

## HKA Submarine Cable – Chung Hom Kok

5th Weekly Impact Water Quality  
Monitoring Report (Zone A)

29 September 2021

Project No.: 0585919

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## Signature Page

29 September 2021

# HKA Submarine Cable – Chung Hom Kok

5th Weekly Impact Water Quality Monitoring Report (Zone A)



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Terence Fong  
Partner

ERM-Hong Kong, Limited  
2509, 25/F One Harbourfront,  
18 Tak Fung Street,  
Hung Hom, Kowloon  
Hong Kong

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**Environmental Permit No. EP- 567/2019**  
**HKA Submarine Cable – Chung Hom Kok**

Environmental Team Leader Certification & Independent Environmental Checker  
Verification

**Reference Document/Plan**

Document/Plan:	5 <sup>th</sup> Weekly Water Quality Monitoring Report
Date of Report:	29 September 2021
Certified by ET:	ERM-Hong Kong Ltd
Verified by IEC:	Ecosystems Ltd.

**Reference EP Requirement**

EP Condition:	Conditions No. 3.2 – 3.3
Content:	<i>Water Quality Monitoring</i>
3.2 Samples, measurements and necessary remedial actions shall be taken in accordance with the EM&A requirements described in the Project Profile (Register No.: PP-573/2018) by:	
(a) conducting baseline environmental monitoring;	
(b) conducting impact monitoring;	
(c) conducting post project monitoring; and	
(d) carrying out remedial actions in accordance to the EM&A requirements as described in the Project Profile (Register No.: PP-573/2018), or as agreed by the Director, in case where specified criteria in the EM&A requirements are exceeded.	
3.3 Submit to the Director three hard copies and one electronic copy of the following, as defined in the EM&A requirements described in the Project Profile (Register No.: PP-573/2018):	
(a) Baseline Monitoring Report on water quality no later than 2 week before the commencement of cable installation/ repair operation works;	
(b) Weekly EM&A Report no later than 5 days after the relevant monitoring data are collected or become available during the cable installation/ repair operation works; and	
(c) Post Project Monitoring Report within one month after completion of the marine works.	

**ETL Certification**

I hereby certify that the above referenced document/plan complies with the above referenced condition of EP-567/2019.

Mandy To, Environmental Team  
Leader

Date: 29 September 2021



**IEC Verification**

I hereby verify that the above referenced document/plan complies with the above referenced condition of EP-567/2019.

A handwritten signature in black ink, appearing to read 'Vincent Lai', written over a light blue grid background.

Dr Vincent Lai, Independent  
Environmental Checker

Date: 29/9/2021

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## EXECUTIVE SUMMARY

The cable installation works for the **HKA Submarine Cable – Chung Hom Kok** (the ‘Project’) have been scheduled as follows:

- **Land & Shore-End Cable Installation and Submarine Cable Installation up to Zone A** – completed on 31 May 2021; and
- **Marine Installation of Submarine Cable** – From 10 to 31 May 2021, and have returned on 7 September 2021 to complete the remaining marine installation works, in accordance to *Condition 2.5(a)* of the Environmental Permit (EP-567/2019), stating, “no marine works shall be carried out within the area of Stanley Bay from 1 June to 31 August inclusive”.

The Project commenced nearshore marine diver jetting works for post-lay inspection burial (PLIB) on 7 September 2021; offshore marine installation works for PLIB to follow immediately. The land works at Sha Shek Tan (SST), Chung Hom Kok (CHK) were completed on 31 May 2021.

This is the 5<sup>th</sup> *Weekly Impact Water Quality Monitoring Report*, presenting the water quality impact monitoring conducted during the period between 14 and 20 September 2021 in Zone A, in accordance with the EM&A Manual.

### *Summary of Construction Works undertaken during the Reporting Period*

During the reporting week, marine installation works for PLIB in Zone A were carried out between 14 and 20 September 2021 inclusive.

### *Water Quality*

Monitoring events were conducted for the installation period between 14 and 20 September 2021 in Zone A. Monitoring was carried out for three (3) days over the six (6) work days, at mid-flood and mid-ebb tides, at three (3) depths (surface, middle and bottom). The intervals between two (2) sets of monitoring were not less than 36 hours. For this relatively short work period in Zone A, two (2) monitoring events at the four (4) designated monitoring stations in Zone A (including two [2] Sensitive Receiver Station, one [1] Gradient Station and one [1] Control Station) were performed on schedule, i.e. on 14, 16 and 18 September 2021.

### *Environmental Non-conformance*

No non-conformance was recorded; results of detailed investigations indicated none of the exceedances recorded were attributed to the Project construction works:

- Three (3) Notification of Exceedances (NOEs) with detailed investigation reports were issued to EPD during the reporting period for recording daily exceedances of Action and Limit Levels for dissolved oxygen, both bottom layer as well as surface and middle. Also, there were exceedances of turbidity and suspended solids.
- The Contractors have been requested by the Environmental Team (ET) to be aware in case of any exceedances, and take care to ensure all necessary procedures are followed to avoid the Project impacting the water environment.

### *Future Key Issues*

There are no key issues identified.

Marine installation works for PLIB in Zone A will be ongoing, according to *Condition 2.5(a)* of the EP, stating, “no marine works shall be carried out within the area of Stanley Bay from 1 June to 31 August inclusive”.

## 1. INTRODUCTION

### 1.1 Background

The proposed submarine cable is a section of the 'Hong Kong-America (HKA)' submarine cable network (hereafter known as 'HKA' and / or the Project), which will span more than 13,000 kilometers in total. The system will further boost the external telecommunications capacity of Hong Kong, reinforcing Hong Kong as a key communication hub in the Asia-Pacific region.

The cable will connect to Chung Hom Kok (CHK) within the HKSAR. **China Telecom Global Limited (CTG)** is providing the cable landing point and the associated cable landing services in Hong Kong.

The route of the proposed HKA submarine cable system within Hong Kong SAR is depicted in **Figure 1.1**. The proposed cable would land at an existing Beach Manhole (BMH) location at Sha Shek Tan (SST), CHK, and connect to an existing Cable Landing Station (CLS).

It should be noted that CHK is currently the landing site for a number of submarine cables (i.e. New T&T domestic cable route, C2C Cable network; and SJC). The existing BMH is connected to the CLS on the hill above the landing beach and existing conduits connect the BMH and CLS.

The cable will travel from SST of CHK southward, exiting Stanley Bay, turning east near the Stanley Peninsular and past Cape d'Aguilar, continuing eastward, north of Beaufort and Sung Kong Islands, to the eastern boundary of HKSAR waters, where it will enter the South China Sea.

The Project Profile (PP- 573/2018) which includes an assessment of the potential environmental impacts associated with the installation of the submarine telecommunications cable system within HKSAR (including connection to land at CHK) was prepared and submitted to the Environmental Protection Department (EPD) under section 5(1)(b) and 5(11) of the *Environmental Impact Assessment Ordinance* (EIAO) for the application for Permission to apply directly for Environmental Permit (EP). On 2 January 2019, EPD issued a letter to CTG permitting direct application for an environmental permit and following an application, EPD subsequently issued an Environmental Permit (EP-567/2019) on 20 February 2019.

Pursuant to *Condition 3.1* of the EP, an Environmental Monitoring and Audit (EM&A) programme, as set out in the Project Profile (PP) is required for this Project, with baseline water quality monitoring data collected prior to the start of cable installation works, and Action and Limit Levels derived from these data.

The HKA cable installation is scheduled to be carried out in one (1) continuous phase. The specific Zones for cable installation works for Zone A and Zone B are shown in **Figure 1.2** to **Figure 1.4**, and the current schedule and works carried out to date for each Phase is as follows:

- 1) **Land & Shore-End Cable Installation and Submarine Cable Installation up to Zone A:**  
Land trenching and nearshore marine diver jetting works up to Zone A (i.e. HK Grid coordinate 839544.426E 806852.911N, at 2.088 km from the landing point in SST, CHK) – tentatively scheduled week commencing; and
- 2) **Marine Installation of Submarine Cable:** Installation of the HKA submarine cable from Zone A to HKSAR marine eastern boundary, using injector burial tools/ sledge tools for simultaneous lay and burial operations, and potential diver jetting in specific areas (e.g. HK Electric Pipeline crossing).
  - a. Baseline data for Zone A and Zone B was collected prior to the start of marine installation works (i.e. between 12 March and 6 April 2021) and Action and Limit Levels derived from these data, as presented in the final *Baseline Water Quality Monitoring Report*.



- b. Nearshore marine diver jetting works in Zone A commenced on 10 May 2021, and was partially completed on the same day, as presented in the *1<sup>st</sup> Weekly Impact Water Quality Monitoring Report (Zone A)*.
- c. Remaining marine installation works from end of Zone A to the HKSAR marine eastern boundary using jetting technique commenced on 13 May 2021, and was completed on 19 May 2021, as presented in the *2<sup>nd</sup> Weekly Impact Water Quality Monitoring Report (Zone B)*.
- d. Land trenching and some marine works in Zone A was completed on 31 May 2021. Following issue of Marine Department Notice on 29 January 2021.
- e. Marine installation works for PLIB have re-commenced on 7 September 2021, according to *Condition 2.5(a)* of the EP, stating, “no marine works shall be carried out within the area of Stanley Bay from 1 June to 31 August inclusive”.

This report covers the data collected from monitoring stations as shown in **Figure 1.3**, and refers to the *Baseline Water Quality Monitoring Report* for Action and Limit Levels.

## 1.2 Purpose of this Report

This is the 5<sup>th</sup> Weekly Water Quality Impact Monitoring Report for monitoring works in Zone A, summarising the water quality impact monitoring results during the reporting period from 14 and 20 September 2021.

Under the requirement of *Condition 3.3(b)* of the EP, weekly impact monitoring reports on water quality shall be prepared and submitted to the EPD no later than five (5) days after the relevant monitoring data are collected or become available during the cable installation works.

## 1.3 Structure of this Report

The remainder of the report is structured as follows:

### **Section 1: Introduction**

Provide details of the background, purpose and structure of the report, and scope of the Project.

### **Section 2: Project Information**

Summarises the construction works undertaken and the status of Environmental Permits/Licenses during the reporting period.

### **Section 3: Water Quality Monitoring Requirements**

Summarises the monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations, Action and Limit Levels, and Event / Action Plans.

### **Section 4: Monitoring Results**

Summarises the monitoring results obtained in the reporting period.

### **Section 5: Environmental Non-conformance**

Summarises any monitoring exceedance, environmental complaints and environmental summons within the reporting period.

### **Section 6: Future Key Issues**

Summarises the monitoring schedule for the next week.

**Section 7: Conclusions**

Presents the key findings of the impact monitoring results.

