

## ***China Harbour – Zhen Hua Joint Venture***

**Contract No.: CV/2015/07  
Handling of Surplus Public Fill  
(2016-2018)**

**TSEUNG KWAN O AREA 137 FILL BANK**


**MONTHLY EM&A REPORT NO.24**

**(APRIL 2019)**

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17 May 2019

By Email and Fax No.: 2695 3944

ETS-Testconsult Limited  
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34-36 Au Pui Wan Street  
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Attention: Mr. C L Lau

Dear Mr. Lau,

**Re: Contract No. CV/2015/07  
Handling of Surplus Public Fill (2016 – 2018)**

**Monthly EM&A Report (No. 24) for April 2019 for the Tseung  
Kwan O Area 137 Fill Bank**

Reference is made to your submission of the draft Monthly EM&A Report for April 2019 for the TKO Area 137 Fill Bank received by email on 13 May 2019 and the subsequent revision on 16 May 2019.

We are pleased to inform you that we have no further comment on the captioned report.

Thank you for your attention. Please do not hesitate to contact our Jason Lai or the undersigned should you have any queries.

Yours sincerely,  
For and on behalf of  
Ramboll Hong Kong Limited



F. C. Tsang  
Independent Environmental Checker

c.c. CEDD            Attn: Ms. Lisa Yung  
      CHZHJV        Attn: Mr. S W Sung

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## **EXECUTIVE SUMMARY**

This monthly Environmental Monitoring and Audit (EM&A) report No.24 was prepared by ETS-Testconsult Ltd (ET) for “Contract No: CV/2015/07 – Handling of Surplus Public Fill (2016-2018) – Tseung Kwan O (TKO) Area 137 Fill Bank” (The Project).

This report documented the findings of EM&A Works conducted during the operation phase of Fill Bank at TKO Area 137 in April 2019.

### **Site Activities**

As informed by the Contractor, the site activities in this reporting period were as below:

1. Operation of the TKO137 Fill Bank.
2. Delivery of public fill to Taishan;
3. Operation of dewatering plant and expanded dewatering plant
4. Operation of bentonite pool.
5. Concrete block breaking work.
6. Crushing plant operation.
7. Carrying out defects of Removal of public fill at Portion A6
8. Provision of photoelectric height limits warning system at the existing height restriction gantries;
9. Re-construction of sampling platforms at TKOFB;
10. Break up of concrete pavement at Portion A5c at TKOFB;
11. Replacement of Y40 rebar with Y50 rebar at the existing wheel washing bay at TKOFB;
12. Enhancement Rainwater Collection and Recycling Facility at TKOFB
13. Construction of concrete pavement at expanded dewatering plant
14. Repair works for damaged at TKOFB caused by Super Typhoon
15. Installation of LED Display Board;
16. Installation of Temporary Accommodation to CEDD Site Staff at TKOFB;
17. Carry out preliminary sorting on Public Fill for 3RS project

### **Environmental Monitoring Progress**

The summary of the monitoring activities in this monitoring period is listed below:

- Noise Monitoring (Day-time): 1 Occasion at 1 designated location
- 24-hour TSP Monitoring: 5 Occasions at 2 designated locations
- 1-hour TSP Monitoring: 17 Occasions at 2 designated locations
- Marine Water Quality Monitoring: 12 Occasions at 2 designated locations
- Weekly-site inspection: 5 Occasions

### **Noise Monitoring**

No exceedance of Action and Limit levels for noise monitoring was recorded in the reporting period.

### **Air Monitoring**

No exceedance of Action and Limit levels was recorded for 1-hr and 24-hr TSP monitoring in the reporting period.

### **Marine Water Quality Monitoring**

According to the summary of marine water monitoring results, no exceedance of Action and Limit levels was recorded in this reporting period.

### **Weekly Site Inspections**

In general, performance on environmental mitigation measures implemented was found to be satisfactory in this reporting period. The major findings observed during site inspections are presented in the Section 7.0.

### **Environmental Complaints, Notification of summons and successful prosecutions**

No complaint, notification of summons or successful prosecutions with respect to environmental issues was received in this reporting period.

**Future Key Issues**

Based on site inspections and forecast of engineering works in coming month, key issues to be considered are as follows:

- *Noise and air quality impact due to site works;*
- *Maintain wheel washing facilities properly;*
- *Maintain all drainage and desilting facilities properly;*
- *Use and maintain silt curtain properly;*
- *Clean up the fill material on concrete pavement along the BHA frequently;*
- *Sufficient drip trays for all oil drums / chemical containers;*
- *Implement all necessary preventive measures to avoid oil leakage. In the event an oil leakage happens, the Contractor should properly remove the leaked oil and handle the contaminated soil and all materials using for this cleaning works as chemical waste;*
- *Maintain good site practice and waste management to minimize environmental impacts at the site; and*
- *Follow-up improvements on waste management issues.*

## 1.0 INTRODUCTION

China Harbour – Zhen Hua Joint Venture (CHZH-JV) appointed Environmental Team (ET) of ETS-Testconsult Limited (ETL) to undertake the Environmental Monitoring and Audit (EM&A) for the “Contract No: CV/2015/07 –Handling of Surplus Public Fill (2016-2018) – Tseung Kwan O (TKO) Area 137 Fill Bank” (The Project).

In accordance with the Environmental Permit (No.: EP-134/2002/M) (the EP), an EM&A programme should be implemented in accordance with the procedures and requirements in the EM&A Manual of the approved EIA report (Registration No. AEIAR-060/2002). The EM&A programme for this study as stated in Section 2.3.1 of the EM&A Manual covers the following environmental aspects during the establishment, operation and removal phases of the Fill Bank at Tseung Kwan O Area 137:

- *Fugitive Dust;*
- *Noise generation from onsite activities;*
- *Water Quality; and*
- *Landscape and Visual.*

The EM&A programme requires environmental monitoring for air quality, noise and water quality and environmental site inspections for air quality, noise, water quality, landscape and visual, and waste management. The EM&A requirements for each parameter described in the following sections include:

- *All monitoring parameters;*
- *Monitoring schedules for the reporting period and forthcoming months;*
- *Action and Limit levels for all environmental parameters;*
- *Event/Action Plans;*
- *Environmental mitigation measures, as recommended in the Project EIA study final report; and*
- *Environmental requirements in contract documents.*

Baseline monitoring was completed in August and October 2002 by Materialab. Action and Limit Levels were established for air and water quality parameters based on the baseline monitoring results.

This report documented the findings of EM&A Works conducted during the operation phase of Fill Bank at Tseung Kwan O Area 137 in April 2019.

## 2.0 PROJECT INFORMATION

### 2.1 Scope of the Project

The scale and scope of the Project as stated in the EP include:

- Site clearance;
- Construction of a temporary storm water system;
- Stockpiling of 6 million m<sup>3</sup> of public fill;
- Setting up two barging points: one at the TKO Basin and one at the Construction and Demolition Material Sorting Facility (C&DMSF) for transporting the stockpiled public fill by barges;
- Setting up a temporary barging point at the existing Explosive Off-loading Barging Point located in the south-eastern part of Area 137 for the month of May 2004 to December 2004 for transporting the stockpiled public fill by barge;
- Construction and operation of a Construction and Demolition Material Sorting Facility (C&DMSF);
- Setting up a Construction and Demolition Material Crushing Facility at the TKO Basin; and
- Remove the temporary fill bank.

### 2.2 Site Description

TKO Area 137 Fill Bank is located at the southern end of Wan Po Road. In the vicinity of the site are other industrial uses such as SENT landfill, TKO Industrial Estate, etc. Both Island Resort and Fullview Garden are also situated at more than 1.8km from the site. Other existing ASRs and NSRs, including resident developments and schools, are located at a further distance away from TKO Area 137.

### 2.3 Work Programme

Details of work programme are shown in Appendix G.

### 2.4 Project Organization and Management Structure

The project organization chart is shown in Appendix A.

### 2.5 Contact Details of Key Personnel

The key personnel contact names and telephone numbers are shown in Table 2.1.

Table 2.1 Contact Details of Key Personnel

Organization	Name of Key Staff	Project Role	Tel. No.	Fax No.
CEDD	Lisa Yung, Norelle Li May Lau, James Sze, Phoebe Tang	Engineer's Representative	2762 5555	2714 0113
IEC (Ramboll)	F C Tsang	IEC	3465 2888	3465 2899
Contractor (CHZH-JV)	Zhou Chang Ying	Project Director	96266299	22474108
ET (ETL)	C. L. Lau	ET Leader	2946 7791	2695 3944

### 3.0 WORK PROGRESS IN THIS REPORTING PERIOD

As informed by the Contractor, the activities in the reporting period include:

1. Operation of the TKO137 Fill Bank.
2. Delivery of public fill to Taishan;
3. Operation of dewatering plant and expanded dewatering plant
4. Operation of bentonite pool.
5. Concrete block breaking work.
6. Crushing plant operation.
7. Carrying out defects of Removal of public fill at Portion A6
8. Provision of photoelectric height limits warning system at the existing height restriction gantries;
9. Re-construction of sampling platforms at TKOFB;
10. Break up of concrete pavement at Portion A5c at TKOFB;
11. Replacement of Y40 rebar with Y50 rebar at the existing wheel washing bay at TKOFB;
12. Enhancement Rainwater Collection and Recycling Facility at TKOFB
13. Construction of concrete pavement at expanded dewatering plant
14. Repair works for damaged at TKOFB caused by Super Typhoon
15. Installation of LED Display Board;
16. Installation of Temporary Accommodation to CEDD Site Staff at TKOFB;
17. Carry out preliminary sorting on Public Fill for 3RS project

### 4.0 AIR QUALITY MONITORING

#### 4.1 Monitoring Requirement

TSP levels were monitored in the reporting period in accordance with the EM&A Manual. Table 4.4 shows the Action and Limit Levels for the environmental monitoring works.

#### 4.2 Monitoring Equipment

Both 1-hour and 24-hour TSP air quality monitoring was performed using a GMWS2310 High Volume Air Sampler (HVS) located at each of the designated monitoring station. Table 4.1 summarizes the equipment used in the air quality monitoring programme. A copy of the calibration certificates for the HVS and calibrator are attached in Appendix B1.

Table 4.1 Air Quality Monitoring Equipment

Equipment	Model and Make
HVS	Greasby GMWS2310
Calibrator	Tisch TE-5025A



#### 4.3 Monitoring Parameters, Frequency and Duration

Table 4.2 summarizes the monitoring parameters, monitoring duration and frequencies of air quality monitoring.

Table 4.2 Monitoring parameters, duration, frequency of air quality monitoring

<i>Parameter</i>	<i>Duration</i>	<i>Frequency</i>
<i>24-hr TSP</i>	<i>24 hr</i>	<i>Once every six days</i>
<i>1-hr TSP</i>	<i>1 hr</i>	<i>Three times per day every six days</i>

#### 4.4 Monitoring Locations

Table 4.3 tabulates the air quality monitoring locations of this project.

Table 4.3 Air quality monitoring locations

<i>Monitoring station</i>	<i>Location</i>
<i>TKO-A1</i>	<i>Site Egress</i>
<i>TKO-A2a</i>	<i>CREO</i>

#### 4.5 Monitoring Methodology

##### ***Both 1-hr and 24-hr air quality monitoring (High Volume Sampler)***

##### Instrumentation

High volume sampler, as HVS, (Greasby GMWS2310) complete with appropriate sampling inlets were employed for both 1-hour and 24-hour TSP monitoring. The sampler is composed of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complies with that required by USEPA standard Title 40, Code of Federation Regulations Chapter 1 (Part 50).

##### Installation

The installation of HVS refers to the requirement stated in EM&A Manual.

##### Operation/Analytical Procedures

Operating/analytical procedures for the operation of HVS are as below:

- Prior to the commencement of the dust sampling, the flow rate of the high volume sampler was properly set (between 0.6m<sup>3</sup>/min and 1.7m<sup>3</sup>/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50. The flow rate was indicated on the flow rate chart.
- For TSP sampling, fiberglass filters (Whatman G653) were used.
- The power supply was checked to ensure the sampler worked properly.
- On sampling, the sampler was operated 5 minutes to establish thermal equilibrium before placing any filter media at designated air monitoring station.
- The filter holding frame was then removed by loosening the four nuts and carefully a weighted and conditioned filter was centered with the stamped number upwards, on a supporting screen.
- The filter was aligned on the screen so that the gasket formed an air-tight seal on the outer edges of the filter. Then the filter holder frame was tightened to the filter holder with swing bolts. The applied pressure should be sufficient to avoid air leakage at the edges.
- The programmable timer will be set for a sampling month of 1 hour or 24 hours. Information was recorded on the record sheet, which included the starting time, the weather condition and the filter number (the initial weight of the filter paper can be found out by using the filter number.).
- After sampling, the filter was transferred from the filter holder of the HVS to a sealed plastic bag and sent to the laboratory for weighting. The elapsed time was also recoded.
- Before weighting, all filters were equilibrated in a desiccator for 24 hour with the temperature of 25°C ± 3°C and the relative humidity (RH) <50% ±5%.
- All measurement procedures in Section 2.3 of the EM&A Manual were followed during the reporting period.

#### Maintenance & Calibration

- HVS and their accessories should be maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
- HVS should be calibrated at bi-monthly intervals.

#### **Wind Data Monitoring**

Wind data (wind speed and wind direction) were directly extracted from Tseung Kwan O Station of Hong Kong Observatory. All wind data during this reporting period are shown in Appendix E.

#### **4.6 Action and Limit Levels**

Table 4.4 shows the Action and Limit levels for 24-hr TSP and 1-hr TSP monitoring.

Table 4.4 Action and Limit Levels for 24-hr TSP and 1-hr TSP

Monitoring Location	24-hr TSP ( $\mu\text{g}/\text{m}^3$ )		1-hr TSP ( $\mu\text{g}/\text{m}^3$ )	
	Action Level	Limit Level	Action Level	Limit Level
TKO-A1	210	260	376	500
TKO-A2a *	210	260	376	500

Remark (\*): Since dust monitoring stations TKO-A2 and TKO-A2a are located close to the major dust emission sources and also close to the same sensitive receptor and no significant difference between them on the prevailing meteorological conditions, the baseline data from TKO-A2 (August and September 2002 by MaterialLab) can also be valid in the case of TKO-A2a.

#### **4.7 Event-Action Plans**

Please refer to Appendix F for details.

#### **4.8 Results and Observation**

##### **4.8.1 1-hour and 24-hour TSP Monitoring results**

Monitoring data of both 1-hour and 24-hour TSP monitoring carried out in this reporting period are summarized in Appendix B2. Graphical presentation of 1-hour and 24-hour TSP monitoring results for the reporting period is shown in Appendix B3. Wind data included wind speed and wind direction was extracted from Tseung Kwan O Station of Hong Kong Observatory during this reporting period and is presented in Appendix E.

No exceedance of Action and Limit Level of 1-hr TSP and 24-hour TSP monitoring results was recorded during the reporting period.

##### **4.8.2 Observation**

Generally, the Contractor implemented sufficient dust mitigation measures, including operation of the mist spraying systems at the CEDD Combined Reception Office and the site egress area, wheel washing facilities, road dampening by water bowsers and automatic water sprinklers on the main haul roads. Other dust sources near TKO Area 137 also included operation of the temporary CWSF and dumping activities at the SENT Landfill.

#### **5.0 Noise Monitoring**

##### **5.1 Monitoring Requirements**

Noise monitoring was conducted at 1 monitoring station as specified in the approved EM&A Monitoring Proposal for good site practice. The equipment, parameter, frequency, duration, methodology, calibration details, results and observations of the noise monitoring for the reporting period are presented in this section.

##### **5.2 Monitoring Equipment**

An Integrating Sound Level Meter was used for noise monitoring. It was a Type 1 sound level meter capable of giving a continuous readout of the noise level reading including equivalent continuous sound pressure level ( $L_{eq}$ ) and percentile sound pressure level ( $L_x$ ). It complies with International Electro

Technical Commission Publications IEC 61672 Type 1 specification, and speed in m/s was used to monitor the wind speed.

Table 5.1 summarizes noise monitoring equipment model being used. A copy of the calibration certificate for noise meter and calibrator are attached in Appendix C1

Table 5.1 Noise Monitoring Equipment

<i>Equipment</i>	<i>Model</i>
<i>Sound Level Meter</i>	<i>Rion NL-31 / Rion NL-52</i>
<i>Sound Level Calibrator</i>	<i>Rion NC-73 / Castle GA607</i>

### 5.3 Monitoring Parameters, Duration and Frequency

Duration, frequencies and parameters of noise measurement are presented in Table 5.2.

Table 5.2 Duration, Frequencies and Parameters of Noise Monitoring

<i>Time</i>	<i>Duration/min</i>	<i>Parameters</i>	<i>Frequency</i>
<i>Day-time: 0700-1900 hrs on normal weekday</i>	<i>30</i>	<i>L<sub>eq</sub>, L<sub>10</sub>, L<sub>90</sub></i>	<i>Once per month</i>

### 5.4 Monitoring Locations

One Noise monitoring was conducted at the noise monitoring location, TKO-N1 as shown in Figure 2 during the reporting period. Table 5.3 describes the location of the monitoring station.

Table 5.3 Noise Monitoring Location

<i>Monitoring station</i>	<i>Location</i>	<i>Type of Measurement</i>
<i>TKO-N1</i>	<i>Outside site Egress along Wan Po Road</i>	<i>Free Field</i>

### 5.5 Monitoring Procedures and Calibration Details

#### Operation/Analysis Procedures

- The Sound Level Meter was set on a tripod at a height of 1.2m above the ground.
- For free field measurement, the meter was positioned away from any nearby reflective surfaces.
- The battery condition was checked to ensure the correct functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
  - *Frequency weighting: A*
  - *Time weighting : Fast*
  - *Time measurement : 30 mins*
- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94 dB at 1000HZ. If the difference in the calibration level before and after measurement was more than 1dB(A), the measurement would be considered invalid and repeat measurement would be required after re-calibration or repair of the equipment.
- The wind speed was frequently checked with a portable wind meter.
- During the monitoring period, the Leq, L10 and L90 were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- Correction factor of +3dB(A) should be made to the free Field measurements.
- Noise monitoring would be cancelled in the presence of fog, rain, wind with a steady speed exceeding 5m/s, or wind gusts exceeding 10m/s.

#### Maintenance and Calibration

- The microphone head of the sound level meter and calibrator are cleaned with soft cloth in quarterly intervals.
- The meter is sent to the supplier or HOKLAS laboratory to check and calibrated in yearly intervals.

## 5.6 Action and Limit Levels

The Action and Limit levels for noise levels derived as illustrated in Table 5.4.

Table 5.4 Action and Limit Levels for noise monitoring

<i>Time Period</i>	<i>Action</i>	<i>Limit</i>
<i>0700-1900 hrs on normal week days</i>	<i>When one documented complaint is received</i>	<i>75 dB(A)</i>

## 5.7 Event-Action Plans

Please refer to the Appendix F for details.

## 5.8 Results and Observation

### 5.8.1 Results

Only Day-time noise monitoring was carried out at monitoring station TKO-N1 in this reporting period. The detail of the noise monitoring is provided in Appendix C2. Graphical presentation of the monitoring result for the reporting period is shown in Appendix C3.

Since no documented complaints on noise issue were received in this reporting period, no Action Level exceedance was recorded. Besides, no exceedance in Limit Level was recorded according to the result from Day-time monitoring.

### 5.8.2 Observation

The major noise source during the monitoring event was the dump truck traffic.

## 6.0 MARINE WATER QUALITY MONITORING

### 6.1 Monitoring Requirements

In accordance with the EM&A Manual, impact marine water quality monitoring was conducted three days per week. Measurements were taken at both mid-flood and mid-ebb tides at three depths (i.e. 1m below surface, mid depth and 1m from seabed) at Control Station, C1 and Monitoring Station, M4.

### 6.2 Monitoring Locations

For the Reclamation Project, there were 4 Designated Monitoring Stations and 2 Designated Control Stations specified in the EM&A Manual. Upon the completion of the monitoring programme under Stage 2 reclamation works, the ET started monitoring events at the impact station M4 and the control station C1 from 18 May 2004 onwards.

Figure 1 shows the location of the marine water quality monitoring stations. Table 6.1 describes the locations of the monitoring stations in the reporting period.

Table 6.1 Locations of Marine Water Monitoring Stations

<i>Station Description</i>	<i>Code</i>	<i>HK Metric Grid E</i>	<i>HK Metric Grid N</i>
<i>Control Station (Ebb tide)</i>	<i>TKO-C1</i>	<i>844 740.208</i>	<i>815 371.502</i>
<i>Monitoring Station, Tung Lung Chau Fish Culture Zone</i>	<i>TKO-M4</i>	<i>847 741.029</i>	<i>812 977.878</i>

According to Environmental Permit (Permit no.:EP-134/2002/M) Condition 3.2, water quality survey/monitoring shall be conducted at control station C1a, monitoring stations M4a and M5 for the period from two weeks before commencement of operation of the additional 5 barging points to 4 weeks after cessation of their operation. The water quality survey/monitoring frequency and parameters at stations C1a, M4a and M5 shall be same as the requirements set out in the EM&A Manual and the monitoring results shall be incorporated in the monthly EM&A reports.

Due to "Hong Kong International Airport, Three Runway System Project Contract 3206 – Main Reclamation Works "(3RS project) operation of the additional barging point at TKO Area 137, the ET started monitoring events at the impact station M4a, M5 and the control station C1a from 14 May 2018 onwards.

Figure 4 shows the location of water control station C1a and water monitoring station M4a and M5.

Table 6.2 describes the locations of the additional marine water monitoring stations

Table 6.2 Locations of Additional Marine Water Monitoring Stations (3RS project)

Station Description	Code	HK Metric Grid E	HK Metric Grid N
Control Station (Ebb tide)	C1a	845647	814146
Impact Monitoring Station	M4a	845922	813973
	M5	847005	813678

### 6.3 Monitoring Parameters

Monitoring of the marine water quality parameters are listed in Table 6.3.

Table 6.3 Marine Water Quality Monitoring Parameters

In-situ measurement	Laboratory analysis
Depth (m)	Suspended solids (mg/L)
Temperature (°C)	
Dissolved Oxygen (mg/L and % saturation)	
Turbidity (NTU)	
Salinity (ppt)	

### 6.4 Monitoring Frequency

The monitoring frequency of the marine water monitoring is summarized in Table 6.4.

Table 6.4 Monitoring frequency of the marine water

Parameter	Frequency	No. of Location	No. of Depths
Temperature	3 days/week, 2 tides/day	2	3 (Surface, mid-depth & bottom)
Salinity		(TKO-C1 and TKO-M4)	
DO		and	
Turbidity		3	
Suspended solids		(C1a, M4a and M5)	

### 6.5 Monitoring Methodology and Equipment Used

#### For Location of the monitoring stations

##### **Global Positioning System (GPS)**

A hand-held digital GPS was used to identify the designated monitoring stations prior to water sampling.

#### For Water Depth measurement

##### **Echo Sounder**

A portable, battery-operated echo sounder was used for the determination of water depth at each designated monitoring station.

#### For In-situ Water Quality Measurement

All in-situ monitoring instruments were checked, calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme before use, and subsequently re-calibrated at 3 monthly intervals or sometimes longer throughout all stages of the water quality monitoring.

#### **Dissolved Oxygen, Salinity and Temperature Measuring Equipment**

A portable, weatherproof dissolved oxygen & salinity measuring instrument, which complete with cable, sensor and DC power source (e.g. YSI 85 or equivalent) was used for measuring:

- a dissolved oxygen level in the range of 0-20 mg/L and 0-200 % saturation;
- a salinity in range 0-40 ppt; and
- a temperature of 0-45 degree Celsius

A membrane electrode with automatic temperature compensation complete with a cable was installed.

#### **Turbidity Measurement Instrument**

A portable and weatherproof turbidity meter (HACH model 2100Q) was used during impact monitoring. It has a photoelectric sensor capable of measuring turbidity between 0-1000 NTU. Response of the sensor was checked with certified standard Turbidity solutions before the start of measurement.

#### **For Water Sampling and Sample Analysis**

In-situ monitoring was carried out at three depths: 1 meter below water surface, at mid-depth and 1 meter above the seabed. If the water depth is less than 6 m, the mid-depth station shall be omitted and if the water depth is below 3 m, only the mid depth station shall be monitored.

#### **Water Sampler**

A water sampler comprising a transparent PVC cylinder, with a capacity of not less than 2 liters, was lowered into the water body at the predetermined depth. The both opening ends of the sampler were then closed accordingly by dead weight and water samples were collected.

#### **Water Container**

The sample container, made by high-density polythene, was rinsed with a portion of the water sample. The water sample was then transferred to the container, labelled with a unique sample ID and sealed with a screw cap. The water samples were stored in a cool box maintained at 4°C. The water samples were then delivered to a local HOKLAS-accredited laboratory (Environmental Laboratory, ETS-Testconsult Ltd, HOKLAS Registration No. 022) on the same day for analysis.

The summary of testing method of testing parameter as recommended by EIA or required by EPD, with the QA/QC results in accordance with the requirement of HOKLAS or international accredited scheme is shown in Table 6.5.

Table 6.5 Summary of testing procedures

<i>Laboratory Analysis</i>	<i>Testing Procedure</i>	<i>Detection Limit</i>
<i>Total suspended solids</i>	<i>In house method based on APHA 19<sup>th</sup> ed 2540D</i>	<i>1.0 mg/L</i>

#### **In-situ measurement**

All in-situ monitoring instruments were checked, calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme before use. Responses of sensors and electrodes were checked with certified standard solutions before each use. Wet bulb calibration for a DO meter was carried out before the start of measurement.

At each measurement/sampling depth, two consecutive measurements of dissolved oxygen (DO), dissolved oxygen saturation (DOS), turbidity and salinity were taken. For turbidity measurement, the sample was collected by using sampler and then transferred to the cell. The reading of turbidity of the sample was directly recorded from the Turbidimeter (HACH 2100Q) after inserting the cell to the Turbidimeter. For DO, DOS and Salinity, duplicate measurements were performed by dropping the calibrated probes of the corresponding monitoring equipments to the designated depths of the water column and taking readings after stabilized. The duplicate measurements were averaged if the difference was not greater than 25%. If the difference is greater than 25%, repeat measurement will be required.

Table 6.6 shows the equipment used for in-situ monitoring of water quality. The calibration certificates are attached in Appendix D1.

Table 6.6 Details of Marine Water Quality Monitoring Equipment (In-site measurement)

Parameter	Model	Date of Calibration	Due Date	Equipment No.
Coordinate of Monitoring stations	Garmin eTrex 10	-----	-----	ET/EW/005/09
Dissolved Oxygen (Saturation), Temperature, Salinity	YSI Dissolved Oxygen, Salinity & Temperature Meter, YSI 2030	02/03/19	01/06/19	ET/EW/008/006*
Turbidity	HACH Model 2100Q Turbid Meter	25/04/19	24/07/19	ET/0505/021*
Water Depth	Speedtech SM-5	-----	-----	ET/EW/002/08

Remark:(\*) indicates the instrument should be calibrated on use.

## 6.6 Action and Limit Level

The water quality criteria, namely Action and Limit (A/L) levels are presented in the table below.

Table 6.7 Water Quality Action and Limit Levels

Parameter	Action Level	Limit Level
DO (mg/L)	<u>Surface &amp; Middle</u> <5.45 mg/L (5%-ile of baseline data) <u>Bottom</u> <4.72 mg/L (5%-ile of baseline data)	<u>Surface &amp; Middle</u> <5.10 mg/L (1%-ile of baseline data) <u>Bottom</u> <2.00 mg/L
SS (mg/L) (Depth-averaged)	>6.74 mg/L (95%-ile of baseline data) or >120% of the upstream control station's SS at the same tide on the same day	>7.67 mg/L (99%-ile of baseline data) or >130% of the upstream control station's SS at the same tide on the same day
Turbidity (NTU) (Depth-averaged)	>4.28 NTU (95%-ile of baseline data) or >120% of the upstream control station's turbidity at the same tide on the same day	>4.58 NTU (99%-ile of baseline data) or >130% of the upstream control station's turbidity at the same tide on the same day

The water quality Action and Limit Levels (3RS project) are presented in the table below.

Table 6.8 Water Quality Action and Limit Levels (3RS project)

Parameter	Action Level	Limit Level
DO (mg/L)	<u>Surface &amp; Middle</u> <5.5 mg/L <u>Bottom</u> <5.2 mg/L	<u>Surface &amp; Middle</u> <4.00 mg/L (1%-ile of baseline data) <u>Bottom</u> <2.00 mg/L
SS (mg/L) (Depth-averaged)	>4.9 mg/L or >120% of the upstream control station's SS at the same tide on the same day	>5.2 mg/L or >130% of the upstream control station's SS at the same tide on the same day
Turbidity (NTU) (Depth-averaged)	>3.9NTU or >120% of the upstream control station's turbidity at the same tide on the same day	>4.2 NTU or >130% of the upstream control station's turbidity at the same tide on the same day

## 6.7 Event and Action Plan

Please refer to the Appendix F for details.

## 6.8 Monitoring Duration in this reporting period

Below is the time schedule for the marine water quality monitoring events that were conducted in this reporting period:

Table 6.9 Time Schedule of Impact Marine Water Quality Monitoring

April 2019						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1/4	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Remark: (▼) = Marine water quality monitoring carried out by ET.

(⊙) = Due to the tidal period is not in working hour, 19 April 2019 water monitoring was cancelled.

The daily marine water quality monitoring duration are detailed in Appendix D2.

## 6.9 Marine Water Quality Monitoring Results

The impact water quality measurement results are detailed in Appendix D2. Appendix D3 presents the water quality monitoring data and graphical presentations of monitoring results. The summary of marine water quality exceedances is shown in Table 6.10.

Table 6.10 Summary of Impact Marine Water Quality Exceedances

Station	Exceedance Level	DO		Turbidity		SS		Total	
		Flood	Ebb	Flood	Ebb	Flood	Ebb	Flood	Ebb
TKO-C1	Action	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0
TKO-M4	Action	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0

The impact water quality measurement results (3RS project) are detailed in Appendix D4. Appendix D5 presents the water quality monitoring data and graphical presentations of monitoring results. The summary of marine water quality exceedances (3RS project) is shown in Table 6.11.

Table 6.11 Summary of Impact Marine Water Quality Exceedances (3RS project)

Station	Exceedance Level	DO		Turbidity		SS		Total	
		Flood	Ebb	Flood	Ebb	Flood	Ebb	Flood	Ebb
C1a	Action	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0
M4a	Action	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0
M5	Action	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0

According to the summary of marine water monitoring results, no exceedance of Action and limit levels was recorded for this reporting period.

## 7.0 ENVIRONMENTAL AUDIT



## 7.1 Weekly ET Site Inspections and EPD's Site Inspection

### 7.1.1 Weekly ET Site Inspections

Weekly ET site inspections were carried out by ET to monitor the timely implementation of proper environmental pollution control and mitigation measures for the Project. In this reporting period, five weekly site inspections were conducted (03, 10, 17, 24 and 29 April 2019). Table 7.1 presents the key findings of weekly ET site inspection in this reporting period.

Table 7.1 Key Findings of Weekly ET Site Audits in this reporting period

<i>Date</i>	<i>Key Findings</i>	<i>Action(s) Taken recommended by ET</i>	<i>Action(s) Taken by the Contractor during the ET weekly site audit</i>	<i>Rectification Status by ET</i>
03 April 2019	<i>Drainage system was found damaged near wheels washing facility and the U-channel was found accumulated mud. (New item)</i>	<i>Replace the damaged barrier system to prevent flooding / overflow and clean the mud properly.</i>	<i>Drainage system was repaired and the accumulated mud was cleaned.</i>	<b>Closed</b>
10 April 2019	<i>No defective work or observation was recorded during the weekly ET site inspection</i>			
17 April 2019	<i>No defective work or observation was recorded during the weekly ET site inspection</i>			
24 April 2019	<i>No defective work or observation was recorded during the weekly ET site inspection</i>			
29 April 2019	<i>No defective work or observation was recorded during the weekly ET site inspection</i>			

### 7.1.2 EPD's Site Inspection

EPD's site inspection was carried out at TKO137 Fill Blank on 3 & 18 April 2019.

## 7.2 Review of Environmental Monitoring Procedures

The monitoring works conducted by the Environmental Team were inspected regularly. The observations for the monitoring works were recorded and summarized as follows:

### **Air Quality Monitoring**

- The monitoring team recorded the observations around the monitoring stations within and outside of the site.
- The monitoring team recorded the temperature, air pressure and general weather condition on the monitoring day.

### **Noise Monitoring**

- The monitoring team recorded the observations around the monitoring station, which might affect the results.
- Major noise sources were identified and recorded.

### **Water Quality Monitoring**

- The monitoring team recorded the observations around the monitoring stations, which might affect the results.

## 7.3 Assessment of Environmental Monitoring Results

All monitoring results were audited against the Action and Limit levels and any exceedance would be validated.

No exceedance was recorded in water quality, air quality and noise monitoring in this reporting period.

The monitoring results in this reporting period were comparable with those of baseline month. Detailed discussions were given in Section 4, 5 and 6 of this Report.

## 7.4 Advice on the Solid and Liquid Waste Management Status

The Contractor usually disposed of non-inert waste, including general refuse and materials segregated from the existing stockpiles, to SENT landfill. Table 7.2 summarizes data on offsite waste disposal in this reporting period.

Table 7.2 Actual amounts of Waste generated in this reporting period

Waste Type	Actual Amount	Disposal Locations
Public Fill ('000m <sup>3</sup> )	0	TKO 137 Fill Bank
C&D Waste ('000kg)	287.51	SENT Landfill / Refuse Collection Point
Chemical Waste (kg/L)	0	Collected by licensed collector

The Contractor should provide sufficient preventive measures during equipment maintenance works so as to avoid oil leakage on the ground. In the event of any oil leakage, the Contractor should clean up the polluted soil and handle all the materials used for this cleaning works as chemical waste.

Concrete bunding has erected outside the CEDD combined reception office and near the automatic wheel washing facilities for storing generator sets and oil drums. The drain outlet of all the bunded areas should be plugged properly. Besides, pre-cast drip trays were provided for oil drums at several areas, such as workshop and chemical storage area. The Contractor should collect and dispose of any stagnant water accumulated in the concrete bunding and drip trays and handle them as chemical waste.

