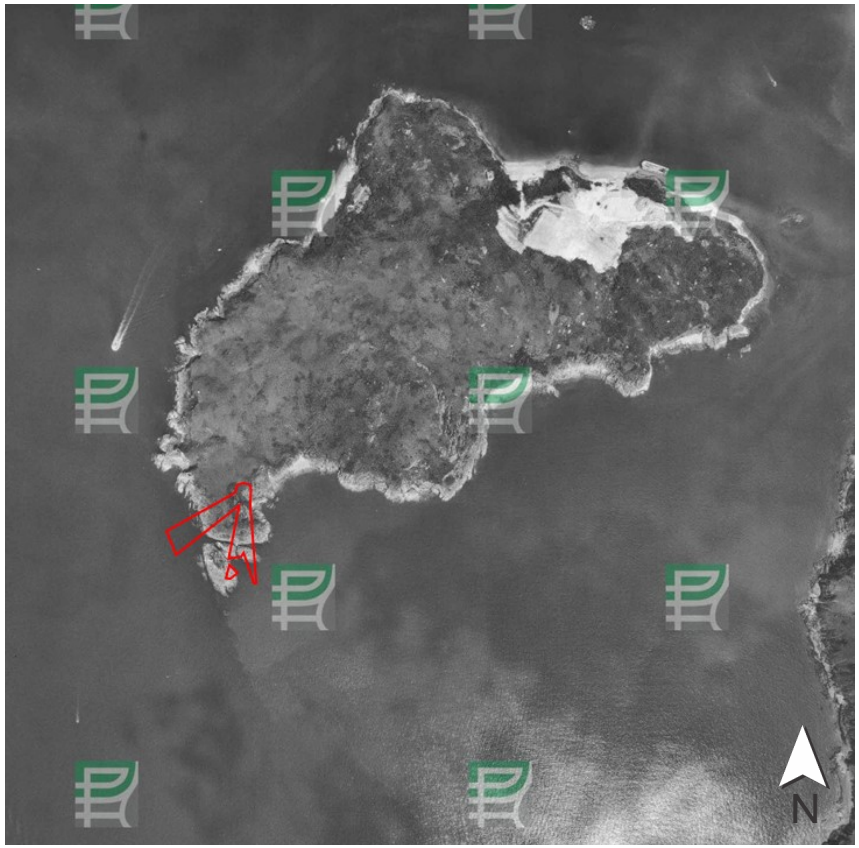
The environmental impact of a designated project, for which an environmental permit has been issued, is considered to be materially changed if the environmental performance requirements set out in the EIA report for this project may be exceeded or violated, even with the mitigation measures in place.

The potential environmental impacts, including water quality, benthic ecology, pelagic ecology, fisheries, avifauna, cultural heritage, landscape & visual, waste and materials management, and land contamination, associated with the proposed changes in the cable landing point and cable alignment have been assessed with results presented in *Section 3* of this *ERR*. It is demonstrated that the potential environmental impacts are not considered to be materially changed. The environmental performance requirements set out in the approved EIA Report for this Project are not exceeded or violated, with the implementation of the mitigation measures proposed. The potential environmental impacts comply with the requirements and criteria stipulated in EIAO-TM.

6. CONCLUSION

A review against the approved EIA Report has been conducted for the proposed variations and the findings show that there are not predicted to be any adverse environmental impacts as a result of the variations. Changes under the circumstances specified in Schedule 1 of the EIAO and Section 6.2 of the EIAO-TM regarding material changes to a designated project have been evaluated and it is confirmed that the proposed variations will not constitute a material change to the Project.

APPENDIX A REFERENCED AERIAL PHOTOGRAPHS



Year 1991:
The cable landing site was comprised of island and sea.

Year 1994:
No significant change was observed at the cable landing site. Reclamation of TKO137 Fill Bank was in progress.

Approximate location of the Cable Landing Site at Fat Tong Chau

Source - GEO INFO, Lands Department, HKSARG

PROJECT:
Hong Kong Offshore Wind Farm in Southeastern Waters – Environmental Review Report for Proposed Cable Route

ERM-Hong Kong, Limited
2509, 25/F, One Harbourfront,
Tak Fung Street,
Hung Hom, Kowloon
Tel: (852) 2271 3000
Fax: (852) 2723 5660

TITLE: Appendix A
Referenced Aerial Photographs

DATE:	CHECKED:	PROJECT: 0559424
DRAWN:	APPROVED:	SCALE:
DRAWING:		SIZE: A4 / REV: 0

Year 1996:
No significant change was observed at the cable landing site. Reclamation of TKO137 Fill Bank was in progress.

Year 1997:
The cable landing site was mainly comprised of island and sea. Reclamation of area near the cable landing site was in progress.

Approximate location of the Cable Landing Site at Fat Tong Chau

Source - GEO INFO, Lands Department, HKSARG

PROJECT:
Hong Kong Offshore Wind Farm in Southeastern Waters – Environmental Review Report for Proposed Cable Route

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TITLE: Appendix A
Referenced Aerial Photographs

DATE:	CHECKED:	PROJECT: 0559424	
DRAWN:	APPROVED:	SCALE:	
DRAWING:		SIZE: A4	REV: 0

Year 1997:
No significant change was observed at the cable landing site. Reclamation of TKO137 Fill Bank was in progress.