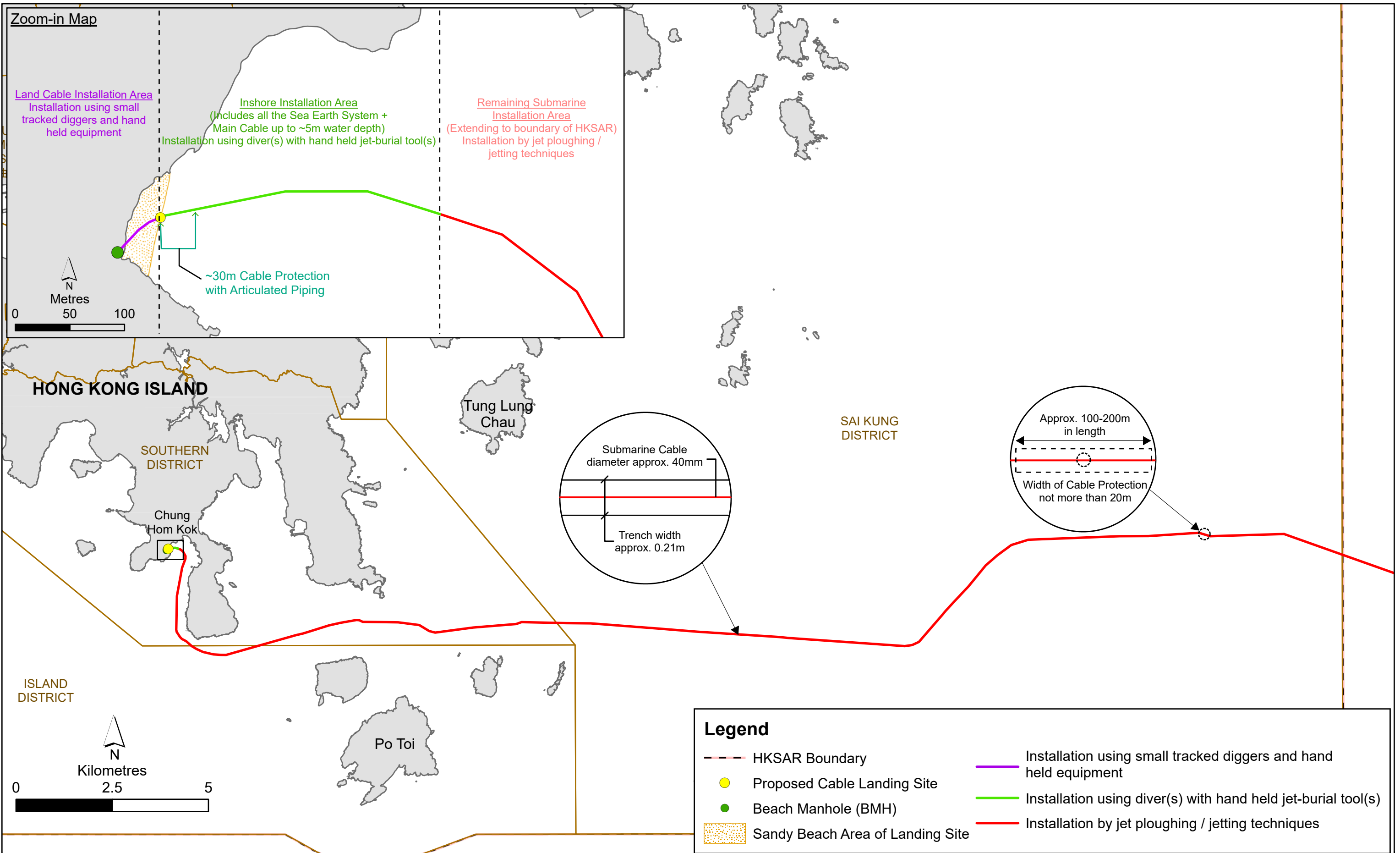


Figure 1.1

Proposed HKA Cable System

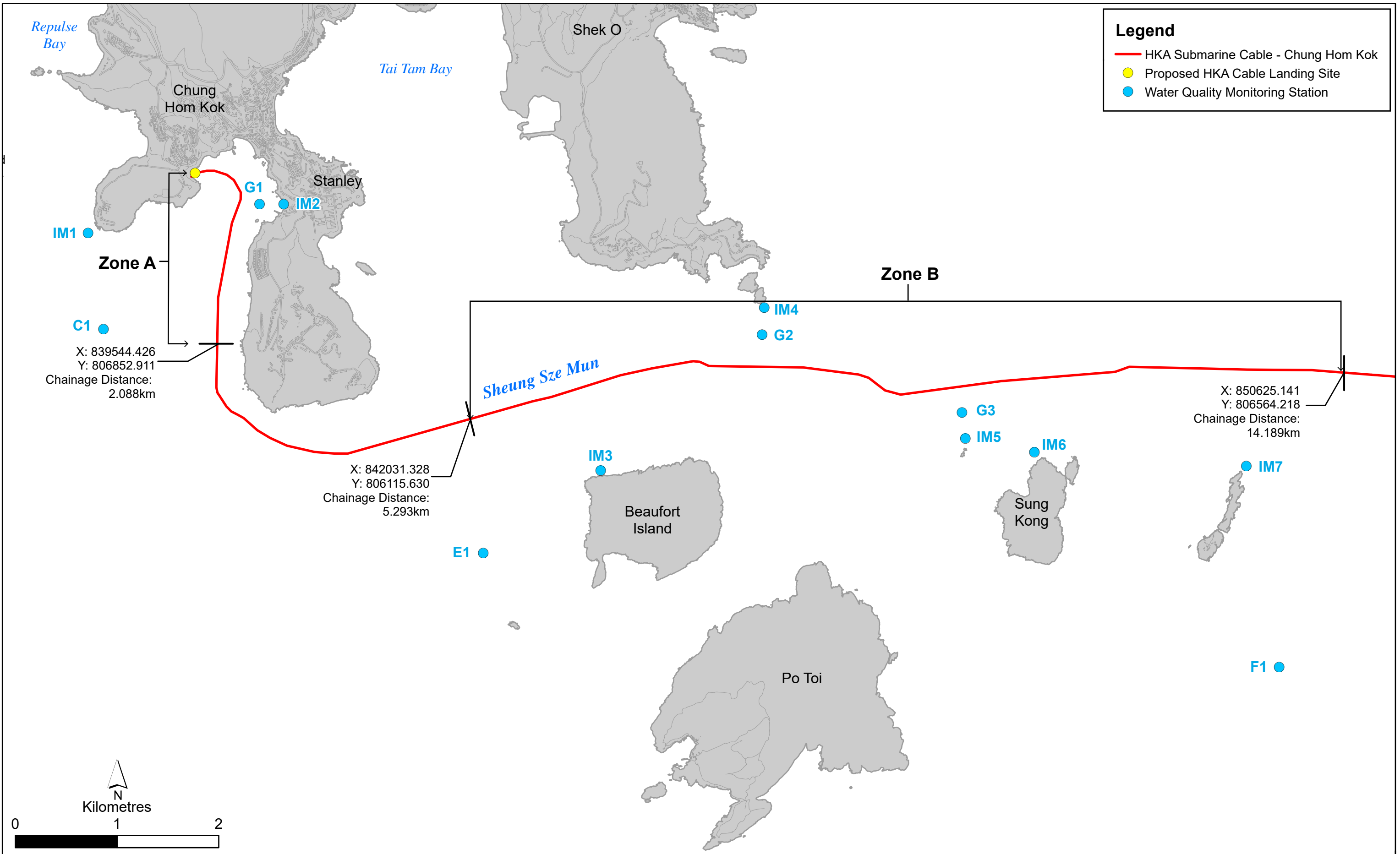


Figure 1.2

Water Quality Monitoring Stations

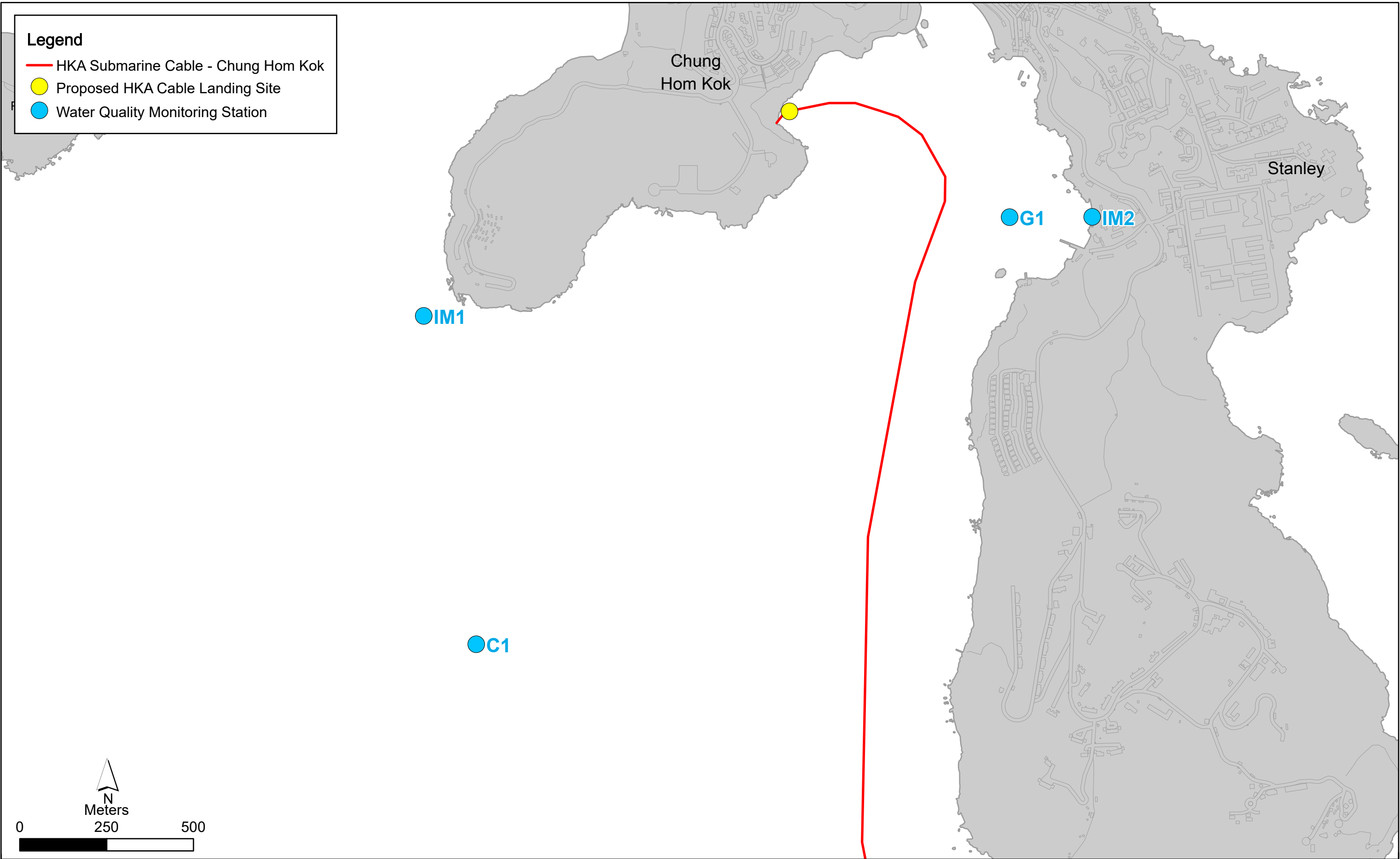


Figure 1.3

Water Quality Monitoring Stations - Zone A

**Legend**

- HKA Submarine Cable - Chung Hom Kok
- Water Quality Monitoring Station

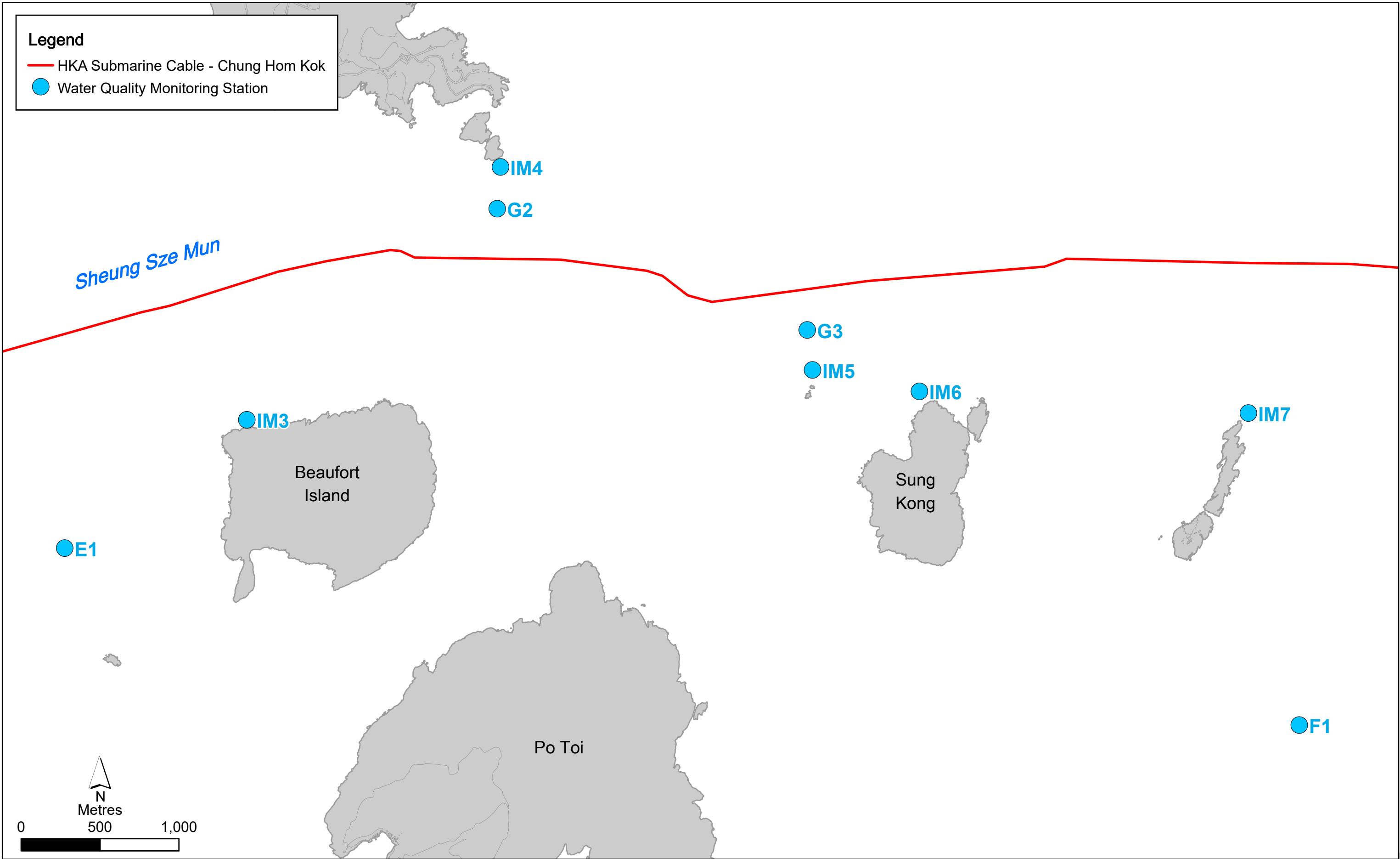


Figure 1.4

Water Quality Monitoring Stations - Zone B

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Date: 8/4/2021

Environmental  
Resources  
Management





## 2. PROJECT INFORMATION

### 2.1 Marine Construction Works Undertaken during Reporting Week

A summary of the key works undertaken during the reporting week is shown in **Table 2.1**:

**Table 2.1 Summary of Marine Works Undertaken During the Reporting Week**

Date	Works Area	Activity
Tue 14 September 2021	Zone A	Diver hand jetting works for marine installation in Zone A.
Wed 15 September 2021	Zone A	Diver hand jetting works for marine installation in Zone A.
Thu 16 September 2021	Zone A	Diver hand jetting works for marine installation in Zone A.
Fri 17 September 2021	Zone A	Diver hand jetting works for marine installation in Zone A.
Sat 18 September 2021	Zone A	Diver hand jetting works for marine installation in Zone A.
Sun 19 September 2021	Zone A	No works conducted.
Mon 20 September 2021	Zone A	Diver hand jetting works for marine installation in Zone A.

### 2.2 Status of Environmental Approval Documents

A summary of the relevant permits, licences, notifications and/or reports on environmental protection for this Project is presented in **Table 2.2**:

**Table 2.2 Summary of Environmental Licensing, Notification, Permit and Reporting Status**

Permit / Licence / Notification / Report	Reference	Validity Period	Remarks
Environmental Permit	(EP-567/2019) Available at <a href="https://www.epd.gov.hk/eia/register/permit/latest/ep5672019.htm">https://www.epd.gov.hk/eia/register/permit/latest/ep5672019.htm</a>	Throughout construction & operation period	Granted on 20 February 2019
EM&A Manual	(PP-573/2018) As part of the Project Profile; available at: <a href="https://www.epd.gov.hk/eia/register/profile/latest/dir265/dir265.pdf">https://www.epd.gov.hk/eia/register/profile/latest/dir265/dir265.pdf</a>	Throughout construction & operation period	Approved by EPD on 2 January 2019
Marine Department Notice	(No. 28/2021) Available at: <a href="https://www.mardep.gov.hk/en/notices/pdf/mdn21028.pdf">https://www.mardep.gov.hk/en/notices/pdf/mdn21028.pdf</a>	Throughout construction & operation period	Issued by the Marine Department on 29 January 2021
<i>Baseline Water Quality Monitoring Report</i> and <i>Pre-Installation Coral Survey Report</i>	Currently unavailable online, at the time of this report	Throughout construction period & operation period	Approval by EPD still ongoing at the time of report writing

Permit / Licence / Notification / Report	Reference	Validity Period	Remarks
1 <sup>st</sup> Weekly Water Quality Monitoring Report (Zone A) and 2 <sup>nd</sup> Weekly Water Quality Monitoring Report (Zone B)	Available at: <a href="https://www.epd.gov.hk/eia/register/english/permit/ep5672019/documents/1wiwqmr/pdf/1wiwqmr.pdf">https://www.epd.gov.hk/eia/register/english/permit/ep5672019/documents/1wiwqmr/pdf/1wiwqmr.pdf</a> and <a href="https://www.epd.gov.hk/eia/register/english/permit/ep5672019/documents/2wiwqmr/pdf/2wiwqmr.pdf">https://www.epd.gov.hk/eia/register/english/permit/ep5672019/documents/2wiwqmr/pdf/2wiwqmr.pdf</a>	Throughout construction period & operation period	Approved by EPD as of 3 June 2021
3 <sup>rd</sup> Weekly Water Quality Monitoring Report (Zone A)	Available at: <a href="https://www.epd.gov.hk/eia/register/english/permit/ep5672019/documents/3wiwqmr/pdf/3wiwqmr.pdf">https://www.epd.gov.hk/eia/register/english/permit/ep5672019/documents/3wiwqmr/pdf/3wiwqmr.pdf</a>	Throughout construction period & operation period	Approved by EPD as of 18 June 2021
4 <sup>th</sup> Weekly Water Quality Monitoring Report (Zone A)	Currently unavailable online, at the time of this report	Throughout construction period & operation period	Approval by EPD still ongoing at the time of report writing

### 3. WATER QUALITY MONITORING

#### 3.1 Monitoring Location

In accordance with the *Appendix F* of approved PP, during the installation of the HKA Project in Zone A, water quality sampling was undertaken at stations situated around the cable laying works at CHK. The locations of the sampling stations are listed in **Table 3.1** and shown in **Figure 1.2** and **Figure 1.3**.