The Contractor should use suitable containers with proper labels to store chemical wastes in accordance with Code of Practice on the Packaging, Labeling and Storage of Chemical Waste. The Contractor should also advise their workers of the proper procedures in handling the chemical waste. All the trip tickets for chemical waste disposal were properly kept in the site office.

The Contractor was reminded to increase the frequency of inspection and cleaning of the site drainage system, including permanent desilting chambers, desilting facilities, oil interceptor bypass tank, DP3 and DP4 and all the trapezoidal channels. Moreover, the Contractor should apply approved pesticides in the stagnant water ponds.

All the runoff from the parking area should be pumped to the desilting facilities and oil interceptors to remove suspended solids and oil & grease prior to discharge.

## 8.0 Status of Environmental Licensing and Permitting

All permits/licenses valid in this reporting period are summarized in Table 8.1.

Table 8.1 Summary of environmental licensing and permit status

Description	Permit No.	Valid Period		Section
		From	To	
Environmental Permit	EP-134/2002/M	17/12/18	---	<ul style="list-style-type: none"> <li>▪ Site clearance</li> <li>▪ Construction of a temporary storm water system</li> <li>▪ Stockpiling of 6 million m<sup>3</sup> of public fill</li> <li>▪ Setting up two barging points for transporting the stockpiled public fill by barges</li> <li>▪ Setting up a temporary barging point at the existing Explosive Off-loading Barging Point for the month of May 2004 to December 2004 for transporting the stockpiled public fill by barge</li> <li>▪ Construction of operation of a construction and Demolition Material Sorting Facility (C&amp;DMSF)</li> <li>▪ Setting up a Construction and Demolition Material Crushing Facility at the TKO Basin</li> <li>▪ Remove the temporary fill bank</li> </ul>

Marine Dumping Permit	EP/MD/19-115	03/04/19	30/06/19	<ul style="list-style-type: none"> <li>Approval for dumping 3,000,000 tons (approximately equal to 1,666,667 cu.m. bulked quantity) of Public Fill (Reclamation Materials) from Tseung Kwan O Area 137 Fill Bank and Tuen Mun Area 38 Fill Bank to designated dumping area at Guanghaiwan of Taishan</li> </ul>
Chemical Waste Producer	5919-839-C4181-01	19/04/17	---	<ul style="list-style-type: none"> <li>Spent battery cell containing heavy metals and spent lubricating oil</li> </ul>
Effluent Discharge License	WT00029178-2017	27/09/17	30/09/22	<ul style="list-style-type: none"> <li>Effluent, Surface Run-off, and all other wastewater discharges from screen and sedimentation tank</li> </ul>
Billing Account for Waste Disposal	7027643	22/05/17	---	---
Notification Pursuant to Section 3(1) of the Air Pollution Control (Construction Dust)	415682	12/04/17	---	---

## 9.0 ENVIRONMENTAL NON-CONFORMANCE

### 9.1 Summary of air quality, noise and marine water quality

No Action and Limit level exceedance of 1-hour and 24-hr TSP monitoring was recorded in this reporting period.

Since no documented complaints on noise issue were received in this reporting period, no Action Level exceedance was recorded. Besides, no exceedance in Limit Level was recorded according to the result from Day-time monitoring.

According to the summary of marine water monitoring results, no exceedance of Action and Limit levels was recorded for this reporting period.

### 9.2 Summary of Environmental Complaints

No complaint was received in this reporting period.

### 9.3 Summary of Notification of Summons and successful Prosecution

There was no notification of summons and successful prosecution respect to environmental issues registered in this reporting period.

## 10.0 IMPLEMENTATION STATUS

### 10.1 Implementation Status of Environmental Mitigation Measures

An updated summary of the Environmental Mitigation Implementation Schedule (EMIS) is presented in Appendix I. Most of the necessary mitigation measures were implemented properly. Any deficiencies were noted in the remarks of the schedule.

### 10.2 Implementation Status of Event and Action Plan

Since no exceedance of Action and Limit level of air quality, noise and marine water monitoring results was recorded for this reporting period, no further action was required.

### 10.3 Implementation Status of Environmental Complaint, Notifications of Summons and Successful Prosecutions Handling

No complaint, notification of summon and successful prosecution was received in this reporting period.

A summary of environmental complaints, notifications of summons and successful prosecutions was given in Table 10.1 and further details of the complaint could be found in the Complaint Log (Appendix L).

Table 10.1 Summary of Environmental Complaints and Prosecutions

<i>Complaints logged</i>		<i>Summons served</i>		<i>Successful prosecution received</i>	
<i>April 2019</i>	<i>Cumulative</i>	<i>April 2019</i>	<i>Cumulative</i>	<i>April 2019</i>	<i>Cumulative</i>
0	4	0	0	0	0

## 11.0 CONCLUSIONS AND RECOMMENDATIONS

### **Conclusions**

Impact monitoring of air quality, noise and water quality were carried out at designated locations in accordance with the EM&A Manual in this reporting period.

No Action and Limit level exceedance of 1-hour and 24-hr TSP monitoring was recorded in this reporting period.

Since no documented complaints on noise issue were received in this reporting period, no Action Level exceedance was recorded. Besides, no exceedance in Limit Level was recorded according to the result from Day-time monitoring.

According to the summary of marine water monitoring results, no exceedance of Action and Limit levels was recorded for this reporting period.

No complaint, prosecutions and notifications of summons were received in this reporting period.

According to the ET weekly site inspections carried out in this reporting period, the Contractor generally implemented sufficient dust mitigation measures, including operation of the mist spraying systems and automatic wheel washing facilities, dampening of haul roads and stockpiling areas.

### **Recommendations**

According to the environmental site inspections performed in the reporting period, the following recommendations were provided:

#### **Air Quality**

- Ensure the frequency of water spraying on haul roads, unloading areas and stockpiles to be sufficient to suppress the dust sources;
- Provide proper maintenance for the powered mechanical equipment and barges to avoid emission of dark smoke;
- Provide water spraying onto the truckloads during inspection of fill material;
- Conduct road sweeping on all paved haul roads and public roads especially outside and near the site egress by the road sweeper. Undertake water spraying on stockpiling area by water bowser;
- Erect adequate speed limit signs to advise the truck drivers of the speed limit;
- Operate mist spraying systems and automatic water sprinklers in the Fill Bank;
- Implement the dust mitigation measures for the site activities;
- Designate proper haul roads to ensure effective water spraying; and
- Ensure all vehicles to be washed before leaving the site egress by provision, operation and maintenance of automatic wheel washing facilities.

#### **Noise**

- Conduct noisy activities at a farther location from the NSRs.

#### **Water Quality**

- Maintain the drainage system, including the trapezoidal channels, permanent desilting chambers, regularly;
- Operate and maintain the silt curtains regularly;
- Operate the cleaning vessel within the TKO Basin regularly;
- Clean up the fill material on the concrete pavement at BHA frequently; and
- Remove the stagnant water or provide approved pesticides for the stagnant water in the permanent desilting chambers, if any.

#### **Landscape and Visual**

- Provide hydroseeding on the exposed slopes, on which the final profile has been formed;
- Erect all the site hoarding/chaining fences in accordance with agreed design at proper location;
- Maintain the hydroseeded slopes in accordance with the Landscape Plan.

#### **Chemical and Waste Management**

- Remove waste materials from the site to avoid accumulation regularly;
- Handle and store chemical wastes properly;
- Remove unwanted material in the existing stockpiles and avoid further dumping of such material;
- Provide and maintain sufficient drip trays for diesel drums, chemical containers, chemical waste storage drums and diesel operated generator set;
- Maintain mesh screen on top of the additional drainage to avoid improper dumping of rubbish;
- Maintain good housekeeping at the workshop area;
- Ensure sufficient tarpaulin sheets are provided to cover drip trays; and
- Avoid soil being polluted during oil filling and equipment maintenance; hence, properly remove and store the contaminated soil, if any

## **12.0 FUTURE KEY ISSUES**

### **12.1 Work Programme for the Coming Month**

As informed by the Contractor, the activities to be conducted by them in the next month included:

1. *Operation of the TKO137 Fill Bank.*
2. *Delivery of public fill to Taishan;*
3. *Operation of dewatering plant and expanded dewatering plant*
4. *Operation of bentonite pool.*
5. *Concrete block breaking work.*
6. *Crushing plant operation.*
7. *Removal of public fill at Portion A6*
8. *Construction of concrete pavement for Expanded Dewatering Plant*
9. *Provision of photoelectric height limits warning system at the existing height restriction gantries;*
10. *Re-construction of sampling platforms*
11. *Replacement of Y40 rebar with Y50 rebar at the existing wheel washing bay*
12. *Construction of concrete pavement at expanded dewatering plant*
13. *Repair works for damaged at TKOFB caused by Super Typhoon*
14. *Upgrading Works for Optical Fibre Cable System for CCTV at Tipping Halls of TKOFB;*
15. *Installation of Temporary Accommodation to CEDD Site Staff at TKOFB;*
16. *Demolition of Damaged Principle Site Office at TKOFB*
17. *Re-construction of CREO Room A at TKOFB*

### **12.2 Key Issues for the Coming Month**

**Key issues to be considered in the coming month include:**

- *Chemical and waste management;*
- *Treatment of runoff and wastewater prior to discharge;*
- *Dust generated from loading and unloading activities; and*
- *Dust generated from dump trucks traffic.*

**Mitigation measures to be required in the coming month:**

#### *Air Quality Impact*

- To provide adequate water spraying on haul roads and working platform;
- To operate and maintain automatic wheel washing facilities properly;

- To dampen the fill material prior to unloading or movement;
- To provide road sweeping on haul road near site egress and public roads outside site egress;
- To ensure implementation of the dust mitigation measures for the site activities;
- To maintain proper operation of the mist spraying system;
- To provide proper maintenance for vehicles and machines on site; and
- To investigate any other dust sources around the air sensitive receivers

#### Noise

- To switch off equipment if not in use;
- To operate silent equipment;
- To identify the noise sources inside and outside of the site;
- To follow up any exceedance caused by the Fill Bank operation; and
- To re-schedule the work activities in the event of valid noise exceedance.

#### Water Quality Impact

- To maintain the drainage system in the Fill Bank;
- To ensure the cleanliness of oil interceptor bypass tanks and all the drainage channels;
- To maintain the existing silt trap to ensure good efficiency of wheel wash facilities;
- To repair, inspect and maintain the silt curtains regularly;
- To provide covers for the drip trays to avoid stagnant water pond due to rainfall;
- To deploy a cleaning vessel to remove floating rubbish in the TKO Basin;
- To clean up the concrete paved area at Portion I every night to avoid fill materials from being washed into the sea; and
- To avoid any stagnant water or provide insecticide to avoid mosquito breeding in the Fill Bank.

#### Chemical and Waste Management

- To remove waste from the site regularly;
- To properly store and handle chemical wastes on site;
- To implement trip ticket system for all the imported public fill and general refuse disposal;
- To provide and manage sufficiently sized drip trays for diesel drums or chemical containers;
- To remove existing unwanted material in the stockpiles and avoid improper disposal at the Fill Bank through inspection of imported truckloads;
- To maintain proper housekeeping at the workshop area;
- To remove the oil stains in the event of leakage and handle all materials using for this cleaning works as chemical waste;
- To maintain mesh screen on top of the additional drainage, DP3 opening to avoid improper dumping of rubbish into this channel; and
- To identify C&D material by packaging, labeling, storage, transportation and disposal in accordance with statutory regulations.

### **12.3 Monitoring Schedule for the Coming Month**

The proposed EM&A program of the coming month is attached in Appendix K.

- END OF REPORT -

## **Appendix A**

### **Project Organization Chart**



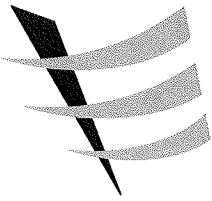


## **Appendix B1**

### **Calibration Certificates for Impact Air Quality Monitoring Equipment**







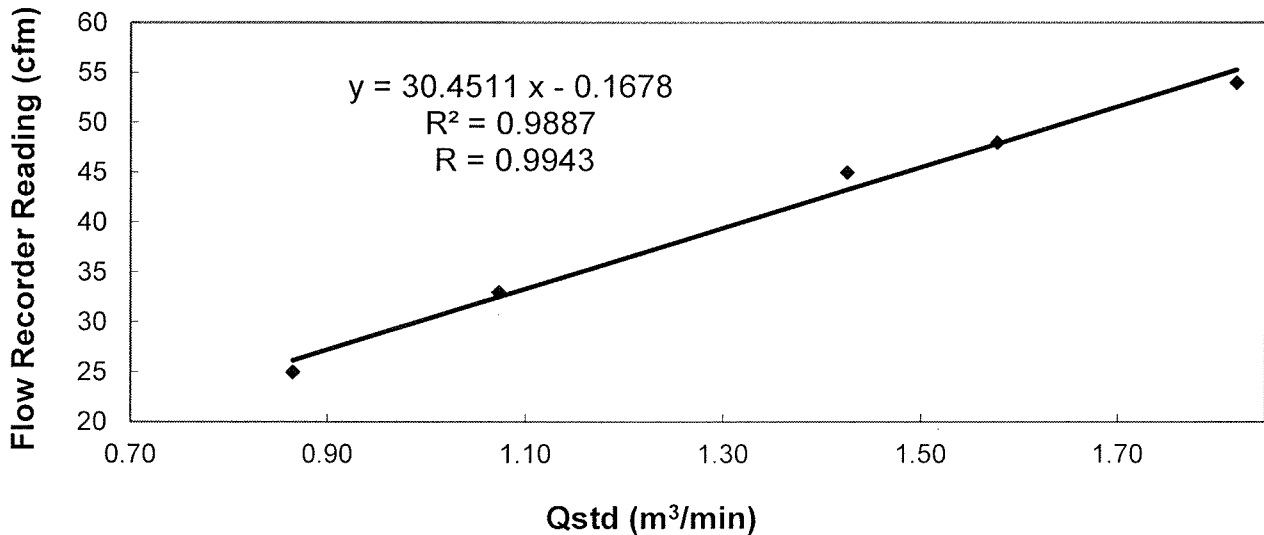
**Calibration Report**  
of  
**High Volume Air Sampler**

**Manufacturer** : Andersen G1051                      **Date of Calibration** : 15 February 2019  
**Serial No.** : 1176 ( ET / EA / 003 / 05 )                      **Calibration Due Date** : 14 April 2019  
**Method** : Based on Operations Manual for the 5-point calibration using standard calibration kit  
manufactured by Tisch TE-5025 A

**Results** :

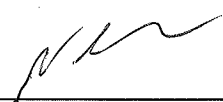
Flow recorder reading (cfm)	54	48	45	33	25
Qstd (Actual flow rate, m <sup>3</sup> /min)	1.82	1.58	1.43	1.07	0.86
Pressure :	768.81 mm Hg		Temp. :	291 K	

**Sampler 1176 Calibration Curve**  
Site: Tseung Kwan O 137 (TKO-A2a)

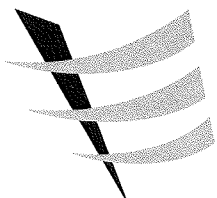


Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration

The high volume sampler complies\* / does not comply\* with the specified requirements and is deemed acceptable\* / unacceptable \* for use.

Calibrated by :   
LIAO, Yun Chao  
(Technician)

Checked by :   
LAU, Chi Leung  
(Environmental Team Leader)



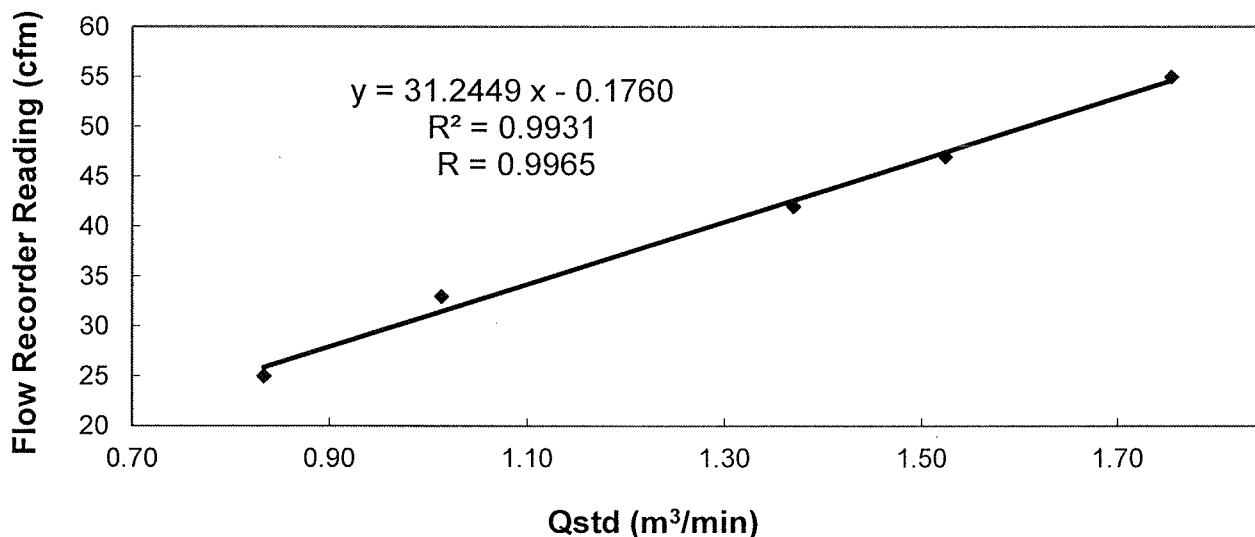
**Calibration Report**  
of  
**High Volume Air Sampler**

**Manufacturer** : Andersen G1051                      **Date of Calibration** : 12 April 2019  
**Serial No.** : 1176 ( ET / EA / 003 / 05 )                      **Calibration Due Date** : 11 June 2019  
**Method** : Based on Operations Manual for the 5-point calibration using standard calibration kit  
manufactured by Tisch TE-5025 A

**Results** :

Flow recorder reading (cfm)	55	47	42	33	25
Qstd (Actual flow rate, m <sup>3</sup> /min)	1.75	1.52	1.37	1.01	0.83
Pressure :	762.06 mm Hg			Temp. :	296 K

**Sampler 1176 Calibration Curve**  
**Site: Tseung Kwan O 137 (TKO-A2a)**



Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration

The high volume sampler complies\* / ~~does not comply\*~~ with the specified requirements and is deemed acceptable\* / unacceptable\* for use.

Calibrated by :   
LIAO, Yun Chao  
(Technician)

Checked by :   
LAU, Chi Leung  
(Environmental Team Leader)

# Certificate of Calibration

Calibration Certification Information			
Cal. Date: March 15, 2019	Rootmeter S/N: 438320	Ta: 293	°K
Operator: Jim Tisch		Pa: 760.7	mm Hg
Calibration Model #: TE-5025A	Calibrator S/N: <b>3612</b>		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4500	3.2	2.00
2	3	4	1	1.0300	6.3	4.00
3	5	6	1	0.9220	7.8	5.00
4	7	8	1	0.8780	8.7	5.50
5	9	10	1	0.7220	12.6	8.00

Data Tabulation					
Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left( \frac{Pa}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left( Ta/Pa \right)}$ (y-axis)
1.0138	0.6991	1.4269	0.9958	0.6868	0.8777
1.0096	0.9802	2.0180	0.9917	0.9628	1.2412
1.0076	1.0928	2.2561	0.9897	1.0735	1.3877
1.0064	1.1462	2.3663	0.9886	1.1259	1.4555
1.0012	1.3867	2.8538	0.9834	1.3621	1.7553
<b>QSTD</b>	m=	<b>2.07834</b>	<b>QA</b>	m=	<b>1.30142</b>
	b=	<b>-0.02094</b>		b=	<b>-0.01288</b>
	r=	<b>0.99994</b>		r=	<b>0.99994</b>

Calculations			
Vstd= $\Delta Vol / ((Pa - \Delta P) / Pstd) (Tstd / Ta)$	Va= $\Delta Vol / ((Pa - \Delta P) / Pa)$		
Qstd= Vstd / ΔTime	Qa= Va / ΔTime		
<b>For subsequent flow rate calculations:</b>			
Qstd= $1/m \left( \left( \sqrt{\Delta H \left( \frac{Pa}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)} \right) - b \right)$		Qa= $1/m \left( \left( \sqrt{\Delta H \left( Ta/Pa \right)} \right) - b \right)$	

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg
Key	
ΔH: calibrator manometer reading (in H2O)	
ΔP: rootmeter manometer reading (mm Hg)	
Ta: actual absolute temperature (°K)	
Pa: actual barometric pressure (mm Hg)	
b: intercept	
m: slope	

RECALIBRATION
US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

## **Appendix B2**

### **Impact Air Quality Monitoring Results**

## Summary of 24-hr TSP Monitoring Results



Monitoring Station : TKO-A1

Location : Site Egress

Start		Finish		Elapse Time		Sampling Time (hrs)	Flow Rate (m <sup>3</sup> /min.)		Average (m <sup>3</sup> /min.)	Filter Weight (g)		Conc. (µg/m <sup>3</sup> )
Date	Time	Date	Time	Initial	Final		Initial	Final		Initial	Final	
04/04/2019	08:00	05/04/2019	08:00	20075.74	20099.74	24.00	1.1381	1.1381	1.1381	2.6557	2.8032	90
10/04/2019	14:30	11/04/2019	14:30	20102.74	20126.74	24.00	1.1803	1.1803	1.1803	2.6432	2.8134	100
16/04/2019	08:00	17/04/2019	08:00	20129.74	20153.74	24.00	1.1233	1.1233	1.1233	2.6397	2.8001	99
22/04/2019	08:00	23/04/2019	08:00	20156.74	20180.74	24.00	1.1233	1.1233	1.1233	2.5854	2.7081	76
28/04/2019	08:00	29/04/2019	08:00	20183.74	20207.74	24.00	1.0839	1.0839	1.0839	2.5996	2.7274	82

Monitoring Station : TKO-A2a

Location : CREO

Start		Finish		Elapse Time		Sampling Time (hrs)	Flow Rate (m <sup>3</sup> /min.)		Average (m <sup>3</sup> /min.)	Filter Weight (g)		Conc. (µg/m <sup>3</sup> )
Date	Time	Date	Time	Initial	Final		Initial	Final		Initial	Final	
04/04/2019	08:00	05/04/2019	08:00	22169.61	22193.61	24.00	1.0564	1.0564	1.0564	2.6887	2.8011	74
10/04/2019	14:38	11/04/2019	14:38	22196.61	22220.61	24.00	1.0892	1.0892	1.0892	2.7049	2.8154	70
16/04/2019	08:00	17/04/2019	08:00	22223.61	22247.61	24.00	1.0618	1.0618	1.0618	2.6942	2.8123	77
22/04/2019	08:00	23/04/2019	08:00	22250.61	22274.61	24.00	1.0618	1.0618	1.0618	2.5961	2.7058	72
28/04/2019	08:00	29/04/2019	08:00	22277.61	22301.61	24.00	1.0938	1.0938	1.0938	2.5944	2.7384	91



## Summary of 1-hr TSP Monitoring Results



Monitoring Station : TKO-A1

Location : Site Egress

Start		Finish		Elapse Time		Sampling Time (hrs)	Flow Rate (m <sup>3</sup> /min.)		Average (m <sup>3</sup> /min.)	Filter Weight (g)		Conc. (µg/m <sup>3</sup> )
Date	Time	Date	Time	Initial	Final		Initial	Final		Initial	Final	
01/04/2019	09:43	01/04/2019	10:43	20072.74	20073.74	1.00	1.1381	1.1381	1.1381	2.6578	2.6636	85
01/04/2019	13:00	01/04/2019	14:00	20073.74	20074.74	1.00	1.1381	1.1381	1.1381	2.6553	2.6640	127
03/04/2019	09:50	03/04/2019	10:50	20074.74	20075.74	1.00	1.1381	1.1381	1.1381	2.6484	2.6634	220
08/04/2019	10:44	08/04/2019	11:44	20099.74	20100.74	1.00	1.1803	1.1803	1.1803	2.6318	2.6535	306
08/04/2019	13:11	08/04/2019	14:11	20100.74	20101.74	1.00	1.1803	1.1803	1.1803	2.6382	2.6611	323
08/04/2019	14:21	08/04/2019	15:21	20101.74	20102.74	1.00	1.1803	1.1803	1.1803	2.6848	2.7089	340
12/04/2019	14:50	12/04/2019	15:50	20126.74	20127.74	1.00	1.1233	1.1233	1.1233	2.6063	2.6164	150
12/04/2019	15:53	12/04/2019	16:53	20127.74	20128.74	1.00	1.1233	1.1233	1.1233	2.6108	2.6226	175
15/04/2019	09:30	15/04/2019	10:30	20128.74	20129.74	1.00	1.0839	1.0839	1.0839	2.5702	2.5747	69
17/04/2019	10:20	17/04/2019	11:20	20153.74	20154.74	1.00	1.1233	1.1233	1.1233	2.5943	2.6047	154
17/04/2019	13:00	17/04/2019	14:00	20154.74	20155.74	1.00	1.1233	1.1233	1.1233	2.5989	2.6079	134
17/04/2019	14:03	17/04/2019	15:03	20155.74	20156.74	1.00	1.1233	1.1233	1.1233	2.5981	2.6067	128
24/04/2019	14:50	24/04/2019	15:50	20180.74	20181.74	1.00	1.0839	1.0839	1.0839	2.6227	2.6427	308
24/04/2019	16:40	24/04/2019	17:40	20181.74	20182.74	1.00	1.0839	1.0839	1.0839	2.5984	2.6181	303
26/04/2019	09:05	26/04/2019	10:05	20182.74	20183.74	1.00	1.0839	1.0839	1.0839	2.6100	2.6325	346
29/04/2019	09:00	29/04/2019	10:00	20207.74	20208.74	1.00	1.1233	1.1233	1.1233	2.5995	2.6092	144
29/04/2019	10:04	29/04/2019	11:04	20208.74	20209.74	1.00	1.1233	1.1233	1.1233	2.6439	2.6552	168

Monitoring Station : TKO-A2a

Location : CREO



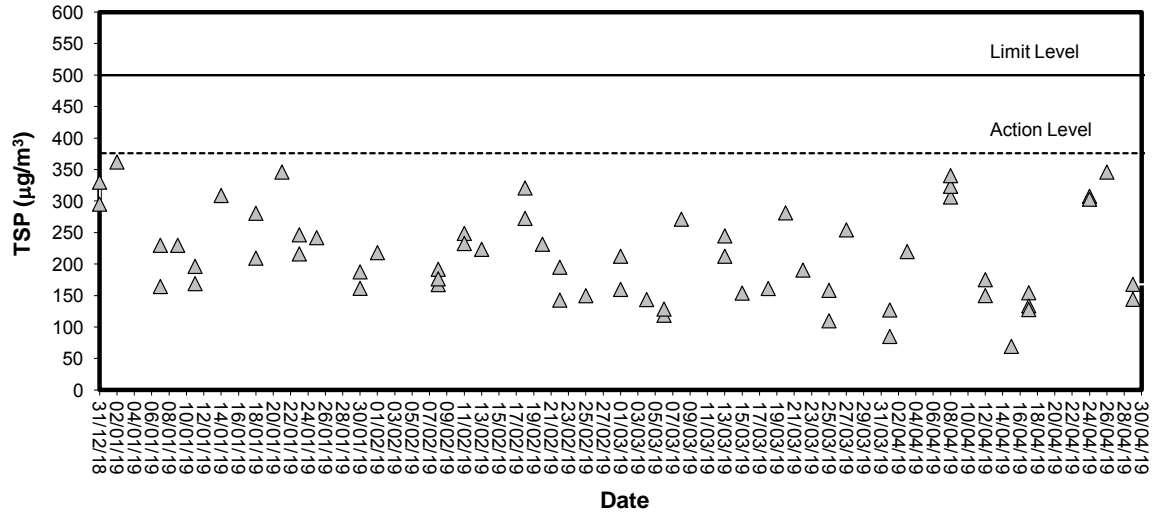
Start		Finish		Elapse Time		Sampling Time (hrs)	Flow Rate (m <sup>3</sup> /min.)		Average (m <sup>3</sup> /min.)	Filter Weight (g)		Conc. (µg/m <sup>3</sup> )
Date	Time	Date	Time	Initial	Final		Initial	Final		Initial	Final	
01/04/2019	09:38	01/04/2019	10:38	22166.61	22167.61	1.00	1.0564	1.0564	1.0564	2.6478	2.6550	114
01/04/2019	13:10	01/04/2019	14:10	22167.61	22168.61	1.00	1.0564	1.0564	1.0564	2.6534	2.6628	148
03/04/2019	09:45	03/04/2019	10:45	22168.61	22169.61	1.00	1.0564	1.0564	1.0564	2.6556	2.6723	263
08/04/2019	10:48	08/04/2019	11:48	22193.61	22194.61	1.00	1.0564	1.0564	1.0564	2.6488	2.6712	353
08/04/2019	13:15	08/04/2019	14:15	22194.61	22195.61	1.00	1.0564	1.0564	1.0564	2.6428	2.6649	349
08/04/2019	14:17	08/04/2019	15:17	22195.61	22196.61	1.00	1.0564	1.0564	1.0564	2.6949	2.7175	357
12/04/2019	14:58	12/04/2019	15:58	22220.61	22221.61	1.00	1.0618	1.0618	1.0618	2.6205	2.6320	181
12/04/2019	16:10	12/04/2019	17:10	22221.61	22222.61	1.00	1.0618	1.0618	1.0618	2.6084	2.6190	166
15/04/2019	09:25	15/04/2019	10:25	22222.61	22223.61	1.00	1.0618	1.0618	1.0618	2.5983	2.6046	99
17/04/2019	10:30	17/04/2019	11:30	22247.61	22248.61	1.00	1.0618	1.0618	1.0618	2.6061	2.6119	91
17/04/2019	13:00	17/04/2019	14:00	22248.61	22249.61	1.00	1.0618	1.0618	1.0618	2.5999	2.6067	107
17/04/2019	14:10	17/04/2019	15:10	22249.61	22250.61	1.00	1.0618	1.0618	1.0618	2.5946	2.6016	110
24/04/2019	14:54	24/04/2019	15:54	22274.61	22275.61	1.00	1.0298	1.0298	1.0298	2.6128	2.6322	314
24/04/2019	16:30	24/04/2019	17:30	22275.61	22276.61	1.00	1.0298	1.0298	1.0298	2.6127	2.6345	353
26/04/2019	09:10	26/04/2019	10:10	22276.61	22277.61	1.00	1.0298	1.0298	1.0298	2.5947	2.6149	327
29/04/2019	09:05	29/04/2019	10:05	22301.61	22302.61	1.00	1.0938	1.0938	1.0938	2.5808	2.5907	151
29/04/2019	10:10	29/04/2019	11:10	22302.61	22303.61	1.00	1.0938	1.0938	1.0938	2.5961	2.6054	142

## **Appendix B3**

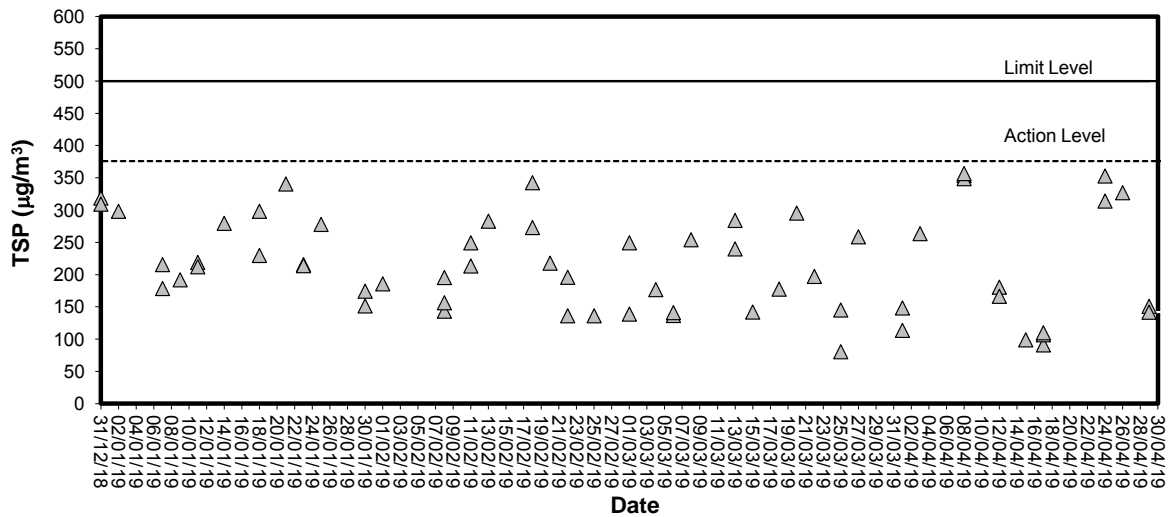
### **Graphical Plots of Impact Air Quality Monitoring Data**



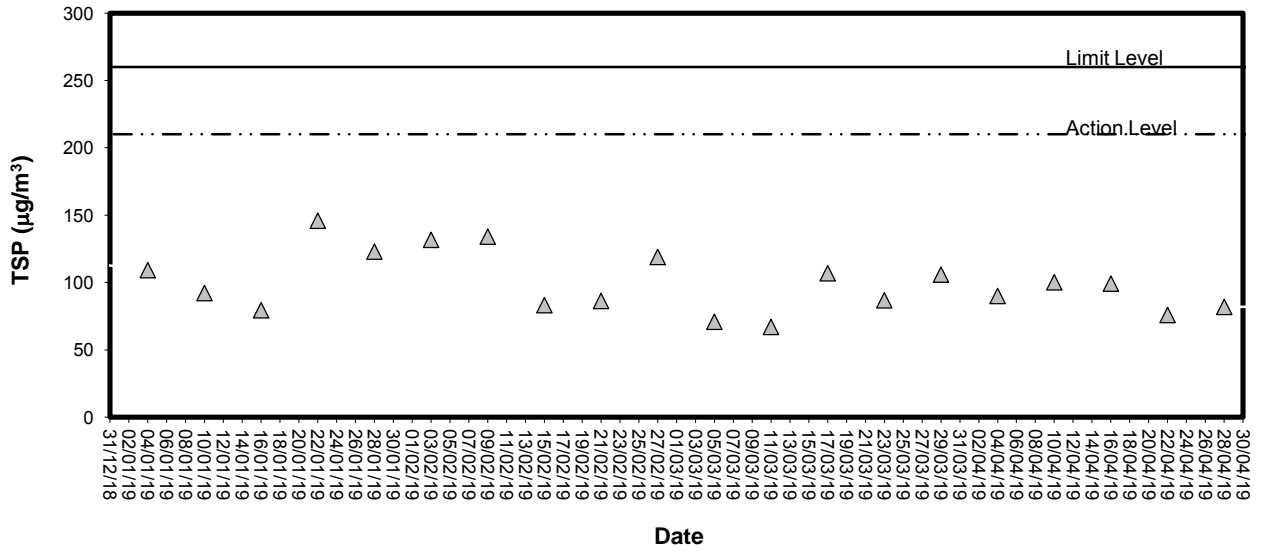
**1-hour TSP level at TKO-A1**



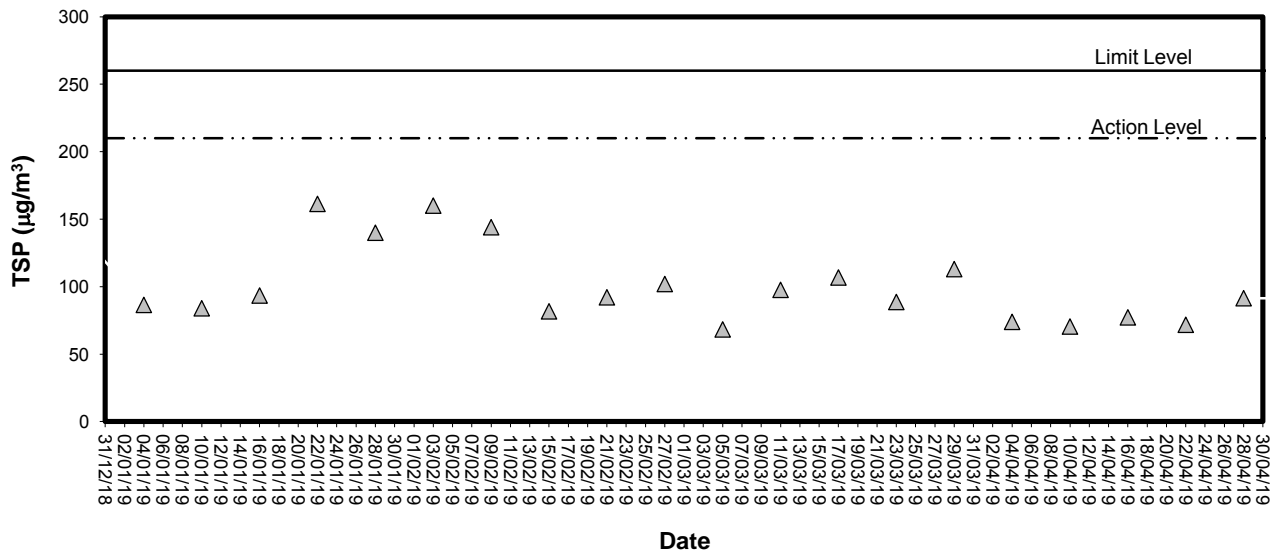
**1-hour TSP level at TKO-A2a**



**24-hour TSP level at TKO-A1**



**24-hour TSP level at TKO-A2a**



## **Appendix C1**

### **Calibration Certificates for Impact Noise Monitoring Equipment**



# Calibration Certificate

Certificate No. **901844**

Page 1 of 2 Pages

**Customer :** ETS-Testconsult Limited

**Address :** 8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan St., Fotan, Hong Kong.

**Order No. :** Q90738

**Date of receipt :** 26-Feb-19

## Item Tested

**Description :** Acoustic Calibrator

**Manufacturer :** Castle

**I.D. :** ET/EN/002/07

**Model :** GA607

**Serial No. :** 038641

## Test Conditions

**Date of Test :** 6-Mar-19

**Supply Voltage :** --

**Ambient Temperature :** (23 ± 3)°C

**Relative Humidity :** (50 ± 25) %

## Test Specifications

Calibration check.