Year 2000:
No significant change was observed at the cable landing site.

Approximate location of the Cable Landing Site at Fat Tong Chau

Source - GEO INFO, Lands Department, HKSARG

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TITLE: Appendix A
Referenced Aerial Photographs

DATE:	CHECKED:	PROJECT: 0559424
DRAWN:	APPROVED:	SCALE:
DRAWING:		SIZE: A4 / REV: 0

Year 2007:
No significant change was observed at the cable landing site.

Year 2010:
No significant change was observed at the cable landing site.

Approximate location of the Cable Landing Site at Fat Tong Chau

Source - GEO INFO, Lands Department, HKSARG

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Referenced Aerial Photographs

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Year 2020:
No significant change was observed at the cable landing site.

Approximate location of the Cable Landing Site at Fat Tong Chau

Source - GEO INFO, Lands Department, HKSARG

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Referenced Aerial Photographs

DATE:	CHECKED:	PROJECT: 0559424
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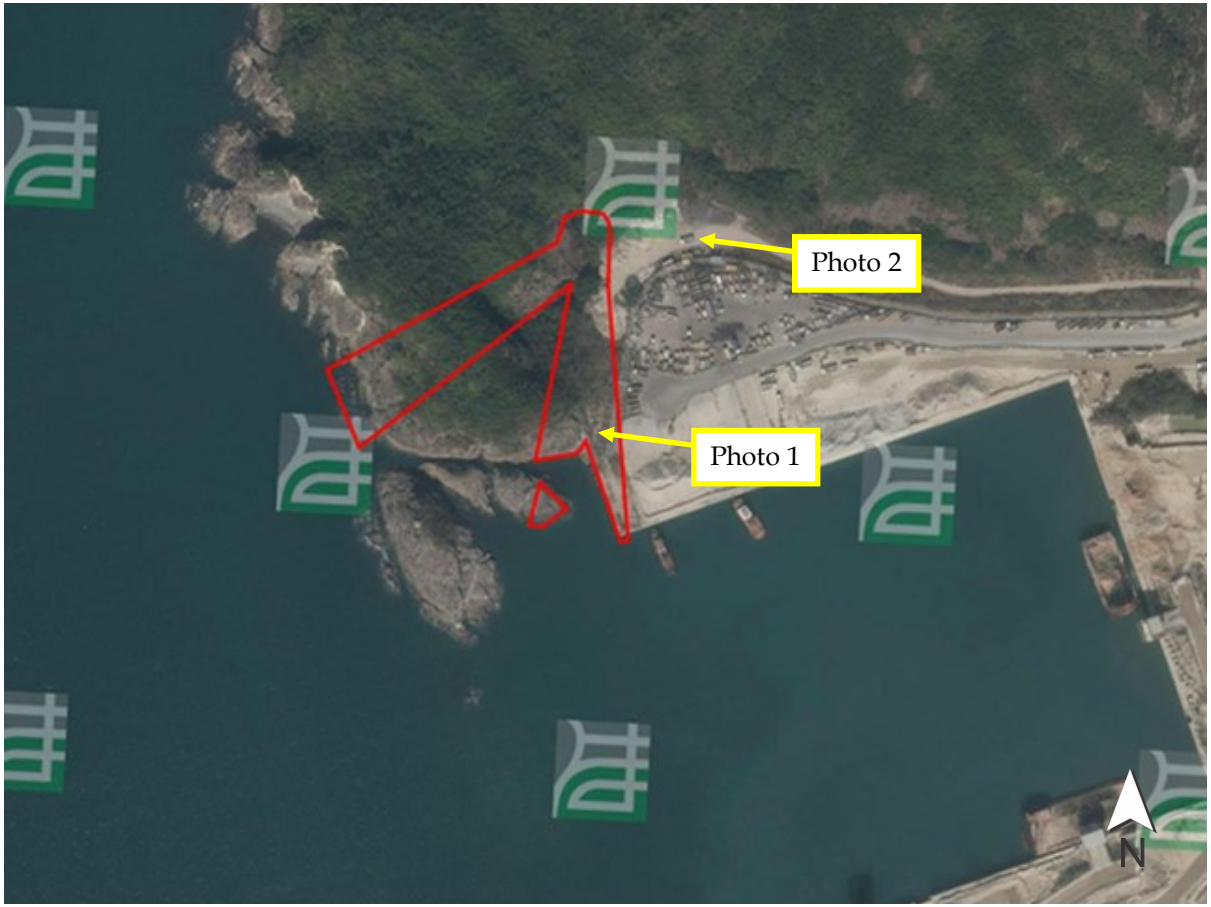
APPENDIX B SITE VISIT PHOTOS



Aerial photo showing the location of site visit photos taken.

Approximate location of the Cable Landing Site at Fat Tong Chau

Source - GEO INFO, Lands Department, HKSARG

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TITLE: Appendix B
Site Visit Photos

DATE:	CHECKED:	PROJECT: 0559424
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DRAWING:		SIZE: A4 / REV: 0

Photo 1: Location of Cable Landing Site (CLS) at Fat Tong Chau. The CLS is located at island.

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Photo 2: Photo of TKO137 Area (not falling within the CLS)

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