**Table 3.1 Water Quality Monitoring Stations**

Stations	Nature	Approx. Geodesic Distance <sup>(1)</sup> to Proposed Cable Alignment (m)	Easting	Northing
Zone A: The waters near Stanley Bay Covers the cable alignment between Chainage 0 and 2.088 km.				
IM1	Coral sites along the coast of Chung Hom Kok	1320	838275	807941
IM2	Saint Stephen's Beach	430	840199	808226
G1	Gradient Stations (Between Saint Stephen's Beach and cable alignment)	190	839961	808225
C1 <sup>(2)</sup>	Control Station for Zone A	1120	838426	806996

**Note:**

- (1) Geodesic distance refers to the shortest straight line distance between two locations, without regard on the physical obstacles in between.  
(2) These stations are also considered to fall within the spawning grounds of commercial fisheries resources.

#### 3.2 Sampling and Testing Methodology

The impact water quality monitoring was conducted in accordance with the requirements stated in the *Appendix F* of approved PP. These are presented below.

##### 3.2.1 Parameters Measured

The parameters measured *in situ* were:

- dissolved oxygen (DO) (% saturation and mgL<sup>-1</sup>)
- temperature (°C)
- turbidity (NTU)
- salinity (‰ or ppt)

The only parameter to be measured in the laboratory was:

- suspended solids (SS) (mgL<sup>-1</sup>)

In addition to the water quality parameters, other relevant data had also been measured and recorded in field logs, including the location of the sampling stations and cable vessel/ burial machine at the time of sampling, water depth, time, weather conditions, sea conditions, tidal state, current direction and speed, special phenomena and work activities undertaken around the monitoring and works area that may influence the monitoring results.

##### 3.2.2 Equipment

**Table 3.2** summaries the equipment used for the impact water quality monitoring.

**Table 3.2 Equipment used during Impact Water Quality Monitoring**

Equipment	Model
Global Positioning Device	Garmin etrex 20x
Water Depth Gauge	Sontek Riversurveyor
Water Sampling Equipment	Aquatic Research Instruments horizontal / vertical types 2.2L
Salinity, DO, Temperature Measuring Meter	YSI ProDSS (Multi-Parameter)
Current Velocity and Direction	Sontek Riversurveyor
Turbidity Meter	YSI ProDSS (Multi-Parameter)

### 3.2.3 Monitoring Frequency and Timing

Impact Monitoring at all monitoring stations within Zone A (i.e. IM1, IM2, G1, and C1) took place when the cable installation works were undertaken within Zone A only, as shown in **Figure 1.3**. The sampling works ceased when no cable installation works were conducted inside each particular Zone.

All construction works were undertaken during the designated working hours (i.e. 00:00 - 24:00; including Sundays and public holidays). A total of three (3) monitoring rounds were conducted during the 24-hour work period on each work-day from 00:00 - 24:00. The interval between two (2) sets of impact monitoring (i.e. including the collection of *In-situ* and SS data) during the cable installation works was no less than 36 hours and samples were taken twice during a 4 hour window of 2 hours before and 2 hours after a mid-flood and mid-ebb tidal state on each sampling occasion.

Reference was made to the predicted tides at Waglan Island, which is the tidal station nearest to the Project Site, published on the website of the Hong Kong Observatory <sup>(1)</sup>. Based on the predicted tidal levels at Waglan Island, the impact water quality monitoring was, and will be conducted between 7 and 25 September 2021, following the schedule presented in **Appendix A**.

### 3.2.4 Sampling / Testing Protocols

All *in situ* monitoring instruments were checked, calibrated and certified by a laboratory accredited under HOKLAS (Quality Pro Test-Consult Limited) before use (see calibration reports in **Appendix B**), and will subsequently be re-calibrated at-monthly intervals throughout all stages of the water quality monitoring. Responses of sensors and electrodes were checked with certified standard solutions before each use.

For the on-site calibration of field equipment, the *BS 1427: 1993, Guide to Field and On-Site Test Methods for the Analysis of Waters* were observed. Sufficient stocks of spare parts shall be maintained for replacements when necessary. Backup monitoring equipment were made available so that monitoring could proceed uninterrupted even when equipment is under maintenance, calibration etc.

Water samples for SS measurements were collected in high density polythene bottles, packed in ice (cooled to 4°C without being frozen), and delivered to a HOKLAS laboratory as soon as possible after collection.

At least two (2) replicate samples were collected from each of the monitoring events for *in situ* measurement and lab analysis.

### 3.2.5 Laboratory Analysis

All laboratory work was carried out in a HOKLAS accredited laboratory (ALS Technichem (HK) Pty Ltd). Water samples of about 1,000 mL were collected at the monitoring, gradient and control stations for carrying out the laboratory determinations. The determination work shall start within the next

<sup>(1)</sup> Hong Kong Observatory (2021) <https://www.hko.gov.hk/en/tide/predtide.htm?s=WAG> [Accessed in September 2021]

working day after collection of the water samples. The SS laboratory measurements were provided within five (5) days of the sampling event. The analyses followed the standard methods as described in *APHA Standard Methods for the Examination of Water and Wastewater, 19th Edition*, unless otherwise specified (APHA 2540D for SS).

The submitted information included pre-treatment procedures, instrument use, Quality Assurance/Quality Control (QA/QC) details (such as blank, spike recovery, number of duplicate samples per-batch etc.), detection limits and accuracy. The QA/QC details were in accordance with requirements of HOKLAS or another internationally accredited scheme (**Appendix C**).

### 3.2.6 Sampling Depths

At each station, measurements and water samples were taken at three (3) depths, namely 1 m below water surface, mid-depth and 1 m above seabed. For stations that are less than 3 m in depth, only the mid-depth sample was taken. For stations that are less than 6 m in depth, only the surface and seabed sample was taken.

### 3.2.7 Action and Limit Levels

The Action and Limit levels, which were established based on the results of *Baseline Water Quality Monitoring Report*, are presented in **Table 3.3**.

**Table 3.3 Action and Limit Level for Water Quality**

Parameter	Action Level	Limit Level
SS in mgL <sup>-1</sup> (Depth-averaged)	95%-ile of baseline data (3.9 mg L <sup>-1</sup> ), or 20% exceedance of value at any impact station compared with corresponding data from control station, whichever monitoring result is higher	99%-ile of baseline data (4.6 mg L <sup>-1</sup> ), or 30% exceedance of value at any impact station compared with corresponding data from control station, whichever monitoring result is higher
DO in mgL <sup>-1</sup>	<u>Surface and Middle</u> 5%-ile of baseline data for surface or middle layer (6.84 mg L <sup>-1</sup> ) <u>Bottom</u> 5%-ile of baseline data for bottom layers (6.69 mg L <sup>-1</sup> )	<u>Surface and Middle</u> 4mg/L or 1%-ile of baseline for surface and middle layer, whichever is lower (4 mg L <sup>-1</sup> ) <u>Bottom</u> 2mg/L or 1%-ile of baseline data for bottom layer whichever is lower (2 mg L <sup>-1</sup> )
Turbidity in NTU (Depth-averaged)	95%-ile of baseline data (2.7 NTU), or 20% exceedance of value at any impact station compared with corresponding data from control station, whichever monitoring result is higher	99%-ile of baseline data (3.7 NTU), or 30% exceedance of value at any impact station compared with corresponding data from control station, whichever monitoring result is higher

**Notes:**

- For DO, non-compliance of the water quality limits occurs when the monitoring result is lower than the limits.
- "Depth-averaged" is calculated by taking the arithmetic means of reading of all sampled depths.
- For SS and turbidity, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
- Limit level for DO was derived from the Water Quality Objectives (WQO) for Southern, Eastern Buffer, and Mirs Bay Water Control Zones under the Water Pollution Control Ordinance (WPCO) Chapters 358L, 358Y, and 358I respectively.

## 4. IMPACT MONITORING RESULTS

A total of three (3) monitoring events were carried out between 14 and 20 September 2021 at Zone A over six (6) work days during the period of the 5<sup>th</sup> week of impact monitoring reporting. All monitoring events at all designated monitoring stations within Zone A were performed on schedule, i.e. on 14, 16 and 18 September 2021.

No major Project activities that influenced the water quality within Zone A were identified between 14 and 20 September 2021.

### 4.1 Data Collected

The impact monitoring data taken for this 5<sup>th</sup> weekly impact monitoring report within Zone A are presented in **Appendix D**. In general, the water quality parameters were stable throughout each sampling day (i.e. on 14, 16 and 18 September 2021). Recorded levels of dissolved oxygen, albeit frequently recorded as being below the corresponding Action and Limit Levels, were deemed to be due to natural fluctuations, as dissolved oxygen at control station C1 (which is away from potential impact from any works at the cable alignment) was also often recorded to be at similar level.

Fluctuation in turbidity and suspended solids levels was observed during the monitoring days (i.e. 14, 16 and 18 September 2021), again deemed to be due to natural seasonal variation.



## **5. ENVIRONMENTAL NON-CONFORMANCES**

### **5.1 Summary of Environmental Exceedance**

Exceedances were recorded during the monitoring period (i.e. between 14 and 20 September 2021) for dissolved oxygen, turbidity and suspended solids at the monitoring stations in Zone A. None of the exceedances recorded were attributed to the Project construction works as detailed below.

Three (3) Notification of Exceedances (NOEs) with detailed investigation reports were issued to EPD during the reporting period for recording exceedances of Action and Limit Levels for dissolved oxygen, both bottom layer as well as surface and middle (on all monitoring days), for turbidity (on 16 and 18 September 2021) and suspended solids (on 14 and 18 September 2021).

The exceedances were examined against the Project works in the NOEs. The exceedances of dissolved oxygen, turbidity and suspended solids on the monitoring days were considered to be seasonal variation or natural variation. The recorded exceedances were therefore deemed not to be due to project works.

The Contractors have been requested by the ET to be aware in case of any exceedances, and take care to ensure all necessary procedures are followed to avoid the Project impacting the water environment.

### **5.2 Summary of Environmental Non-compliance**

No non-compliance events were recorded during the reporting period due to the Project.

### **5.3 Summary of Environmental Complaint**

No environmental complaints were received during the reporting period.

### **5.4 Summary of Environmental Summons and Prosecution**

No summons or prosecution on environmental matters were received during the reporting period.

## **6. FUTURE KEY ISSUES**

### **6.1 Key Issues for the Coming Week**

There is no key issue identified.

The remaining diver hand jetting works for marine installation will continue for the coming week, i.e. between 21 and 25 September 2021.

### **6.2 Monitoring Schedule for the Coming Weeks**

Over the next monitoring periods (i.e. on 21 and 25 September 2021), diver hand jetting works for marine installation in Zone A are due to occur, as well as the water quality impact monitoring work during all installation work-days, accordingly.

## 7. CONCLUSION

This 5<sup>th</sup> Weekly Impact Monitoring Report presents the EM&A work undertaken during the period from 14 and 20 September 2021 in accordance with the *Appendix F* of the approved Project Profile (PP) and the requirements under EP-567/2019.

No non-compliance events were recorded during the reporting week due to the Project.

There were exceedances of Action and Limit Levels for dissolved oxygen, both bottom layer as well as surface and middle layer on all monitoring days (i.e. on 14, 16 and 18 September 2021), for turbidity (on 16 and 18 September 2021) and suspended solids (on 14 and 18 September 2021).

The exceedances were examined against the Project works in the NOEs. The exceedance of dissolved oxygen, turbidity and suspended solids on the monitoring days were considered to be seasonal variation or natural variation. The recorded exceedances were therefore deemed not to be due to project works.

The Contractors have been requested by the Environmental Team (ET) to be aware in case of any exceedances, take care to ensure all necessary procedures are followed to avoid the Project impacting the water environment.

The ET will keep track of the EM&A programme to verify compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

**APPENDIX A            IMPACT WATER QUALITY MONITORING SCHEDULE  
(ZONE A)**



**APPENDIX B      CERTIFICATES OF CALIBRATION FOR *IN SITU*  
MONITORING INSTRUMENTS**





專業化驗有限公司  
QUALITY PRO TEST-CONSULT LIMITED

Unit 10, 14/F, Wah Wai Centre, 38-40 Au Pui Wan St., Fotan, Hong Kong  
Email: info@qualityprotest.com; Website: www.qualityprotest.com  
Tel: (852) 3956 8717; Fax: (852) 3956 3928

## REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : BA080093  
Date of Issue : 27 August 2021  
Page No. : 1 of 2

### PART A – CUSTOMER INFORMATION

Enovative Environmental Service Ltd.  
Flat 2207, Yu Fun House,  
Yu Chui Court, Shatin  
New Territories, Hong Kong  
Attn: Mr. Thomas WONG

### PART B – DESCRIPTION

Name of Equipment : YSI ProDSS (Multi-Parameters)  
Manufacturer : YSI (a xylem brand)  
Serial Number : 16H104234  
Date of Received : Aug 27, 2021  
Date of Calibration : Aug 27, 2021  
Date of Next Calibration<sup>(a)</sup> : Nov 26, 2021

### PART C – REFERENCE METHODS/ DOCUMENTS FOR THE CALIBRATION

Parameter	Reference Method
pH at 25°C	APHA 21e 4500-H <sup>+</sup> B
Dissolved Oxygen	APHA 21e 4500-O G
Conductivity at 25°C	APHA 21e 2510 B
Salinity	APHA 21e 2520 B
Turbidity	APHA 21e 2130 B
Temperature	Section 6 of international Accreditation New Zealand Technical Guide no. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

### PART D – CALIBRATION RESULTS<sup>(b,c)</sup>

#### (1) pH at 25°C

Target (pH unit)	Displayed Reading <sup>(d)</sup> (pH Unit)	Tolerance <sup>(e)</sup> (pH Unit)	Results
4.00	4.01	0.01	Satisfactory
7.42	7.45	0.03	Satisfactory
10.01	9.98	-0.03	Satisfactory

Tolerance of pH should be less than ±0.20 (pH unit)

#### (2) Temperature


Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)	Results
10	10.0	0.0	Satisfactory
20	20.0	0.0	Satisfactory
45	44.9	-0.1	Satisfactory

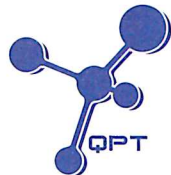
Tolerance limit of temperature should be less than ±2.0 (°C)

~ CONTINUED ON NEXT PAGE ~

#### Remark(s): -

- <sup>(a)</sup> The "Date of Next Calibration" is recommended according to best practice principals as practiced by QPT or quoted from relevant international standards.  
<sup>(b)</sup> The results relate only to the calibrated equipment as received  
<sup>(c)</sup> The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.  
<sup>(d)</sup> "Displayed Reading" denotes the figure shown on item under calibration/ checking regardless of equipment precision or significant figures.  
<sup>(e)</sup> The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted from relevant international standards..