Ref. Document/Procedure : IEC 60942, F06, F20, Z02.

## Test Results

All results were within the IEC 60942 Class 1 specification.

The results are shown in the attached page(s).

Main Test equipment used:

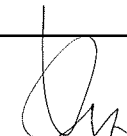
<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Traceable to</u>
S014	Spectrum Analyzer	805025	NIM-PRC & SCL-HKSAR
S240	Sound Level Calibrator	803357	NIM-PRC & SCL-HKSAR
S041	Universal Counter	802061	SCL-HKSAR
S206	Sound Level Meter	805027	SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI), or by reference to a natural constant.

The test results apply to the above Unit-Under-Test only

**Calibrated by :**   
Elva Chong

**Approved by :**   
Kin Wong

This Certificate is issued by:  
Hong Kong Calibration Ltd.  
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.  
Tel: 2425 8801 Fax: 2425 8646

**Date:** 6-Mar-19



# Calibration Certificate

Certificate No. 901844

Page 2 of 2 Pages

Results :

## 1. Generated Sound Pressure Level

UUT Nominal Value (dB)	Measured Value (dB)	IEC 60942 Class 1 Spec.
94.0	94.1	± 0.4 dB

Uncertainty : ± 0.2 dB

## 2. Short-term Level Fluctuation : 0.0 dB

IEC 60942 Class 1 Spec. : ± 0.1 dB

Uncertainty : ± 0.01 dB

## 3. Frequency

UUT Nominal Value (kHz)	Measured Value (kHz)	IEC 60942 Class 1 Spec.
1	1.000	± 1 %

Uncertainty : ± 3.6 x 10<sup>-6</sup>

## 4. Total Distortion : < 2.9 %

IEC 60942 Class 1 Spec. : < 4 %

Uncertainty : ± 2.3 % of reading

Remark : 1. UUT : Unit-Under-Test

2. The uncertainty claimed is for a confidence probability of not less than 95%.

3. Atmospheric Pressure : 1 002 hPa.

----- END -----





# Calibration Certificate

Certificate No. **901292**

Page 1 of 3 Pages

**Customer :** ETS-Testconsult Limited

**Address :** 8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan St., Fotan, Hong Kong.

**Order No. :** Q90546

**Date of receipt :** 14-Feb-19

## Item Tested

**Description :** Sound Level Meter

**Manufacturer :** Rion

**I.D. :** ET/EN/003/18

**Model :** NL-52

**Serial No. :** 00264520

## Test Conditions

**Date of Test :** 27-Feb-19

**Supply Voltage :** --

**Ambient Temperature :** (23 ± 3)°C

**Relative Humidity :** (50 ± 25) %

## Test Specifications

Calibration check.

Ref. Document/Procedure: Z01, IEC 61672.

## Test Results

All results were within the IEC 61672 Type 1 or manufacturer's specification.

The results are shown in the attached page(s).

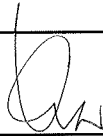
Main Test equipment used:

<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Traceable to</u>
S017	Multi-Function Generator	C190926	SCL-HKSAR
S240	Sound Level Calibrator	803357	NIM-PRC & SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI), or by reference to a natural constant. The test results apply to the above Unit-Under-Test only

**Calibrated by :**   
Elva Chong

**Approved by :**   
Kin Wong

**Date:** 27-Feb-19

This Certificate is issued by:  
Hong Kong Calibration Ltd.  
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.  
Tel: 2425 8801 Fax: 2425 8646



# Calibration Certificate

Certificate No. 901292

Page 2 of 3 Pages

Results :

## Acoustical signal test

1. Self-generated noise: 15.9 dBA (Mfr's Spec  $\leq$  17 dBA )

## 2. Reference Sound Pressure Level

UUT Setting				Applied Value (dB)	UUT Reading (dB)
Range (dB)	Frequency Weighting	Time Weighting	Octave Filter		
20 ~ 130	A	F	OFF	94.0	94.0
		S	OFF		94.0
	C	F	OFF		94.0
	Z	F	OFF		94.0
	A	F	OFF	114.0	114.0
		S	OFF		114.0
	C	F	OFF		114.0
	Z	F	OFF		114.0

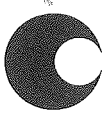
IEC 61672 Type 1 Spec. :  $\pm$  1.1 dB  
Uncertainty :  $\pm$  0.1 Db

## Electrical signal tests

### 3. Electrical signal tests of frequency weightings (A weighting)

Frequency	Attenuation (dB)	IEC 61672 Type 1 Spec.
31.5 Hz	-39.6	- 39.4 dB, $\pm$ 2 dB
63 Hz	-26.3	- 26.2 dB, $\pm$ 1.5 dB
125 Hz	-16.2	- 16.1 dB, $\pm$ 1.5 dB
250 Hz	-8.7	- 8.6 dB, $\pm$ 1 dB
500 Hz	-3.3	- 3.2 dB, $\pm$ 1.4 dB
1 kHz	0.0 (Ref)	0 dB, $\pm$ 1.1 dB
2 kHz	+1.2	+ 1.2 dB, $\pm$ 1.6 dB
4 kHz	+1.0	+ 1.0 dB, $\pm$ 1.6 dB
8 kHz	-1.1	- 1.1 dB, + 2.1 dB ~ -3.1 dB
16 kHz	-8.0	- 6.6 dB, + 3.5 dB ~ - 17.0 dB

Uncertainty :  $\pm$  0.1 dB



# Calibration Certificate

Certificate No. 901292

Page 3 of 3 Pages

## 4. Frequency & Time weightings at 1 kHz

### 4.1 Frequency Weighting (Fast)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
A	94.0	94.0 (Ref.)	--	± 0.4 dB
C	94.0	94.0	0.0	
Z	94.0	94.0	0.0	

### 4.2 Time Weighting (A-weighted)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
Fast	94.0	94.0 (Ref.)	--	± 0.3 dB
Slow	94.0	94.0	0.0	
Time-averaging	94.0	94.0	0.0	

Uncertainty : ± 0.1 dB

Remarks : 1. UUT : Unit-Under-Test

2. The uncertainty claimed is for a confidence probability of not less than 95%.

3. Atmospheric Pressure : 1 001 hPa.

4. Preamplifier model : NH-25 , S/N : 64645

5. Firmware Version: 1.7

6. Power Supply Check: OK

7. The UUT was adjusted with the laboratory's sound calibrator at the reference sound pressure level before the calibration.

----- END -----

## **Appendix C2**

### **Impact Noise Monitoring Results**

## Day-time Noise Monitoring

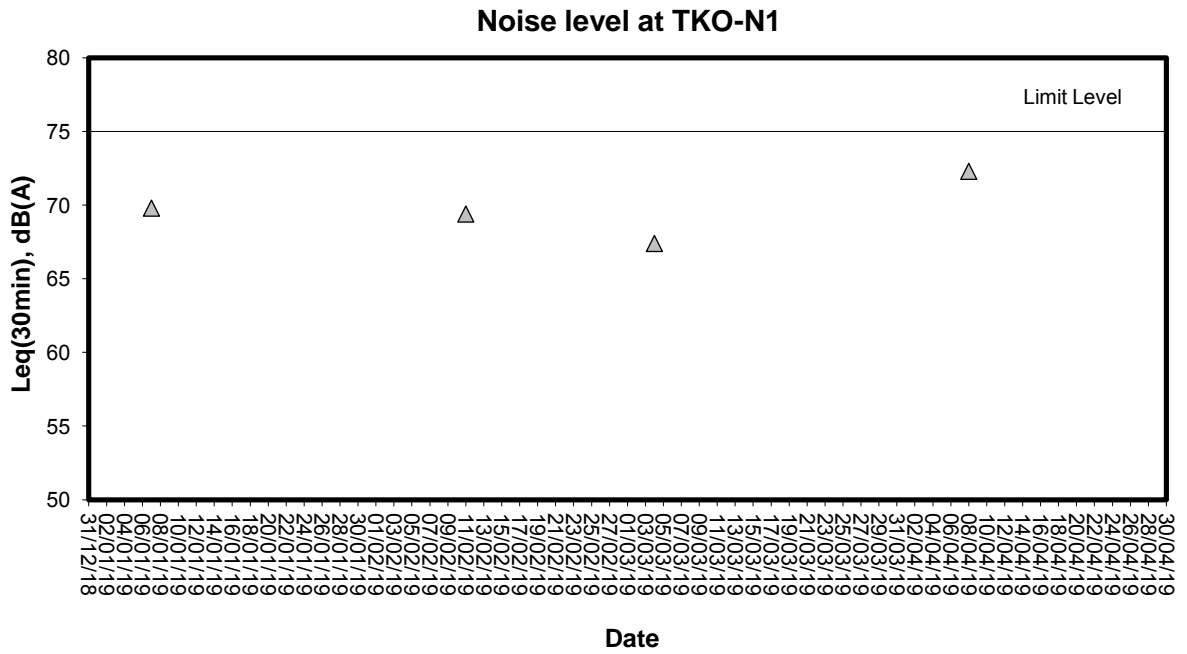
Monitoring Location: TKO-N1 (Site Egress)

Date	Start Sampling Time (hh:mm)	Noise Level dB (A)			Wind Speed (m/s)	Weather Condition
		$L_{eq(30min)}$	$L_{10}$	$L_{90}$		
08/04/19	14:15	72.3	74.6	68.5	0.1	Cloudy

## **Appendix C3**

### **Graphical Plots of Impact Noise Monitoring Data**

## Noise Monitoring (Day-time)



## **Appendix D1**

### **Calibration Certificates for Impact Marine Water Quality Monitoring Equipments**





### Calibration Report of Dissolved Oxygen Meter (*In situ* Measurement)

Equipment Ref. No. : <u>ET/EW/008/006</u>	Manufacturer : <u>YSI</u>
Model No. : <u>Pro 2030</u>	Serial No. : <u>12A100554</u>
Calibration Date : <u>2/3/2019</u>	Calibration Due Date : <u>1/6/2019</u>

**Temperature Verification by Reference Thermometer (ET/0521/028)**

	Temperature Reading (°C)	Correction (°C)	Corrected Temperature (°C)	Difference (°C)
Reference Thermometer	20.2	0.0	20.2	0.1
DO Meter	20.3	0.0	20.3	

Criteria: Difference between corrected temperature from DO meter and reference thermometer :  $< \pm 0.5 \text{ }^\circ\text{C}$

**Zero Point Checking**

DO meter reading (mg/L)	0.01
-------------------------	------

Criteria: Zero checking: 0.0 mg/L

**Linearity Checking of Dissolved Oxygen Content by APHA 19ed 4500-O G**

Purging time, min	Expected DO value (mg/L) (ET/0510/012)	DO meter reading (mg/L)	Difference of DO Content (mg/L)
2	6.22	6.41	0.19
5	3.88	3.96	0.08
10	2.15	2.31	0.16

Criteria: Difference between DO meter reading and expected DO value:  $< \pm 0.30 \text{ mg/L}$

**Salinity Checking by APHA 19ed 2520 B**

	Expected Salinity (ppt)	DO meter reading (ppt)
Reagent No. of NaCl (10 ppt): CPE/012/4.7/27	10	9.3
Reagent No. of NaCl (30 ppt): CPE/012/4.8/27	30	28.5

Criteria: Difference between DO meter reading and expected Salinity:  $\pm 10.0 \%$

The equipment complies <sup>#</sup> / ~~does not comply~~ <sup>#</sup> with the specified requirements and is deemed acceptable <sup>#</sup> / unacceptable <sup>#</sup> for use.

<sup>#</sup> Delete as appropriate

Calibrated by :

Approved by :



## Performance Check of Turbidity Meter

Equipment Ref. No. : ET/0505/021      Manufacturer : HACH  
Model No. : 2100Q      Serial No. : 17020C056013  
Date of Calibration : 25/4/2019      Due Date : 24/7/19


Theoretical Value of Turbidity Standard (NTU)	Measured Value (NTU)	Difference % *
20	20.2	1.0%
100	102	2.0%
800	785	-1.9%

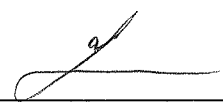
(\* ) Difference = (Measured Value – Theoretical Value) / Theoretical Value x 100

Acceptance Criteria

Difference : -5 % to 5 %

The turbidity meter complies \* / ~~does not comply~~ \* with the specified requirements and is deemed acceptable \* / ~~unacceptable~~ \* for use. Measurements are traceable to national standards.

Prepared by : 

Checked by : 

## **Appendix D2**

### **Impact Marine Water Quality Monitoring Results**

**Mid-Ebb Tide**

**Monitoring Station : TKO-C1**

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)				
						Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average		
01/04/19	0940-0955	21/Cloudy	Surface	1.0	20.9	31.4	31.4	7.29	7.28	7.15	98.1	98.0	3.68	3.67	3.86	2.3	2.4	2.5		
						31.4		7.27			97.9		3.66			2.4				
			Middle	10.5	20.7	31.5	31.5	7.01	7.03		94.1	94.3	94.5	91.9		3.84	3.88		2.4	2.5
						31.5		7.04			94.5		3.88			2.5				
			Bottom	19.9	20.5	31.7	31.7	6.88	6.86		92.1	91.9	4.02	4.04		4.02	4.04		2.4	2.6
						31.7		6.84			91.6		4.05			2.7				
03/04/19	1042-1058	26/Fine	Surface	1.0	23.7	31.0	31.1	7.36	7.42	7.35	103.9	104.7	3.81	3.83	3.58	2.9	3.0	3.0		
						31.1		7.47			105.5		3.85			3.1				
			Middle	10.7	23.5	31.2	31.3	7.21	7.28		101.6	102.6	103.5	99.9		3.64	3.66		2.9	3.1
						31.3		7.35			103.5		3.68			2.9				
			Bottom	20.3	23.4	31.4	31.5	7.04	7.11		99.0	99.9	100.8	99.9		3.21	3.24		3.0	3.0
						31.5		7.17			100.8		3.26			2.9				
06/04/19	1017-1033	25/Fine	Surface	1.0	24.8	31.3	31.3	7.19	7.17	7.09	103.6	103.3	3.56	3.58	3.78	3.4	3.2	3.0		
						31.3		7.15			103.0		3.59			2.9				
			Middle	10.6	24.7	31.4	31.4	7.02	7.01		101.0	100.9	100.7	98.3		3.81	3.79		2.4	2.8
						31.4		7.00			100.7		3.77			3.2				
			Bottom	20.1	24.5	31.5	31.6	6.86	6.85		98.4	98.3	98.1	98.3		3.98	3.97		2.9	3.0
						31.6		6.83			98.1		3.96			3.1				
08/04/19	1314-1329	27/Cloudy	Surface	1.0	23.8	31.4	31.5	7.17	7.18	7.08	101.5	101.7	3.77	3.74	3.90	1.9	1.9	2.2		
						31.5		7.19			101.8		3.70			1.8				
			Middle	10.6	23.6	31.5	31.6	6.97	6.98		98.4	98.6	98.7	97.1		3.92	3.90		1.8	1.9
						31.6		6.99			98.7		3.88			1.9				
			Bottom	20.2	23.5	31.6	31.6	6.90	6.89		97.3	97.1	96.9	97.1		4.04	4.06		3.0	2.9
						31.6		6.87			96.9		4.08			2.8				
10/04/19	1432-1448	27/Fine	Surface	1.0	26.8	31.3	31.3	7.42	7.44	7.39	110.6	110.9	3.71	3.70	3.86	2.1	2.0	1.7		
						31.3		7.46			111.2		3.69			1.9				
			Middle	10.6	26.6	31.4	31.4	7.35	7.34		109.2	109.1	108.9	106.5		3.82	3.84		1.4	1.6
						31.4		7.33			108.9		3.86			1.7				
			Bottom	20.1	26.5	31.5	31.6	7.18	7.17		106.7	106.5	106.2	106.5		4.04	4.03		1.5	1.6
						31.6		7.15			106.2		4.01			1.7				
12/04/19	1448-1503	24/Cloudy	Surface	1.0	23.6	30.8	30.8	7.04	7.06	6.96	99.0	99.3	3.87	3.84	3.94	3.2	3.1	3.1		
						30.8		7.07			99.5		3.81			3.0				
			Middle	10.8	23.5	31.2	31.2	6.87	6.86		96.7	96.5	96.3	95.1		3.94	3.96		3.0	3.0
						31.2		6.84			96.3		3.98			3.0				
			Bottom	20.6	23.4	31.3	31.4	6.75	6.77		94.9	95.1	95.3	95.1		4.04	4.02		3.2	3.2
						31.4		6.78			95.3		3.99			3.1				
15/04/19	0853-0908	22/Cloudy	Surface	1.0	21.8	31.2	31.3	7.36	7.37	7.30	100.6	100.7	3.57	3.56	3.75	4.3	4.6	6.1		
						31.3		7.38			100.8		3.55			4.8				
			Middle	10.8	21.7	31.4	31.4	7.21	7.23		98.5	98.8	99.0	96.0		3.78	3.77		7.5	7.2
						31.4		7.25			99.0		3.75			6.8				
			Bottom	20.5	21.5	31.6	31.6	7.03	7.05		95.8	96.0	96.1	96.0		3.89	3.91		6.4	6.6
						31.5		7.06			96.1		3.93			6.7				

**Mid-Ebb Tide**

**Monitoring Station : TKO-C1**

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average
17/04/19	0938-0952	28/Fine	Surface	1.0	20.8	31.1	31.1	7.34	7.42	7.32	98.3	99.4	3.86	3.88	3.69	2.8	3.0	3.2
						31.1		7.50			100.5		3.90			3.1		
			Middle	10.7	20.6	31.2	31.3	7.16	7.22		95.7	96.5	3.67	3.64		3.7	3.6	
						31.3		7.28			97.3		3.61			3.4		
			Bottom	20.3	20.5	31.4	31.5	7.05	7.08		94.1	94.5	3.53	3.55		3.2	3.1	
						31.5		7.11			94.9		3.56			3.0		
23/04/19	1400-1419	28/Fine	Surface	1.0	25.1	30.9	30.9	7.07	7.08	7.17	102.0	102.2	3.41	3.43	3.54	2.8	2.7	2.2
						30.9		7.09			102.3		3.44			2.6		
			Middle	10.8	24.7	31.3	31.3	7.24	7.26		104.1	104.3	3.60	3.62		2.1	2.2	
						31.2		7.27			104.4		3.63			2.3		
			Bottom	20.5	24.5	31.5	31.5	7.30	7.32		104.8	105.0	3.55	3.57		1.9	1.8	
						31.4		7.33			105.1		3.58			1.7		
25/04/19	1534-1548	30/Cloudy	Surface	1.0	27.9	31.8	31.8	7.06	7.08	6.96	107.5	107.7	3.93	3.92	4.06	5.1	5.5	5.1
						31.8		7.09			107.9		3.91			5.8		
			Middle	11.1	27.7	32.0	32.0	6.87	6.85		104.4	104.0	4.06	4.05		5.0	5.1	
						31.9		6.83			103.6		4.03			5.1		
			Bottom	21.1	27.6	32.2	32.2	6.71	6.70		101.8	101.7	4.18	4.20		4.8	4.7	
						32.1		6.69			101.5		4.22			4.5		
27/04/19	1518-1532	27/Cloudy	Surface	1.0	25.8	31.7	31.8	7.08	7.07	7.02	103.9	103.7	3.82	3.84	3.96	5.6	5.8	6.2
						31.8		7.05			103.5		3.85			6.0		
			Middle	10.7	25.6	31.9	32.0	6.98	6.97		102.3	102.1	3.97	3.94		5.9	5.6	
						32.0		6.95			101.9		3.91			5.3		
			Bottom	20.4	25.5	32.1	32.1	6.94	6.92		101.6	101.3	4.12	4.10		7.4	7.3	
						32.1		6.90			101.0		4.08			7.1		
29/04/19	0849-0903	24/Fine	Surface	1.0	24.5	31.0	31.1	7.36	7.40	7.33	105.4	106.0	3.91	3.93	3.74	1.6	1.7	2.1
						31.1		7.44			106.6		3.94			1.8		
			Middle	10.7	24.3	31.2	31.2	7.21	7.26		103.0	103.6	3.85	3.86		2.4	2.6	
						31.2		7.30			104.2		3.86			2.7		
			Bottom	20.4	24.1	31.3	31.4	7.10	7.18		101.1	102.2	3.43	3.45		2.0	1.9	
						31.4		7.25			103.2		3.46			1.8		

**Mid-Ebb Tide**

**Monitoring Station : TKO-M4**

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average
01/04/19	1101-1116	21/Cloudy	Surface	1.0	20.8	31.5	31.5	7.21	7.23	7.15	96.9	97.2	3.55	3.54	3.76	2.9	2.8	2.6
						31.5		7.25					97.5			3.53		
			Middle	4.9	20.6	31.6	31.7	7.06	7.08		94.6	94.8	3.74	3.76		2.8	2.9	
						31.7		7.09			95.0		3.77			2.9		
			Bottom	8.7	20.4	31.8	31.8	6.94	6.93		92.8	92.7	3.99	3.97		2.1	2.2	
						31.8		6.92			92.5		3.95			2.3		
03/04/19	1212-1226	26/Fine	Surface	1.0	23.7	31.0	31.1	7.46	7.40	7.36	105.3	104.4	3.74	3.76	3.42	2.6	2.6	2.9
						31.1		7.33					103.5			3.78		
			Middle	4.7	23.6	31.3	31.3	7.27	7.33		102.5	103.4	3.36	3.38		2.9	3.0	
						31.3		7.39			104.2		3.39			3.0		
			Bottom	8.4	23.6	31.3	31.4	7.11	7.16		100.2	100.9	3.09	3.12		3.3	3.2	
						31.4		7.20			101.6		3.14			3.0		
06/04/19	1140-1155	25/Fine	Surface	1.0	24.7	31.4	31.4	7.22	7.23	7.14	103.9	104.1	3.43	3.44	3.59	3.3	3.3	3.4
						31.4		7.24					104.2			3.45		
			Middle	4.7	24.5	31.6	31.6	7.07	7.06		101.6	101.3	3.60	3.59		3.5	3.4	
						31.5		7.04			101.0		3.57			3.2		
			Bottom	8.4	24.3	31.7	31.7	6.93	6.91		99.3	99.0	3.75	3.73		3.5	3.7	
						31.7		6.89			98.7		3.71			3.8		
08/04/19	1428-1441	27/Cloudy	Surface	1.0	23.7	31.5	31.5	7.34	7.36	7.26	103.8	104.1	3.56	3.54	3.77	2.6	2.6	2.5
						31.5		7.38					104.4			3.52		
			Middle	4.4	23.5	31.6	31.6	7.18	7.16		101.2	101.0	3.88	3.85		2.8	2.7	
						31.6		7.14			100.7		3.81			2.5		
			Bottom	7.8	23.4	31.5	31.6	7.02	7.04		98.8	99.1	3.94	3.92		2.0	2.2	
						31.6		7.06			99.3		3.90			2.4		
10/04/19	1555-1610	27/Fine	Surface	1.0	26.9	31.3	31.4	7.59	7.58	7.52	113.3	113.2	3.57	3.56	3.72	1.5	1.7	1.8
						31.4		7.56					113.0			3.55		
			Middle	4.8	26.7	31.5	31.5	7.44	7.46		110.9	111.2	3.76	3.78		1.4	1.5	
						31.5		7.48			111.5		3.79			1.5		
			Bottom	8.6	26.5	31.6	31.6	7.25	7.24		107.7	107.6	3.84	3.82		2.1	2.3	
						31.6		7.23			107.4		3.80			2.4		
12/04/19	1605-1620	24/Cloudy	Surface	1.0	23.6	30.9	31.0	7.15	7.17	7.10	100.7	100.9	3.70	3.73	3.81	4.0	3.9	3.5
						31.0		7.18					101.1			3.76		
			Middle	4.6	23.4	31.0	31.1	7.01	7.03		98.4	98.6	3.79	3.77		3.2	3.1	
						31.1		7.04			98.8		3.75			3.0		
			Bottom	8.2	23.4	31.2	31.2	6.90	6.88		97.0	96.8	3.93	3.92		3.8	3.6	
						31.2		6.86			96.5		3.90			3.4		
15/04/19	1014-1028	22/Cloudy	Surface	1.0	21.7	31.3	31.3	7.44	7.42	7.32	101.5	101.3	3.47	3.46	3.59	5.6	5.3	6.3
						31.3		7.40					101.0			3.44		
			Middle	4.8	21.5	31.5	31.5	7.20	7.22		98.0	98.2	3.56	3.58		7.6	7.3	
						31.4		7.23			98.4		3.60			6.9		
			Bottom	8.6	21.4	31.6	31.6	7.11	7.10		96.6	96.5	3.73	3.72		6.6	6.3	
						31.6		7.09			96.3		3.71			5.9		

**Mid-Ebb Tide**

**Monitoring Station : TKO-M4**

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average
17/04/19	1105-1121	28/Fine	Surface	1.0	20.8	31.1	31.1	7.41	7.37	7.34	99.3	98.8	3.68	3.69	3.45	4.5	4.4	3.7
						31.1		7.33			98.2		3.69			4.2		
						31.2		7.26			97.3		3.41			4.1		
			Middle	4.8	20.7	31.3	31.3	7.35	7.31		98.5	97.9	3.38	3.40		4.6	4.4	
						31.4		7.17			96.1		3.26			2.5		
						31.5		7.24			97.1		3.29			2.2		
			Bottom	8.5	20.7	31.5	31.5	7.21	7.21		96.6	96.6	3.26	3.28		2.2	2.4	
						31.4		7.17			96.1		3.26			2.5		
						31.5		7.24			97.1		3.29			2.2		
23/04/19	1535-1550	28/Fine	Surface	1.0	24.9	31.0	31.1	7.00	6.99	7.16	101.0	100.9	3.27	3.29	3.43	2.3	2.5	2.5
						31.1		6.97			100.7		3.31			2.6		
						31.3		7.31			105.1		3.38			2.5		
			Middle	4.8	24.6	31.3	31.3	7.34	7.33		105.4	105.3	3.40	3.39		2.6	2.6	
						31.5		7.45			106.9		3.60			2.7		
						31.6		7.47			107.1		3.63			2.5		
			Bottom	9.5	24.5	31.6	31.6	7.46	7.46		107.0	107.0	3.63	3.62		2.5	2.6	
						31.5		7.45			106.9		3.60			2.7		
						31.6		7.47			107.1		3.63			2.5		
25/04/19	1645-1658	30/Cloudy	Surface	1.0	27.8	31.9	31.9	7.15	7.14	7.07	108.7	108.6	3.67	3.65	3.82	5.3	5.1	5.2
						31.9		7.13			108.4		3.63			4.8		
						32.1		7.02			106.5		3.85			5.2		
			Middle	5.0	27.6	32.1	32.1	6.98	7.00		105.9	106.2	3.88	3.87		5.5	5.4	
						32.2		6.74			102.0		3.96			5.3		
						32.3		6.77			102.6		3.94			4.9		
			Bottom	9.0	27.4	32.3	32.3	6.76	6.76		102.3	102.3	3.96	3.95		4.9	5.1	
						32.2		6.74			102.0		3.96			5.3		
						32.3		6.77			102.6		3.94			4.9		
27/04/19	1626-1639	27/Cloudy	Surface	1.0	25.8	31.9	32.0	7.15	7.17	7.10	105.1	105.3	3.65	3.63	3.84	6.5	6.5	6.5
						32.0		7.18			105.5		3.61			6.4		
						32.0		7.02			102.9		3.94			6.5		
			Middle	4.4	25.6	32.1	32.1	7.04	7.03		103.2	103.1	3.90	3.92		6.6	6.6	
						32.1		6.97			102.3		3.98			6.8		
						32.1		6.94			101.8		3.95			6.4		
			Bottom	7.8	25.6	32.1	32.1	6.96	6.96		102.1	102.1	3.95	3.97		6.4	6.6	
						32.1		6.97			102.3		3.98			6.8		
						32.1		6.94			101.8		3.95			6.4		
29/04/19	1014-1028	24/Fine	Surface	1.0	24.5	31.0	31.0	7.41	7.37	7.34	106.1	105.6	3.56	3.53	3.36	2.4	2.4	1.9
						31.0		7.33			105.0		3.50			2.3		
						31.1		7.25			103.8		3.40			1.5		
			Middle	4.8	24.5	31.2	31.2	7.36	7.31		105.4	104.6	3.41	3.41		1.5	1.5	
						31.4		7.18			102.8		3.16			1.8		
						31.4		7.24			103.7		3.11			1.8		
			Bottom	8.6	24.4	31.4	31.4	7.21	7.21		103.3	103.3	3.11	3.14		1.8	1.8	
						31.4		7.24			103.7		3.11			1.8		
						31.4		7.24			103.7		3.11			1.8		