  
LEE Chun-ning  
Senior Chemist



專業化驗有限公司  
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Email: info@qualityprotest.com; Website: www.qualityprotest.com  
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## REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : BA080093  
Date of Issue : 27 August 2021  
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### PART D – CALIBRATION RESULTS (Cont'd)

#### (3) Dissolved Oxygen

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)	Results
0.20	0.28	0.08	Satisfactory
2.19	2.30	0.11	Satisfactory
4.99	4.99	0.00	Satisfactory
7.49	7.53	0.04	Satisfactory

Tolerance limit of dissolved oxygen should be less than  $\pm 0.50$  (mg/L)

#### (4) Conductivity at 25°C

Conc. of KCl (M)	Expected Reading ( $\mu\text{S/cm}$ )	Displayed Reading ( $\mu\text{S/cm}$ )	Tolerance (%)	Results
0.001	146.9	138.4	-5.79	Satisfactory
0.01	1412	1339.3	-5.15	Satisfactory
0.1	12890	12663.2	-1.76	Satisfactory
0.5	58670	57882.1	-1.34	Satisfactory
1.0	111900	110653.4	-1.11	Satisfactory

Tolerance limit of conductivity should be less than  $\pm 10.0$  (%)

#### (5) Salinity

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)	Results
10	9.93	-0.70	Satisfactory
20	19.89	-0.55	Satisfactory
30	30.20	0.67	Satisfactory

Tolerance limit of salinity should be less than  $\pm 10.0$  (%)

#### (6) Turbidity

Expected Reading (NTU)	Displayed Reading <sup>(f)</sup> (NTU)	Tolerance <sup>(g)</sup> (%)	Results
0	0.10	--	Satisfactory
10	9.90	-1.0	Satisfactory
20	19.88	-0.6	Satisfactory
100	107.31	7.3	Satisfactory
800	796.34	-0.5	Satisfactory

Tolerance limit of turbidity should be less than  $\pm 10.0$  (%)

~ END OF REPORT ~

#### Remark(s): -

<sup>(f)</sup> "Displayed Reading" presents the figures shown on item under calibration/ checking regardless of equipment precision or significant figures.

<sup>(g)</sup> The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted from relevant international standards.



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Tel: (852) 3956 8717; Fax: (852) 3956 3928

## REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : BA080092  
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Name of Equipment : YSI ProDSS (Multi-Parameters)  
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### PART C – REFERENCE METHODS/ DOCUMENTS FOR THE CALIBRATION

Parameter	Reference Method
pH at 25°C	APHA 21e 4500-H <sup>+</sup> B
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Salinity	APHA 21e 2520 B
Turbidity	APHA 21e 2130 B
Temperature	Section 6 of international Accreditation New Zealand Technical Guide no. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

### PART D – CALIBRATION RESULTS<sup>(b,e)</sup>

#### (1) pH at 25°C

Target (pH unit)	Displayed Reading <sup>(d)</sup> (pH Unit)	Tolerance <sup>(e)</sup> (pH Unit)	Results
4.00	4.02	0.02	Satisfactory
7.42	7.44	0.02	Satisfactory
10.01	9.96	-0.05	Satisfactory

Tolerance of pH should be less than  $\pm 0.20$  (pH unit)

#### (2) Temperature

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)	Results
10	10.0	0.0	Satisfactory
20	20.0	0.0	Satisfactory
45	44.9	-0.1	Satisfactory

Tolerance limit of temperature should be less than  $\pm 2.0$  (°C)

~ CONTINUED ON NEXT PAGE ~

#### Remark(s): -

- <sup>(a)</sup> The "Date of Next Calibration" is recommended according to best practice principals as practiced by QPT or quoted form relevant international standards.  
<sup>(b)</sup> The results relate only to the calibrated equipment as received  
<sup>(c)</sup> The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.  
<sup>(d)</sup> "Displayed Reading" denotes the figure shown on item under calibration/ checking regardless of equipment precision or significant figures.  
<sup>(e)</sup> The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted form relevant international standards..

LEE Chun-ning  
Senior Chemist





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## REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : BA080092  
Date of Issue : 27 August 2021  
Page No. : 2 of 2

### PART D – CALIBRATION RESULTS (Cont'd)

#### (3) Dissolved Oxygen

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)	Results
0.20	0.30	0.10	Satisfactory
2.19	2.27	0.08	Satisfactory
4.99	5.00	0.01	Satisfactory
7.49	7.58	0.09	Satisfactory

Tolerance limit of dissolved oxygen should be less than  $\pm 0.50$  (mg/L)

#### (4) Conductivity at 25°C

Conc. of KCl (M)	Expected Reading ( $\mu\text{S/cm}$ )	Displayed Reading ( $\mu\text{S/cm}$ )	Tolerance (%)	Results
0.001	146.9	137.4	-6.47	Satisfactory
0.01	1412	1336.6	-5.34	Satisfactory
0.1	12890	12567.3	-2.50	Satisfactory
0.5	58670	57933.2	-1.26	Satisfactory
1.0	111900	110783	-1.00	Satisfactory

Tolerance limit of conductivity should be less than  $\pm 10.0$  (%)

#### (5) Salinity

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)	Results
10	9.94	-0.60	Satisfactory
20	20.11	0.55	Satisfactory
30	30.18	0.60	Satisfactory

Tolerance limit of salinity should be less than  $\pm 10.0$  (%)

#### (6) Turbidity

Expected Reading (NTU)	Displayed Reading <sup>(f)</sup> (NTU)	Tolerance <sup>(g)</sup> (%)	Results
0	0.10	--	Satisfactory
10	9.93	-0.7	Satisfactory
20	20.06	0.3	Satisfactory
100	106.42	6.4	Satisfactory
800	797.21	-0.3	Satisfactory

Tolerance limit of turbidity should be less than  $\pm 10.0$  (%)

~ END OF REPORT ~

#### Remark(s): -

<sup>(f)</sup> "Displayed Reading" presents the figures shown on item under calibration/ checking regardless of equipment precision or significant figures.

<sup>(g)</sup> The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted from relevant international standards.

**APPENDIX C      QA/ QC RESULTS FOR SUSPENDED SOLIDS TESTING**

QA/QC Results of Laboratory Analysis of Total Suspended Solids				
Sampling Date	Sample Duplicate		Method Blank * (mg/L)	Laboratory Control Spike % Recovery **
	Sample ID	% Error		
14-Sep-21	C1-ME-S-1	4.5	<0.5	110.0
	IM1-ME-B-1	6.7		
	G1-ME-B-1	4.3	<0.5	100.0
	IM1-MF-M-1	4.5		
	G1-MF-M-1	3.2		
16-Sep-21	C1-ME-S-1	14.7	<0.5	99.5
	IM1-ME-B-1	7.1		
	G1-ME-B-1	5.3	<0.5	108.0
	IM1-MF-M-1	6.7		
	G1-MF-M-1	10.3		
18-Sep-21	C1-ME-S-1	6.7	<0.5	92.5
	IM1-ME-B-1	6.7		
	G1-ME-B-1	16.7	<0.5	104.0
	IM1-MF-M-1	5.6		
	G1-MF-M-1	9.1		

Note: (\*) Reporting limit of SS is 0.5 mg/L.

(\*\*) % Recovery of laboratory control spike should be between 85% to 115%.





### CERTIFICATE OF ANALYSIS

<i>Client</i>	: ENOVATIVE ENVIRONMENTAL SERVICE LTD	<i>Laboratory</i>	: ALS Technichem (HK) Pty Ltd	<i>Page</i>	: 1 of 5
<i>Contact</i>	: MR THOMAS WONG	<i>Contact</i>	: Richard Fung	<i>Work Order</i>	: <b>HK2137339</b>
<i>Address</i>	: FLAT 2207, YU FUN HSE, YU CHUI COURT, SHATIN, N.T. HONG KONG	<i>Address</i>	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
<i>E-mail</i>	: thomas.wong@eno.com.hk	<i>E-mail</i>	: richard.fung@alsglobal.com		
<i>Telephone</i>	: ----	<i>Telephone</i>	: +852 2610 1044	<i>Date received</i>	: 14-Sep-2021
<i>Facsimile</i>	: ----	<i>Facsimile</i>	: +852 2610 2021	<i>Date of issue</i>	: 17-Sep-2021
<i>Project</i>	: HKA SUBMARINE CABLE – CHUNG HOM KOK			<i>No. of samples</i>	- Received : 44
<i>Order number</i>	: —	<i>Quote number</i>	: HKE/1236/2021		- Analysed : 44
<i>C-O-C number</i>	: —				
<i>Site</i>	: —				

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This document has been signed by those names that appear on this report and are the authorised signatories.

*Signatory*

*Position*

*Authorised results for:*

**Fung Lim Chee, Richard**

**Managing Director**

**Inorganics**



### **General Comments**

This report supersedes any previous report(s) with this reference. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 14-Sep-2021 to 17-Sep-2021.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

### **Specific Comments for Work Order HK2137339 :**

Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in chilled condition. The result(s) related only to the item(s) tested.

Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.

---



**Analytical Results**

Sub-Matrix: MARINE WATER			Compound	EA025: Suspended Solids (SS)	---	---	---	---
			LOR Unit	0.5 mg/L	---	---	---	---
Sample ID	Sampling date / time	Laboratory sample ID	EA/ED: Physical and Aggregate Properties	---	---	---	---	---
C1-ME-S-1	14-Sep-2021	HK2137339-001	2.2	---	---	---	---	---
C1-ME-S-2	14-Sep-2021	HK2137339-002	2.1	---	---	---	---	---
C1-ME-M-1	14-Sep-2021	HK2137339-003	1.8	---	---	---	---	---
C1-ME-M-2	14-Sep-2021	HK2137339-004	1.8	---	---	---	---	---
C1-ME-B-1	14-Sep-2021	HK2137339-005	1.7	---	---	---	---	---
C1-ME-B-2	14-Sep-2021	HK2137339-006	1.6	---	---	---	---	---
IM1-ME-S-1	14-Sep-2021	HK2137339-007	1.8	---	---	---	---	---
IM1-ME-S-2	14-Sep-2021	HK2137339-008	2.0	---	---	---	---	---
IM1-ME-M-1	14-Sep-2021	HK2137339-009	1.6	---	---	---	---	---
IM1-ME-M-2	14-Sep-2021	HK2137339-010	1.8	---	---	---	---	---
IM1-ME-B-1	14-Sep-2021	HK2137339-011	1.5	---	---	---	---	---
IM1-ME-B-2	14-Sep-2021	HK2137339-012	1.7	---	---	---	---	---
IM2-ME-S-1	14-Sep-2021	HK2137339-013	1.5	---	---	---	---	---
IM2-ME-S-2	14-Sep-2021	HK2137339-014	1.8	---	---	---	---	---
IM2-ME-B-1	14-Sep-2021	HK2137339-017	3.2	---	---	---	---	---
IM2-ME-B-2	14-Sep-2021	HK2137339-018	3.6	---	---	---	---	---
G1-ME-S-1	14-Sep-2021	HK2137339-019	3.1	---	---	---	---	---
G1-ME-S-2	14-Sep-2021	HK2137339-020	2.9	---	---	---	---	---
G1-ME-M-1	14-Sep-2021	HK2137339-021	2.4	---	---	---	---	---
G1-ME-M-2	14-Sep-2021	HK2137339-022	2.4	---	---	---	---	---
G1-ME-B-1	14-Sep-2021	HK2137339-023	2.3	---	---	---	---	---
G1-ME-B-2	14-Sep-2021	HK2137339-024	1.9	---	---	---	---	---
C1-MF-S-1	14-Sep-2021	HK2137339-025	2.6	---	---	---	---	---
C1-MF-S-2	14-Sep-2021	HK2137339-026	2.6	---	---	---	---	---
C1-MF-M-1	14-Sep-2021	HK2137339-027	3.4	---	---	---	---	---
C1-MF-M-2	14-Sep-2021	HK2137339-028	3.3	---	---	---	---	---
C1-MF-B-1	14-Sep-2021	HK2137339-029	3.8	---	---	---	---	---
C1-MF-B-2	14-Sep-2021	HK2137339-030	4.1	---	---	---	---	---
IM1-MF-S-1	14-Sep-2021	HK2137339-031	2.0	---	---	---	---	---
IM1-MF-S-2	14-Sep-2021	HK2137339-032	1.7	---	---	---	---	---
IM1-MF-M-1	14-Sep-2021	HK2137339-033	2.2	---	---	---	---	---



Sub-Matrix: MARINE WATER

			<i>Compound</i>	EA025: Suspended Solids (SS)	----	----	----	----
			<i>LOR Unit</i>	0.5 mg/L	----	----	----	----
<i>Sample ID</i>	<i>Sampling date / time</i>	<i>Laboratory sample ID</i>	EA/ED: Physical and Aggregate Properties	----	----	----	----	----
IM1-MF-M-2	14-Sep-2021	HK2137339-034	2.3	----	----	----	----	----
IM1-MF-B-1	14-Sep-2021	HK2137339-035	3.8	----	----	----	----	----
IM1-MF-B-2	14-Sep-2021	HK2137339-036	3.5	----	----	----	----	----
IM2-MF-S-1	14-Sep-2021	HK2137339-037	4.0	----	----	----	----	----
IM2-MF-S-2	14-Sep-2021	HK2137339-038	4.4	----	----	----	----	----
IM2-MF-B-1	14-Sep-2021	HK2137339-041	4.6	----	----	----	----	----
IM2-MF-B-2	14-Sep-2021	HK2137339-042	5.0	----	----	----	----	----
G1-MF-S-1	14-Sep-2021	HK2137339-043	5.2	----	----	----	----	----
G1-MF-S-2	14-Sep-2021	HK2137339-044	5.8	----	----	----	----	----
G1-MF-M-1	14-Sep-2021	HK2137339-045	6.2	----	----	----	----	----
G1-MF-M-2	14-Sep-2021	HK2137339-046	6.4	----	----	----	----	----
G1-MF-B-1	14-Sep-2021	HK2137339-047	8.8	----	----	----	----	----
G1-MF-B-2	14-Sep-2021	HK2137339-048	8.5	----	----	----	----	----



**Laboratory Duplicate (DUP) Report**

Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 3903251)</b>								
HK2137339-001	C1-ME-S-1	EA025: Suspended Solids (SS)	----	0.5	mg/L	2.2	2.3	5.6
HK2137339-011	IM1-ME-B-1	EA025: Suspended Solids (SS)	----	0.5	mg/L	1.5	1.6	8.1
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 3903252)</b>								
HK2137339-023	G1-ME-B-1	EA025: Suspended Solids (SS)	----	0.5	mg/L	2.3	2.2	5.6
HK2137339-033	IM1-MF-M-1	EA025: Suspended Solids (SS)	----	0.5	mg/L	2.2	2.3	0.0
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 3903253)</b>								
HK2137339-045	G1-MF-M-1	EA025: Suspended Solids (SS)	----	0.5	mg/L	6.2	6.4	1.6

**Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report**

Matrix: WATER		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
						LCS	DCS	Low	High	Value	Control Limit
<b>EA/ED: Physical and Aggregate Properties (QCLot: 3903251)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	110	----	85.9	117	----	----
<b>EA/ED: Physical and Aggregate Properties (QCLot: 3903252)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	100	----	85.9	117	----	----
<b>EA/ED: Physical and Aggregate Properties (QCLot: 3903253)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	104	----	85.9	117	----	----

**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report**

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



### CERTIFICATE OF ANALYSIS

<i>Client</i>	: ENOVATIVE ENVIRONMENTAL SERVICE LTD	<i>Laboratory</i>	: ALS Technichem (HK) Pty Ltd	<i>Page</i>	: 1 of 5
<i>Contact</i>	: MR THOMAS WONG	<i>Contact</i>	: Richard Fung	<i>Work Order</i>	: <b>HK2137464</b>
<i>Address</i>	: FLAT 2207, YU FUN HSE, YU CHUI COURT, SHATIN, N.T. HONG KONG	<i>Address</i>	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
<i>E-mail</i>	: thomas.wong@eno.com.hk	<i>E-mail</i>	: richard.fung@alsglobal.com		
<i>Telephone</i>	: ----	<i>Telephone</i>	: +852 2610 1044	<i>Date received</i>	: 16-Sep-2021
<i>Facsimile</i>	: ----	<i>Facsimile</i>	: +852 2610 2021	<i>Date of issue</i>	: 20-Sep-2021
<i>Project</i>	: HKA SUBMARINE CABLE – CHUNG HOM KOK			<i>No. of samples</i>	- Received : 44
<i>Order number</i>	: —	<i>Quote number</i>	: HKE/1236/2021		- Analysed : 44
<i>C-O-C number</i>	: —				
<i>Site</i>	: —				

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This document has been signed by those names that appear on this report and are the authorised signatories.