# Mid-Flood Tide

Monitoring Station : TKO-C1

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)				
						Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average		
01/04/19	1436-1450	22/Cloudy	Surface	1.0	21.8	31.5	31.5	7.46	7.47	7.34	102.1	102.2	3.55	3.54	3.72	2.1	2.1	2.3		
						31.4		7.48			102.3		3.52			2.1				
			Middle	10.6	21.6	31.6	31.6	7.23	7.22		98.6	98.4	98.2	98.4		3.70	3.72		2.6	2.7
						31.6		7.20			98.2		3.74			2.7				
			Bottom	20.2	21.5	31.7	31.8	7.09	7.07		96.6	96.4	96.2	96.4		3.92	3.91		2.2	2.1
						31.8		7.05			96.2		3.89			2.0				
03/04/19	1612-1628	27/Fine	Surface	1.0	23.8	31.1	31.1	7.81	7.78	7.70	110.4	110.0	3.59	3.63	3.43	2.4	2.2	2.1		
						31.1		7.75			109.6		3.66			2.0				
			Middle	10.8	23.7	31.2	31.3	7.54	7.61		106.6	107.6	108.6	107.6		3.51	3.55		2.4	2.4
						31.3		7.68			108.6		3.58			2.4				
			Bottom	20.6	23.6	31.4	31.4	7.43	7.51		104.9	106.1	107.2	106.1		3.09	3.12		2.0	1.8
						31.4		7.59			107.2		3.14			1.6				
06/04/19	1557-1612	27/Fine	Surface	1.0	26.9	31.4	31.4	7.31	7.33	7.24	109.3	109.5	3.47	3.46	3.63	3.8	3.8	4.8		
						31.3		7.34			109.6		3.45			3.7				
			Middle	10.7	26.7	31.5	31.5	7.13	7.15		106.3	106.6	106.9	106.6		3.66	3.65		6.9	7.1
						31.5		7.17			106.9		3.63			7.3				
			Bottom	20.4	26.5	31.6	31.7	6.99	7.00		103.9	104.1	104.2	104.1		3.75	3.77		3.3	3.5
						31.7		7.01			104.2		3.79			3.6				
08/04/19	0800-0815	27/Cloudy	Surface	1.0	23.6	31.3	31.3	7.12	7.14	7.10	100.4	100.7	3.27	3.24	3.58	2.2	2.2	2.0		
						31.3		7.16			100.9		3.21			2.2				
			Middle	10.9	23.5	31.4	31.4	7.08	7.07		99.8	99.6	99.4	99.6		3.69	3.67		1.9	1.9
						31.4		7.05			99.4		3.65			1.9				
			Bottom	20.8	23.4	31.4	31.5	6.93	6.95		97.4	97.6	97.8	97.6		3.84	3.82		2.0	1.9
						31.5		6.96			97.8		3.80			1.7				
10/04/19	0911-0925	28/Fine	Surface	1.0	27.9	31.4	31.4	7.61	7.63	7.54	115.7	115.8	3.53	3.55	3.71	2.1	2.0	2.2		
						31.3		7.64			115.9		3.56			1.9				
			Middle	10.7	27.7	31.5	31.5	7.47	7.46		113.2	113.1	112.9	113.1		3.77	3.75		2.4	2.2
						31.5		7.45			112.9		3.73			2.0				
			Bottom	20.4	27.6	31.6	31.7	7.34	7.36		111.0	111.4	111.8	111.4		3.85	3.84		2.4	2.5
						31.7		7.38			111.8		3.83			2.5				
12/04/19	0910-0925	23/Drizzle	Surface	1.0	23.5	30.9	30.9	7.15	7.16	7.10	100.5	100.7	3.43	3.41	3.74	3.9	3.8	3.1		
						30.8		7.17			100.8		3.38			3.6				
			Middle	11.0	23.4	31.2	31.3	7.02	7.04		98.7	98.9	99.1	98.9		3.82	3.84		2.6	2.7
						31.3		7.05			99.1		3.86			2.8				
			Bottom	21.0	23.3	31.3	31.4	6.96	6.94		97.7	97.4	97.1	97.4		3.98	3.97		2.9	3.0
						31.4		6.92			97.1		3.95			3.0				
15/04/19	1323-1339	21/Cloudy	Surface	1.0	20.8	31.2	31.2	7.57	7.56	7.49	101.6	101.4	3.45	3.44	3.61	6.9	6.6	5.9		
						31.2		7.54			101.2		3.42			6.3				
			Middle	10.9	20.6	31.4	31.4	7.40	7.42		99.1	99.3	99.5	99.3		3.63	3.65		5.8	5.7
						31.3		7.44			99.5		3.66			5.6				
			Bottom	20.7	20.4	31.5	31.5	7.29	7.28		97.2	97.1	96.9	97.1		3.78	3.76		5.8	5.5
						31.5		7.27			96.9		3.74			5.2				



**Mid-Flood Tide**

Monitoring Station : TKO-C1

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average
17/04/19	1545-1601	29/Fine	Surface	1.0	20.9	31.1	31.1	7.67	7.71	7.61	103.1	103.6	3.59	3.62	3.50	4.2	4.4	2.9
						31.1		7.74			104.0		3.64			4.6		
						31.2		7.44			99.6		3.51			2.5		
			Middle	10.8	20.7	31.2	31.2	7.57	7.51	101.3	100.5	3.54	3.53	2.2		2.4		
						31.3		7.21		96.2		3.33		2.1				
						31.4		7.36		98.2		3.36		1.9				
			Bottom	20.5	20.5	31.4	31.4	7.29	7.29	97.2	97.2	3.33	3.35	2.0		2.0		
						31.4		7.36		98.2		3.36		1.9				
						31.4		7.36		98.2		3.36		1.9				
23/04/19	0930-0947	28/Fine	Surface	1.0	25.0	31.0	31.1	6.94	6.96	7.00	100.1	100.3	3.77	3.78	3.85	3.6	3.6	3.1
						31.1		6.97			100.4		3.79			3.5		
						31.3		7.03			101.1		3.82			2.8		
			Middle	10.9	24.8	31.2	31.3	7.06	7.05	101.4	101.3	3.85	3.84	2.5		2.7		
						31.5		7.30		104.8		3.91		3.0				
						31.6		7.27		104.5		3.93		3.4				
			Bottom	20.8	24.7	31.6	31.6	7.29	7.29	104.5	104.7	3.91	3.92	3.2		3.2		
						31.6		7.27		104.5		3.93		3.4				
						31.6		7.27		104.5		3.93		3.4				
25/04/19	0900-0915	29/Cloudy	Surface	1.0	25.8	31.8	31.9	7.21	7.19	7.11	106.3	106.1	3.72	3.74	3.87	5.6	5.8	4.8
						31.9		7.17			105.8		3.76			6.0		
						32.2		7.05			103.5		3.93			3.9		
			Middle	11.2	25.6	32.3	32.3	7.01	7.03	103.0	103.3	3.90	3.92	4.0		4.0		
						32.3		6.93		101.6		3.96		4.7				
						32.3		6.89		101.1		3.92		4.5				
			Bottom	21.4	25.5	32.3	32.3	6.91	6.91	101.4	101.4	3.96	3.94	4.6		4.6		
						32.3		6.89		101.1		3.92		4.5				
						32.3		6.89		101.1		3.92		4.5				
27/04/19	0930-0944	27/Cloudy	Surface	1.0	25.7	32.0	32.0	7.12	7.14	7.07	104.5	104.7	3.72	3.74	3.87	5.5	5.8	6.6
						31.9		7.15			104.9		3.75			6.0		
						31.9		7.01			102.6		3.84			10.1		
			Middle	11.1	25.5	32.0	32.0	6.99	7.00	102.2	102.4	3.80	3.82	9.5		9.8		
						32.0		6.86		100.2		4.04		4.0				
						32.1		6.82		99.7		4.08		4.3				
			Bottom	21.2	25.4	32.1	32.1	6.84	6.84	100.0	100.0	4.04	4.06	4.2		4.2		
						32.1		6.82		99.7		4.08		4.3				
						32.1		6.82		99.7		4.08		4.3				
29/04/19	1250-1306	25/Fine	Surface	1.0	24.6	31.1	31.1	7.65	7.63	7.57	109.7	109.4	3.75	3.77	3.64	1.8	1.9	1.9
						31.1		7.61			109.1		3.79			2.0		
						31.2		7.46			106.7		3.62			1.6		
			Middle	10.8	24.4	31.2	31.2	7.57	7.52	108.3	107.5	3.64	3.63	1.7		1.7		
						31.3		7.30		103.9		3.50		1.9				
						31.3		7.44		105.9		3.53		2.1				
			Bottom	20.6	24.1	31.3	31.3	7.37	7.37	104.9	104.9	3.50	3.52	2.0		2.0		
						31.3		7.44		105.9		3.53		2.1				
						31.3		7.44		105.9		3.53		2.1				

# Mid-Flood Tide



Monitoring Station : TKO-M4

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)				
						Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average		
01/04/19	1553-1607	22/Cloudy	Surface	1.0	21.7	31.4	31.5	7.44	7.43	7.36	101.6	101.4	3.41	3.42	3.59	2.7	2.9	2.9		
						31.5		7.41			101.2		3.43			3.0				
			Middle	5.0	21.5	31.7	31.7	7.31	7.29		99.6	99.4	99.9	99.4		3.59	3.57		2.7	2.6
						31.6		7.27			99.1		3.55			2.4				
			Bottom	8.9	21.3	31.8	31.8	7.16	7.18		97.3	97.5	97.7	97.5		3.75	3.77		3.1	3.2
						31.8		7.19			97.7		3.78			3.2				
03/04/19	1739-1752	27/Fine	Surface	1.0	23.8	31.1	31.1	7.69	7.62	7.60	108.7	107.7	3.55	3.55	3.28	2.5	2.4	2.5		
						31.0		7.54			106.6		3.54			2.2				
			Middle	4.9	23.7	31.2	31.3	7.53	7.58		106.5	107.1	107.7	107.1		3.21	3.24		2.7	2.9
						31.3		7.62			107.7		3.26			3.1				
			Bottom	8.8	23.7	31.3	31.4	7.42	7.39		104.8	104.4	104.8	104.4		3.10	3.07		2.0	2.2
						31.4		7.36			103.9		3.04			2.3				
06/04/19	1717-1733	27/Fine	Surface	1.0	26.7	31.5	31.5	7.43	7.44	7.36	110.7	110.8	3.20	3.22	3.37	3.0	3.2	4.2		
						31.4		7.45			110.9		3.23			3.4				
			Middle	4.9	26.5	31.6	31.6	7.29	7.28		108.3	108.2	108.0	108.2		3.38	3.37		3.5	3.7
						31.6		7.27			108.0		3.36			3.9				
			Bottom	8.7	26.4	31.8	31.8	7.04	7.06		104.6	104.8	105.0	104.8		3.51	3.53		6.0	5.7
						31.7		7.08			105.0		3.55			5.4				
08/04/19	0914-0927	27/Cloudy	Surface	1.0	23.6	31.4	31.4	7.21	7.23	7.12	101.8	102.1	3.12	3.14	3.27	2.3	2.5	2.0		
						31.4		7.24			102.3		3.15			2.6				
			Middle	4.9	23.5	31.5	31.5	7.01	7.02		98.8	99.0	99.1	99.0		3.27	3.25		2.1	2.1
						31.5		7.03			99.1		3.23			2.0				
			Bottom	8.8	23.5	31.5	31.5	6.96	6.97		98.1	98.3	98.4	98.3		3.43	3.42		1.6	1.5
						31.5		6.98			98.4		3.40			1.3				
10/04/19	1027-1040	28/Fine	Surface	1.0	27.8	31.4	31.4	7.70	7.72	7.63	110.8	114.1	3.33	3.34	3.51	2.5	2.6	4.0		
						31.4		7.73			117.3		3.35			2.7				
			Middle	4.9	27.7	31.6	31.6	7.56	7.55		114.6	114.4	114.2	114.4		3.54	3.53		5.7	5.7
						31.5		7.54			114.2		3.51			5.7				
			Bottom	8.8	27.6	31.7	31.7	7.40	7.42		112.1	112.4	112.7	112.4		3.68	3.66		3.7	3.7
						31.7		7.44			112.7		3.64			3.6				
12/04/19	1020-1033	23/Drizzle	Surface	1.0	23.4	30.9	30.9	7.22	7.20	7.14	101.2	101.0	3.27	3.26	3.50	3.4	3.4	3.3		
						30.9		7.18			100.7		3.24			3.3				
			Middle	4.9	23.4	31.1	31.1	7.10	7.09		99.7	99.5	99.3	99.5		3.53	3.52		2.8	3.0
						31.0		7.07			99.3		3.50			3.2				
			Bottom	8.8	23.3	31.2	31.2	7.01	7.03		98.3	98.6	98.8	98.6		3.71	3.73		3.6	3.5
						31.2		7.05			98.8		3.74			3.4				
15/04/19	1443-1458	21/Cloudy	Surface	1.0	20.7	31.3	31.3	7.58	7.60	7.50	101.6	101.9	3.21	3.22	3.40	6.0	6.1	5.7		
						31.3		7.62			102.1		3.23			6.1				
			Middle	5.0	20.6	31.4	31.4	7.41	7.40		99.2	99.1	98.9	99.1		3.46	3.44		5.9	5.7
						31.4		7.39			98.9		3.42			5.4				
			Bottom	8.9	20.5	31.5	31.6	7.31	7.27		97.7	97.9	98.0	97.9		3.55	3.54		5.1	5.4
						31.6		7.23			98.0		3.52			5.6				

# Mid-Flood Tide



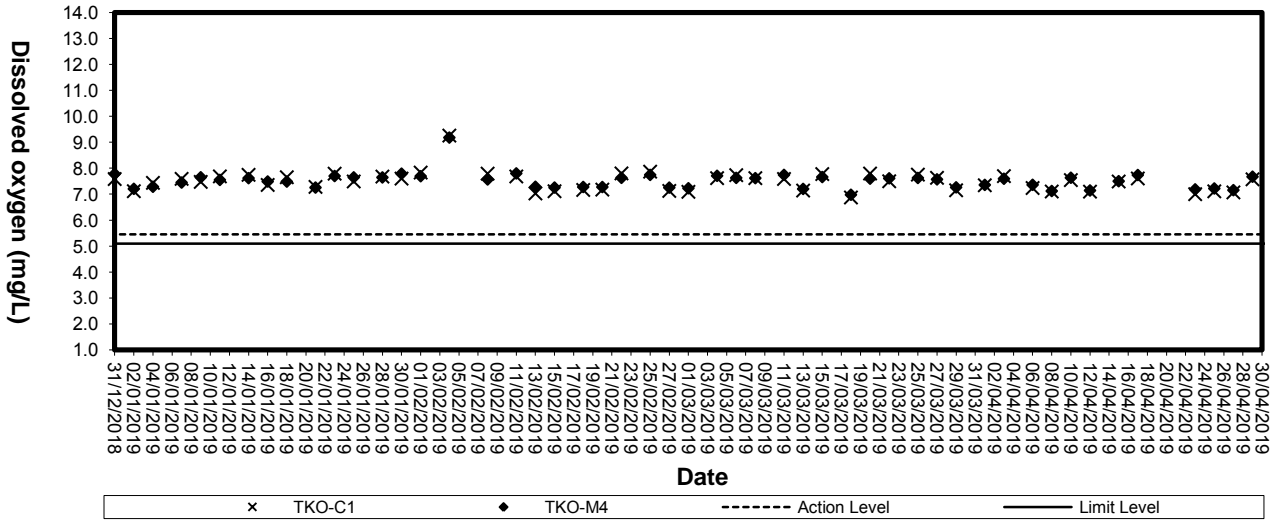
Monitoring Station : TKO-M4

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average
17/04/19	1719-1735	29/Fine	Surface	1.0	20.9	31.1	31.1	7.77	7.81	7.74	104.4	105.0	3.32	3.34	3.18	2.3	2.3	3.0
						31.1		7.85			105.5		3.36			2.2		
			Middle	4.9	20.8	31.1	31.2	7.62	7.67		102.3	102.9	3.12	3.13		2.9	3.0	
						31.2		7.71			103.4		3.13			3.0		
			Bottom	8.8	20.7	31.3	31.4	7.36	7.32		98.7	98.1	3.05	3.06		3.8	3.7	
						31.4		7.27			97.4		3.07			3.6		
23/04/19	1051-1125	28/Fine	Surface	1.0	24.9	30.9	31.0	7.15	7.16	7.19	103.2	103.4	3.64	3.66	3.73	2.4	2.4	3.8
						31.0		7.17			103.5		3.67			2.3		
			Middle	4.9	24.6	31.2	31.2	7.20	7.21		103.5	103.7	3.71	3.72		2.0	1.9	
						31.2		7.22			103.8		3.73			1.8		
			Bottom	8.7	24.4	31.4	31.4	6.93	6.95		99.5	99.7	3.80	3.82		7.4	7.3	
						31.4		6.96			99.8		3.83			7.1		
25/04/19	1014-1027	29/Cloudy	Surface	1.0	25.8	32.0	32.0	7.30	7.29	7.22	107.3	107.1	3.56	3.54	3.69	5.0	5.0	5.8
						32.0		7.27			106.9		3.52			5.0		
			Middle	5.1	25.6	32.1	32.2	7.17	7.16		105.2	105.0	3.72	3.74		5.3	5.5	
						32.2		7.14			104.8		3.75			5.6		
			Bottom	9.2	25.6	32.2	32.2	7.09	7.07		104.1	103.9	3.78	3.81		7.0	7.0	
						32.2		7.05			103.6		3.83			6.9		
27/04/19	1044-1057	27/Cloudy	Surface	1.0	25.7	32.0	32.0	7.24	7.26	7.16	106.3	106.5	3.55	3.53	3.72	3.4	3.5	3.8
						32.0		7.27			106.7		3.50			3.5		
			Middle	4.9	25.5	32.0	32.1	7.07	7.06		103.5	103.3	3.79	3.77		3.8	3.6	
						32.1		7.04			103.1		3.75			3.4		
			Bottom	8.8	25.5	32.1	32.1	6.93	6.92		101.4	101.2	3.88	3.86		4.1	4.2	
						32.1		6.90			101.0		3.84			4.3		
29/04/19	1424-1443	25/Fine	Surface	1.0	24.6	31.1	31.1	7.71	7.78	7.67	110.6	111.5	3.33	3.36	3.24	1.7	1.8	2.4
						31.1		7.84			112.4		3.38			1.9		
			Middle	5.0	24.5	31.2	31.2	7.63	7.57		109.3	108.4	3.26	3.28		3.4	3.6	
						31.1		7.51			107.5		3.29			3.7		
			Bottom	8.9	24.5	31.3	31.4	7.47	7.52		107.1	107.8	3.05	3.08		2.0	2.0	
						31.4		7.56			108.4		3.10			1.9		

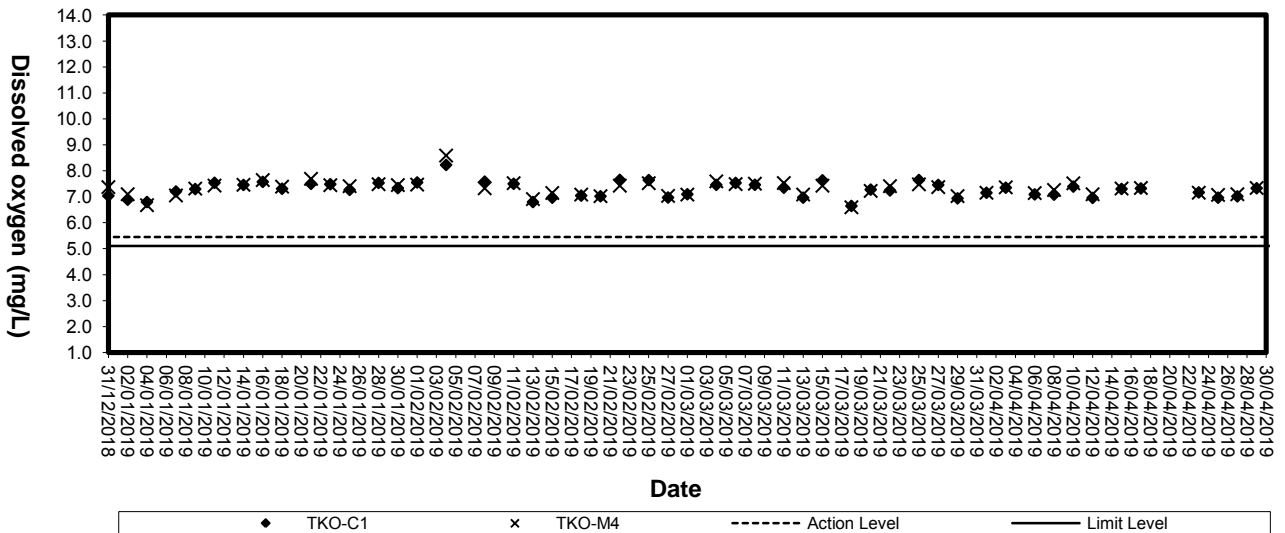
## **Appendix D3**

### **Graphical Plots of Impact Marine Water Quality Monitoring Data**

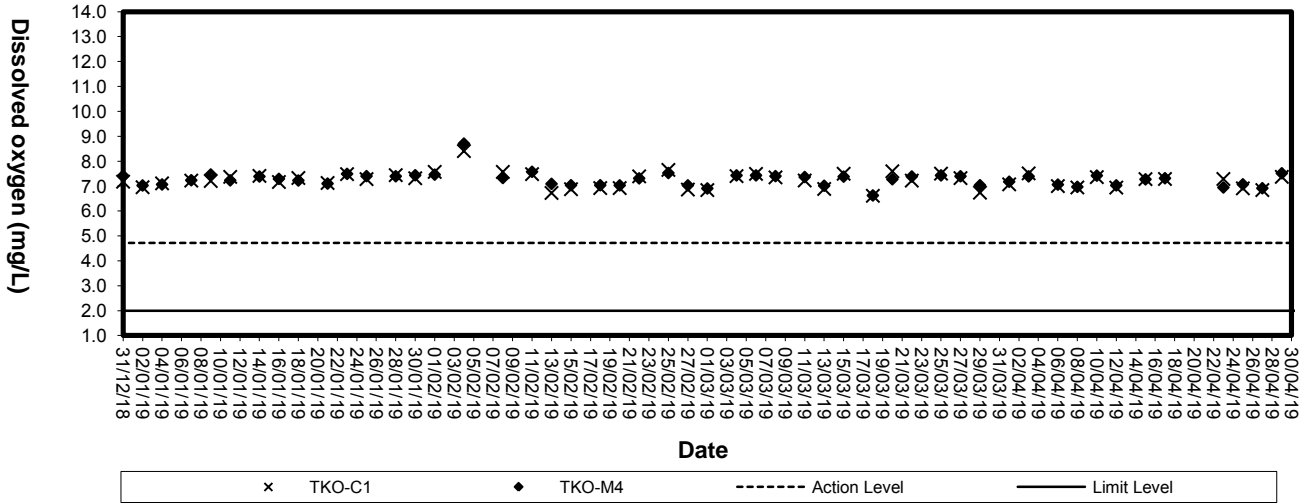
### Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



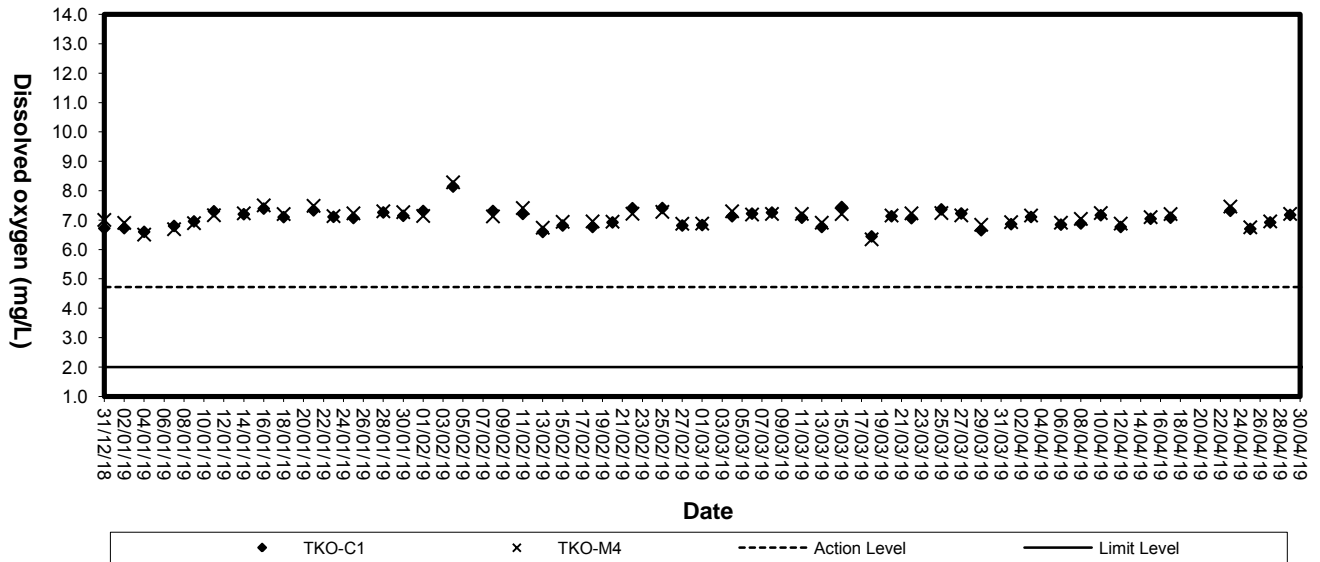
### Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



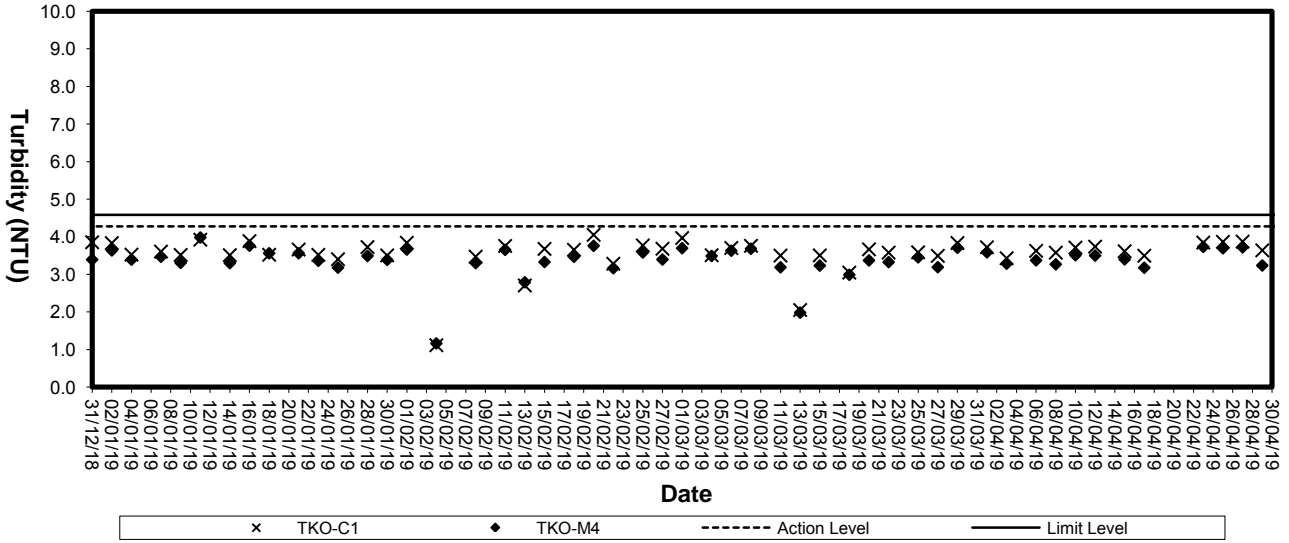
### Dissolved Oxygen (Bottom) at Mid-Flood Tide



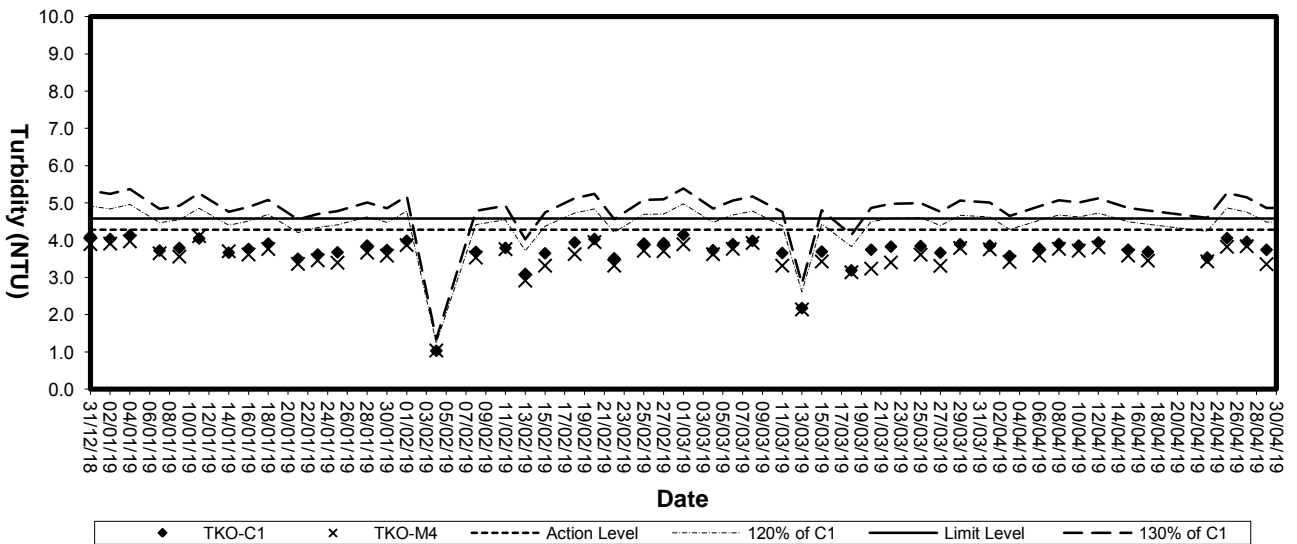
### Dissolved Oxygen (Bottom) at Mid-Ebb Tide



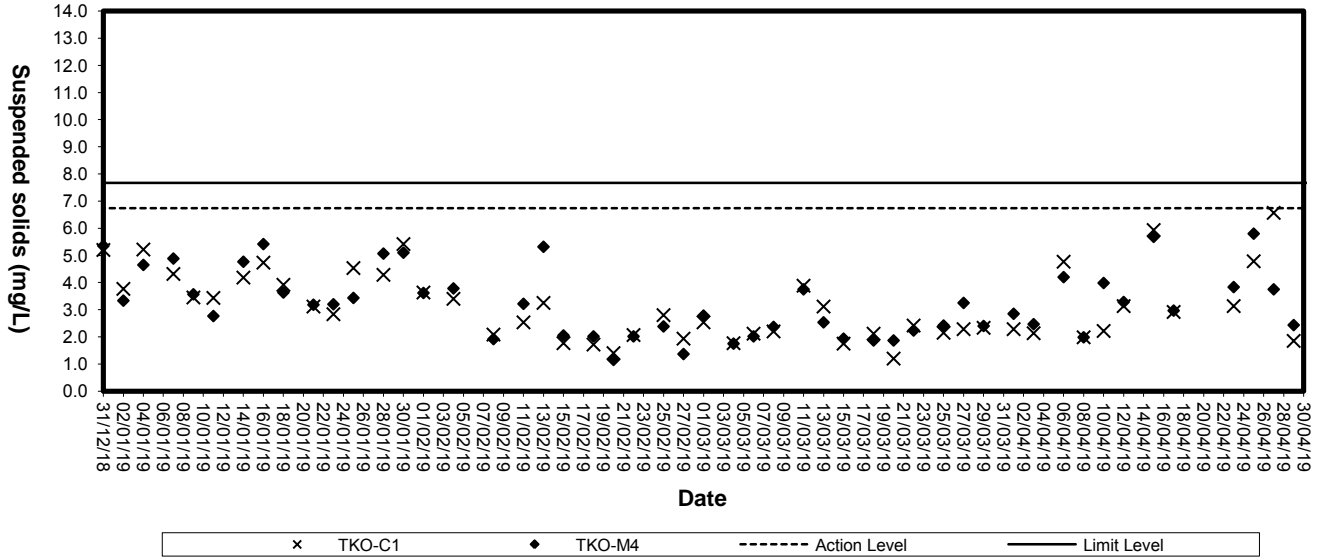
### Turbidity (Depth-average) at Mid-Flood Tide



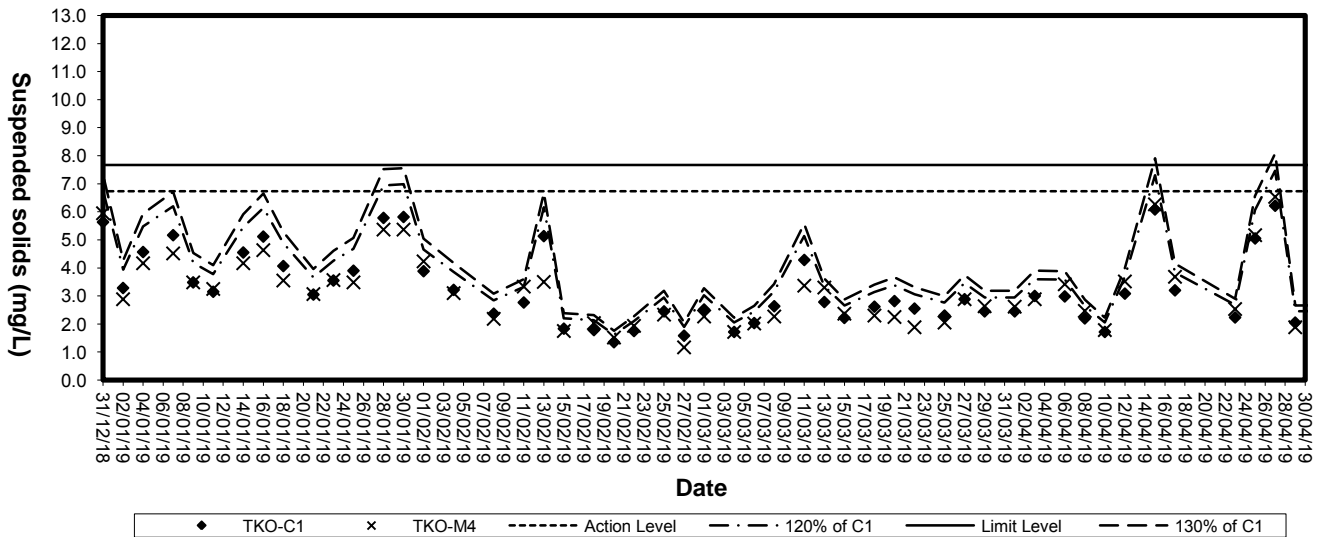
### Turbidity (Depth-average) at Mid-Ebb Tide