<i>Signatory</i>	<i>Position</i>	<i>Authorised results for:</i>
 Fung Lim Chee, Richard	Managing Director	Inorganics



### **General Comments**

This report supersedes any previous report(s) with this reference. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 16-Sep-2021 to 20-Sep-2021.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

### **Specific Comments for Work Order HK2137464 :**

Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in chilled condition. The result(s) related only to the item(s) tested.

Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.

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**Analytical Results**

Sub-Matrix: MARINE WATER			Compound	EA025: Suspended Solids (SS)	---	---	---	---
			LOR Unit	0.5 mg/L	---	---	---	---
Sample ID	Sampling date / time	Laboratory sample ID	EA/ED: Physical and Aggregate Properties	---	---	---	---	---
C1-ME-S-1	16-Sep-2021	HK2137464-001	3.4	---	---	---	---	---
C1-ME-S-2	16-Sep-2021	HK2137464-002	4.2	---	---	---	---	---
C1-ME-M-1	16-Sep-2021	HK2137464-003	3.5	---	---	---	---	---
C1-ME-M-2	16-Sep-2021	HK2137464-004	4.0	---	---	---	---	---
C1-ME-B-1	16-Sep-2021	HK2137464-005	2.4	---	---	---	---	---
C1-ME-B-2	16-Sep-2021	HK2137464-006	2.1	---	---	---	---	---
IM1-ME-S-1	16-Sep-2021	HK2137464-007	3.1	---	---	---	---	---
IM1-ME-S-2	16-Sep-2021	HK2137464-008	3.5	---	---	---	---	---
IM1-ME-M-1	16-Sep-2021	HK2137464-009	2.4	---	---	---	---	---
IM1-ME-M-2	16-Sep-2021	HK2137464-010	3.0	---	---	---	---	---
IM1-ME-B-1	16-Sep-2021	HK2137464-011	2.8	---	---	---	---	---
IM1-ME-B-2	16-Sep-2021	HK2137464-012	2.3	---	---	---	---	---
IM2-ME-S-1	16-Sep-2021	HK2137464-013	2.6	---	---	---	---	---
IM2-ME-S-2	16-Sep-2021	HK2137464-014	2.4	---	---	---	---	---
IM2-ME-B-1	16-Sep-2021	HK2137464-017	2.0	---	---	---	---	---
IM2-ME-B-2	16-Sep-2021	HK2137464-018	2.0	---	---	---	---	---
G1-ME-S-1	16-Sep-2021	HK2137464-019	2.1	---	---	---	---	---
G1-ME-S-2	16-Sep-2021	HK2137464-020	1.8	---	---	---	---	---
G1-ME-M-1	16-Sep-2021	HK2137464-021	3.9	---	---	---	---	---
G1-ME-M-2	16-Sep-2021	HK2137464-022	3.1	---	---	---	---	---
G1-ME-B-1	16-Sep-2021	HK2137464-023	3.8	---	---	---	---	---
G1-ME-B-2	16-Sep-2021	HK2137464-024	2.9	---	---	---	---	---
C1-MF-S-1	16-Sep-2021	HK2137464-025	2.8	---	---	---	---	---
C1-MF-S-2	16-Sep-2021	HK2137464-026	2.4	---	---	---	---	---
C1-MF-M-1	16-Sep-2021	HK2137464-027	3.4	---	---	---	---	---
C1-MF-M-2	16-Sep-2021	HK2137464-028	3.3	---	---	---	---	---
C1-MF-B-1	16-Sep-2021	HK2137464-029	4.0	---	---	---	---	---
C1-MF-B-2	16-Sep-2021	HK2137464-030	3.1	---	---	---	---	---
IM1-MF-S-1	16-Sep-2021	HK2137464-031	2.4	---	---	---	---	---
IM1-MF-S-2	16-Sep-2021	HK2137464-032	3.2	---	---	---	---	---
IM1-MF-M-1	16-Sep-2021	HK2137464-033	3.0	---	---	---	---	---



Sub-Matrix: MARINE WATER

			<i>Compound</i>	EA025: Suspended Solids (SS)	----	----	----	----
			<i>LOR Unit</i>	0.5 mg/L	----	----	----	----
<i>Sample ID</i>	<i>Sampling date / time</i>	<i>Laboratory sample ID</i>	EA/ED: Physical and Aggregate Properties	----	----	----	----	----
IM1-MF-M-2	16-Sep-2021	HK2137464-034	2.7	----	----	----	----	----
IM1-MF-B-1	16-Sep-2021	HK2137464-035	2.9	----	----	----	----	----
IM1-MF-B-2	16-Sep-2021	HK2137464-036	2.4	----	----	----	----	----
IM2-MF-S-1	16-Sep-2021	HK2137464-037	2.3	----	----	----	----	----
IM2-MF-S-2	16-Sep-2021	HK2137464-038	3.1	----	----	----	----	----
IM2-MF-B-1	16-Sep-2021	HK2137464-041	2.4	----	----	----	----	----
IM2-MF-B-2	16-Sep-2021	HK2137464-042	1.6	----	----	----	----	----
G1-MF-S-1	16-Sep-2021	HK2137464-043	4.0	----	----	----	----	----
G1-MF-S-2	16-Sep-2021	HK2137464-044	3.2	----	----	----	----	----
G1-MF-M-1	16-Sep-2021	HK2137464-045	2.9	----	----	----	----	----
G1-MF-M-2	16-Sep-2021	HK2137464-046	3.5	----	----	----	----	----
G1-MF-B-1	16-Sep-2021	HK2137464-047	2.4	----	----	----	----	----
G1-MF-B-2	16-Sep-2021	HK2137464-048	3.0	----	----	----	----	----



**Laboratory Duplicate (DUP) Report**

Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 3908966)</b>								
HK2137464-001	C1-ME-S-1	EA025: Suspended Solids (SS)	----	0.5	mg/L	3.4	3.9	14.3
HK2137464-011	IM1-ME-B-1	EA025: Suspended Solids (SS)	----	0.5	mg/L	2.8	3.0	8.6
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 3908967)</b>								
HK2137464-023	G1-ME-B-1	EA025: Suspended Solids (SS)	----	0.5	mg/L	3.8	4.0	4.5
HK2137464-033	IM1-MF-M-1	EA025: Suspended Solids (SS)	----	0.5	mg/L	3.0	3.2	8.0
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 3908968)</b>								
HK2137464-045	G1-MF-M-1	EA025: Suspended Solids (SS)	----	0.5	mg/L	2.9	3.2	12.2

**Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report**

Matrix: WATER		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
						LCS	DCS	Low	High	Value	Control Limit
<b>EA/ED: Physical and Aggregate Properties (QCLot: 3908966)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	99.5	----	85.9	117	----	----
<b>EA/ED: Physical and Aggregate Properties (QCLot: 3908967)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	108	----	85.9	117	----	----
<b>EA/ED: Physical and Aggregate Properties (QCLot: 3908968)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	110	----	85.9	117	----	----

**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report**

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



### CERTIFICATE OF ANALYSIS

<i>Client</i>	: ENOVATIVE ENVIRONMENTAL SERVICE LTD	<i>Laboratory</i>	: ALS Technichem (HK) Pty Ltd	<i>Page</i>	: 1 of 5
<i>Contact</i>	: MR THOMAS WONG	<i>Contact</i>	: Richard Fung	<i>Work Order</i>	: <b>HK2137466</b>
<i>Address</i>	: FLAT 2207, YU FUN HSE, YU CHUI COURT, SHATIN, N.T. HONG KONG	<i>Address</i>	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
<i>E-mail</i>	: thomas.wong@eno.com.hk	<i>E-mail</i>	: richard.fung@alsglobal.com		
<i>Telephone</i>	: ----	<i>Telephone</i>	: +852 2610 1044	<i>Date received</i>	: 18-Sep-2021
<i>Facsimile</i>	: ----	<i>Facsimile</i>	: +852 2610 2021	<i>Date of issue</i>	: 23-Sep-2021
<i>Project</i>	: HKA SUBMARINE CABLE – CHUNG HOM KOK			<i>No. of samples</i>	- Received : 44
<i>Order number</i>	: —	<i>Quote number</i>	: HKE/1236/2021		- Analysed : 44
<i>C-O-C number</i>	: —				
<i>Site</i>	: —				

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This document has been signed by those names that appear on this report and are the authorised signatories.

*Signatory*

*Position*

*Authorised results for:*

**Fung Lim Chee, Richard**

**Managing Director**

**Inorganics**



### **General Comments**

This report supersedes any previous report(s) with this reference. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 18-Sep-2021 to 23-Sep-2021.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

### **Specific Comments for Work Order HK2137466 :**

Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in chilled condition. The result(s) related only to the item(s) tested.

Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.

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**Analytical Results**

Sub-Matrix: MARINE WATER			Compound	EA025: Suspended Solids (SS)	---	---	---	---
			LOR Unit	0.5 mg/L	---	---	---	---
Sample ID	Sampling date / time	Laboratory sample ID	EA/ED: Physical and Aggregate Properties	---	---	---	---	---
C1-ME-S-1	18-Sep-2021	HK2137466-001	3.0	---	---	---	---	---
C1-ME-S-2	18-Sep-2021	HK2137466-002	3.8	---	---	---	---	---
C1-ME-M-1	18-Sep-2021	HK2137466-003	2.6	---	---	---	---	---
C1-ME-M-2	18-Sep-2021	HK2137466-004	2.1	---	---	---	---	---
C1-ME-B-1	18-Sep-2021	HK2137466-005	2.6	---	---	---	---	---
C1-ME-B-2	18-Sep-2021	HK2137466-006	2.2	---	---	---	---	---
IM1-ME-S-1	18-Sep-2021	HK2137466-007	6.2	---	---	---	---	---
IM1-ME-S-2	18-Sep-2021	HK2137466-008	5.6	---	---	---	---	---
IM1-ME-M-1	18-Sep-2021	HK2137466-009	3.5	---	---	---	---	---
IM1-ME-M-2	18-Sep-2021	HK2137466-010	4.0	---	---	---	---	---
IM1-ME-B-1	18-Sep-2021	HK2137466-011	3.0	---	---	---	---	---
IM1-ME-B-2	18-Sep-2021	HK2137466-012	3.4	---	---	---	---	---
IM2-ME-S-1	18-Sep-2021	HK2137466-013	1.8	---	---	---	---	---
IM2-ME-S-2	18-Sep-2021	HK2137466-014	2.7	---	---	---	---	---
IM2-ME-B-1	18-Sep-2021	HK2137466-017	3.2	---	---	---	---	---
IM2-ME-B-2	18-Sep-2021	HK2137466-018	3.5	---	---	---	---	---
G1-ME-S-1	18-Sep-2021	HK2137466-019	4.4	---	---	---	---	---
G1-ME-S-2	18-Sep-2021	HK2137466-020	4.0	---	---	---	---	---
G1-ME-M-1	18-Sep-2021	HK2137466-021	3.4	---	---	---	---	---
G1-ME-M-2	18-Sep-2021	HK2137466-022	2.7	---	---	---	---	---
G1-ME-B-1	18-Sep-2021	HK2137466-023	2.4	---	---	---	---	---
G1-ME-B-2	18-Sep-2021	HK2137466-024	2.2	---	---	---	---	---
C1-MF-S-1	18-Sep-2021	HK2137466-025	2.6	---	---	---	---	---
C1-MF-S-2	18-Sep-2021	HK2137466-026	2.7	---	---	---	---	---
C1-MF-M-1	18-Sep-2021	HK2137466-027	3.6	---	---	---	---	---
C1-MF-M-2	18-Sep-2021	HK2137466-028	4.1	---	---	---	---	---
C1-MF-B-1	18-Sep-2021	HK2137466-029	4.5	---	---	---	---	---
C1-MF-B-2	18-Sep-2021	HK2137466-030	3.8	---	---	---	---	---
IM1-MF-S-1	18-Sep-2021	HK2137466-031	3.4	---	---	---	---	---
IM1-MF-S-2	18-Sep-2021	HK2137466-032	2.7	---	---	---	---	---
IM1-MF-M-1	18-Sep-2021	HK2137466-033	3.6	---	---	---	---	---



Sub-Matrix: MARINE WATER

			<i>Compound</i>	EA025: Suspended Solids (SS)	----	----	----	----
			<i>LOR Unit</i>	0.5 mg/L	----	----	----	----
<i>Sample ID</i>	<i>Sampling date / time</i>	<i>Laboratory sample ID</i>	EA/ED: Physical and Aggregate Properties	----	----	----	----	----
IM1-MF-M-2	18-Sep-2021	HK2137466-034	3.9	----	----	----	----	----
IM1-MF-B-1	18-Sep-2021	HK2137466-035	4.2	----	----	----	----	----
IM1-MF-B-2	18-Sep-2021	HK2137466-036	4.4	----	----	----	----	----
IM2-MF-S-1	18-Sep-2021	HK2137466-037	5.2	----	----	----	----	----
IM2-MF-S-2	18-Sep-2021	HK2137466-038	6.0	----	----	----	----	----
IM2-MF-B-1	18-Sep-2021	HK2137466-041	3.2	----	----	----	----	----
IM2-MF-B-2	18-Sep-2021	HK2137466-042	3.9	----	----	----	----	----
G1-MF-S-1	18-Sep-2021	HK2137466-043	4.6	----	----	----	----	----
G1-MF-S-2	18-Sep-2021	HK2137466-044	5.0	----	----	----	----	----
G1-MF-M-1	18-Sep-2021	HK2137466-045	2.2	----	----	----	----	----
G1-MF-M-2	18-Sep-2021	HK2137466-046	2.8	----	----	----	----	----
G1-MF-B-1	18-Sep-2021	HK2137466-047	2.2	----	----	----	----	----
G1-MF-B-2	18-Sep-2021	HK2137466-048	2.6	----	----	----	----	----