### Suspended solids (Depth-average) at Mid-Flood Tide



### Suspended Solids (Depth-average) at Mid-Ebb Tide





## **Appendix D4**

### **Impact Marine Water Quality Monitoring Results (3RS Project)**

**Mid-Ebb Tide**

**Monitoring Station : TKO-C1a**

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)				
						Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average		
01/04/19	1000-1016	21/Cloudy	Surface	1.0	20.8	31.5	31.5	7.26	7.25	7.17	97.6	97.4	3.13	3.12	3.31	2.2	2.3	2.3		
						31.5		7.23			97.2		3.11			2.3				
			Middle	10.2	20.6	31.7	31.7	7.08	7.10		94.9	95.2	95.4	91.4		3.33	3.35		2.2	2.0
						31.7		7.12			95.4		3.37			1.8				
			Bottom	19.4	20.5	31.9	31.9	6.81	6.82		91.3	91.4	91.4	91.4		3.48	3.47		2.5	2.7
						31.8		6.83			91.4		3.45			2.8				
03/04/19	1103-1118	26/Fine	Surface	1.0	23.7	31.0	31.0	7.30	7.36	7.26	102.9	103.7	3.75	3.77	3.60	2.3	2.3	2.4		
						31.0		7.41			104.5		3.79			2.2				
			Middle	10.8	23.5	31.0	31.1	7.10	7.16		100.0	100.8	101.6	99.4		3.62	3.60		2.2	2.2
						31.2		7.22			101.6		3.58			2.1				
			Bottom	20.5	23.4	31.3	31.4	7.03	7.07		98.8	99.4	100.0	99.4		3.42	3.44		2.5	2.7
						31.4		7.11			100.0		3.46			2.8				
06/04/19	1037-1052	25/Fine	Surface	1.0	24.9	31.3	31.3	7.14	7.13	7.05	103.0	102.8	3.01	3.03	3.19	1.6	1.7	2.7		
						31.3		7.11			102.6		3.04			1.8				
			Middle	10.3	24.7	31.4	31.4	6.96	6.97		100.1	100.3	100.4	98.6		3.16	3.17		2.2	2.1
						31.4		6.98			100.4		3.18			2.0				
			Bottom	19.5	24.6	31.5	31.5	6.88	6.86		98.9	98.6	98.3	98.6		3.35	3.37		4.2	4.3
						31.5		6.84			98.3		3.39			4.3				
08/04/19	1334-1348	27/Cloudy	Surface	1.0	23.6	31.5	31.5	7.21	7.20	7.08	102.2	102.1	3.74	3.72	3.83	2.1	2.1	1.6		
						31.5		7.19			101.9		3.70			2.0				
			Middle	10.3	23.4	31.5	31.6	6.93	6.95		97.6	97.9	98.1	95.8		3.82	3.84		1.5	1.4
						31.6		6.97			98.1		3.86			1.2				
			Bottom	19.6	23.4	31.6	31.7	6.82	6.81		96.0	95.8	95.6	95.8		3.93	3.92		1.4	1.4
						31.7		6.79			95.6		3.90			1.3				
10/04/19	1453-1509	27/Fine	Surface	1.0	26.8	31.3	31.4	7.40	7.39	7.33	110.3	110.3	2.88	2.87	3.01	2.1	2.3	2.2		
						31.4		7.38			110.2		2.86			2.4				
			Middle	10.2	26.7	31.5	31.5	7.25	7.27		108.1	108.4	108.6	106.1		3.03	3.01		1.1	1.3
						31.5		7.29			108.6		2.99			1.4				
			Bottom	19.4	26.6	31.7	31.7	7.14	7.13		106.3	106.1	105.8	106.1		3.14	3.16		2.9	3.0
						31.6		7.11			105.8		3.17			3.0				
12/04/19	1508-1523	24/Cloudy	Surface	1.0	23.5	30.9	31.0	7.07	7.06	6.99	99.4	99.2	3.74	3.72	3.82	2.8	3.0	2.7		
						31.0		7.04			99.0		3.70			3.1				
			Middle	10.4	23.4	31.2	31.3	6.95	6.93		97.7	97.5	97.2	97.3		3.88	3.87		2.9	2.7
						31.3		6.91			97.2		3.85			2.5				
			Bottom	19.9	23.3	31.4	31.4	6.91	6.93		97.0	97.3	97.5	97.3		3.90	3.88		2.5	2.5
						31.3		6.94			97.5		3.85			2.4				
15/04/19	0913-0927	22/Cloudy	Surface	1.0	21.8	31.2	31.2	7.43	7.42	7.37	101.5	101.4	2.88	2.87	3.03	3.8	3.7	4.6		
						31.2		7.41			101.2		2.85			3.6				
			Middle	10.2	21.6	31.4	31.4	7.29	7.31		99.3	99.6	99.9	96.8		3.06	3.04		4.7	4.6
						31.3		7.33			99.9		3.02			4.5				
			Bottom	19.3	21.4	31.5	31.5	7.14	7.13		97.0	96.8	96.6	96.8		3.17	3.18		5.6	5.4
						31.5		7.11			96.6		3.19			5.1				

**Mid-Ebb Tide**

**Monitoring Station : TKO-C1a**

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average
17/04/19	0956-1012	28/Fine	Surface	1.0	20.8	31.1	31.1	7.45	7.50	7.41	99.8	100.5	3.75	3.76	3.60	2.7	2.6	1.9
						31.1		7.55			101.2		3.77			2.5		
			Middle	10.7	20.6	31.3	31.3	7.26	7.33		97.1	98.0	3.61	3.63		1.3	1.4	
						31.3		7.39			98.8		3.64			1.5		
			Bottom	20.4	20.5	31.4	31.4	7.17	7.23		95.7	96.5	3.40	3.42		1.8	1.7	
						31.4		7.28			97.2		3.44			1.6		
23/04/19	1424-1436	29/Fine	Surface	1.0	25.3	31.0	31.0	7.34	7.33	7.30	105.9	105.8	3.24	3.26	3.36	2.7	2.6	3.3
						31.0		7.32			105.7		3.27			2.5		
			Middle	10.6	25.1	31.3	31.4	7.27	7.27		104.5	104.5	3.31	3.30		3.3	3.1	
						31.4		7.26			104.4		3.29			2.9		
			Bottom	20.2	24.9	31.6	31.6	7.00	7.02		100.5	100.7	3.50	3.51		4.2	4.1	
						31.5		7.04			100.9		3.52			4.0		
25/04/19	1552-1606	30/Cloudy	Surface	1.0	27.8	31.9	31.9	6.95	6.97	6.86	105.6	105.9	3.66	3.64	3.87	4.0	4.2	3.7
						31.9		6.99			106.2		3.62			4.4		
			Middle	10.8	27.7	32.0	32.1	6.77	6.76		102.9	102.7	3.81	3.83		3.2	3.1	
						32.1		6.74			102.4		3.84			3.0		
			Bottom	20.6	27.5	32.2	32.2	6.64	6.65		100.6	100.8	4.12	4.13		3.9	3.9	
						32.2		6.66			100.9		4.14			3.9		
27/04/19	1536-1550	27/Cloudy	Surface	1.0	25.8	31.9	31.9	7.05	7.07	6.96	103.6	103.8	3.64	3.62	3.79	4.6	4.7	4.9
						31.9		7.08			104.0		3.60			4.7		
			Middle	10.6	25.7	32.2	32.2	6.83	6.85		100.4	100.7	3.85	3.87		4.3	4.5	
						32.1		6.86			100.9		3.88			4.6		
			Bottom	20.2	25.6	32.2	32.2	6.78	6.77		99.5	99.3	3.92	3.90		5.8	5.5	
						32.2		6.75			99.1		3.87			5.2		
29/04/19	0907-0922	24/Fine	Surface	1.0	24.5	31.0	31.1	7.45	7.50	7.40	106.7	107.4	3.84	3.82	3.66	2.6	2.6	2.7
						31.1		7.55			108.1		3.80			2.6		
			Middle	10.7	24.3	31.2	31.2	7.23	7.31		103.2	104.3	3.67	3.69		3.0	3.0	
						31.2		7.38			105.4		3.71			2.9		
			Bottom	20.4	24.1	31.3	31.4	7.14	7.20		101.7	102.6	3.46	3.48		2.7	2.7	
						31.4		7.26			103.4		3.49			2.6		

**Mid-Ebb Tide**

**Monitoring Station : TKO-M4a**

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average
01/04/19	1020-1036	21/Cloudy	Surface	1.0	20.7	31.6	31.6	7.11	7.13	7.05	95.4	95.6	3.19	3.21	3.35	2.4	2.3	2.4
						31.5		7.14			95.8		3.22			2.2		
			Middle	9.8	20.5	31.7	31.7	6.99	6.98		93.6	93.5	3.35	3.34		2.4	2.5	
						31.7		6.97			93.3		3.32			2.5		
			Bottom	18.5	20.3	31.8	31.8	6.77	6.75		90.3	90.0	3.54	3.52		2.6	2.6	
						31.8		6.73			89.7		3.50			2.5		
03/04/19	1122-1139	26/Fine	Surface	1.0	23.7	31.0	31.1	7.52	7.49	7.39	106.1	105.7	3.67	3.69	3.59	2.4	2.5	2.0
						31.1		7.46			105.2		3.70			2.5		
			Middle	9.8	23.5	31.2	31.2	7.23	7.30		101.8	102.7	3.59	3.62		2.0	2.0	
						31.2		7.36			103.6		3.64			2.0		
			Bottom	18.6	23.4	31.3	31.4	7.15	7.18		100.5	100.9	3.45	3.47		1.7	1.5	
						31.4		7.20			101.2		3.49			1.3		
06/04/19	1056-1113	25/Fine	Surface	1.0	24.8	31.4	31.4	7.17	7.18	7.11	103.3	103.5	3.23	3.24	3.37	2.6	2.7	2.3
						31.3		7.19			103.6		3.25			2.7		
			Middle	9.7	24.6	31.6	31.6	7.01	7.03		100.9	101.1	3.36	3.35		2.0	2.1	
						31.5		7.05			101.3		3.33			2.1		
			Bottom	18.3	24.5	31.7	31.7	6.80	6.82		97.7	97.9	3.55	3.53		2.2	2.3	
						31.7		6.83			98.1		3.51			2.4		
08/04/19	1351-1405	27/Cloudy	Surface	1.0	23.8	31.5	31.6	7.08	7.07	6.99	100.4	100.2	3.62	3.60	3.77	2.3	2.2	1.7
						31.6		7.05			100.0		3.57			2.0		
			Middle	9.6	23.5	31.6	31.7	6.90	6.92		97.3	97.6	3.82	3.84		1.5	1.4	
						31.7		6.94			97.9		3.85			1.3		
			Bottom	18.2	23.4	31.7	31.7	6.73	6.72		94.9	94.7	3.89	3.88		1.3	1.4	
						31.7		6.70			94.5		3.87			1.5		
10/04/19	1513-1528	27/Fine	Surface	1.0	26.8	31.4	31.4	7.56	7.54	7.45	112.8	112.5	2.96	2.98	3.11	3.5	3.6	2.4
						31.4		7.52			112.2		3.00			3.7		
			Middle	9.7	26.6	31.5	31.6	7.35	7.36		109.4	109.6	3.11	3.10		1.6	1.8	
						31.6		7.37			109.7		3.09			1.9		
			Bottom	18.4	26.5	31.7	31.7	7.20	7.22		107.0	107.2	3.25	3.24		1.7	1.9	
						31.7		7.23			107.4		3.22			2.0		
12/04/19	1527-1541	24/Cloudy	Surface	1.0	23.5	31.0	31.0	7.10	7.09	6.97	99.8	99.6	3.69	3.67	3.73	2.1	2.0	2.4
						30.9		7.07			99.4		3.65			1.8		
			Middle	9.6	23.4	31.3	31.4	6.87	6.86		96.6	96.5	3.74	3.72		2.5	2.5	
						31.4		6.85			96.3		3.70			2.4		
			Bottom	18.2	23.3	31.4	31.4	6.82	6.84		95.7	95.9	3.81	3.80		2.8	2.7	
						31.4		6.85			96.1		3.78			2.5		
15/04/19	0931-1947	22/Cloudy	Surface	1.0	21.8	31.3	31.3	7.31	7.33	7.25	99.9	100.2	2.99	2.98	3.13	4.3	4.3	4.6
						31.3		7.35			100.4		2.96			4.3		
			Middle	9.8	21.7	31.4	31.4	7.17	7.16		97.9	97.8	3.13	3.14		4.0	4.3	
						31.4		7.15			97.7		3.15			4.5		
			Bottom	18.5	21.5	31.5	31.6	7.04	7.03		95.8	95.7	3.28	3.26		5.3	5.3	
						31.6		7.01			95.5		3.24			5.2		

**Mid-Ebb Tide**

**Monitoring Station : TKO-M4a**

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)								
						Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average						
17/04/19	1016-1031	28/Fine	Surface	1.0	20.8	31.1	31.1	7.30	7.33	7.31	97.8	98.2	3.64	3.67	3.46	2.1	2.3	2.1						
						31.1		7.35			98.5		3.69			2.4								
			Middle	9.8	20.6	31.2	31.3	7.26	7.30		97.1	97.6	3.46	3.47		2.3	2.2							
						31.3		7.33			98.0		3.48			2.1								
			Bottom	18.5	20.5	31.3	31.4	7.14	7.21		95.3	96.3	3.21	3.24		1.9	1.9							
						31.4		7.28			97.2		3.26			1.8								
			23/04/19	1440-1457	29/Fine	Surface	1.0	25.0	31.1		31.2	7.25	7.24	7.17		104.7	104.6		2.97	2.99	3.18	3.8	4.0	2.9
									31.2			7.23				104.5			3.00			4.1		
						Middle	9.7	24.8	31.3		31.4	7.09	7.10			101.9	102.0		3.14	3.16		1.9	1.8	
31.4	7.11	102.1							3.17	1.7														
Bottom	18.4	24.5				31.6	31.6	6.83	6.85	98.1	98.3	3.40	3.39		2.9	3.0								
						31.6		6.86		98.4		3.37			3.0									
25/04/19	1609-1623	30/Cloudy				Surface	1.0	27.8	32.1	32.1	7.11	7.10	6.96		108.2	108.0	3.53	3.54	3.82	4.5		4.4	4.3	
									32.0		7.08				107.8		3.55			4.3				
						Middle	10.0	27.6	32.2	32.3	6.81	6.83			103.3	103.7	3.90	3.89		4.1		4.3		
			32.3	6.85	104.1				3.87		4.5													
			Bottom	18.9	27.5	32.3	32.4	6.72	6.71	102.0	101.9	4.04		4.02	4.5	4.3								
						32.4		6.70		101.7		4.00			4.1									
			27/04/19	1552-1605	27/Cloudy	Surface	1.0	25.9	31.9	31.9	7.10	7.08		6.99	104.5	104.3	3.54	3.52		3.78	4.8	4.6		4.8
									31.9		7.06				104.0		3.50				4.3			
						Middle	9.7	25.8	32.1	32.2	6.92	6.90			101.9	101.7	3.90	3.88			4.8	5.0		
32.2	6.88	101.5							3.86		5.2													
Bottom	18.4	25.6				32.2	32.3	6.81	6.80	100.0	99.8	3.96	3.95		4.8	4.8								
						32.3		6.78		99.6		3.93			4.7									
29/04/19	0926-0941	24/Fine				Surface	1.0	24.5	31.1	31.1	7.50	7.55	7.46		107.4	108.1	3.76	3.74	3.55		4.5	4.3	2.4	
									31.1		7.59				108.7		3.71				4.1			
						Middle	9.8	24.3	31.1	31.2	7.41	7.37			105.8	105.2	3.52	3.54			1.3	1.3		
			31.2	7.32	104.5				3.56		1.3													
			Bottom	18.6	24.1	31.3	31.4	7.18	7.20	102.2	102.5	3.36		3.37	1.6	1.7								
						31.4		7.22		102.8		3.37			1.7									

**Mid-Ebb Tide**

**Monitoring Station : TKO-M5**

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average
01/04/19	1042-1056	21/Cloudy	Surface	1.0	20.7	31.5	31.6	7.19	7.17	7.10	96.5	96.3	2.99	2.98	3.18	2.6	2.5	2.2
						31.6		7.15			96.0		2.97			2.3		
			Middle	8.6	20.6	31.7	31.7	7.02	7.04		94.1	94.3	3.15	3.17		2.1	2.1	
						31.7		7.05			94.5		3.18			2.1		
			Bottom	16.2	20.4	31.9	31.9	6.82	6.81		91.2	91.0	3.40	3.38		2.0	2.0	
						31.8		6.79			90.8		3.36			2.0		
03/04/19	1145-1201	26/Fine	Surface	1.0	23.7	31.0	31.1	7.33	7.40	7.36	103.3	104.3	3.58	3.61	3.45	3.5	3.4	2.3
						31.1		7.46			105.2		3.64			3.2		
			Middle	8.9	23.5	31.2	31.2	7.29	7.33		102.6	103.1	3.47	3.44		2.2	2.1	
						31.2		7.36			103.6		3.40			2.0		
			Bottom	16.8	23.4	31.4	31.4	7.05	7.09		99.1	99.6	3.29	3.31		1.4	1.5	
						31.4		7.12			100.1		3.32			1.5		
06/04/19	1119-1135	25/Fine	Surface	1.0	24.8	31.4	31.4	7.26	7.24	7.16	104.6	104.3	2.88	2.86	3.04	3.5	3.3	2.5
						31.4		7.22			104.0		2.84			3.0		
			Middle	8.6	24.7	31.5	31.5	7.09	7.08		102.2	102.0	3.05	3.06		1.9	2.0	
						31.5		7.06			101.7		3.07			2.0		
			Bottom	16.2	24.6	31.6	31.7	6.93	6.94		99.7	99.9	3.21	3.20		2.1	2.2	
						31.7		6.95			100.0		3.18			2.2		
08/04/19	1410-1423	27/Cloudy	Surface	1.0	23.7	31.6	31.6	7.17	7.16	7.04	101.5	101.3	3.60	3.63	3.71	1.4	1.6	1.2
						31.6		7.14			101.1		3.66			1.7		
			Middle	8.7	23.6	31.6	31.6	6.95	6.93		98.3	98.1	3.73	3.72		1.1	1.1	
						31.6		6.91			97.8		3.70			1.0		
			Bottom	16.4	23.5	31.6	31.7	6.86	6.84		96.7	96.5	3.77	3.78		1.0	1.1	
						31.7		6.82			96.2		3.79			1.2		
10/04/19	1534-1550	27/Fine	Surface	1.0	26.9	31.3	31.3	7.60	7.62	7.52	113.4	113.7	2.92	2.90	3.05	2.2	2.3	1.7
						31.3		7.63			113.9		2.88			2.4		
			Middle	8.8	26.8	31.5	31.5	7.44	7.43		111.0	110.9	3.04	3.06		1.3	1.4	
						31.4		7.42			110.8		3.07			1.5		
			Bottom	16.6	26.6	31.6	31.6	7.29	7.28		108.5	108.4	3.20	3.19		1.3	1.4	
						31.6		7.27			108.2		3.18			1.5		
12/04/19	1545-1600	24/Cloudy	Surface	1.0	23.6	31.0	31.0	7.14	7.12	7.08	100.5	100.3	3.58	3.56	3.75	2.5	2.4	2.3
						31.0		7.10			100.0		3.54			2.2		
			Middle	8.7	23.4	31.4	31.4	7.02	7.04		98.7	99.0	3.82	3.84		2.3	2.3	
						31.4		7.05			99.2		3.86			2.3		
			Bottom	16.4	23.3	31.4	31.4	6.98	6.97		98.0	97.8	3.84	3.86		2.1	2.3	
						31.4		6.95			97.6		3.88			2.4		
15/04/19	0953-1009	22/Cloudy	Surface	1.0	21.9	31.2	31.2	7.45	7.47	7.39	101.9	102.1	2.73	2.75	2.93	4.8	4.5	4.0
						31.2		7.48			102.3		2.77			4.2		
			Middle	8.7	21.7	31.3	31.3	7.30	7.31		99.6	99.8	2.95	2.94		4.2	4.1	
						31.3		7.32			99.9		2.92			3.9		
			Bottom	16.4	21.6	31.5	31.5	7.12	7.14		97.1	97.4	3.10	3.09		3.6	3.5	
						31.4		7.16			97.6		3.08			3.4		

**Mid-Ebb Tide**

**Monitoring Station : TKO-M5**

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average
17/04/19	1037-1056	28/Fine	Surface	1.0	20.8	31.1	31.1	7.32	7.39	7.38	98.1	99.1	3.66	3.68	3.53	1.2	1.2	1.5
						31.1		7.46			100.0		3.69			1.1		
						31.2		7.34			98.1		3.52			1.8		
			Middle	8.8	20.6	31.3	31.3	7.41	7.38	99.1	98.6	3.55	3.54	1.7		1.8		
						31.4		7.25		96.8		3.37		1.4				
						31.4		7.18		95.8		3.40		1.5				
			Bottom	16.6	20.5	31.4	31.4	7.22	7.22	96.3	96.3	3.37	3.39	1.4		1.5		
								7.18		95.8		3.40		1.5				
								7.22		96.3		3.37		1.4				
23/04/19	1503-1527	29/Fine	Surface	1.0	25.2	31.0	31.1	7.09	7.10	7.18	102.3	102.5	3.57	3.58	3.73	4.0	3.9	2.7
						31.1		7.11			102.6		3.59			3.7		
						31.2		7.24			104.1		3.77			1.9		
			Middle	8.7	24.9	31.3	31.3	7.27	7.26	104.4	104.3	3.79	3.78	1.7		1.8		
						31.5		6.91		99.2		3.80		2.6				
						31.5		6.94		99.5		3.83		2.5				
			Bottom	16.3	24.7	31.5	31.5	6.93	6.93	99.4	99.4	3.80	3.82	2.6		2.6		
								6.94		99.5		3.83		2.5				
								6.93		99.4		3.80		2.6				
25/04/19	1628-1641	30/Cloudy	Surface	1.0	27.9	32.0	32.0	7.12	7.14	7.04	108.5	108.9	3.46	3.45	3.71	4.5	4.2	3.9
						32.0		7.16			109.2		3.43			3.9		
						32.1		6.96			105.8		3.75			4.1		
			Middle	9.0	27.7	32.1	32.1	6.93	6.95	105.3	105.6	3.77	3.76	4.5		4.3		
						32.2		6.88		104.4		3.95		3.2				
						32.3		6.86		104.3		3.91		3.4				
			Bottom	17.0	27.6	32.3	32.3	6.87	6.87	104.4	104.4	3.95	3.93	3.2		3.3		
								6.86		104.3		3.91		3.4				
								6.87		104.4		3.95		3.2				
27/04/19	1609-1622	27/Cloudy	Surface	1.0	25.9	31.9	32.0	7.11	7.09	7.01	104.7	104.5	3.66	3.63	3.83	4.0	4.2	4.1
						32.0		7.07			104.2		3.60			4.3		
						32.2		6.90			101.4		3.89			3.7		
			Middle	8.8	25.7	32.2	32.2	6.94	6.92	101.9	101.7	3.85	3.87	3.6		3.7		
						32.2		6.86		100.5		3.99		4.7				
						32.2		6.88		100.9		3.97		4.4				
			Bottom	16.6	25.5	32.2	32.2	6.87	6.87	100.9	100.7	3.97	3.98	4.4		4.6		
								6.88		100.9		3.97		4.4				
								6.87		100.7		3.97		4.4				
29/04/19	0947-1003	24/Fine	Surface	1.0	24.5	31.0	31.1	7.31	7.35	7.25	104.7	105.3	3.65	3.66	3.58	1.7	1.7	1.3
						31.1		7.39			105.8		3.66			1.6		
						31.2		7.20			102.8		3.61			1.3		
			Middle	8.8	24.3	31.2	31.2	7.11	7.16	101.5	102.2	3.64	3.63	1.1		1.2		
						31.3		7.04		100.2		3.43		0.9				
						31.4		7.16		101.9		3.46		1.1				
			Bottom	16.6	24.1	31.4	31.4	7.10	7.10	101.1	101.1	3.46	3.45	1.1		1.0		
								7.16		101.9		3.46		1.1				
								7.10		101.1		3.45		1.0				

# Mid-Flood Tide

Monitoring Station : TKO-C1a

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average
01/04/19	1454-1509	22/Cloudy	Surface	1.0	21.9	31.5	31.6	7.37	7.38	7.32	101.1	101.3	2.94	2.93	3.09	2.7	2.9	2.7
						31.6		7.39			101.4		2.92			3.0		
			Middle	10.3	21.7	31.8	31.8	7.40	7.26		97.7	97.5	3.10	3.12		2.5	2.6	
						31.7		7.11			97.3		3.13			2.6		
			Bottom	19.6	21.5	31.9	31.9	6.96	6.94		95.0	94.7	3.25	3.23		2.6	2.8	
						31.9		6.92			94.4		3.21			2.9		
03/04/19	1652-1648	27/Fine	Surface	1.0	23.8	31.1	31.1	7.57	7.63	7.52	107.1	107.9	3.65	3.67	3.46	1.1	1.2	1.9
						31.1		7.69			108.7		3.69			1.3		
			Middle	10.9	23.7	31.2	31.3	7.36	7.41		104.1	104.8	3.46	3.48		1.9	2.0	
						31.3		7.46			105.5		3.49			2.0		
			Bottom	20.8	23.6	31.3	31.4	7.25	7.28		102.4	102.8	3.21	3.24		2.4	2.5	
						31.4		7.31			103.2		3.26			2.6		
06/04/19	1617-1631	27/Fine	Surface	1.0	26.8	31.3	31.3	7.36	7.37	7.30	109.7	109.9	2.80	2.82	2.98	4.5	4.4	3.2
						31.3		7.38			110.0		2.83			4.2		
			Middle	10.4	26.6	31.5	31.5	7.25	7.24		107.9	107.6	2.98	2.97		2.8	3.0	
						31.4		7.22			107.3		2.96			3.1		
			Bottom	19.8	26.5	31.6	31.6	7.09	7.07		105.4	105.1	3.17	3.15		2.3	2.3	
						31.6		7.05			104.8		3.13			2.3		
08/04/19	0820-0835	27/Cloudy	Surface	1.0	23.6	31.4	31.5	7.06	7.05	6.99	99.7	99.5	3.39	3.37	3.62	1.4	1.5	1.7
						31.5		7.03			99.3		3.35			1.5		
			Middle	10.8	23.5	31.5	31.6	6.91	6.93		97.4	97.6	3.74	3.72		1.5	1.6	
						31.6		6.94			97.8		3.70			1.6		
			Bottom	20.6	23.4	31.7	31.7	6.77	6.76		95.4	95.2	3.78	3.77		2.1	2.1	
						31.7		6.74			95.0		3.75			2.0		
10/04/19	0930-0944	28/Fine	Surface	1.0	27.8	31.3	31.3	7.59	7.58	7.51	115.0	114.9	2.66	2.65	2.84	1.7	1.7	1.4
						31.3		7.57			114.7		2.64			1.6		
			Middle	10.4	27.6	31.4	31.5	7.46	7.44		112.7	112.5	2.89	2.87		1.3	1.2	
						31.5		7.42			112.3		2.85			1.0		
			Bottom	19.7	27.5	31.6	31.6	7.23	7.24		109.2	109.4	2.99	3.01		1.4	1.4	
						31.6		7.25			109.5		3.02			1.3		
12/04/19	0929-0943	23/Drizzle	Surface	1.0	23.4	30.9	30.9	7.09	7.07	6.96	99.4	99.1	3.62	3.66	3.76	2.2	2.2	2.7
						30.9		7.05			98.8		3.69			2.2		
			Middle	10.9	23.3	31.2	31.3	6.87	6.86		96.3	96.1	3.79	3.77		2.9	2.8	
						31.3		6.84			95.9		3.75			2.7		
			Bottom	20.8	23.2	31.3	31.4	6.82	6.80		95.5	95.3	3.83	3.87		3.2	3.1	
						31.4		6.78			95.0		3.90			2.9		
15/04/19	1344-1359	21/Cloudy	Surface	1.0	20.8	31.2	31.2	7.60	7.62	7.54	102.0	102.2	2.70	2.72	2.92	4.6	4.7	4.5
						31.1		7.63			102.3		2.74			4.7		
			Middle	10.3	20.7	31.3	31.3	7.48	7.47		100.3	100.1	2.96	2.95		5.4	5.5	
						31.3		7.45			99.9		2.93			5.6		
			Bottom	19.5	20.5	31.4	31.4	7.34	7.33		98.0	97.9	3.11	3.10		3.1	3.2	
						31.4		7.32			97.7		3.09			3.3		



## Mid-Flood Tide

Monitoring Station : TKO-C1a

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average
17/04/19	1605-1621	29/Fine	Surface	1.0	20.9	31.1	31.1	7.74	7.68	7.59	104.0	103.1	3.52	3.54	3.36	2.6	2.5	1.8
						31.0		7.61			102.2		3.55			2.4		
			Middle	10.9	20.7	31.2	31.2	7.45	7.51		99.7	100.5	3.36	3.38		1.2	1.3	
						31.3		7.56			101.2		3.39			1.4		
			Bottom	20.8	20.5	31.3	31.3	7.28	7.34		97.2	97.9	3.16	3.17		1.6	1.7	
						31.3		7.39			98.6		3.18			1.7		
23/04/19	0952-1007	28/Fine	Surface	1.0	24.9	30.9	30.9	7.12	7.13	7.04	102.7	102.9	3.21	3.23	3.33	4.2	4.4	4.1
						30.9		7.14			103.0		3.24			4.6		
			Middle	10.8	24.7	31.2	31.3	6.95	6.94		99.9	99.8	3.30	3.32		4.5	4.3	
						31.3		6.93			99.6		3.33			4.1		
			Bottom	20.5	24.5	31.5	31.5	6.72	6.71		96.4	96.3	3.44	3.46		3.6	3.7	
						31.5		6.70			96.2		3.47			3.8		
25/04/19	0920-0934	29/Cloudy	Surface	1.0	25.8	32.0	32.0	7.18	7.17	7.01	105.5	105.3	3.41	3.43	3.77	4.4	4.5	4.4
						31.9		7.15			105.1		3.45			4.6		
			Middle	10.9	25.7	32.1	32.2	6.87	6.86		101.0	100.8	3.93	3.92		4.6	4.7	
						32.2		6.84			100.6		3.90			4.8		
			Bottom	20.8	25.6	32.3	32.3	6.82	6.84		100.1	100.3	3.97	3.95		3.8	3.9	
						32.3		6.85			100.5		3.93			4.0		
27/04/19	0949-1003	27/Cloudy	Surface	1.0	25.6	31.8	31.8	7.12	7.11	7.03	104.2	104.0	3.51	3.52	3.76	4.7	4.6	4.3
						31.8		7.09			103.8		3.53			4.5		
			Middle	10.9	25.4	31.8	31.9	6.93	6.95		101.1	101.3	3.88	3.86		3.8	3.7	
						31.9		6.96			101.5		3.84			3.6		
			Bottom	20.8	25.3	32.0	32.0	6.85	6.86		100.0	100.2	3.92	3.90		4.7	4.5	
						32.0		6.87			100.3		3.88			4.3		
29/04/19	1311-1325	25/Fine	Surface	1.0	24.6	31.1	31.1	7.81	7.76	7.69	112.1	111.3	3.65	3.66	3.47	2.4	2.4	2.1
						31.1		7.70			110.4		3.66			2.4		
			Middle	10.9	24.4	31.2	31.3	7.56	7.62		108.1	109.0	3.41	3.43		1.9	2.0	
						31.3		7.68			109.8		3.44			2.1		
			Bottom	20.7	24.1	31.4	31.4	7.42	7.51		105.7	106.9	3.33	3.34		1.8	1.9	
						31.4		7.59			108.1		3.35			2.0		

# Mid-Flood Tide



Monitoring Station : TKO-M5

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average
01/04/19	1534-1548	22/Cloudy	Surface	1.0	21.8	31.5	31.5	7.33	7.32	7.23	100.3	100.1	2.85	2.87	3.03	2.2	2.1	1.7
						31.5		7.30			99.9		2.88			2.0		
			Middle	8.8	21.7	31.7	31.7	7.13	7.15		97.5	97.8	3.06	3.04		1.5	1.6	
						31.6		7.17			98.0		3.02			1.6		
			Bottom	16.5	21.5	31.8	31.8	6.89	6.90		94.0	94.2	3.20	3.19		1.2	1.3	
						31.8		6.91			94.3		3.18			1.4		
03/04/19	1716-1730	27/Fine	Surface	1.0	23.8	31.1	31.1	7.48	7.52	7.46	105.8	106.4	3.35	3.37	3.25	1.9	1.9	1.9
						31.1		7.56			106.9		3.39			1.9		
			Middle	9.1	23.7	31.2	31.3	7.36	7.40		104.1	104.7	3.24	3.26		2.0	2.0	
						31.3		7.44			105.2		3.28			1.9		
			Bottom	17.1	23.6	31.4	31.4	7.28	7.24		102.8	102.2	3.10	3.12		1.8	1.8	
						31.4		7.20			101.6		3.14			1.8		
06/04/19	1657-1712	27/Fine	Surface	1.0	26.8	31.3	31.4	7.40	7.42	7.36	110.3	110.6	2.75	2.74	2.91	1.7	1.6	1.5
						31.4		7.43			110.9		2.73			1.5		
			Middle	8.7	26.7	31.5	31.6	7.32	7.30		109.1	108.8	2.90	2.92		1.8	1.7	
						31.6		7.28			108.5		2.94			1.5		
			Bottom	16.4	26.5	31.7	31.7	7.18	7.17		106.7	106.5	3.09	3.08		1.2	1.3	
						31.7		7.15			106.2		3.06			1.4		
08/04/19	0857-0910	27/Cloudy	Surface	1.0	23.5	31.5	31.5	7.25	7.27	7.16	102.2	102.5	3.16	3.15	3.32	1.9	2.0	1.5
						31.4		7.29			102.7		3.13			2.0		
			Middle	9.1	23.3	31.5	31.6	7.07	7.05		99.3	99.0	3.37	3.36		1.4	1.3	
						31.6		7.03			98.7		3.34			1.2		
			Bottom	17.2	23.3	31.6	31.6	6.99	6.97		98.3	98.1	3.48	3.46		1.4	1.3	
						31.6		6.95			97.8		3.44			1.1		
10/04/19	1009-1022	28/Fine	Surface	1.0	27.8	31.3	31.3	7.71	7.73	7.66	116.8	117.1	2.74	2.76	2.89	1.3	1.2	1.2
						31.2		7.75			117.4		2.77			1.1		
			Middle	8.9	27.7	31.4	31.4	7.60	7.59		115.2	115.1	2.88	2.86		1.3	1.2	
						31.4		7.58			114.9		2.84			1.1		
			Bottom	16.8	27.5	31.6	31.6	7.45	7.47		112.5	112.8	3.03	3.05		1.1	1.3	
						31.5		7.48			113.0		3.06			1.5		
12/04/19	1003-1016	23/Drizzle	Surface	1.0	23.5	31.0	31.0	7.19	7.21	7.06	101.1	101.4	3.44	3.42	3.64	2.9	2.9	2.8
						30.9		7.23			101.6		3.40			2.8		
			Middle	9.1	23.2	31.0	31.1	6.92	6.90		96.7	96.5	3.73	3.72		2.8	2.8	
						31.1		6.88			96.2		3.70			2.7		
			Bottom	17.2	23.2	31.2	31.3	6.88	6.86		96.3	96.1	3.79	3.77		3.0	2.9	
						31.3		6.84			95.8		3.75			2.8		
15/04/19	1424-1439	21/Cloudy	Surface	1.0	20.9	31.1	31.2	7.66	7.65	7.55	103.0	102.9	2.62	2.61	2.76	4.0	4.3	4.5
						31.2		7.64			102.7		2.59			4.5		
			Middle	8.9	20.7	31.4	31.4	7.47	7.45		100.1	99.9	2.75	2.74		4.3	4.3	
						31.3		7.43			99.6		2.73			4.2		
			Bottom	16.7	20.6	31.5	31.5	7.25	7.24		97.1	96.9	2.91	2.93		4.9	4.9	
						31.5		7.22			96.7		2.94			4.9		