**Laboratory Duplicate (DUP) Report**

Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 3911837)</b>								
HK2137466-001	C1-ME-S-1	EA025: Suspended Solids (SS)	----	0.5	mg/L	3.0	3.2	9.7
HK2137466-011	IM1-ME-B-1	EA025: Suspended Solids (SS)	----	0.5	mg/L	3.0	2.8	6.8
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 3911838)</b>								
HK2137466-023	G1-ME-B-1	EA025: Suspended Solids (SS)	----	0.5	mg/L	2.4	2.8	13.3
HK2137466-033	IM1-MF-M-1	EA025: Suspended Solids (SS)	----	0.5	mg/L	3.6	3.4	8.6
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 3911839)</b>								
HK2137466-045	G1-MF-M-1	EA025: Suspended Solids (SS)	----	0.5	mg/L	2.2	2.4	11.9

**Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report**

Matrix: WATER		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
						LCS	DCS	Low	High	Value	Control Limit
<b>EA/ED: Physical and Aggregate Properties (QCLot: 3911837)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	92.5	----	85.9	117	----	----
<b>EA/ED: Physical and Aggregate Properties (QCLot: 3911838)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	104	----	85.9	117	----	----
<b>EA/ED: Physical and Aggregate Properties (QCLot: 3911839)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	97.5	----	85.9	117	----	----

**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report**

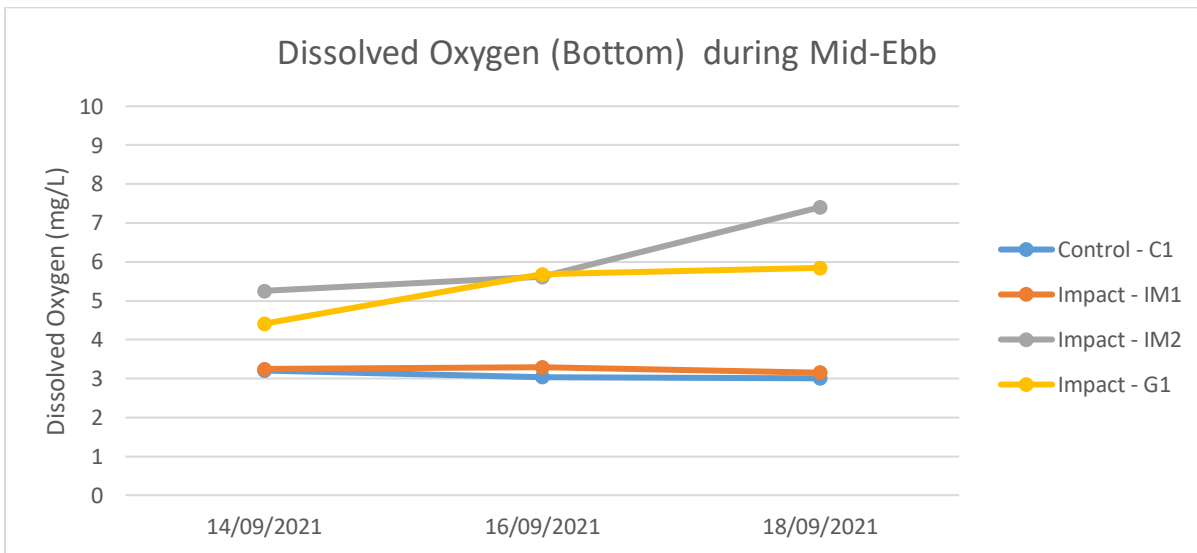
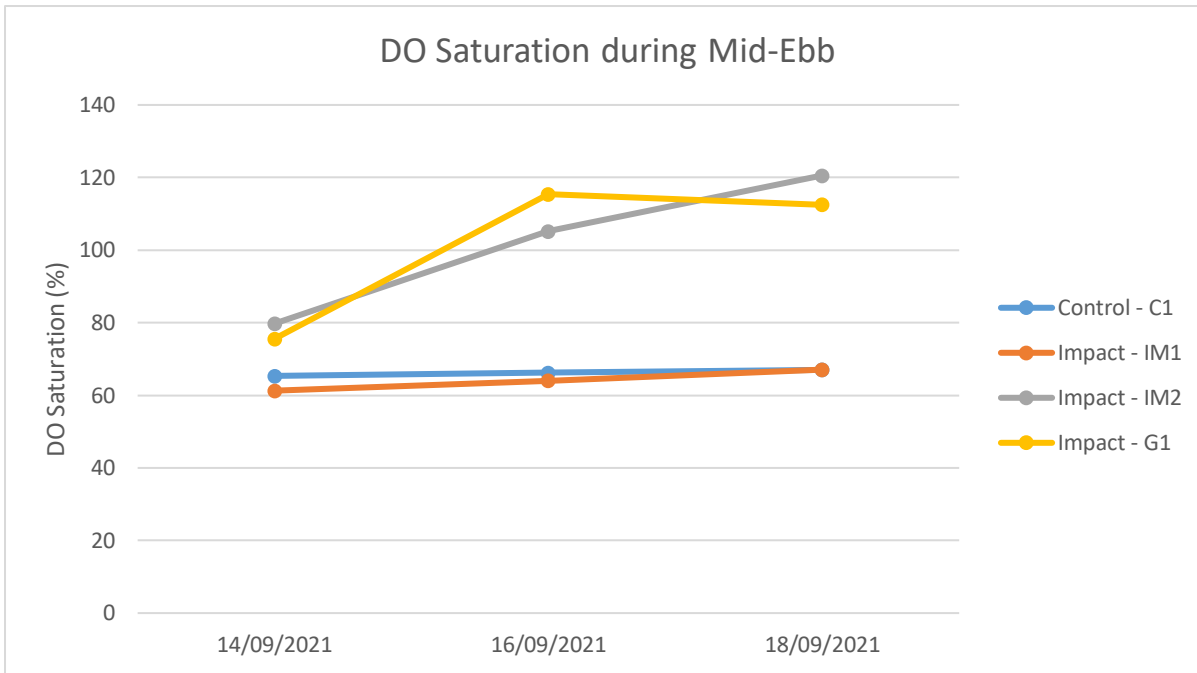
- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



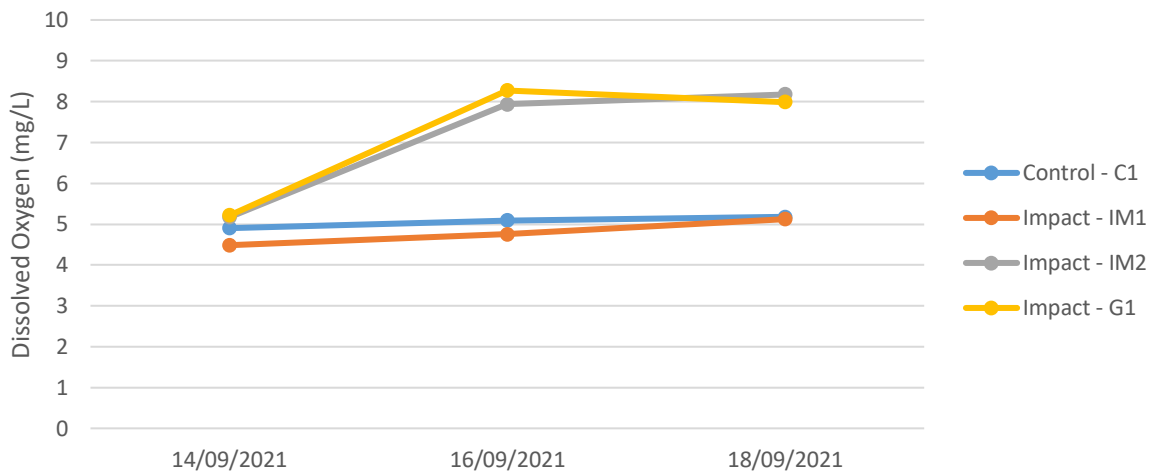
**APPENDIX D      IMPACT WATER QUALITY MONITORING RESULTS (ZONE  
A)**

## Graphical presentation of the Impact monitoring result for Zone A

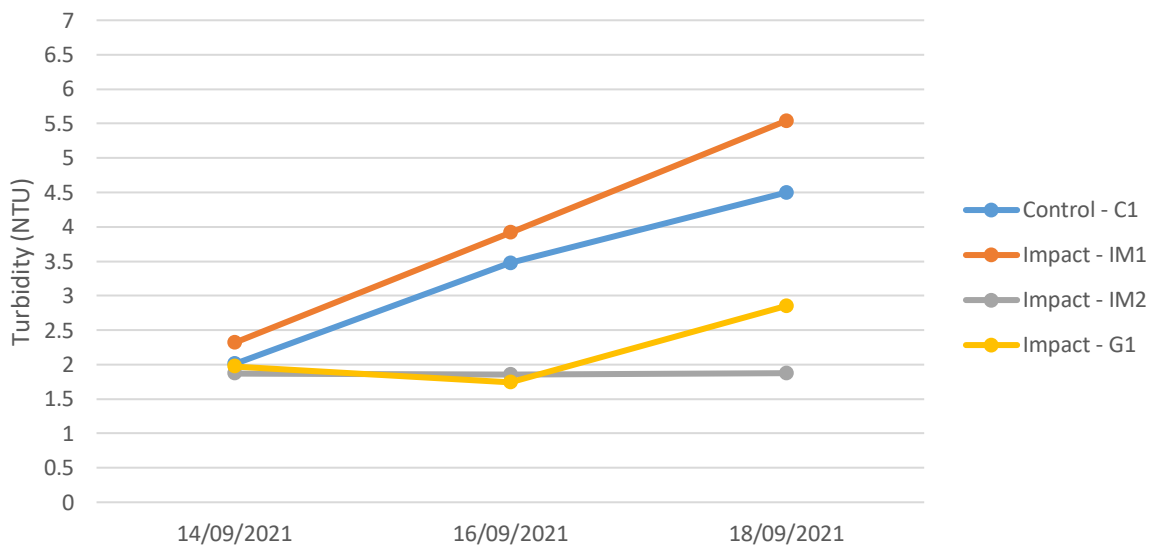
During Mid-Ebb



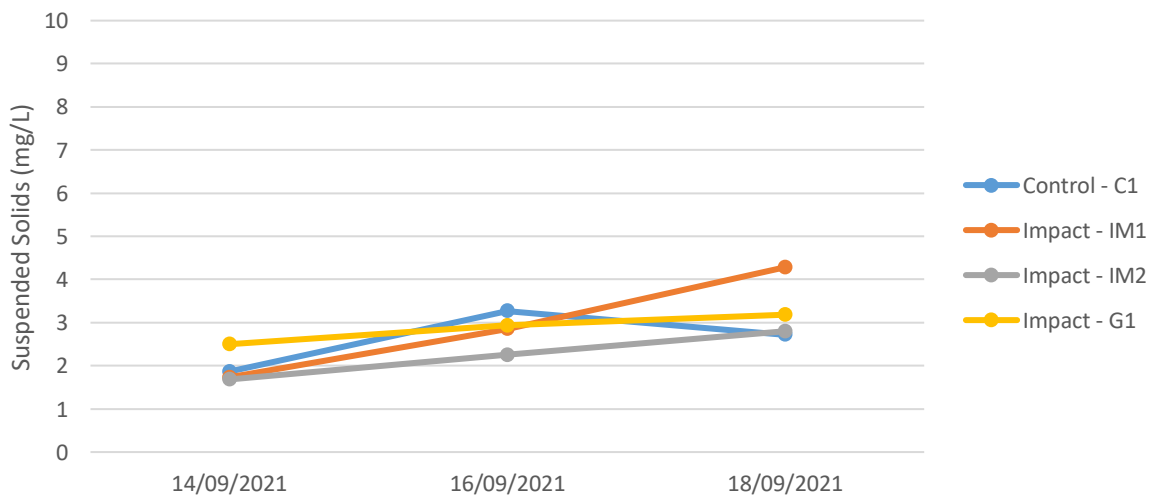
### Dissolved Oxygen (Surface and Middle) during Mid-Ebb



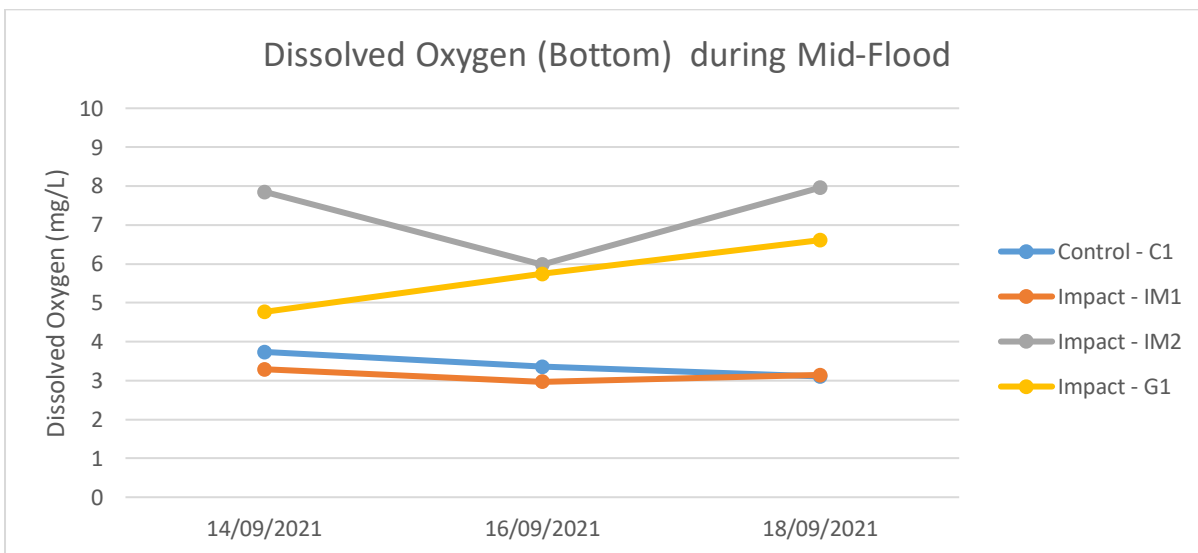
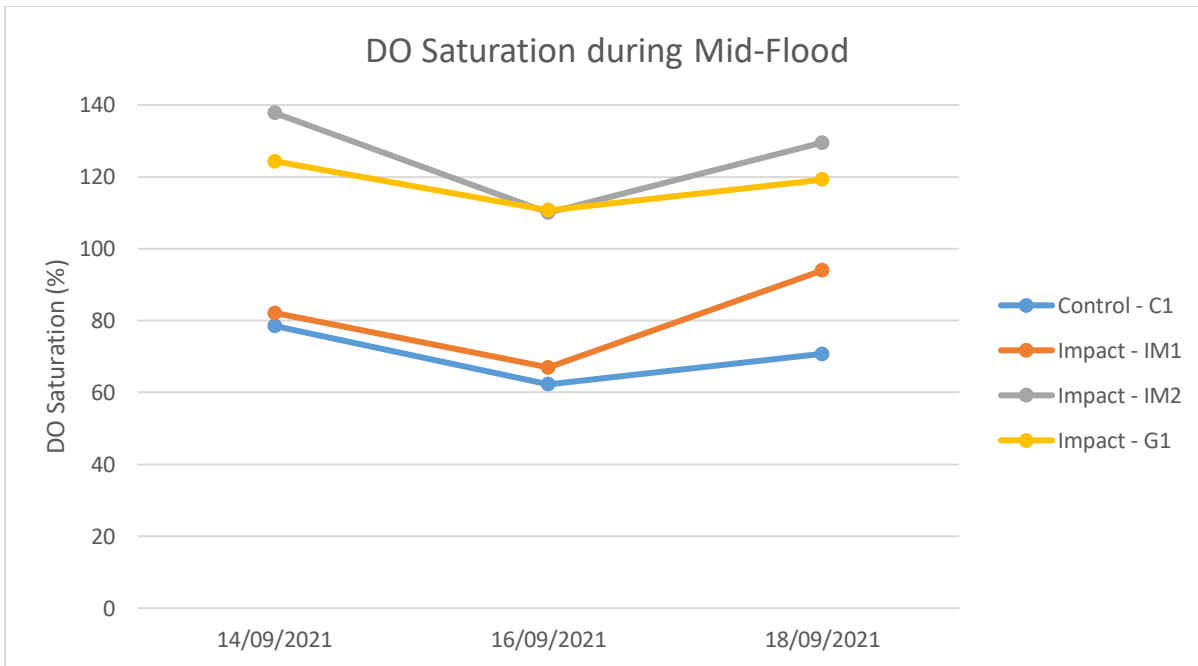
### Turbidity (Depth-averaged) during Mid-Ebb