# Mid-Flood Tide



Monitoring Station : TKO-M5

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average
17/04/19	1649-1707	29/Fine	Surface	1.0	20.9	31.1	31.1	7.66	7.72	7.60	102.9	103.7	3.37	3.39	3.26	1.8	1.9	1.6
						31.1		7.77			104.4		3.41			2.0		
			Middle	9.0	20.7	31.2	31.2	7.42	7.49		99.3	100.3	3.24	3.27		1.6	1.7	
						31.2		7.56			101.2		3.29			1.7		
			Bottom	16.9	20.5	31.3	31.4	7.36	7.31		98.2	97.5	3.10	3.12		1.3	1.4	
						31.4		7.25			96.8		3.14			1.4		
23/04/19	1033-1048	28/Fine	Surface	1.0	25.0	30.9	31.0	7.03	7.05	7.10	101.4	101.6	2.97	2.98	3.30	2.5	2.4	2.2
						31.0		7.06			101.7		2.99			2.3		
			Middle	8.8	24.8	31.2	31.2	7.14	7.16		102.6	102.8	3.38	3.40		2.1	2.1	
						31.2		7.17			102.9		3.41			2.0		
			Bottom	16.6	24.6	31.5	31.5	7.30	7.32		104.8	105.0	3.50	3.52		2.3	2.2	
						31.4		7.33			105.1		3.53			2.1		
25/04/19	0956-1009	29/Cloudy	Surface	1.0	25.7	32.0	32.1	7.27	7.25	7.14	106.7	106.5	3.27	3.26	3.58	4.0	3.8	4.3
						32.1		7.23			106.2		3.25			3.6		
			Middle	9.1	25.6	32.1	32.2	7.02	7.03		103.0	103.2	3.68	3.66		4.9	5.1	
						32.2		7.04			103.4		3.64			5.2		
			Bottom	17.2	25.6	32.3	32.3	6.93	6.92		101.7	101.5	3.85	3.83		4.0	4.2	
						32.3		6.90			101.3		3.81			4.3		
27/04/19	1025-1039	27/Cloudy	Surface	1.0	25.7	32.0	32.0	7.19	7.17	7.05	105.5	105.3	3.39	3.37	3.64	4.4	4.6	3.4
						32.0		7.15			105.0		3.35			4.8		
			Middle	9.1	25.4	32.0	32.1	6.90	6.92		100.8	101.1	3.72	3.71		3.0	2.9	
						32.1		6.94			101.4		3.69			2.8		
			Bottom	17.2	25.4	32.1	32.2	6.78	6.77		99.1	98.9	3.81	3.83		2.8	2.8	
						32.2		6.75			98.7		3.85			2.7		
29/04/19	1354-1412	25/Fine	Surface	1.0	24.6	31.1	31.1	7.65	7.68	7.60	109.7	110.1	3.54	3.55	3.32	1.3	1.3	1.3
						31.0		7.70			110.4		3.55			1.2		
			Middle	9.0	24.4	31.2	31.2	7.48	7.52		107.0	107.5	3.21	3.23		1.3	1.4	
						31.2		7.55			108.0		3.24			1.4		
			Bottom	16.9	24.1	31.4	31.4	7.37	7.30		104.9	103.9	3.16	3.18		1.3	1.4	
						31.4		7.23			102.9		3.19			1.4		

# Mid-Flood Tide

Monitoring Station : TKO-M5

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average
01/04/19	1534-1548	22/Cloudy	Surface	1.0	21.8	31.5	31.5	7.33	7.32	7.23	100.3	100.1	2.85	2.87	3.03	2.2	2.1	1.7
						31.5		7.30			99.9		2.88			2.0		
			Middle	8.8	21.7	31.7	31.7	7.13	7.15		97.5	97.8	3.06	3.04		1.5	1.6	
						31.6		7.17			98.0		3.02			1.6		
			Bottom	16.5	21.5	31.8	31.8	6.89	6.90		94.0	94.2	3.20	3.19		1.2	1.3	
						31.8		6.91			94.3		3.18			1.4		
03/04/19	1716-1730	27/Fine	Surface	1.0	23.8	31.1	31.1	7.48	7.52	7.46	105.8	106.4	3.35	3.37	3.25	1.9	1.9	1.9
						31.1		7.56			106.9		3.39			1.9		
			Middle	9.1	23.7	31.2	31.3	7.36	7.40		104.1	104.7	3.24	3.26		2.0	2.0	
						31.3		7.44			105.2		3.28			1.9		
			Bottom	17.1	23.6	31.4	31.4	7.28	7.24		102.8	102.2	3.10	3.12		1.8	1.8	
						31.4		7.20			101.6		3.14			1.8		
06/04/19	1657-1712	27/Fine	Surface	1.0	26.8	31.3	31.4	7.40	7.42	7.36	110.3	110.6	2.75	2.74	2.91	1.7	1.6	1.5
						31.4		7.43			110.9		2.73			1.5		
			Middle	8.7	26.7	31.5	31.6	7.32	7.30		109.1	108.8	2.90	2.92		1.8	1.7	
						31.6		7.28			108.5		2.94			1.5		
			Bottom	16.4	26.5	31.7	31.7	7.18	7.17		106.7	106.5	3.09	3.08		1.2	1.3	
						31.7		7.15			106.2		3.06			1.4		
08/04/19	0857-0910	27/Cloudy	Surface	1.0	23.5	31.5	31.5	7.25	7.27	7.16	102.2	102.5	3.16	3.15	3.32	1.9	2.0	1.5
						31.4		7.29			102.7		3.13			2.0		
			Middle	9.1	23.3	31.5	31.6	7.07	7.05		99.3	99.0	3.37	3.36		1.4	1.3	
						31.6		7.03			98.7		3.34			1.2		
			Bottom	17.2	23.3	31.6	31.6	6.99	6.97		98.3	98.1	3.48	3.46		1.4	1.3	
						31.6		6.95			97.8		3.44			1.1		
10/04/19	1009-1022	28/Fine	Surface	1.0	27.8	31.3	31.3	7.71	7.73	7.66	116.8	117.1	2.74	2.76	2.89	1.3	1.2	1.2
						31.2		7.75			117.4		2.77			1.1		
			Middle	8.9	27.7	31.4	31.4	7.60	7.59		115.2	115.1	2.88	2.86		1.3	1.2	
						31.4		7.58			114.9		2.84			1.1		
			Bottom	16.8	27.5	31.6	31.6	7.45	7.47		112.5	112.8	3.03	3.05		1.1	1.3	
						31.5		7.48			113.0		3.06			1.5		
12/04/19	1003-1016	23/Drizzle	Surface	1.0	23.5	31.0	31.0	7.19	7.21	7.06	101.1	101.4	3.44	3.42	3.64	2.9	2.9	2.8
						30.9		7.23			101.6		3.40			2.8		
			Middle	9.1	23.2	31.0	31.1	6.92	6.90		96.7	96.5	3.73	3.72		2.8	2.8	
						31.1		6.88			96.2		3.70			2.7		
			Bottom	17.2	23.2	31.2	31.3	6.88	6.86		96.3	96.1	3.79	3.77		3.0	2.9	
						31.3		6.84			95.8		3.75			2.8		
15/04/19	1424-1439	21/Cloudy	Surface	1.0	20.9	31.1	31.2	7.66	7.65	7.55	103.0	102.9	2.62	2.61	2.76	4.0	4.3	4.5
						31.2		7.64			102.7		2.59			4.5		
			Middle	8.9	20.7	31.4	31.4	7.47	7.45		100.1	99.9	2.75	2.74		4.3	4.3	
						31.3		7.43			99.6		2.73			4.2		
			Bottom	16.7	20.6	31.5	31.5	7.25	7.24		97.1	96.9	2.91	2.93		4.9	4.9	
						31.5		7.22			96.7		2.94			4.9		

# Mid-Flood Tide



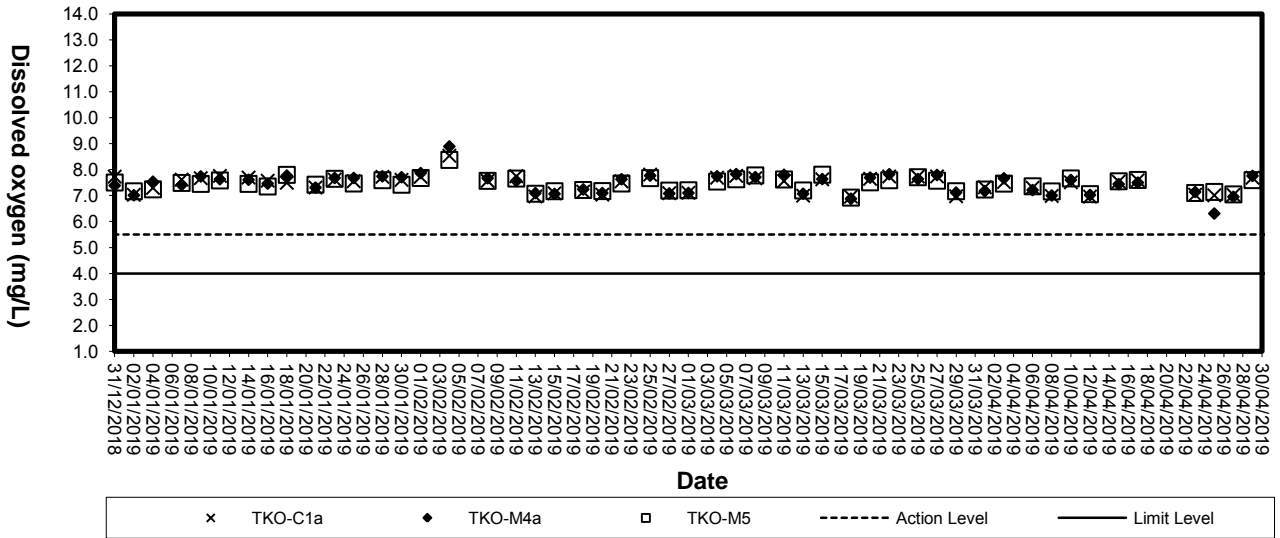
Monitoring Station : TKO-M5

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average
17/04/19	1649-1707	29/Fine	Surface	1.0	20.9	31.1	31.1	7.66	7.72	7.60	102.9	103.7	3.37	3.39	3.26	1.8	1.9	1.6
						31.1		7.77			104.4		3.41			2.0		
			Middle	9.0	20.7	31.2	31.2	7.42	7.49		99.3	100.3	3.24	3.27		1.6	1.7	
						31.2		7.56			101.2		3.29			1.7		
			Bottom	16.9	20.5	31.3	31.4	7.36	7.31		98.2	97.5	3.10	3.12		1.3	1.4	
						31.4		7.25			96.8		3.14			1.4		
23/04/19	1033-1048	28/Fine	Surface	1.0	25.0	30.9	31.0	7.03	7.05	7.10	101.4	101.6	2.97	2.98	3.30	2.5	2.4	2.2
						31.0		7.06			101.7		2.99			2.3		
			Middle	8.8	24.8	31.2	31.2	7.14	7.16		102.6	102.8	3.38	3.40		2.1	2.1	
						31.2		7.17			102.9		3.41			2.0		
			Bottom	16.6	24.6	31.5	31.5	7.30	7.32		104.8	105.0	3.50	3.52		2.3	2.2	
						31.4		7.33			105.1		3.53			2.1		
25/04/19	0956-1009	29/Cloudy	Surface	1.0	25.7	32.0	32.1	7.27	7.25	7.14	106.7	106.5	3.27	3.26	3.58	4.0	3.8	4.3
						32.1		7.23			106.2		3.25			3.6		
			Middle	9.1	25.6	32.1	32.2	7.02	7.03		103.0	103.2	3.68	3.66		4.9	5.1	
						32.2		7.04			103.4		3.64			5.2		
			Bottom	17.2	25.6	32.3	32.3	6.93	6.92		101.7	101.5	3.85	3.83		4.0	4.2	
						32.3		6.90			101.3		3.81			4.3		
27/04/19	1025-1039	27/Cloudy	Surface	1.0	25.7	32.0	32.0	7.19	7.17	7.05	105.5	105.3	3.39	3.37	3.64	4.4	4.6	3.4
						32.0		7.15			105.0		3.35			4.8		
			Middle	9.1	25.4	32.0	32.1	6.90	6.92		100.8	101.1	3.72	3.71		3.0	2.9	
						32.1		6.94			101.4		3.69			2.8		
			Bottom	17.2	25.4	32.1	32.2	6.78	6.77		99.1	98.9	3.81	3.83		2.8	2.8	
						32.2		6.75			98.7		3.85			2.7		
29/04/19	1354-1412	25/Fine	Surface	1.0	24.6	31.1	31.1	7.65	7.68	7.60	109.7	110.1	3.54	3.55	3.32	1.3	1.3	1.3
						31.0		7.70			110.4		3.55			1.2		
			Middle	9.0	24.4	31.2	31.2	7.48	7.52		107.0	107.5	3.21	3.23		1.3	1.4	
						31.2		7.55			108.0		3.24			1.4		
			Bottom	16.9	24.1	31.4	31.4	7.37	7.30		104.9	103.9	3.16	3.18		1.3	1.4	
						31.4		7.23			102.9		3.19			1.4		

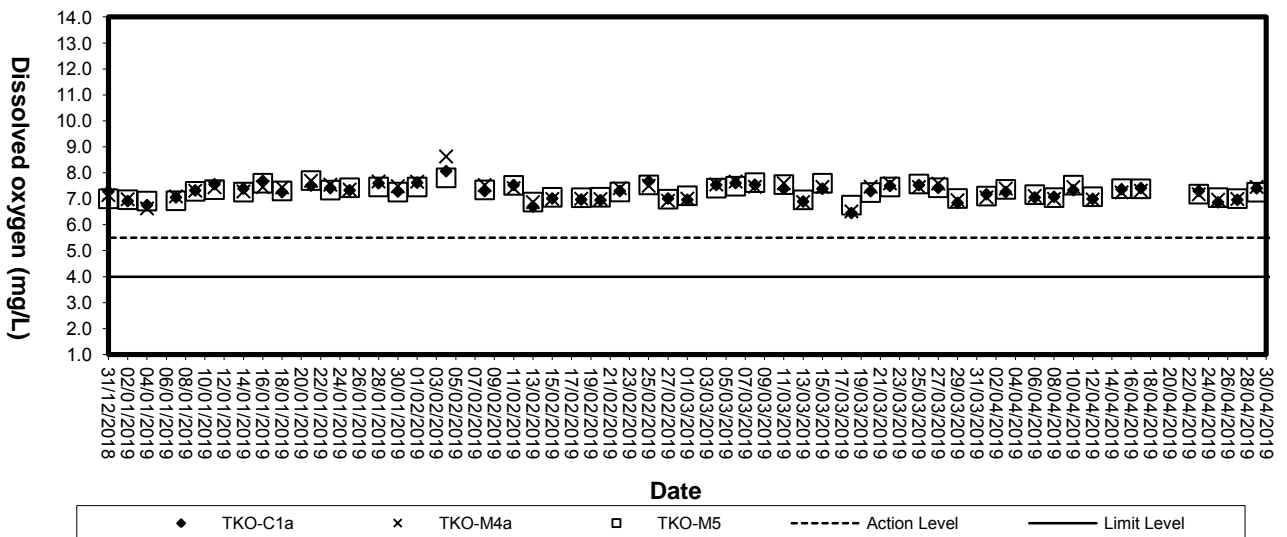
## **Appendix D5**

### **Graphical Plots of Impact Marine Water Quality Monitoring Data (3RS Project)**

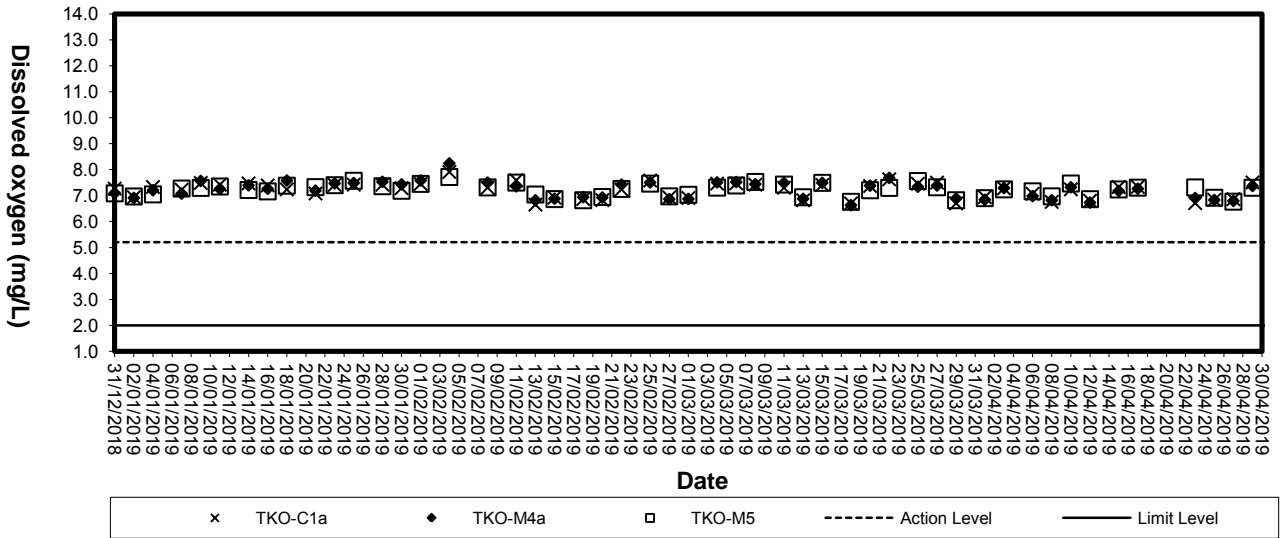
### Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide (3RS project)



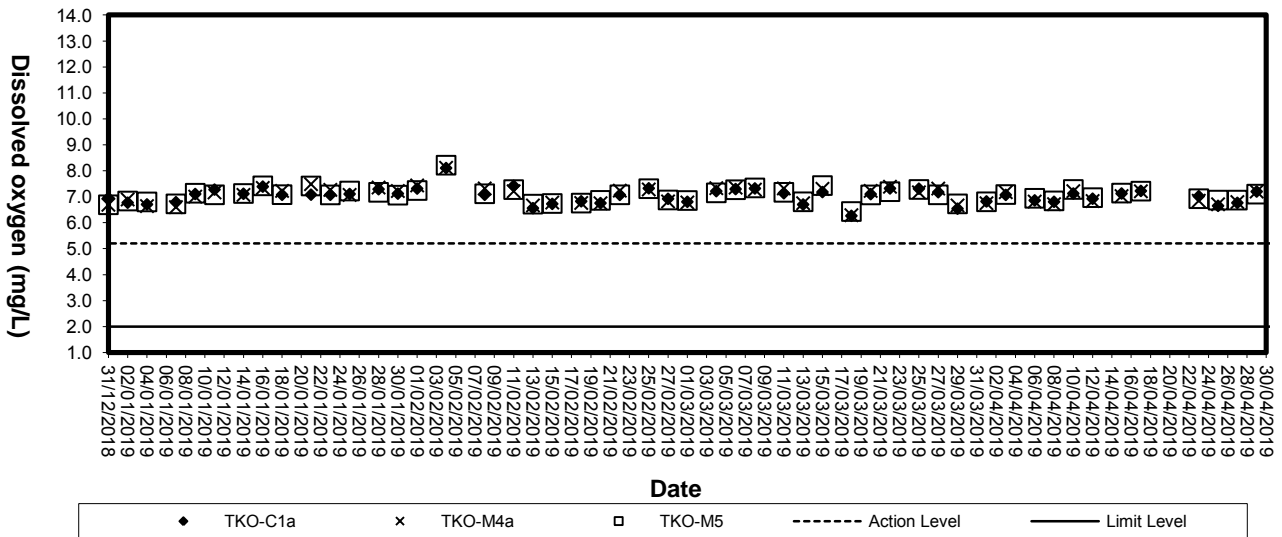
### Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide (3RS project)



### Dissolved Oxygen (Bottom) at Mid-Flood Tide (3RS project)

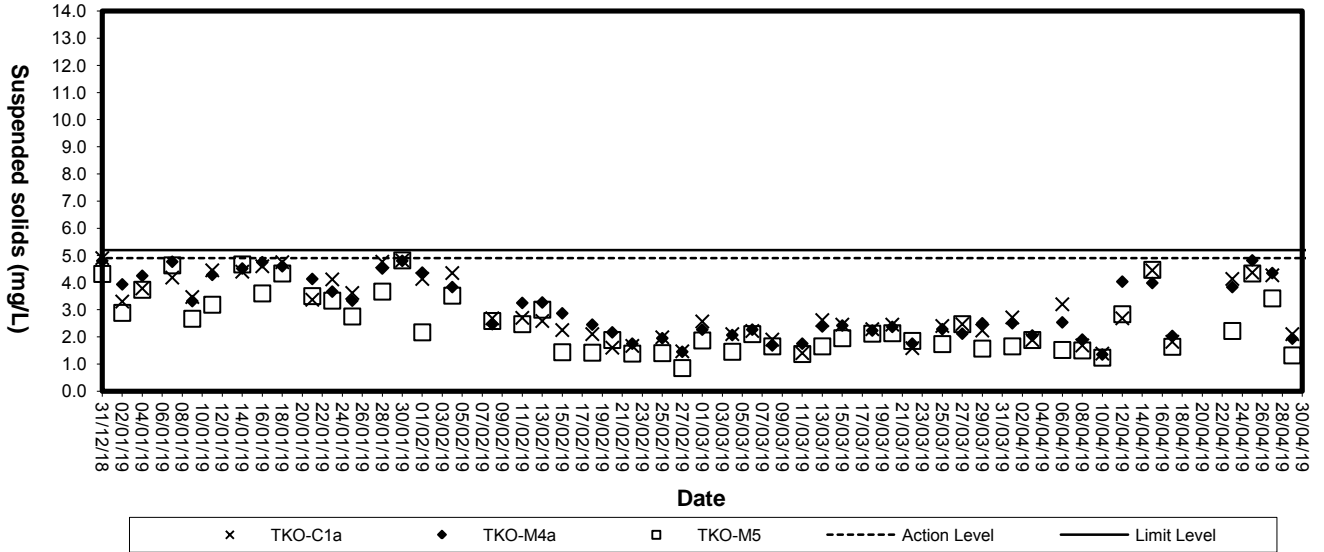


### Dissolved Oxygen (Bottom) at Mid-Ebb Tide (3RS project)

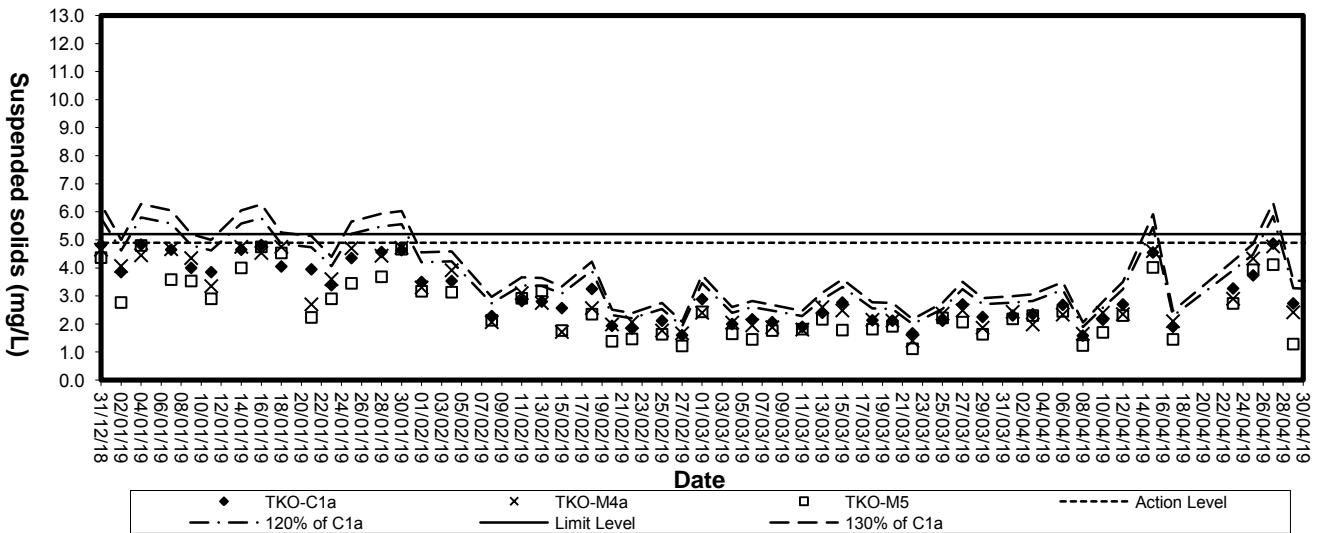




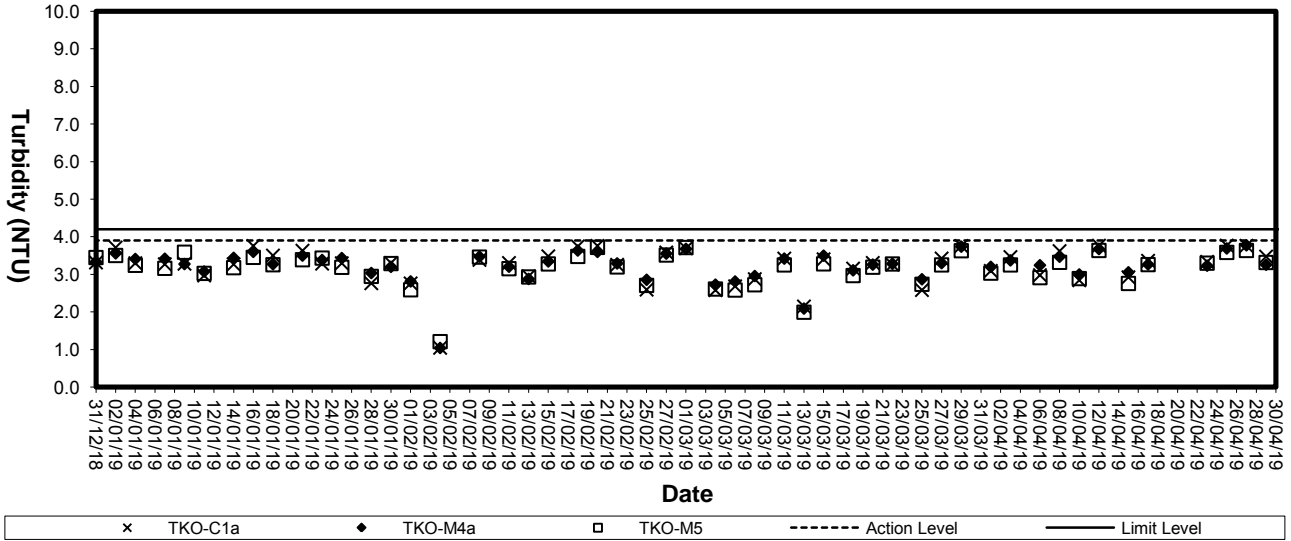
### Suspended solids (Depth-average) at Mid-Flood Tide (3RS project)



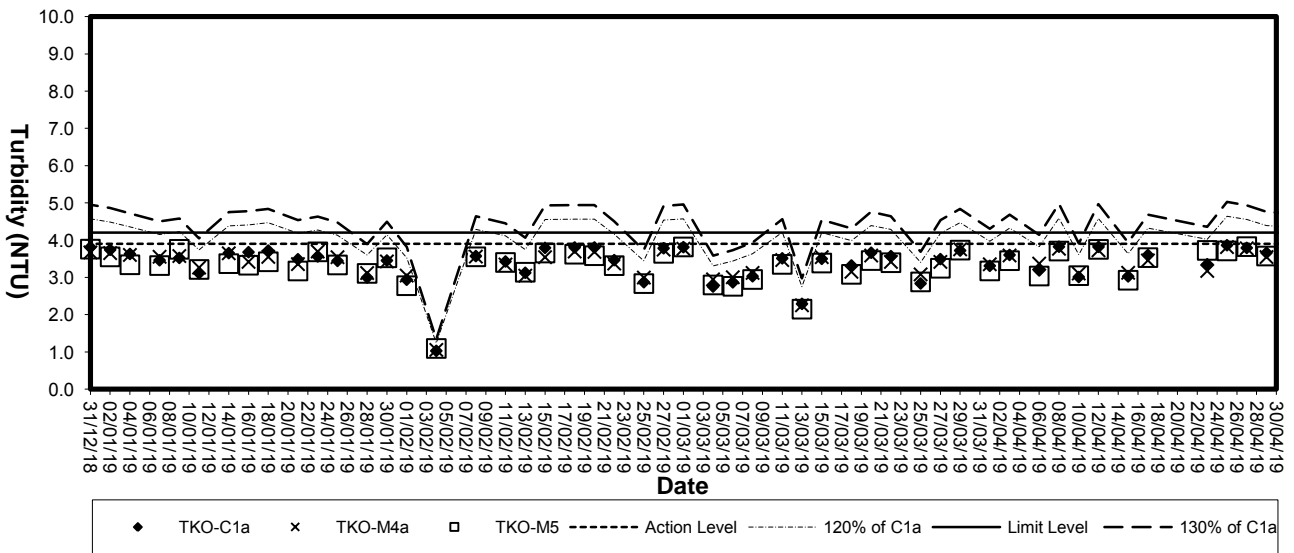
### Suspended Solids (Depth-average) at Mid-Ebb Tide (3RS project)



**Turbidity (Depth-average) at Mid-Flood Tide (3RS project)**



**Turbidity (Depth-average) at Mid-Ebb Tide (3RS project)**



## **Appendix E**

### **Weather Condition**

## Daily Extract of Meteorological Observations , April 2019 - Tseung Kwan O

Day	Mean Pressure (hPa)	Air Temperature			Mean Dew Point (deg. C)	Mean Relative Humidity (%)	Total Rainfall (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
		Absolute Daily Max (deg. C)	Mean (deg. C)	Absolute Daily Min (deg. C)					
1	***	20.2	19.5	19	16.2	81	0	50	9.9
2	***	21	19.7	18.3	15.6	77	0	10	8.8
3	***	23.8	21.7	19.3	18.7	84	0	20	5.3
4	***	22.8	20.5	19	18.2	87	0.5	70	6
5	***	28.6	23.1	18.5	19.3	81	0	320	2.8
6	***	29.8	24.4	20.1	20.3	79	0	200	4
7	***	29.5	25.4	21.5	21.4	80	0	190	4.3
8	***	30	26.2	23.5	22.8	82	0	190	4.8
9	***	28.8	25.8	23.9	22.8	84	0	190	6.5
10	***	30.7	26.5	23.2	23	82	0	190	4.3
11	***	29.6	26.3	23.8	23.6	85	0	180	4.3
12	***	23.8	21.4	20	20	92	12.5	10	8.6
13	***	21.3	20.4	19.4	19.7	96	9.5	10	7.1
14	***	23.3	21.8	20.9	20.7	94	9	10	4.2
15	***	22.1	21	20	19	88	1.5	20	8.3
16	***	21.8	20.1	18.6	19.4	96	15	30	3.8
17	***	26.4	22.4	19.6	20.4	89	0	190	3
18	***	24.3	22.9	20.9	22	94	9.5	110	3.2
19	***	27.6	22.7	20.4	22.1	96	71	10	4.2
20	***	24.8	22.2	21.1	22	99	31	360	2.6
21	***	29.2	24.9	21.9	23.8	94	0.5	180	3.2
22	***	30.7	26.8	24.3	24.5	88	0	180	3.5
23	***	31.7	27.2	23.9	24.2	85	0	180	3.8
24	***	31.7	27.4	24.2	23.6	81	0	180	4.7
25	***	32.6	28.3	25.2	23.5	76	0	190	6.3
26	***	32.2	27.8	24.8	24.3	82	0	190	5
27	***	26.0#	24.2#	22.2#	22.2#	89#	20.5	010#	7.3#
28	***	***	***	***	***	***	***	***	***
29	***	28.9#	26.7#	25.4#	23.8#	84#	0.0#	110#	4.3#
30	***	28.6#	26.0#	25.1#	24.5#	92#	1.0#	180#	3.5#

\*\*\* unavailable

# data incomplete

Rainfall measured in increment of 0.5 mm. Amount of < 0.5 mm cannot be detected

## **Appendix F**

### **Event-Action Plans**

EVENT/ACTION PLAN FOR AIR QUALITY EXCEEDANCE				
EVENT	ACTION			
	ET Leader	IC(E)	ER	Contractor
1. Exceedance for one sample  2. Exceedance for two or more consecutive samples	ACTION LEVEL			
	1. Identify source, investigate the causes of exceedance and propose remedial measures 2. Inform ER, IC(E) and Contractor 3. Repeat measurement to confirm finding 4. Increase monitoring frequency to daily	1. Check monitoring data submitted by the ET 2. Check contractor's working method	1. Notify Contractor	1. Rectify any unacceptable practise 2. Amend working methods if appropriate
1. Exceedance for one sample	LIMIT LEVEL			
	1. Identify source, investigate the causes of exceedance and propose remedial measures 2. Inform IC(E) and Contractor 3. Repeat measurements to confirm finding 4. Increase monitoring frequency to daily 5. Discuss with IC(E) and Contractor on remedial actions 6. If exceedance continues, arrange meeting with IC(E) and ER. 7. If exceedance stops, cease additional monitoring	1. Check monitoring data submitted by the ET Leader 2. Check the Contractor's working method 3. Discuss with ET and Contractor on possible remedial measures 4. Advise the ER on the effectiveness of the proposed remedial measures 5. Supervise implementation of remedial measures	1. Confirm receipt of notification of failure in writing 2. Notify the Contractor 3. Ensure remedial measures properly implemented	1. Submit proposals for remedial actions to IC(E) within 3 working days of notification 2. Implement the agreed proposals 3. Amend proposal if appropriate
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures 2. Inform ER, Contractor and EPD 3. Repeat measurement to confirm finding 4. Increase monitoring frequency to daily 5. Assess the effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results	1. Check monitoring data submitted by the ET Leader 2. Check Contractor's working method 3. Discuss with ET and Contractor on possible remedial measures 4. Advise the ER on the effectiveness of the proposed remedial measures 5. Supervise implementation of remedial measures	1. Confirm receipt of notification of failure in writing 2. Notify the Contractor 3. Ensure remedial measures properly implemented	1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to IC(E) within 3 working days of notification 3. Implement the agreed proposals 4. Amend proposal if appropriate.