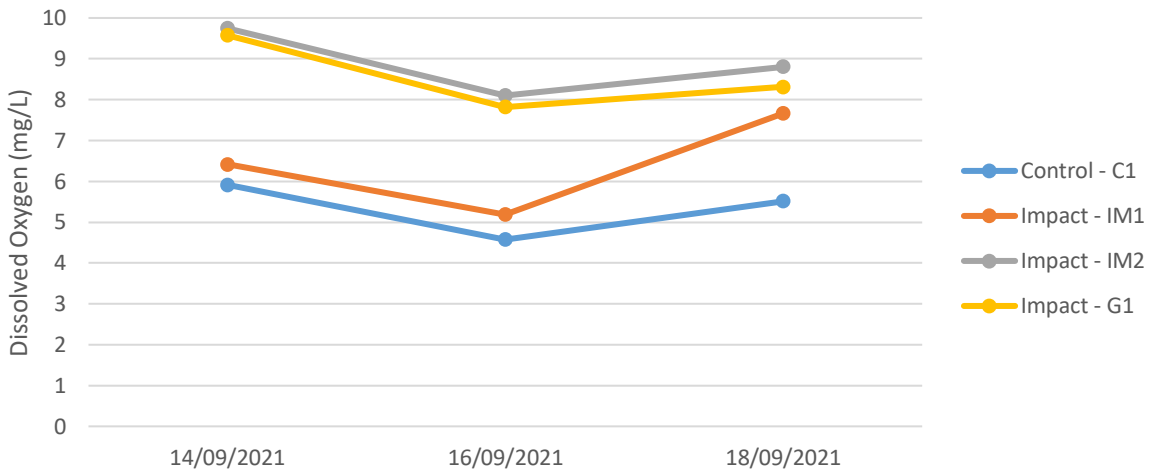
### Suspended Solids (Depth-averaged) during Mid-Ebb



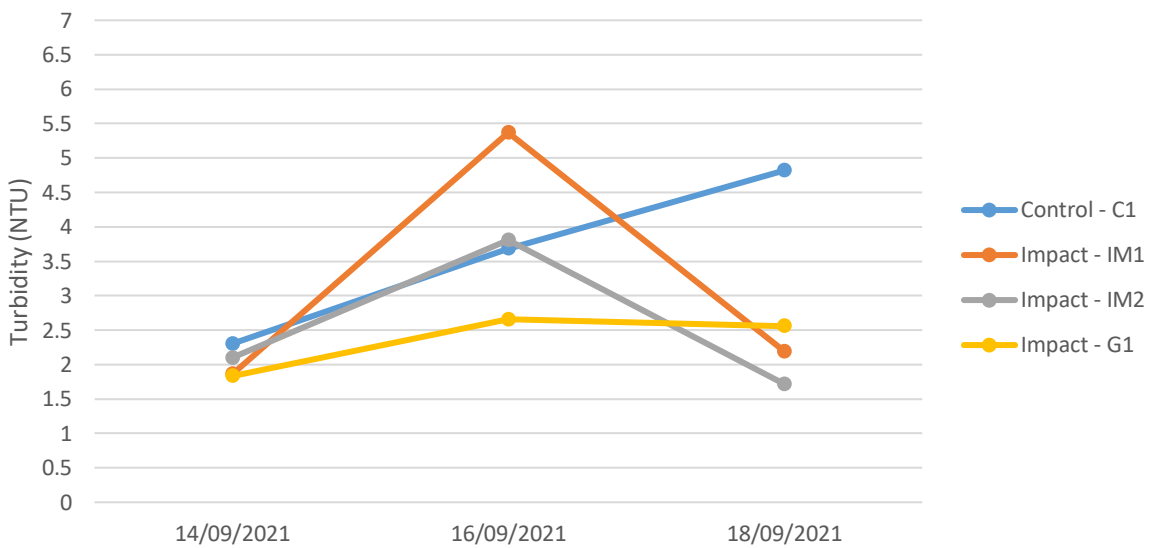
During Mid-Flood



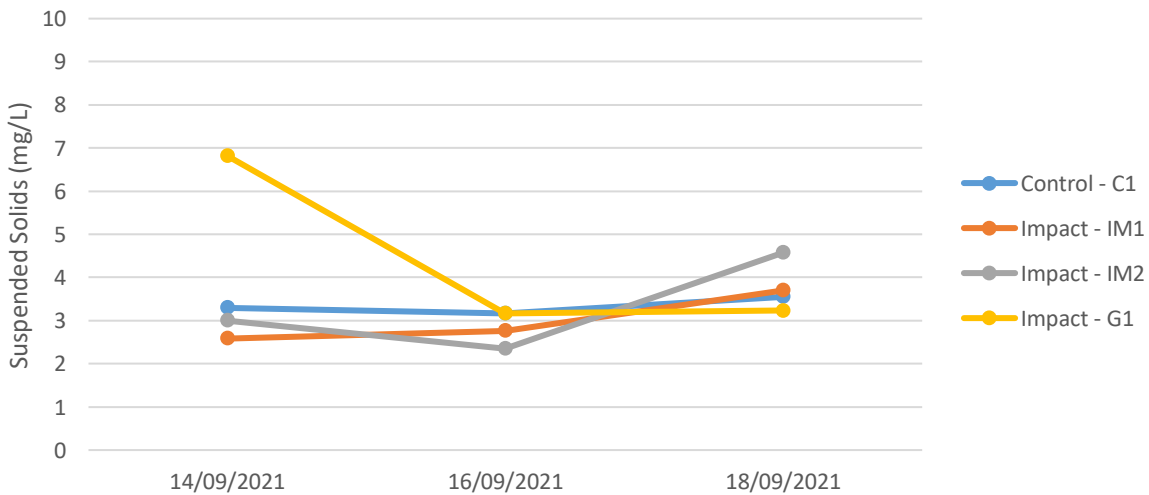
### Dissolved Oxygen (Surface and Middle) during Mid-Flood



### Turbidity (Depth-averaged) during Mid-Flood



### Suspended Solids (Depth-averaged) during Mid-Flood



Water Quality Monitoring Data Log Sheet

14-Sep-2021

Tide: Mid-Ebb

Monitoring Station	Weather Condition	Sea Condition**	Sampling Time	Water Depth (m)	Depth Level ***	Current Velocity (m/s)	Current Direction	Temperature (°C)		Salinity (ppt)		pH		DO Saturation (%)			Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)						
								Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*	
C1	Fine	Moderate	07:25	21.1	S	0.26	50	28.1	28.1	33.02	33.02	8.09	8.09	86.9	86.8	65.4	5.65	5.65	4.90	1.10	1.10	2.01	2.2	2.2	1.9				
						0.26	50	28.1		33.02		8.09		86.7			5.64			1.09			2.1						
					M	0.26	48	26.6	26.6	34.22	34.22	8.04	8.04	62.9	62.9		4.16	4.16		4.16	4.16		1.78	1.78		1.8	1.8	1.8	1.8
						0.27	48	26.6		34.22		8.03		62.8			4.16			1.77			1.8						
					B	0.30	47	23.8	23.8	35.26	35.26	8.00	8.00	46.3	46.4		3.20	3.21		3.17	3.16		3.14	3.16		1.7	1.7	1.7	1.7
						0.31	47	23.8		35.26		8.00		46.5			3.21			3.14			1.6						
IM1	Fine	Moderate	07:21	19.8	S	0.24	180	28.1	28.1	32.91	32.93	8.06	8.06	83.1	82.9	61.3	5.41	5.40	4.49	1.26	1.29	2.32	1.8	1.9	1.7				
						0.24	182	28.1		32.94		8.05		82.7			5.38			1.32			2.0						
					M	0.27	184	26.0	26.0	34.53	34.53	8.00	8.00	53.7	53.6		3.58	3.58		2.08	2.08		2.08	2.08		1.6	1.7	1.6	1.6
						0.27	189	26.0		34.53		8.00		53.4			3.57			2.08			1.8						
					B	0.30	184	24.3	24.4	35.15	35.13	7.99	8.00	47.2	47.4		3.23	3.24		3.53	3.58		3.63	3.58		1.5	1.6	1.5	1.6
						0.33	184	24.4		35.11		8.00		47.6			3.25			3.63			1.7						
IM2	Fine	Rough	07:01	4.6	S	0.08	177	27.9	27.9	33.58	33.60	8.08	8.08	79.5	79.3	79.8	5.18	5.17	5.17	1.88	1.90	1.87	1.5	1.7	1.7				
						0.08	184	27.8		33.62		8.08		79.1			5.16			1.92			1.8						
					M	0.00	0	-	-	-	-	-	-	-	-		-	-		-	-		-	-		0.0	0.0	0.0	0.0
						0.00	0	-		-		-		-			-			0.0									
					B	0.09	151	27.4	27.4	33.87	33.85	8.08	8.08	80.1	80.3		5.25	5.26		1.84	1.84		1.84	1.84		3.2	3.4	3.2	3.4
						0.10	163	27.4		33.83		8.08		80.4			5.26			1.84			3.6						
G1	Fine	Rough	07:07	6.5	S	0.12	93	28.2	28.2	33.39	33.42	8.08	8.08	84.7	84.6	75.6	5.50	5.50	5.21	1.66	1.66	1.97	3.1	3.0	2.5				
						0.12	100	28.1		33.44		8.08		84.5			5.49			1.65			2.9						
					M	0.18	91	27.4	27.4	33.84	33.84	8.08	8.08	75.3	75.3		4.93	4.93		1.60	1.60		1.60	1.60		2.4	2.4	2.4	2.4
						0.19	99	27.4		33.84		8.08		75.3			4.93			1.60			2.4						
					B	0.26	95	26.9	26.9	34.11	34.11	8.07	8.08	66.7	66.9		4.40	4.41		2.70	2.67		2.70	2.67		2.3	2.1	2.3	2.1
						0.27	99	26.9		34.11		8.08		67.0			4.42			2.63			1.9						

Remark: \* DA: Depth-Averaged

\*\*\* S: 1 m below the sea surface; M: mid-depth; B: 1 m above the seabed

Water Quality Monitoring Data Log Sheet

14-Sep-2021

Tide: Mid-Flood

Monitoring Station	Weather Condition	Sea Condition**	Sampling Time	Water Depth (m)	Depth Level ***	Current Velocity (m/s)	Current Direction	Temperature (°C)		Salinity (ppt)		pH		DO Saturation (%)			Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)						
								Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*				
C1	Fine	Rough	16:30	21.6	S	0.29	291	28.8	28.8	33.00	33.00	8.23	8.23	116.7	116.6	78.5	7.51	7.50	5.92	1.32	1.33	2.30	2.6	2.6	3.3				
						0.32	307	28.8		33.00		8.23		116.4			7.49			1.33			2.6						
					M	0.34	294	25.8	25.9	34.88	34.87	8.10	8.10	64.6	64.8		4.32	4.33		4.34	4.33		2.26	2.24		2.22	2.24	3.4	3.4
						0.37	308	25.9		34.85		8.10		65.0			4.34			2.22			3.3						
					B	0.34	295	23.8	23.8	35.64	35.64	8.08	8.08	54.0	54.2		3.72	3.74		3.41	3.35		3.28	3.35		3.41	3.35	3.8	4.0
						0.35	321	23.8		35.64		8.08		54.4			3.75			3.28			4.1						
IM1	Fine	Rough	16:40	20	S	0.32	328	29.2	29.2	32.60	32.60	8.22	8.22	123.2	123.0	82.1	7.88	7.87	6.42	1.39	1.41	1.86	2.0	1.9	2.6				
						0.33	339	29.2		32.60		8.22		122.8			7.86			1.43			1.7						
					M	0.34	330	27.1	27.1	34.18	34.18	8.10	8.10	75.6	75.5		4.97	4.96		4.97	4.96		1.47	1.48		1.47	1.48	2.2	2.3
						0.35	346	27.1		34.18		8.10		75.4			4.95			1.49			2.3						
					B	0.35	328	24.0	24.0	35.41	35.41	8.00	8.00	47.7	47.8		3.28	3.29		2.70	2.70		2.70	2.70		2.70	2.70	3.8	3.7
						0.36	355	24.0		35.41		8.00		47.9			3.30			2.69			3.5						
IM2	Fine	Moderate	16:58	4.9	S	0.23	280	29.6	29.6	33.01	33.00	8.33	8.33	153.5	153.5	137.8	9.75	9.75	9.75	1.76	1.77	2.10	4.0	4.2	3.0				
						0.25	302	29.6		32.99		8.33		153.5			9.74			1.77			4.4						
					M	0.00	0	-	-	-	-	-	-	-	-		-	-		-	-		-	-		-	-	0.0	0.0
						0.00	0	-		-		-		-			-			-			0.0						
					B	0.19	265	28.8	28.8	33.43	33.45	8.19	8.19	122.9	122.1		7.90	7.85		2.39	2.44		2.39	2.44		2.39	2.44	4.6	4.8
						0.21	274	28.7		33.47		8.18		121.2			7.79			2.48			5.0						
G1	Fine	Moderate	16:53	6.7	S	0.25	319	29.3	29.3	33.16	33.16	8.36	8.36	165.5	165.4	124.4	10.54	10.53	9.58	1.43	1.43	1.83	5.2	5.5	6.8				
						0.27	331	29.3		33.16		8.35		165.2			10.52			1.42			5.8						
					M	0.25	319	29.1	29.1	33.14	33.14	8.27	8.27	135.2	134.8		8.65	8.62		8.65	8.62		1.41	1.47		1.41	1.47	6.2	6.3
						0.25	336	29.1		33.13		8.27		134.3			8.59			1.53			6.4						
					B	0.24	319	27.4	27.5	33.99	33.98	8.09	8.10	72.7	73.0		4.75	4.77		2.70	2.61		2.70	2.61		2.70	2.61	8.8	8.7
						0.25	331	27.5		33.97		8.10		73.2			4.78			2.51			8.5						