EVENT/ACTION PLAN FOR AIR QUALITY EXCEEDANCE				
EVENT	ACTION			
	ET Leader	IC(E)	ER	Contractor
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>1. Identify source, investigate the causes of exceedance and propose remedial measures</li> <li>2. Notify IC(E), ER, EPD and Contractor</li> <li>3. Repeat measurement to confirm finding</li> <li>4. Increase monitoring frequency to daily</li> <li>5. Carry out analysis of contractor's working procedures to determine possible mitigation to be implemented</li> <li>6. Arrange meeting with IC(E) and ER to discuss the remedial actions to be taken</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results</li> <li>8. If exceedance stops, cease additional monitoring</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst ER, ET and Contractor on the potential remedial actions</li> <li>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly</li> <li>3. Supervise the implementation of remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing</li> <li>2. Notify Contractor</li> <li>3. In consultation with the IC(E), agree with the Contractor on the remedial measures to be implemented</li> <li>4. Ensure remedial measures are properly implemented</li> <li>5. If exceedances continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedances</li> <li>2. Submit proposals for remedial actions to IC(E) within 3 working days of notification</li> <li>3. Implement the agreed proposals</li> <li>4. Resubmit proposals if problem still not under control</li> <li>5. Stop the relevant activity of works as determined by the ER until the exceedance is abated</li> </ol>

EVENT/ACTION PLAN FOR NOISE EXCEEDANCE				
EVENT	ACTION			
	ET Leader	IC(E)	ER	Contractor
Action Level	<ol style="list-style-type: none"> <li>1. Notify the IC(E) and the Contractor.</li> <li>2. Carry out investigation.</li> <li>3. Report the results of investigation to the IC(E) and the Contractor.</li> <li>4. Discuss with the Contractor and formulate remedial measures.</li> <li>5. Increase monitoring frequency to check mitigation effectiveness</li> </ol>	<ol style="list-style-type: none"> <li>1. Review the analyzed results submitted by the ET.</li> <li>2. Review the proposed remedial measures by the Contractor and advise the ER accordingly.</li> <li>3. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing.</li> <li>2. Notify the Contractor.</li> <li>3. Require the Contractor to propose remedial measures for the analysed noise problem.</li> <li>4. Ensure remedial measures are properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit noise mitigation proposals to IC(E).</li> <li>2. Implement noise mitigation proposals.</li> </ol>
Limit Level	<ol style="list-style-type: none"> <li>1. Notify the IC(E), the ER, the EPD and the Contractor.</li> <li>2. Identify source.</li> <li>3. Repeat measurement to confirm findings.</li> <li>4. Increase monitoring frequency.</li> <li>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented.</li> <li>6. Inform the IC(E), the ER and the EPD the causes &amp; actions taken for the exceedances.</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep the IC(E), the EPD and the ER informed of the results</li> <li>8. If exceedance due to the construction works stops, cease additional monitoring</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst the ER, the ET Leader and the Contractor on the potential remedial actions.</li> <li>2. Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly.</li> <li>3. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing.</li> <li>2. Notify the Contractor.</li> <li>3. Require the Contractor to propose remedial measures for the analysed noise problem.</li> <li>4. Ensure remedial measures are properly implemented.</li> <li>5. If exceedances continue, consider what activity of the work is responsible and instruct the Contractor to stop that activity of work until the exceedances is abated.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance</li> <li>2. Submit proposals for remedial actions to IC(E) within 3 working days of notification.</li> <li>3. Implement the agreed proposals.</li> <li>4. Resubmit proposals if problem still not under control.</li> <li>5. Stop the relevant activity of works as determined by the ER until the exceedances is abated.</li> </ol>



<b>EVENT AND ACTION PLAN FOR WATER QUALITY EXCEEDANCE</b>					
Event	ACTION				
	ET Leader      Contractor      ER      IEC				
Action level being exceeded by one sampling day	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; vertical-align: top;"> <ol style="list-style-type: none"> <li>1. Identify source(s) of impact;</li> <li>2. Repeat in-situ measurement to confirm findings;</li> <li>3. Notify Contractor in writing within 24 hours of identification of the exceedance</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Carry out investigation</li> <li>6. Report the results of investigation to the Contractor within 3 working days of identification of exceedance and advise contractor if exceedance is due to contractor's construction works</li> <li>7. Discuss mitigation measures with Contractor if exceedance is due to the construction works within 4 working days</li> <li>8. Repeat measurement on next day of exceedance if exceedance is due to the construction works</li> </ol> </td> <td style="width: 25%; vertical-align: top;"> <ol style="list-style-type: none"> <li>1. Notify the ER and IEC in writing within 24 hours of identification of exceedance</li> <li>2. Rectify unacceptable practices;</li> <li>3. Check all plant and equipment;</li> <li>4. Submit investigation report to IEC and ER within 3 working days of the identification of an exceedance</li> <li>5. Consider changes of working method if exceedance is due to the construction works</li> <li>6. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER if exceedance is due to the construction works within 4 working days of identification of an exceedance</li> <li>7. Implement the agreed mitigation measures within reasonable time scale</li> </ol> </td> <td style="width: 25%; vertical-align: top;"> <ol style="list-style-type: none"> <li>1. Notify EPD and other relevant governmental agencies in writing within 24 hours of the identification of the exceedance</li> <li>2. Discuss with IEC, ET and Contractor on the proposed mitigation measures;</li> <li>3. Require contractor to propose remedial measures for the analysed problem if related to the construction works</li> <li>4. Ensure remedial measures are properly implemented</li> <li>5. Assess the effectiveness of the mitigation measure</li> </ol> </td> <td style="width: 25%; vertical-align: top;"> <ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET</li> <li>2. Confirm ET assessment if exceedance is due / not due to the works</li> <li>3. Discuss with ET, ER and Contractor on the mitigation measures</li> <li>4. Review contractor's mitigation measures whenever necessary to ensure their effectiveness and advise the ER accordingly</li> <li>5. Supervise the implementation of mitigation measures</li> </ol> </td> </tr> </table>	<ol style="list-style-type: none"> <li>1. Identify source(s) of impact;</li> <li>2. Repeat in-situ measurement to confirm findings;</li> <li>3. Notify Contractor in writing within 24 hours of identification of the exceedance</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Carry out investigation</li> <li>6. Report the results of investigation to the Contractor within 3 working days of identification of exceedance and advise contractor if exceedance is due to contractor's construction works</li> <li>7. Discuss mitigation measures with Contractor if exceedance is due to the construction works within 4 working days</li> <li>8. Repeat measurement on next day of exceedance if exceedance is due to the construction works</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify the ER and IEC in writing within 24 hours of identification of exceedance</li> <li>2. Rectify unacceptable practices;</li> <li>3. Check all plant and equipment;</li> <li>4. Submit investigation report to IEC and ER within 3 working days of the identification of an exceedance</li> <li>5. Consider changes of working method if exceedance is due to the construction works</li> <li>6. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER if exceedance is due to the construction works within 4 working days of identification of an exceedance</li> <li>7. Implement the agreed mitigation measures within reasonable time scale</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify EPD and other relevant governmental agencies in writing within 24 hours of the identification of the exceedance</li> <li>2. Discuss with IEC, ET and Contractor on the proposed mitigation measures;</li> <li>3. Require contractor to propose remedial measures for the analysed problem if related to the construction works</li> <li>4. Ensure remedial measures are properly implemented</li> <li>5. Assess the effectiveness of the mitigation measure</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET</li> <li>2. Confirm ET assessment if exceedance is due / not due to the works</li> <li>3. Discuss with ET, ER and Contractor on the mitigation measures</li> <li>4. Review contractor's mitigation measures whenever necessary to ensure their effectiveness and advise the ER accordingly</li> <li>5. Supervise the implementation of mitigation measures</li> </ol>
<ol style="list-style-type: none"> <li>1. Identify source(s) of impact;</li> <li>2. Repeat in-situ measurement to confirm findings;</li> <li>3. Notify Contractor in writing within 24 hours of identification of the exceedance</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Carry out investigation</li> <li>6. Report the results of investigation to the Contractor within 3 working days of identification of exceedance and advise contractor if exceedance is due to contractor's construction works</li> <li>7. Discuss mitigation measures with Contractor if exceedance is due to the construction works within 4 working days</li> <li>8. Repeat measurement on next day of exceedance if exceedance is due to the construction works</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify the ER and IEC in writing within 24 hours of identification of exceedance</li> <li>2. Rectify unacceptable practices;</li> <li>3. Check all plant and equipment;</li> <li>4. Submit investigation report to IEC and ER within 3 working days of the identification of an exceedance</li> <li>5. Consider changes of working method if exceedance is due to the construction works</li> <li>6. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER if exceedance is due to the construction works within 4 working days of identification of an exceedance</li> <li>7. Implement the agreed mitigation measures within reasonable time scale</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify EPD and other relevant governmental agencies in writing within 24 hours of the identification of the exceedance</li> <li>2. Discuss with IEC, ET and Contractor on the proposed mitigation measures;</li> <li>3. Require contractor to propose remedial measures for the analysed problem if related to the construction works</li> <li>4. Ensure remedial measures are properly implemented</li> <li>5. Assess the effectiveness of the mitigation measure</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET</li> <li>2. Confirm ET assessment if exceedance is due / not due to the works</li> <li>3. Discuss with ET, ER and Contractor on the mitigation measures</li> <li>4. Review contractor's mitigation measures whenever necessary to ensure their effectiveness and advise the ER accordingly</li> <li>5. Supervise the implementation of mitigation measures</li> </ol>		

EVENT AND ACTION PLAN FOR WATER QUALITY				
Event	ACTION			
	ET Leader	Contractor	ER	
Action level being exceeded by more than one consecutive sampling days	<ol style="list-style-type: none"> <li>Identify source(s) of impact;</li> <li>Repeat in-situ measurement to confirm findings</li> <li>Notify Contractor in writing within 24 hours of identification</li> <li>Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>Carry out investigation</li> <li>Report the results of investigation to the Contractor within 3 working days of identification of exceedance and advise contractor if exceedance is due to contractor's construction works</li> <li>Discuss mitigation measures with IEC and Contractor within 4 working of identification of an exceedance</li> <li>Ensure mitigation measures are implemented;</li> <li>Prepare to increase the monitoring frequency to daily;</li> <li>Repeat measurement on next day of exceedance.</li> </ol>	<ol style="list-style-type: none"> <li>Notify IEC and ER in writing within 24 hours of identification of exceedance</li> <li>Rectify unacceptable practice;</li> <li>Check all plant and equipment;</li> <li>Consider changes of working methods;</li> <li>Submit the results of the investigation to IEC and ER within 3 working days of the identification of an exceedance</li> <li>Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 4 working days of identification of an exceedance</li> <li>Implement the agreed mitigation measures within reasonable time scale</li> </ol>	<ol style="list-style-type: none"> <li>Notify EPD and other relevant governmental agencies in writing within 24 hours of the identification of the exceedance</li> <li>Discuss with IEC, ET and Contractor on the proposed mitigation measures;</li> <li>Require contractor to propose remedial measures for the analysed problem if related to the construction works</li> <li>Ensure remedial measures are properly implemented</li> <li>Assess the effectiveness of the mitigation measure</li> </ol>	<ol style="list-style-type: none"> <li>Check monitoring data submitted by ET</li> <li>Confirm ET assessment if exceedance is due / not due to the works</li> <li>Discuss with ET, ER and Contractor on the mitigation measures.</li> <li>Review contractor's mitigation measures whenever necessary to ensure their effectiveness and advise the ER accordingly</li> <li>Assess the effectiveness of the implemented mitigation measures.</li> </ol>

Event	EVENT AND ACTION PLAN FOR WATER QUALITY EXCEEDANCE			
	ET Leader	Contractor	ER	IEC
Limit level being exceeded by one sampling day	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurement to confirm findings;</li> <li>2. Identify source(s) of impact;</li> <li>3. Notify Contractor in writing within 24 hours of identification of the exceedance</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Carry out investigation</li> <li>6. Report the results of investigation to the Contractor within 3 working days of identification of exceedance and advise contractor if exceedance is due to contractor's construction works</li> <li>7. Discuss mitigation measures with IEC, ER and Contractor within 4 working of identification of an exceedance</li> <li>8. Ensure mitigation measures are implemented;</li> <li>9. Increase the monitoring frequency to daily until no exceedance of Limit Level.</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify IEC and ER in writing; within 24 hours of the identification of the exceedance</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment;</li> <li>4. Consider changes of working methods;</li> <li>5. Submit the results of the investigation to IEC and ER within 3 working days of the identification of an exceedance</li> <li>6. Discuss with ET, IEC and ER and propose mitigation within 4 working days of the identification of an exceedance</li> <li>7. Implement the agreed mitigation measures within reasonable time scale</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify EPD and other relevant governmental agencies in writing within 24 hours of identification of exceedance</li> <li>2. Discuss with IEC, ET and Contractor on the proposed mitigation measures;</li> <li>3. Request Contractor to critically review the working methods;</li> <li>4. Ensure remedial measures are properly implemented</li> <li>5. Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET</li> <li>2. Confirm ET assessment if exceedance is due / not due to the works</li> <li>3. Discuss with ET, ER and Contractor on the mitigation measures.</li> <li>4. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly.</li> <li>5. Assess the effectiveness of the implemented mitigation measures</li> </ol>

EVENT AND ACTION PLAN FOR WATER QUALITY EXCEEDANCE				
Event	ACTION			
	ET Leader	Contractor	ER	
Limit Level being exceeded by more than one consecutive sampling days	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurement to confirm findings;</li> <li>2. Identify source(s) of impact;</li> <li>3. Notify Contractor in writing within 24 hours of identification of the exceedance</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Carry out investigation</li> <li>6. Report the results of investigation to the Contractor within 3 working days of identification of exceedance and advise contractor if exceedance is due to contractor's construction works</li> <li>7. Discuss mitigation measures with IEC, ER and Contractor;</li> <li>8. Ensure mitigation measures are implemented;</li> <li>9. Increase the monitoring frequency to daily until no exceedance of Limit Level for two consecutive days.</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify ER and IEC in writing within 24 hours of the identification of the exceedance and Rectify unacceptable practice;</li> <li>2. Check all plant and equipment;</li> <li>3. Consider changes of working methods;</li> <li>4. Submit the results of the investigation to IEC and ER within 3 working days of the identification of an exceedance</li> <li>5. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 4 working days;</li> <li>6. Implement the agreed mitigation measures within reasonable time scale</li> <li>7. As directed by the Engineer, to slow down or to stop all or part of the marine work or construction activities.</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify EPD and other relevant governmental agencies in writing within 24 hours of identification of exceedance</li> <li>2. Discuss with IEC, ET and Contractor on the proposed mitigation measures;</li> <li>3. Request Contractor to critically review the working methods;</li> <li>4. Ensure remedial measures are properly implemented</li> <li>5. Assess the effectiveness of the implemented mitigation measures;</li> <li>6. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit Level.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET</li> <li>2. Confirm ET assessment if exceedance is due / not due to the works</li> <li>3. Discuss with ER, ET and Contractor on the mitigation measures.</li> <li>4. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly.</li> <li>5. Assess the effectiveness of the implemented mitigation measures.</li> </ol>

## **Appendix G**

### **Works Programme**

China Harbour - Zhen Hua Joint Venture  
 Contract No. CV/2015/07  
 Handling of Surplus Public Fill (2016 -2018)

Three Months Rolling Programme (1-March-2019 to 31-May-2019)

Item	Description	From	To	Mar-19																															Apr-19																															May-19																															
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
1	Section 1A	1-Mar-19	31-May-19	[Blue bar]																																																																																													
1.1	Operation of Fill Bank, surveillance system and tipping halls	1-Mar-19	31-May-19	[Green bar]																																																																																													
1.2	Operation of crushing plant	1-Mar-19	31-May-19	[Green bar]																																																																																													
1.3	Operation of the existing and expanded dewatering plants	1-Mar-19	31-May-19	[Green bar]																																																																																													
1.4	Collection and delivery of Public Fill from CWPFBP and MWPFPRF to TKOFB	1-Mar-19	31-May-19	[Green bar]																																																																																													
1.5	Breaking up the incoming precast concrete units	1-Mar-19	31-May-19	[Green bar]																																																																																													
1.6	Carry out repair works for damages caused by Super Typhoon	1-Mar-19	31-May-19	[Green bar]																																																																																													
1.7	Carry out preliminary sorting on Public Fill for Three Runway System (3RS) project	1-Mar-19	31-May-19	[Green bar]																																																																																													
2	Section 2A	1-Mar-19	31-May-19	[Blue bar]																																																																																													
2.1	Operation of Fill Bank, surveillance system and tipping halls	1-Mar-19	31-May-19	[Green bar]																																																																																													
2.2	Breaking up the incoming precast concrete units	1-Mar-19	31-May-19	[Green bar]																																																																																													
2.3	Operation of glass cullet storage compartment at Portion B7	1-Mar-19	31-May-19	[Green bar]																																																																																													
2.4	Construction of transformer room and meter room	1-Mar-19	31-May-19	[Green bar]																																																																																													
2.5	Carry out repair works for damages caused by Super Typhoon	1-Mar-19	31-May-19	[Green bar]																																																																																													
2.6	Carry out preliminary sorting on Public Fill for Three Runway System (3RS) project	1-Mar-19	31-May-19	[Green bar]																																																																																													
3	Section 3	1-Mar-19	15-Apr-19	[Blue bar]																																																																																													
3.1	Design and construction of seawalls at Zone B (approx. 900m)	1-Mar-19	15-Apr-19	[Green bar]																																																																																													
3.2	Design and construction of seawalls at Zone C (approx. 2000m)	1-Mar-19	15-Apr-19	[Green bar]																																																																																													
4	Section 3A	1-Mar-19	15-Apr-19	[Blue bar]																																																																																													
4.1	Design, construction and operation of new berthing facilities at Zone B	1-Mar-19	15-Apr-19	[Green bar]																																																																																													
4.2	Design, construction and operation of new navigation channel and turning basin in associated with the berthing facilities at Zone B	1-Mar-19	15-Apr-19	[Green bar]																																																																																													
4.3	Design and construction of seawalls at Zone B (approx. 1500m)	1-Mar-19	15-Apr-19	[Green bar]																																																																																													
5	Section 4	1-Mar-19	31-May-19	[Blue bar]																																																																																													
5.1	Collection and delivery of Public Fill to the Designated Reclamation Sites in the Mainland	1-Mar-19	31-May-19	[Green bar]																																																																																													
6	Section 6	1-Mar-19	15-May-19	[Blue bar]																																																																																													
6.1	Removal of existing stockpiled Public Fill at Portion A5b down to +5.2mPD	1-Mar-19	15-May-19	[Green bar]																																																																																													
7	Section 7	1-Mar-19	31-May-19	[Blue bar]																																																																																													
7.1	Removal of existing stockpiled Public Fill at Portion A5c down to +5.2mPD and +6.0mPD	1-Mar-19	31-May-19	[Green bar]																																																																																													

## **Appendix H**

### **Weekly ET's Site Inspection Record**

Inspection Date : 3/4/19


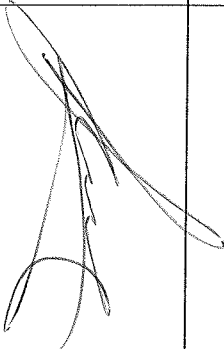
Time : 15:15

Weather : Sunny / Fine / Cloudy / Overcast / Drizzle / Rain / Storm / Hazy

Wind : Calm / Light / Breeze / Strong

Temperature : 22°C

Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:			Mark
Name:	Tseung Tseung	S.H. Lam	Mark Kai Man
Title	Area /	Co.	ET



**Environmental Checklist**

	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Fugitive Dust Emission</b>				
<ul style="list-style-type: none"> <li>▪ Dust control / mitigation measures shall be provided to prevent dust nuisance.</li> <li>▪ A buffer zone of at least 100m shall be maintained between the edge of the stockpiling area and the nearest ASRs at the TKO Industrial Estate. Within the buffer zone, no dusty material shall be stockpiled and no loading / unloading and similar activities should be allowed.</li> <li>▪ Water sprays shall be provided and used to dampen materials.</li> <li>▪ Regular cleaning and watering the site shall be provided to minimize the fugitive dust emissions.</li> <li>▪ All vehicles shall be restrict to a maximum speed of 10 km per hour.</li> <li>▪ Any vehicle with open load carrying area used for moving materials which has the potential to create dust shall have properly fitting side and tail boards. Material having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin.</li> <li>▪ The designated site main haul road shall be paved or regular watering.</li> <li>▪ Frequent watering of work site shall be at least three times per day.</li> <li>▪ Wheel washing facilities including high-pressure water jet shall be provided at the entrance of work site.</li> <li>▪ Every vehicle shall be washed to remove any dusty materials from its body and wheels before leaving the fill bank.</li> <li>▪ All plant and equipment should be well maintained e.g. without black smoke emission.</li> <li>▪ Open burning should be prohibited.</li> <li>▪ The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD.</li> <li>▪ Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shot concrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.</li> <li>▪ When fill material is transfer by belt conveyor systems, the conveyors shall be enclosed on top and 2 sides.</li> <li>▪ The belt scraper shall be equipped with bottom plates or other similar means to prevent falling of material from the return belt.</li> <li>▪ The level of stockpiling belt conveyor shall be adjustable such that the vertical distance between the belt conveyor and the material landing point is maintained at no more than 1m.</li> <li>▪ Approval or exemption Non-road Mobile Machinery (NRM/M) labels should be painted or securely fixed on regulated machines and non-road vehicles at a conspicuous position according to the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation (APCO Cap.311).</li> </ul>	√			
<b>Noise Impact</b>				
<ul style="list-style-type: none"> <li>▪ The approved method of working, equipment and sound-reducing measures (e.g. use of silenced type of equipment, etc.) shall be adapted.</li> <li>▪ Only well maintained plant should be operated on-site and plant should be serviced regularly during the construction works.</li> <li>▪ Powered mechanical equipment (PME) should be covered or shielded by appropriate acoustic materials.</li> <li>▪ Air compressors and hand held breakers should have noise labels.</li> <li>▪ Machines and plants that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.</li> <li>▪ Noisy equipment and mobile plant shall always be site away from NSRs.</li> </ul>	√			

**Environmental Checklist**

**Water Quality**

	Implementation Stages*			Remark
	Yes	No	N/A	
Drainage system should be adequate and well maintained to prevent flooding and overflow, especially after rain storms.	√			
The permanent drainage channels should have sediment basin, traps and baffles and maintain properly.	√			
Temporary intercepting drains should be used at the stockpiling area to divert polluted stormwater to the intercepting channels. Earth bunds and sand bay barriers shall be used to assist the diversion of polluted stormwater to the intercepting channels.	√			
Manholes should be covered and sealed.	√			
Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding.	√			
A buffer distance of at least 100m shall be maintained between the boundary of the public fill stockpiling area and the sea front.	√			
A buffer distance of at least 20m shall be maintained between the boundary of the C&DMSE and the seafront.	√			
The stormwater intercepting system shall be effective to collect of runoff and remove suspended solids before discharge.	√			
The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEEDD.	√			
Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shotconcrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEEDD.	√			
Existing and newly constructed Catchpits, sand and silt removal facilities and intercepting channels shall be maintained, and the deposited silt and grit shall be removed weekly and on a need basis especially at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.	√			
A wheel washing bay shall be provided at the site exit and wash-water shall have sand and silt settled out or removed before being discharged into storm drains.	√			
The section of construction road between wheel washing bay and the public road shall be paved with concrete, bituminous materials or hardcores to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.	√			
Sewage from toilets shall be discharged in to a foul sewer, or chemical toilets shall be provided. The chemical toilets (if use) shall be provided by a licensed contractor, who will be responsible for disposal and maintenance of these facilities.	√			
Oil intercept in addition of sand / silt removal facilities shall be provided at the car parking areas.	√			
Oil interceptor shall be provided at work shop.	√			
Tipping halls enclosed with top and 3-side to prevent spillage of material into marine water.	√			
The barges shall be in right size such that adequate clearance is maintained between the vessels and the seabed at all states of the tide to ensure the undue turbidity is not generated by turbulence from vessel movement or propeller wash.	√			
All vessels used for transportation of fill material shall have tight fitting seals to their bottom openings to prevent leakage of material during transport.	√			
Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer.	√			
Barges shall not be filled to a level which may cause the overflow of material during loading or transportation. Barge effluents shall be properly collected and treated before disposal.	√			
The work activities shall not cause any visible foam, oil, grease, scum, litter or other objectionable matters to be present on the water in the vicinity of the barging facilities.	√			
Existing silt curtain at the outward side of the basin near the Barging Handling Area (BHA) throughout the period shall be repair, maintain and service when there is public fill intake by barges to the Fill Bank in accordance with PS Clause 1.68. The total length of the silt curtains shall not be less than 160m, and a gap of about 80m shall be left open for access of barges. The silt curtain shall be properly maintained such that it can also serve the function of refuse containment boom to confine floating refuse.	√			
A waste collection vessel shall be deployed to remove floating debris.	√			

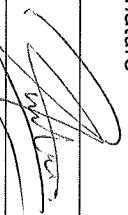
Environmental Checklist	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Landscape and Visual</b>				
<ul style="list-style-type: none"> <li>The design of the fill bank and platform heights adopted should allow the fill bank to fit into the general topography of the surrounding land. Straight edged slopes should be avoided.</li> </ul>	√			
<ul style="list-style-type: none"> <li>The maximum stockpiling height at the fill bank shall be limited to a maximum of +35.2mPD.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Surface of outer slopes of the fill bank shall preferably be hydroseeded or covered with geo-textile matting of appropriate colour (e.g. dark green / brown) once completed.</li> </ul>	√			
<ul style="list-style-type: none"> <li>The barging point and the C&amp;DMSF at the fill bank shall not be in operation from 07:00 pm to 08:00 am daily to avoid potential visual impact from glare.</li> </ul>	√			
<b>Other Environmental Factors</b>				
<ul style="list-style-type: none"> <li>C&amp;D waste sorted from mixed C&amp;D material shall be removed from the temporary buffer storage area on a daily basis and transfer to SENT landfill for disposal.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Any unused materials or those with remaining functional capacity should be recycled and stored properly.</li> </ul>	√			
<ul style="list-style-type: none"> <li>All generators, fuel and oil storage are within bundle areas.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Oil leakage from machinery, vehicle and plant is prevented.</li> </ul>	√			
<ul style="list-style-type: none"> <li>The Environmental Permit should be displaced conspicuously on site.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Good site practices should be adopted to clean the rubbish and litter on a regular basis so as to prevent the rubbish and litter from dropping into the nearby environment.</li> </ul>	√			
<ul style="list-style-type: none"> <li>To encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to segregate this waste from other general refuse generated by the workforce.</li> </ul>	√			

**Summary of the Weekly Site Inspection:**

Item	Details of defective works or observations	Proposed Follow Up Action	Photo Ref.	Further Action Required (Yes/No)	Follow up Date
1	Follow up action to item no. 1 on 26/03/19, Drainage system was repaired and the accumulated mud was cleaned.	---	190403_001	No	---

Remark

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Checked by	Name	Title	Signature	Date
	Frankie Tang	ET Representative		03 April 2019

Photo

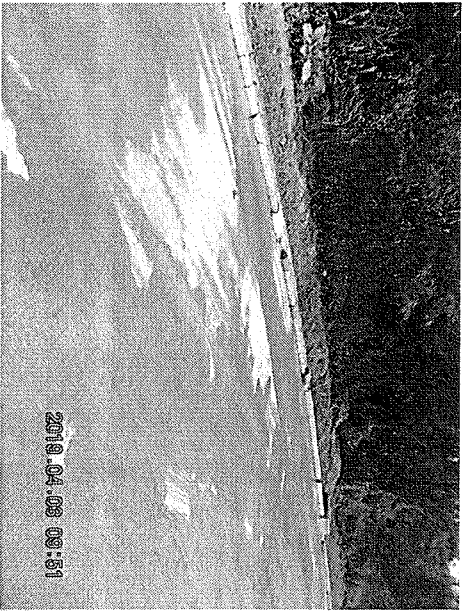


Photo 190403\_001 (Near wheels washing facility)(Improved)

Inspection Date : 10/04/19


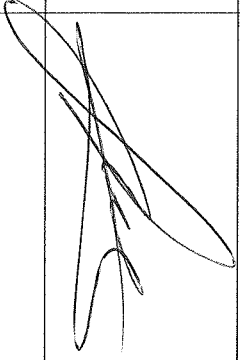

Time : 15:00

Weather : Sunny / Fine / Cloudy / Overcast / Drizzle / Rain / Storm / Hazy

Wind : Calm / Light / Breeze / Strong

Temperature : 29°C

Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:			
Name:	Tsz Ho Tsang	Sun Sun	Chen Y. Chiu
Title	Atom	Co.	E.T.