Remark: \* DA: Depth-Averaged

\*\*\* S: 1 m below the sea surface; M: mid-depth; B: 1 m above the seabed



Water Quality Monitoring Data Log Sheet

16-Sep-2021

Tide: Mid-Ebb

Monitoring Station	Weather Condition	Sea Condition**	Sampling Time	Water Depth (m)	Depth Level ***	Current Velocity (m/s)	Current Direction	Temperature (°C)		Salinity (ppt)		pH		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)									
								Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*						
C1	Cloudy	Moderate	10:21	20.6	S	0.26	50	28.5	28.5	32.83	32.83	8.13	8.13	105.7	105.7	66.3	6.83	6.83	5.09	1.33	1.35	3.47	3.4	3.8	3.3						
						0.26	50	28.5		32.83		8.13		105.6			6.83			1.37			4.2								
					M	0.26	48	24.9	25.0	35.03	35.02	7.98	7.98	49.3	49.4		3.34	3.35		2.75	2.74		2.73	3.5		3.8					
						0.27	48	25.0		35.01		7.97		49.5			3.35			2.73			4.0								
					B	0.30	47	23.3	23.3	35.38	35.38	7.95	7.95	43.5	43.8		3.02	3.04		6.21	6.33		6.45	2.4		2.3					
						0.31	47	23.3		35.38		7.95		44.0			3.06			6.45			2.1								
IM1	Cloudy	Moderate	10:32	19.8	S	0.24	180	28.4	28.4	32.78	32.79	8.12	8.13	99.0	97.3	64.1	6.41	6.30	4.75	1.55	1.65	3.92	3.1	3.3	2.9						
						0.24	182	28.4		32.79		8.13		95.6			6.19			1.75			3.5								
					M	0.27	184	25.0	25.0	34.98	34.99	7.95	7.95	47.2	47.2		3.20	3.20		4.88	4.88		4.87	2.4		2.7					
						0.27	189	25.0		34.99		7.95		47.2			3.20			4.87			3.0								
					B	0.30	184	23.8	23.8	35.30	35.30	7.95	7.95	47.5	47.7		3.28	3.29		5.02	5.23		5.44	2.8		2.6					
						0.33	184	23.8		35.30		7.95		47.9			3.30			5.44			2.3								
IM2	Cloudy	Moderate	10:47	4.7	S	0.08	177	29.3	29.3	32.61	32.61	8.25	8.25	124.4	124.3	105.2	7.94	7.94	7.94	1.42	1.42	1.86	2.6	2.5	2.3						
						0.08	184	29.3		32.60		8.25		124.1			7.93			1.42			2.4								
					M	0.00	0		-		-		-		-			-			-										
						0.00	0																								
					B	0.09	151	27.9	27.9	33.50	33.50	8.10	8.10	85.3	86.2		5.55	5.61		2.34	2.29		5.67	2.34		2.29	2.0	2.0			
						0.10	163	27.9		33.50		8.10		87.1			5.67			2.24			2.0								
G1	Cloudy	Moderate	10:39	6.2	S	0.12	93	29.7	29.7	32.53	32.53	8.28	8.28	134.3	134.3	115.4	8.54	8.54	8.27	1.34	1.34	1.74	2.1	2.0	2.9						
						0.12	100	29.7		32.53		8.28		134.3			8.54			1.34			1.8								
					M	0.18	91	29.1	29.2	32.72	32.70	8.24	8.24	125.3	125.1		8.02	8.01		1.55	1.58		1.61	3.9		3.5					
						0.19	99	29.2		32.68		8.24		124.8			7.99			1.61			3.1								
					B	0.26	95	27.5	27.5	33.72	33.72	8.09	8.09	86.8	86.9		5.67	5.68		2.31	2.31		2.31	3.8		3.4					
						0.27	99	27.5		33.72		8.09		87.0			5.69			2.30			2.9								

Remark: \* DA: Depth-Averaged

\*\*\* S: 1 m below the sea surface; M: mid-depth; B: 1 m above the seabed

Water Quality Monitoring Data Log Sheet

16-Sep-2021

Tide: Mid-Flood

Monitoring Station	Weather Condition	Sea Condition**	Sampling Time	Water Depth (m)	Depth Level ***	Current Velocity (m/s)	Current Direction	Temperature (°C)		Salinity (ppt)		pH		DO Saturation (%)			Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)						
								Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*	
C1	Cloudy	Moderate	19:46	21.2	S	0.29	291	28.4	28.4	32.06	32.08	8.04	8.04	89.0	88.9	62.3	5.79	5.79	4.57	1.64	1.65	3.69	2.8	2.6	3.2				
						0.32	307	28.4		32.09		8.04		88.7			5.78			1.66			2.4						
					M	0.34	294	25.1	25.1	34.90	34.89	7.95	7.95	49.8	49.7		3.37	3.36		3.07	3.08		3.07	3.08		3.4	3.4		
						0.37	308	25.1		34.87		7.95		49.6			3.35			3.08			3.3						
					B	0.34	295	23.3	23.3	35.38	35.38	7.97	7.97	48.0	48.3		3.34	3.36		6.46	6.33		6.46	6.33		4.0	3.6		
						0.35	321	23.3		35.38		7.97		48.5			3.37			6.20			3.1						
IM1	Cloudy	Moderate	19:38	20.2	S	0.32	328	28.7	28.7	32.83	32.83	8.19	8.19	115.9	115.7	67.0	7.48	7.47	5.19	1.45	1.46	5.37	2.4	2.8	2.8				
						0.33	339	28.7		32.83		8.19		115.5			7.45			1.47			3.2						
					M	0.34	330	24.3	24.3	35.19	35.20	7.93	7.93	42.5	42.4		2.91	2.91		7.30	7.25		7.30	7.25		3.0	2.9		
						0.35	346	24.2		35.21		7.93		42.3			2.90			7.19			2.7						
					B	0.35	328	23.6	23.6	35.36	35.36	7.95	7.95	42.8	42.9		2.96	2.97		7.40	7.40		7.40	7.40		2.9	2.7		
						0.36	355	23.6		35.36		7.95		42.9			2.97			7.40			2.4						
IM2	Cloudy	Moderate	19:23	5.8	S	0.23	280	30.0	30.0	32.28	32.27	8.30	8.30	128.2	127.9	110.0	8.12	8.10	8.10	1.70	1.84	3.81	2.3	2.7	2.4				
						0.25	302	30.0		32.26		8.30		127.6			8.08			1.98			3.1						
					M	0.00	0		-		-		-		-			-			-			-			-		
						0.00	0																						
					B	0.19	265	28.1	28.1	33.43	33.44	8.11	8.12	92.1	92.2		5.98	5.98		5.78	5.78		5.98	5.98		5.78	5.78	2.4	2.0
						0.21	274	28.1		33.44		8.12		92.2			5.98			5.77			1.6						
G1	Cloudy	Moderate	19:26	7.2	S	0.25	319	29.7	29.7	32.63	32.61	8.32	8.32	141.3	141.0	110.7	8.97	8.96	7.82	1.43	1.46	2.66	4.0	3.6	3.2				
						0.27	331	29.7		32.59		8.32		140.7			8.94			1.48			3.2						
					M	0.25	319	28.2	28.2	33.30	33.32	8.12	8.12	103.2	102.9		6.70	6.68		2.02	2.07		6.70	6.68		2.9	3.2		
						0.25	336	28.1		33.34		8.11		102.6			6.66			2.12			3.5						
					B	0.24	319	27.7	27.7	33.64	33.64	8.11	8.11	88.1	88.1		5.74	5.74		4.38	4.45		5.74	5.74		2.4	2.7		
						0.25	331	27.7		33.64		8.11		88.1			5.74			4.52			3.0						

Remark: \* DA: Depth-Averaged

\*\*\* S: 1 m below the sea surface; M: mid-depth; B: 1 m above the seabed

Water Quality Monitoring Data Log Sheet

18-Sep-2021

Tide: Mid-Ebb

Monitoring Station	Weather Condition	Sea Condition**	Sampling Time	Water Depth (m)	Depth Level ***	Current Velocity (m/s)	Current Direction	Temperature (°C)		Salinity (ppt)		pH		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)			
								Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Cloudy	Moderate	11:53	20.8	S	0.26	50	28.5	28.5	33.01	33.01	8.22	8.22	113.2	113.2	67.0	7.31	7.31	5.18	1.13	1.15	4.50	3.0	3.4	2.7
						0.26	50	28.5		33.01		8.22		113.1			7.30			1.16			3.8		
					M	0.26	48	24.3	24.3	35.03	35.02	7.97	7.97	44.5	44.6		3.05	3.06		2.86	2.87		2.6	2.4	
						0.27	48	24.3		35.01		7.97		44.7			2.87			2.1					
					B	0.30	47	23.4	23.4	35.29	35.29	7.97	7.97	43.2	43.3		3.00	3.01		9.86	9.49		2.6	2.4	
						0.31	47	23.4		35.29		7.97		43.3			3.01			9.11			2.2		
IM1	Cloudy	Moderate	12:07	19.8	S	0.24	180	28.6	28.6	32.87	32.87	8.22	8.22	113.9	113.7	67.1	7.35	7.34	5.12	1.24	1.24	5.54	6.2	5.9	4.3
						0.24	182	28.6		32.87		8.22		113.4			7.32			1.24			5.6		
					M	0.27	184	24.1	24.1	35.08	35.08	7.95	7.95	42.3	42.4		2.91	2.91		6.72	6.70		3.5	3.8	
						0.27	189	24.1		35.07		7.95		42.4			2.91			6.68			4.0		
					B	0.30	184	23.3	23.3	35.30	35.30	7.96	7.96	45.1	45.3		3.14	3.15		8.72	8.68		3.0	3.2	
						0.33	184	23.3		35.30		7.96		45.4			3.16			8.64			3.4		
IM2	Cloudy	Moderate	12:23	5.1	S	0.08	177	28.7	28.7	32.79	32.79	8.25	8.25	126.9	126.8	120.6	8.18	8.18	8.18	1.13	1.12	1.88	1.8	2.3	2.8
						0.08	184	28.7		32.79		8.25		126.7			8.17			1.11			2.7		
					M	0.00	0		-		-		-		-			-			-			-	
						0.00	0																		
					B	0.09	151	28.3	28.3	33.06	33.06	8.21	8.21	114.4	114.4		7.41	7.41		2.63	2.63		3.2	3.4	
						0.10	163	28.3		33.06		8.21		114.3			7.40			2.63			3.5		
G1	Cloudy	Moderate	12:20	6.5	S	0.12	93	29.0	29.0	32.71	32.72	8.26	8.26	126.2	126.2	112.6	8.10	8.10	7.99	1.06	1.06	2.85	4.4	4.2	3.2
						0.12	100	29.0		32.73		8.26		126.1			8.10			1.06			4.0		
					M	0.18	91	28.4	28.4	32.95	32.96	8.26	8.26	122.0	121.9		7.89	7.89		1.13	1.15		3.4	3.1	
						0.19	99	28.4		32.96		8.26		121.7			7.88			1.17			2.7		
					B	0.26	95	27.8	27.8	33.41	33.41	8.13	8.14	89.6	89.7		5.84	5.85		6.33	6.35		2.4	2.3	
						0.27	99	27.8		33.41		8.14		89.7			5.85			6.36			2.2		

Remark: \* DA: Depth-Averaged

\*\*\* S: 1 m below the sea surface; M: mid-depth; B: 1 m above the seabed

Water Quality Monitoring Data Log Sheet

18-Sep-2021

Tide: Mid-Flood

Monitoring Station	Weather Condition	Sea Condition**	Sampling Time	Water Depth (m)	Depth Level ***	Current Velocity (m/s)	Current Direction	Temperature (°C)		Salinity (ppt)		pH		DO Saturation (%)			Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)					
								Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Cloudy	Moderate	16:05	21.9	S	0.29	291	28.5	28.5	33.06	33.05	8.23	8.23	119.5	118.8	70.7	7.73	7.69	5.51	1.43	1.45	4.82	2.6	2.7	3.6			
						0.32	307	28.4		33.03		8.23		118.0			7.64			1.47			2.7					
					M	0.34	294	24.7	24.7	34.79	34.77	7.96	7.96	48.9	48.9		3.34	3.34		3.42	3.43		3.44	3.6		3.9	4.1	
						0.37	308	24.7		34.74		7.96		48.9			3.34			3.44			4.1					
					B	0.34	295	23.2	23.2	35.37	35.37	7.95	7.95	44.4	44.5		3.10	3.11		9.52	9.58		3.11	9.52		4.5	4.2	3.8
						0.35	321	23.2		35.37		7.95		44.6			3.11			9.63			3.8					
IM1	Cloudy	Moderate	15:57	20.4	S	0.32	328	28.7	28.7	33.10	33.10	8.29	8.29	131.9	131.9	93.9	8.49	8.49	7.66	1.31	1.30	2.19	3.4	3.1	3.7			
						0.33	339	28.7		33.10		8.29		131.8			8.49			1.29			2.7					
					M	0.34	330	27.8	27.8	33.47	33.47	8.18	8.18	104.8	104.7		6.84	6.84		1.72	1.73		6.83	3.6		3.8	3.9	
						0.35	346	27.7		33.47		8.18		104.6			6.83			1.73			3.9					
					B	0.35	328	23.5	23.5	35.28	35.28	7.97	7.97	45.1	45.3		3.13	3.14		3.94	3.55		3.15	4.2		4.3	4.4	
						0.36	355	23.5		35.28		7.97		45.4			3.15			3.15			4.4					
IM2	Cloudy	Moderate	15:43	4.8	S	0.23	280	28.5	28.5	33.12	33.14	8.27	8.27	136.5	136.4	129.5	8.81	8.81	8.81	1.51	1.52	1.72	5.2	5.6	4.6			
						0.25	302	28.5		33.15		8.27		136.2			8.80			1.52			6.0					
					M	0.00	0	-	-	-	-	-	-	-	-		-	-		-	-		-	-		-	-	
						0.00	0	-		-		-		-			-			-			-					
					B	0.19	265	28.1	28.1	33.35	33.35	8.25	8.25	122.7	122.6		7.97	7.96		1.79	1.92		7.95	3.2		3.6	3.9	
						0.21	274	28.1		33.35		8.25		122.4			7.95			2.05			3.9					
G1	Cloudy	Moderate	15:47	6.6	S	0.25	319	28.7	28.7	33.01	33.03	8.28	8.28	140.5	140.2	119.3	9.06	9.05	8.31	1.39	1.43	2.56	4.6	4.8	3.2			
						0.27	331	28.6		33.04		8.28		139.9			9.03			1.46			5.0					
					M	0.25	319	28.0	28.0	33.37	33.37	8.21	8.21	116.5	116.5		7.58	7.58		1.69	1.72		7.57	2.2		2.5	2.8	
						0.25	336	28.0		33.37		8.21		116.4			7.57			1.74			2.8					
					B	0.24	319	27.7	27.7	33.52	33.51	8.19	8.20	101.0	101.2		6.60	6.61		4.66	4.54		6.62	2.2		2.4	2.6	
						0.25	331	27.7		33.50		8.20		101.4			6.62			4.42			2.6					

Remark: \* DA: Depth-Averaged

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**ERM-Hong Kong, Limited**

2509, 25/F One Harbourfront  
18 Tak Fung Street  
Hunghom  
Kowloon  
Hong Kong

T: +852 2271 3000

F: +852 3015 8052

[www.erm.com](http://www.erm.com)