Environmental Checklist

	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Fugitive Dust Emission</b>				
<ul style="list-style-type: none"> <li>Dust control / mitigation measures shall be provided to prevent dust nuisance.</li> </ul>	√			
<ul style="list-style-type: none"> <li>A buffer zone of at least 100m shall be maintained between the edge of the stockpiling area and the nearest ASRs at the TKO Industrial Estate. Within the buffer zone, no dusty material shall be stockpiled and no loading / unloading and similar activities should be allowed.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Water sprays shall be provided and used to dampen materials.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Regular cleaning and watering the site shall be provided to minimize the fugitive dust emissions.</li> </ul>	√			
<ul style="list-style-type: none"> <li>All vehicles shall be restrict to a maximum speed of 10 km per hour.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Any vehicle with open load carrying area used for moving materials which has the potential to create dust shall have properly fitting side and tail boards. Material having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin.</li> </ul>	√			
<ul style="list-style-type: none"> <li>The designated site main haul road shall be paved or regular watering.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Frequent watering of work site shall be at least three times per day.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Wheel washing facilities including high-pressure water jet shall be provided at the entrance of work site.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Every vehicle shall be washed to remove any dusty materials from its body and wheels before leaving the fill bank.</li> </ul>	√			
<ul style="list-style-type: none"> <li>All plant and equipment should be well maintained e.g. without black smoke emission.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Open burning should be prohibited.</li> </ul>	√			
<ul style="list-style-type: none"> <li>The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shot concrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.</li> </ul>	√			
<ul style="list-style-type: none"> <li>When fill material is transfer by belt conveyor systems, the conveyors shall be enclosed on top and 2 sides.</li> </ul>	√			
<ul style="list-style-type: none"> <li>The belt scraper shall be equipped with bottom plates or other similar means to prevent falling of material from the return belt.</li> </ul>	√			
<ul style="list-style-type: none"> <li>The level of stockpiling belt conveyor shall be adjustable such that the vertical distance between the belt conveyor and the material landing point is maintained at no more than 1m.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Approval or exemption Non-road Mobile Machinery (NRM/M) labels should be painted or securely fixed on regulated machines and non-road vehicles at a conspicuous position according to the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation (APCCO Cap.311).</li> </ul>	√			
<b>Noise Impact</b>				
<ul style="list-style-type: none"> <li>The approved method of working, equipment and sound-reducing measures (e.g. use of silenced type of equipment, etc.) shall be adapted.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Only well maintained plant should be operated on-site and plant should be serviced regularly during the construction works.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Powered mechanical equipment (PME) should be covered or shielded by appropriate acoustic materials.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Air compressors and hand held breakers should have noise labels.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Machines and plants that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Noisy equipment and mobile plant shall always be site away from NSRs.</li> </ul>	√			

**Environmental Checklist**

**Water Quality**

	Implementation Stages*			Remark
	Yes	No	N/A	
<ul style="list-style-type: none"> <li>▪ Drainage system should be adequate and well maintained to prevent flooding and overflow, especially after rain storms.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ The permanent drainage channels should have sediment basin, traps and baffles and maintain properly.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ Temporary intercepting drains should be used at the stockpiling area to divert polluted stormwater to the intercepting channels. Earth bunds and sand bay barriers shall be used to assist the diversion of polluted stormwater to the intercepting channels.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ Manholes should be covered and sealed.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ A buffer distance of at least 100m shall be maintained between the boundary of the public fill stockpiling area and the sea front.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ A buffer distance of at least 20m shall be maintained between the boundary of the C&amp;DMSF and the seafront.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ The stormwater intercepting system shall be effective to collect of runoff and remove suspended solids before discharge.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shotconcrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ Existing and newly constructed Catchpits, sand and silt removal facilities and intercepting channels shall be maintained, and the deposited silt and grit shall be removed weekly and on a need basis especially at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ A wheel washing bay shall be provided at the site exit and wash-water shall have sand and silt settled out or removed before being discharged into storm drains.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ The section of construction road between wheel washing bay and the public road shall be paved with concrete, bituminous materials or hardcores to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ Sewage from toilets shall be discharged in to a foul sewer, or chemical toilets shall be provided. The chemical toilets (if use) shall be provided by a licensed contractor, who will be responsible for disposal and maintenance of these facilities.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ Oil intercept in addition of sand / silt removal facilities shall be provided at the car parking areas.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ Oil interceptor shall be provided at work shop.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ Tipping halls enclosed with top and 3-side to prevent spillage of material into marine water.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ The barges shall be in right size such that adequate clearance is maintained between the vessels and the seabed at all states of the tide to ensure the undue turbidity is not generated by turbulence from vessel movement or propeller wash.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ All vessels used for transportation of fill material shall have tight fitting seals to their bottom openings to prevent leakage of material during transport.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ Barges shall not be filled to a level which may cause the overflow of material during loading or transportation. Barge effluents shall be properly collected and treated before disposal.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ The work activities shall not cause any visible foam, oil, grease, scum, litter or other objectionable matters to be present on the water in the vicinity of the barging facilities.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ Existing silt curtain at the outward side of the basin near the Barging Handling Area (BHA) throughout the period shall be repair, maintain and service when there is public fill intake by barges to the Fill Bank in accordance with PS Clause 1.68. The total length of the silt curtains shall not be less than 160m, and a gap of about 80m shall be left open for access of barges. The silt curtain shall be properly maintained such that it can also serve the function of refuse containment boom to confine floating refuse.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ A waste collection vessel shall be deployed to remove floating debris.</li> </ul>	√			



**Environmental Checklist**


	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Landscape and Visual</b>				
<ul style="list-style-type: none"> <li>The design of the fill bank and platform heights adopted should allow the fill bank to fit into the general topography of the surrounding land. Straight edged slopes should be avoided.</li> </ul>	√			
<ul style="list-style-type: none"> <li>The maximum stockpiling height at the fill bank shall be limited to a maximum of +35.2mPD.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Surface of outer slopes of the fill bank shall preferably be hydroseeded or covered with geo-textile matting of appropriate colour (e.g. dark green / brown) once completed.</li> </ul>	√			
<ul style="list-style-type: none"> <li>The barging point and the C&amp;DMSF at the fill bank shall not be in operation from 07:00 pm to 08:00 am daily to avoid potential visual impact from glare.</li> </ul>	√			
<b>Other Environmental Factors</b>				
<ul style="list-style-type: none"> <li>C&amp;D waste sorted from mixed C&amp;D material shall be removed from the temporary buffer storage area on a daily basis and transfer to SENT landfill for disposal.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Any unused materials or those with remaining functional capacity should be recycled and stored properly.</li> </ul>	√			
<ul style="list-style-type: none"> <li>All generators, fuel and oil storage are within bundle areas.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Oil leakage from machinery, vehicle and plant is prevented.</li> </ul>	√			
<ul style="list-style-type: none"> <li>The Environmental Permit should be displaced conspicuously on site.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Good site practices should be adopted to clean the rubbish and litter on a regular basis so as to prevent the rubbish and litter from dropping into the nearby environment.</li> </ul>	√			
<ul style="list-style-type: none"> <li>To encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to segregate this waste from other general refuse generated by the workforce.</li> </ul>	√			

**Summary of the Weekly Site Inspection:**

Item	Details of defective works or observations	Proposed Follow Up Action	Photo Ref.	Further Action Required (Yes/No)	Follow up Date
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Remark

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Checked by	Name	Title	Signature	Date
	Frankie Tang	ET Representative		10 April 2019

Inspection Date : 17/4/19

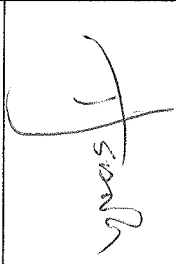
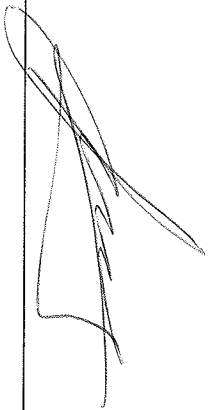

Time : 1500

Weather : Sunny / Fine / Cloudy / Overcast / Drizzle / Rain / Storm / Hazy

Wind : Calm / Light / Breeze / Strong

Temperature : 26°C

Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:			
Name:	Yin Tsang	S. W. Sun	Mak Kai Wan
Title	Asst. Comm.	Co.	ET

Environmental Checklist

	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Fugitive Dust Emission</b>				
<ul style="list-style-type: none"> <li>Dust control / mitigation measures shall be provided to prevent dust nuisance.</li> </ul>	√			
<ul style="list-style-type: none"> <li>A buffer zone of at least 100m shall be maintained between the edge of the stockpiling area and the nearest ASRs at the TKO Industrial Estate. Within the buffer zone, no dusty material shall be stockpiled and no loading / unloading and similar activities should be allowed.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Water sprays shall be provided and used to dampen materials.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Regular cleaning and watering the site shall be provided to minimize the fugitive dust emissions.</li> </ul>	√			
<ul style="list-style-type: none"> <li>All vehicles shall be restrict to a maximum speed of 10 km per hour.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Any vehicle with open load carrying area used for moving materials which has the potential to create dust shall have properly fitting side and tail boards. Material having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin.</li> </ul>	√			
<ul style="list-style-type: none"> <li>The designated site main haul road shall be paved or regular watering.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Frequent watering of work site shall be at least three times per day.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Wheel washing facilities including high-pressure water jet shall be provided at the entrance of work site.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Every vehicle shall be washed to remove any dusty materials from its body and wheels before leaving the fill bank.</li> </ul>	√			
<ul style="list-style-type: none"> <li>All plant and equipment should be well maintained e.g. without black smoke emission.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Open burning should be prohibited.</li> </ul>	√			
<ul style="list-style-type: none"> <li>The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shot concrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.</li> </ul>	√			
<ul style="list-style-type: none"> <li>When fill material is transfer by belt conveyor systems, the conveyors shall be enclosed on top and 2 sides.</li> </ul>	√			
<ul style="list-style-type: none"> <li>The belt scraper shall be equipped with bottom plates or other similar means to prevent falling of material from the return belt.</li> </ul>	√			
<ul style="list-style-type: none"> <li>The level of stockpiling belt conveyor shall be adjustable such that the vertical distance between the belt conveyor and the material landing point is maintained at no more than 1m.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Approval or exemption Non-road Mobile Machinery (NRM/M) labels should be painted or securely fixed on regulated machines and non-road vehicles at a conspicuous position according to the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation (APCCO Cap.311).</li> </ul>	√			
<b>Noise Impact</b>				
<ul style="list-style-type: none"> <li>The approved method of working, equipment and sound-reducing measures (e.g. use of silenced type of equipment, etc.) shall be adapted.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Only well maintained plant should be operated on-site and plant should be serviced regularly during the construction works.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Powered mechanical equipment (PME) should be covered or shielded by appropriate acoustic materials.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Air compressors and hand held breakers should have noise labels.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Machines and plants that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Noisy equipment and mobile plant shall always be site away from NSRs.</li> </ul>	√			

**Environmental Checklist**

	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Water Quality</b>				
▪ Drainage system should be adequate and well maintained to prevent flooding and overflow, especially after rain storms.	✓			
▪ The permanent drainage channels should have sediment basin, traps and baffles and maintain properly.	✓			
▪ Temporary intercepting drains should be used at the stockpiling area to divert polluted stormwater to the intercepting channels. Earth bunds and sand bay barriers shall be used to assist the diversion of polluted stormwater to the intercepting channels.	✓			
▪ Manholes should be covered and sealed.	✓			
▪ Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding.	✓			
▪ A buffer distance of at least 100m shall be maintained between the boundary of the public fill stockpiling area and the sea front.	✓			
▪ A buffer distance of at least 20m shall be maintained between the boundary of the C&DMSF and the seafront.	✓			
▪ The stormwater intercepting system shall be effective to collect of runoff and remove suspended solids before discharge.	✓			
▪ The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD.	✓			
▪ Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shotconcrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.	✓			
▪ Existing and newly constructed Catchpits, sand and silt removal facilities and intercepting channels shall be maintained, and the deposited silt and grit shall be removed weekly and on a need basis especially at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.	✓			
▪ A wheel washing bay shall be provided at the site exit and wash-water shall have sand and silt settled out or removed before being discharged into storm drains.	✓			
▪ The section of construction road between wheel washing bay and the public road shall be paved with concrete, bituminous materials or hardcores to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.	✓			
▪ Sewage from toilets shall be discharged in to a foul sewer, or chemical toilets shall be provided. The chemical toilets (if use) shall be provided by a licensed contractor, who will be responsible for disposal and maintenance of these facilities.	✓			
▪ Oil intercept in addition of sand / silt removal facilities shall be provided at the car parking areas.	✓			
▪ Oil interceptor shall be provided at work shop.	✓			
▪ Tipping halls enclosed with top and 3-side to prevent spillage of material into marine water.	✓			
▪ The barges shall be in right size such that adequate clearance is maintained between the vessels and the seabed at all states of the tide to ensure the undue turbidity is not generated by turbulence from vessel movement or propeller wash.	✓			
▪ All vessels used for transportation of fill material shall have tight fitting seals to their bottom openings to prevent leakage of material during transport.	✓			
▪ Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer.	✓			
▪ Barges shall not be filled to a level which may cause the overflow of material during loading or transportation. Barge effluents shall be properly collected and treated before disposal.	✓			
▪ The work activities shall not cause any visible foam, oil, grease, scum, litter or other objectionable matters to be present on the water in the vicinity of the barging facilities.	✓			
▪ Existing silt curtain at the outward side of the basin near the Barging Handling Area (BHA) throughout the period shall be repair, maintain and service when there is public fill intake by barges to the Fill Bank in accordance with PS Clause 1.68. The total length of the silt curtains shall not be less than 160m, and a gap of about 80m shall be left open for access of barges. The silt curtain shall be properly maintained such that it can also serve the function of refuse containment boom to confine floating refuse.	✓			
▪ A waste collection vessel shall be deployed to remove floating debris.	✓			


Environmental Checklist	Implementation Stages*		Remark
	Yes	No / N/A	
<b>Landscaping and Visual</b>			
<ul style="list-style-type: none"> <li>The design of the fill bank and platform heights adopted should allow the fill bank to fit into the general topography of the surrounding land. Straight edged slopes should be avoided.</li> </ul>	✓		
<ul style="list-style-type: none"> <li>The maximum stockpiling height at the fill bank shall be limited to a maximum of +35.2mPD.</li> </ul>	✓		
<ul style="list-style-type: none"> <li>Surface of outer slopes of the fill bank shall preferably be hydroseeded or covered with geo-textile matting of appropriate colour (e.g. dark green / brown) once completed.</li> </ul>	✓		
<ul style="list-style-type: none"> <li>The barging point and the C&amp;DMSF at the fill bank shall not be in operation from 07:00 pm to 08:00 am daily to avoid potential visual impact from glare.</li> </ul>	✓		
<b>Other Environmental Factors</b>			
<ul style="list-style-type: none"> <li>C&amp;D waste sorted from mixed C&amp;D material shall be removed from the temporary buffer storage area on a daily basis and transfer to SENT landfill for disposal.</li> </ul>	✓		
<ul style="list-style-type: none"> <li>Plan and stock construction materials carefully to minimise amount of waste generated and avoid unneccessary generation of waste.</li> </ul>	✓		
<ul style="list-style-type: none"> <li>Any unused materials or those with remaining functional capacity should be recycled and stored properly.</li> </ul>	✓		
<ul style="list-style-type: none"> <li>All generators, fuel and oil storage are within bundle areas.</li> </ul>	✓		
<ul style="list-style-type: none"> <li>Oil leakage from machinery, vehicle and plant is prevented.</li> </ul>	✓		
<ul style="list-style-type: none"> <li>The Environmental Permit should be displaced conspicuously on site.</li> </ul>	✓		
<ul style="list-style-type: none"> <li>Good site practices should be adopted to clean the rubbish and litter on a regular basis so as to prevent the rubbish and litter from dropping into the nearby environment.</li> </ul>	✓		
<ul style="list-style-type: none"> <li>To encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to segregate this waste from other general refuse generated by the workforce.</li> </ul>	✓		

Summary of the Weekly Site Inspection:

Item	Details of defective works or observations	Proposed Follow Up Action	Photo Ref.	Further Action Required (Yes/No)	Follow up Date
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Remark

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Checked by	Name	Title	Signature	Date
	Frankie Tang	ET Representative		17 April 2019


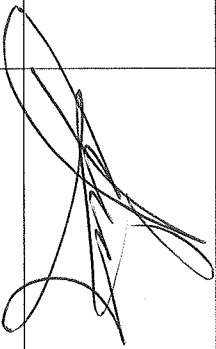

Inspection Date : 24/04/19  
Time : 15:00

Weather : Sunny / Fine / Cloudy / Overcast / Drizzle / Rain / Storm / Hazy

Wind : Calm / Light / Breeze / Strong

Temperature : 21

Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:			
Name:	Tseung Yau wai	S.W. Sun	Lisa Yau
Title	Deon	To.	Z.T





	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Fugitive Dust Emission</b>				
• Dust control / mitigation measures shall be provided to prevent dust nuisance.	✓			
• A buffer zone of at least 100m shall be maintained between the edge of the stockpiling area and the nearest ASRs at the TKO Industrial Estate. Within the buffer zone, no dusty material shall be stockpiled and no loading / unloading and similar activities should be allowed.	✓			
• Water sprays shall be provided and used to dampen materials.	✓			
• Regular cleaning and watering the site shall be provided to minimize the fugitive dust emissions.	✓			
• All vehicles shall be restrict to a maximum speed of 10 km per hour.	✓			
• Any vehicle with open load carrying area used for moving materials which has the potential to create dust shall have properly fitting side and tail boards. Material having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin.	✓			
• The designated site main haul road shall be paved or regular watering.	✓			
• Frequent watering of work site shall be at least three times per day.	✓			
• Wheel washing facilities including high-pressure water jet shall be provided at the entrance of work site.	✓			
• Every vehicle shall be washed to remove any dusty materials from its body and wheels before leaving the fill bank.	✓			
• All plant and equipment should be well maintained e.g. without black smoke emission.	✓			
• Open burning should be prohibited.	✓			
• The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD.	✓			
• Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shot concrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.	✓			
• When fill material is transfer by belt conveyor systems, the conveyors shall be enclosed on top and 2 sides.	✓			
• The belt scraper shall be equipped with bottom plates or other similar means to prevent falling of material from the return belt.	✓			
• The level of stockpiling belt conveyor shall be adjustable such that the vertical distance between the belt conveyor and the material landing point is maintained at no more than 1m.	✓			
• Approval or exemption Non-road Mobile Machinery (NRMV) labels should be painted or securely fixed on regulated machines and non-road vehicles at a conspicuous position according to the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation (APCO Cap.311).	✓			
<b>Noise Impact</b>				
• The approved method of working, equipment and sound-reducing measures (e.g. use of silenced type of equipment, etc.) shall be adapted.	✓			
• Only well maintained plant should be operated on-site and plant should be serviced regularly during the construction works.	✓			
• Powered mechanical equipment (PME) should be covered or shielded by appropriate acoustic materials.	✓			
• Air compressors and hand held breakers should have noise labels.	✓			
• Machines and plants that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.	✓			
• Noisy equipment and mobile plant shall always be site away from NSRs.	✓			

**Environmental Checklist**

**Water Quality**

	Implementation Stages*			Remark
	Yes	No	N/A	
<ul style="list-style-type: none"> <li>Drainage system should be adequate and well maintained to prevent flooding and overflow, especially after rain storms.</li> </ul>	√			
<ul style="list-style-type: none"> <li>The permanent drainage channels should have sediment basin, traps and baffles and maintain properly.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Temporary intercepting drains should be used at the stockpiling area to divert polluted stormwater to the intercepting channels. Earth bunds and sand bay barriers shall be used to assist the diversion of polluted stormwater to the intercepting channels.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Manholes should be covered and sealed.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding.</li> </ul>	√			
<ul style="list-style-type: none"> <li>A buffer distance of at least 100m shall be maintained between the boundary of the public fill stockpiling area and the sea front.</li> </ul>	√			
<ul style="list-style-type: none"> <li>A buffer distance of at least 20m shall be maintained between the boundary of the C&amp;DMSF and the seafront.</li> </ul>	√			
<ul style="list-style-type: none"> <li>The stormwater intercepting system shall be effective to collect of runoff and remove suspended solids before discharge.</li> </ul>	√			
<ul style="list-style-type: none"> <li>The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEEDD.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shotconcrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEEDD.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Existing and newly constructed Catchpits, sand and silt removal facilities and intercepting channels shall be maintained, and the deposited silt and grit shall be removed weekly and on a need basis especially at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.</li> </ul>	√			
<ul style="list-style-type: none"> <li>A wheel washing bay shall be provided at the site exit and wash-water shall have sand and silt settled out or removed before being discharged into storm drains.</li> </ul>	√			
<ul style="list-style-type: none"> <li>The section of construction road between wheel washing bay and the public road shall be paved with concrete, bituminous materials or hardcore to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Sewage from toilets shall be discharged in to a foul sewer, or chemical toilets shall be provided. The chemical toilets (if use) shall be provided by a licensed contractor, who will be responsible for disposal and maintenance of these facilities.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Oil intercept in addition of sand / silt removal facilities shall be provided at the car parking areas.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Oil interceptor shall be provided at work shop.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Tipping hails enclosed with top and 3-side to prevent spillage of material into marine water.</li> </ul>	√			
<ul style="list-style-type: none"> <li>The barges shall be in right size such that adequate clearance is maintained between the vessels and the seabed at all states of the tide to ensure the undue turbidity is not generated by turbulence from vessel movement or propeller wash.</li> </ul>	√			
<ul style="list-style-type: none"> <li>All vessels used for transportation of fill material shall have tight fitting seals to their bottom openings to prevent leakage of material during transport.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Barges shall not be filled to a level which may cause the overflow of material during loading or transportation. Barge effluents shall be properly collected and treated before disposal.</li> </ul>	√			
<ul style="list-style-type: none"> <li>The work activities shall not cause any visible foam, oil, grease, scum, litter or other objectionable matters to be present on the water in the vicinity of the barging facilities.</li> </ul>	√			
<ul style="list-style-type: none"> <li>Existing silt curtain at the outward side of the basin near the Barging Handling Area (BHA) throughout the period shall be repair, maintain and service when there is public fill intake by barges to the Fill Bank in accordance with PS Clause 1.68. The total length of the silt curtains shall not be less than 160m, and a gap of about 80m shall be left open for access of barges. The silt curtain shall be properly maintained such that it can also serve the function of refuse containment boom to confine floating refuse.</li> </ul>	√			
<ul style="list-style-type: none"> <li>A waste collection vessel shall be deployed to remove floating debris.</li> </ul>	√			


Environmental Checklist	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Landscape and Visual</b>				
▪ The design of the fill bank and platform heights adopted should allow the fill bank to fit into the general topography of the surrounding land. Straight edged slopes should be avoided.	✓			
▪ The maximum stockpiling height at the fill bank shall be limited to a maximum of +35.2mPD.	✓			
▪ Surface of outer slopes of the fill bank shall preferably be hydroseeded or covered with geo-textile matting of appropriate colour (e.g. dark green / brown) once completed.	✓			
▪ The barging point and the C&DMSF at the fill bank shall not be in operation from 07:00 pm to 08:00 am daily to avoid potential visual impact from glare.	✓			
<b>Other Environmental Factors</b>				
▪ C&D waste sorted from mixed C&D material shall be removed from the temporary buffer storage area on a daily basis and transfer to SENT landfill for disposal.	✓			
▪ Plan and stock construction materials carefully to minimise amount of waste generated and avoid unneccessary generation of waste.	✓			
▪ Any unused materials or those with remaining functional capacity should be recycled and stored properly.	✓			
▪ All generators, fuel and oil storage are within bundle areas.	✓			
▪ Oil leakage from machinery, vehicle and plant is prevented.	✓			
▪ The Environmental Permit should be displaced conspicuously on site.	✓			
▪ Good site practices should be adopted to clean the rubbish and litter on a regular basis so as to prevent the rubbish and litter from dropping into the nearby environment.	✓			
▪ To encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to segregate this waste from other general refuse generated by the workforce.	✓			

Summary of the Weekly Site Inspection:

Item	Details of defective works or observations	Proposed Follow Up Action	Photo Ref.	Further Action Required (Yes/No)	Follow up Date
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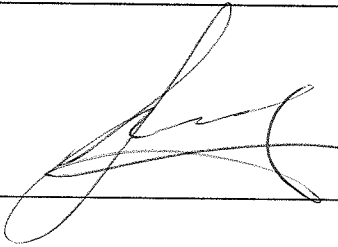
Remark

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	Name	Title	Signature	Date
Checked by	Frankie Tang	ET Representative		24 April 2019

Handling of Surplus Public Fill (2016-2018) - **Tseung Kwan O Area 137 Fill Bank**

Inspection Date : 29/4/19  
 Time : 14:30  
 Weather : Sunny / Fine / Cloudy / Overcast / Drizzle / Rain / Storm / Hazy  
 Wind : Calm / Light / Breeze / Strong  
 Temperature : 28°C  
 Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:			Mak
Name:	M. K. Kenny	S. W. Sun	Mak Sei Wai
Title	AZOW	W.	E.T

## Handling of Surplus Public Fill (2016-2018) - Tseung Kwan O Area 137 Fill Bank

Environmental Checklist	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Fugitive Dust Emission</b>				
▪ Dust control / mitigation measures shall be provided to prevent dust nuisance.	√			
▪ A buffer zone of at least 100m shall be maintained between the edge of the stockpiling area and the nearest ASRs at the TKO Industrial Estate. Within the buffer zone, no dusty material shall be stockpiled and no loading / unloading and similar activities should be allowed.	√			
▪ Water sprays shall be provided and used to dampen materials.	√			
▪ Regular cleaning and watering the site shall be provided to minimize the fugitive dust emissions.	√			
▪ All vehicles shall be restrict to a maximum speed of 10 km per hour.	√			
▪ Any vehicle with open load carrying area used for moving materials which has the potential to create dust shall have properly fitting side and tail boards. Material having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin.	√			
▪ The designated site main haul road shall be paved or regular watering.	√			
▪ Frequent watering of work site shall be at least three times per day.	√			
▪ Wheel washing facilities including high-pressure water jet shall be provided at the entrance of work site.	√			
▪ Every vehicle shall be washed to remove any dusty materials from its body and wheels before leaving the fill bank.	√			
▪ All plant and equipment should be well maintained e.g. without black smoke emission.	√			
▪ Open burning should be prohibited.	√			
▪ The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD.	√			
▪ Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shot concrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.	√			
▪ When fill material is transfer by belt conveyor systems, the conveyors shall be enclosed on top and 2 sides.	√			
▪ The belt scraper shall be equipped with bottom plates or other similar means to prevent falling of material from the return belt.	√			
▪ The level of stockpiling belt conveyor shall be adjustable such that the vertical distance between the belt conveyor and the material landing point is maintained at no more than 1m.	√			
▪ Approval or exemption Non-road Mobile Machinery (NRMM) labels should be painted or securely fixed on regulated machines and non-road vehicles at a conspicuous position according to the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation (APCO Cap.311).	√			
<b>Noise Impact</b>				
▪ The approved method of working, equipment and sound-reducing measures (e.g. use of silenced type of equipment, etc.) shall be adapted.	√			
▪ Only well maintained plant should be operated on-site and plant should be serviced regularly during the construction works.	√			
▪ Powered mechanical equipment (PME) should be covered or shielded by appropriate acoustic materials.	√			
▪ Air compressors and hand held breakers should have noise labels.	√			
▪ Machines and plants that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.	√			
▪ Noisy equipment and mobile plant shall always be site away from NSRs.	√			

Handling of Surplus Public Fill (2016-2018) - Tseung Kwan O Area 137 Fill Bank

Environmental Checklist	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Water Quality</b>				
▪ Drainage system should be adequate and well maintained to prevent flooding and overflow, especially after rain storms.	√			
▪ The permanent drainage channels should have sediment basin, traps and baffles and maintain properly.	√			
▪ Temporary intercepting drains should be used at the stockpiling area to divert polluted stormwater to the intercepting channels. Earth bunds and sand bay barriers shall be used to assist the diversion of polluted stormwater to the intercepting channels.	√			
▪ Manholes should be covered and sealed.	√			
▪ Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding.	√			
▪ A buffer distance of at least 100m shall be maintained between the boundary of the public fill stockpiling area and the sea front.	√			
▪ A buffer distance of at least 20m shall be maintained between the boundary of the C&DMSF and the seafront.	√			
▪ The stormwater intercepting system shall be effective to collect of runoff and remove suspended solids before discharge.	√			
▪ The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD.	√			
▪ Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shotconcrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.	√			
▪ Existing and newly constructed Catchpits, sand and silt removal facilities and intercepting channels shall be maintained, and the deposited silt and grit shall be removed weekly and on a need basis especially at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.	√			
▪ A wheel washing bay shall be provided at the site exit and wash-water shall have sand and silt settled out or removed before being discharged into storm drains.	√			
▪ The section of construction road between wheel washing bay and the public road shall be paved with concrete, bituminous materials or hardcores to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.	√			
▪ Sewage from toilets shall be discharged in to a foul sewer, or chemical toilets shall be provided. The chemical toilets (if use) shall be provided by a licensed contractor, who will be responsible for disposal and maintenance of these facilities.	√			
▪ Oil intercept in addition of sand / silt removal facilities shall be provided at the car parking areas.	√			
▪ Oil interceptor shall be provided at work shop.	√			
▪ Tipping halls enclosed with top and 3-side to prevent spillage of material into marine water.	√			
▪ The barges shall be in right size such that adequate clearance is maintained between the vessels and the seabed at all states of the tide to ensure the undue turbidity is not generated by turbulence from vessel movement or propeller wash.	√			
▪ All vessels used for transportation of fill material shall have tight fitting seals to their bottom openings to prevent leakage of material during transport.	√			
▪ Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer.	√			
▪ Barges shall not be filled to a level which may cause the overflow of material during loading or transportation. Barge effluents shall be properly collected and treated before disposal.	√			
▪ The work activities shall not cause any visible foam, oil, grease, scum, litter or other objectionable matters to be present on the water in the vicinity of the barging facilities.	√			
▪ Existing silt curtain at the outward side of the basin near the Barging Handling Area (BHA) throughout the period shall be repair, maintain and service when there is public fill intake by barges to the Fill Bank in accordance with PS Clause 1.68. The total length of the silt curtains shall not be less than 160m, and a gap of about 80m shall be left open for access of barges. The silt curtain shall be properly maintained such that it can also serve the function of refuse containment boom to confine floating refuse.	√			
▪ A waste collection vessel shall be deployed to remove floating debris.	√			

## Handling of Surplus Public Fill (2016-2018) - Tseung Kwan O Area 137 Fill Bank

Environmental Checklist	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Landscape and Visual</b>				
<ul style="list-style-type: none"> <li>▪ The design of the fill bank and platform heights adopted should allow the fill bank to fit into the general topography of the surrounding land. Straight edged slopes should be avoided.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ The maximum stockpiling height at the fill bank shall be limited to a maximum of +35.2mPD.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ Surface of outer slopes of the fill bank shall preferably be hydroseeded or covered with geo-textile matting of appropriate colour (e.g. dark green / brown) once completed.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ The barging point and the C&amp;DMSF at the fill bank shall not be in operation from 07:00 pm to 08:00 am daily to avoid potential visual impact from glare.</li> </ul>	√			
<b>Other Environmental Factors</b>				
<ul style="list-style-type: none"> <li>▪ C&amp;D waste sorted from mixed C&amp;D material shall be removed from the temporary buffer storage area on a daily basis and transfer to SENT landfill for disposal.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ Any unused materials or those with remaining functional capacity should be recycled and stored properly.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ All generators, fuel and oil storage are within bundle areas.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ Oil leakage from machinery, vehicle and plant is prevented.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ The Environmental Permit should be displayed conspicuously on site.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ Good site practices should be adopted to clean the rubbish and litter on a regular basis so as to prevent the rubbish and litter from dropping into the nearby environment.</li> </ul>	√			
<ul style="list-style-type: none"> <li>▪ To encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to segregate this waste from other general refuse generated by the workforce.</li> </ul>	√			




**Summary of the Weekly Site Inspection:**

Item	Details of defective works or observations	Proposed Follow Up Action	Photo Ref.	Further Action Required (Yes/No)	Follow up Date
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Remark

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	Name	Title	Signature	Date
Checked by	Frankie Tang	ET Representative		29 April 2019

## **Appendix I**

### **Implementation Schedule of Mitigation Measures**

Handling of Surplus Public Fill (2016-2018) – Tseung Kwan O Area 137 Fill Bank  
 Contract No.: CV/2015/07

## Environmental Mitigation Implementation Schedule

Environmental Protection Measures	Location	Implementation Status			
		Implemented	Partially implemented	Not implemented	Not Applicable
<b>Air Quality</b>					
<ul style="list-style-type: none"> <li>Dust control / mitigation measures shall be provided to prevent dust nuisance.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>A buffer zone of at least 100m shall be maintained between the edge of the stockpiling area and the nearest ASRs at the TKO Industrial Estate. Within the buffer zone, no dusty material shall be stockpiled and no loading / unloading and similar activities should be allowed.</li> </ul>	Northern Site Boundary	√			
<ul style="list-style-type: none"> <li>Water sprays shall be provided and used to dampen materials.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>Regular cleaning and watering the site shall be provided to minimize the fugitive dust emissions.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>All vehicles shall be restricted to a maximum speed of 10 km per hour.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>Any vehicle with open load carrying area used for moving materials which has the potential to create dust shall have properly fitting side and tail boards. Material having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin.</li> </ul>	Site Egress	√			
<ul style="list-style-type: none"> <li>The designated site main haul route shall be paved or regular watering.</li> </ul>	All haul roads	√			
<ul style="list-style-type: none"> <li>Frequent watering of work site shall be at least three times per day.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>Wheel washing facilities including high pressure water jet shall be provided at the entrance of work site.</li> </ul>	Site Egress	√			
<ul style="list-style-type: none"> <li>Every vehicle shall be washed to remove any dusty materials from its body and wheels before leaving the fill bank.</li> </ul>	Site Egress	√			
<ul style="list-style-type: none"> <li>The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shotconcrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>When fill material is transferred by belt conveyor systems, the conveyors shall be enclosed on top and 2 sides.</li> </ul>	C&DMSF	√			
<ul style="list-style-type: none"> <li>The belt scraper shall be equipped with bottom plates or other similar means to prevent falling of material from the return belt.</li> </ul>	C&DMFS	√			
<ul style="list-style-type: none"> <li>The level of stockpiling belt conveyor shall be adjustable such that the vertical distance between the belt conveyor and the material landing point is maintained at no more than 1m.</li> </ul>	C&DMFS	√			
<ul style="list-style-type: none"> <li>All plant and equipment should be well maintained e.g. without black smoke emission.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>Approval or exemption Non-road Mobile Machinery (NRMM) labels should be painted or securely fixed on regulated machines and non-road vehicles at a conspicuous position according to the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation (APCO Cap.311).</li> </ul>	All areas	√			
<b>Noise Impact</b>					
<ul style="list-style-type: none"> <li>Approved method of working, equipment and sound-reducing measures (e.g. use of silenced type of equipment, etc.) shall be adapted.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>Only well maintained plant should be operated on-site and plant should be serviced regularly during the site works.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>Powered mechanical equipment (PME) should be covered or shielded by appropriate acoustic materials.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>Air compressors and hand held breakers should have noise labels.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>Machines and plants that may be in intermittent use should be shut down between work months or should be throttled down to a minimum.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>Noisy equipment and mobile plant shall always be site away from NSRs.</li> </ul>	All areas	√			

Handling of Surplus Public Fill (2016-2018) – Tseung Kwan O Area 137 Fill Bank Contract No.: CV/2015/07 <b>Environmental Protection Measures</b>	Location	Implementation Status			
		Implemented	Partially implemented	Not implemented	Not Applicable
<b>Water Quality</b>					
▪ Drainage system should be adequate and well maintained to prevent flooding and overflow, especially after rain storms.	All areas	√			
▪ The permanent drainage channels should have sediment basin, traps and baffles and maintain properly.	All areas	√			
▪ Temporary intercepting drains should be used at the stockpiling area to divert polluted stormwater to the intercepting channels. Earth bunds and sand bay barriers shall be used to assist the diversion of polluted stormwater to the intercepting channels.	All areas	√			
▪ Manholes should be covered and sealed.	All areas	√			
▪ Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding.	All areas	√			
▪ A buffer distance of at least 100m shall be maintained between the boundary of the public fill stockpiling area and the sea front.	Public fill stockpiling area	√			
▪ A buffer distance of at least 20m shall be maintained between the boundary of the C&DMFS and the seafront.	C&DMFS	√			
▪ The stormwater intercepting system shall be effective to collect runoff and remove suspended solids before discharge.	All areas	√			
▪ The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD.	Temporary Slopes	√			
▪ Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shotcrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.	Temporary Slopes	√			
▪ Existing and newly constructed Catchpits, sand and silt removal facilities and intercepting channels shall be maintained, and the deposited silt and grit shall be removed weekly and on a need basis especially at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.	All areas	√			
▪ A wheel washing bay shall be provided at the site exit and wash-water shall have sand and silt settled out or removed before being discharged into storm drains.	Wheel Washing facility	√			
▪ The section of construction road between wheel washing bay and the public road shall be paved with concrete, bituminous materials or hardcores to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.	Wheel Washing facility	√			
▪ Sewage from toilets shall be discharged into a foul sewer, or chemical toilets shall be provided. The chemical toilets (if use) shall be provided by a licensed contractor, who will be responsible for disposal and maintenance of these facilities.	All areas	√			
▪ Oil intercept in addition of sand / silt removal facilities shall be provided at the car parking areas and work shop.	All areas	√			
▪ Tipping halls enclosed with top and 3-side to prevent spillage of material into marine water.	Barge Handling Area (BHA)	√			
▪ The barges shall be in right size such that adequate clearance is maintained between the vessels and the seabed at all states of the tide to ensure the undue turbidity is not generated by turbulence from vessel movement or propeller wash.	Barge Handling Area (BHA)	√			
▪ All vessels used for transportation of fill material shall have tight fitting seals to their bottom openings to prevent leakage of material during transport.	Barge Handling Area (BHA)	√			
▪ Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer.	Along the seafront	√			
▪ Barges shall not be filled to a level which may cause the overflow of material during loading or transportation. Barge effluents shall be properly collected and treated before disposal.	Barge Handling Area (BHA)	√			
▪ The work activities shall not cause any visible foam, oil, grease, scum, litter or other objectionable matters to be present on the water in the vicinity of the barging facilities.	Along the seafront	√			
▪ Existing silt curtain at the outward side of the basin near the Barging Handling Area throughout the period shall be repair, maintain and service when there is public fill intake by barges to the Fill Bank in accordance with PS Clause 1.68. The total length of the silt curtains shall not be less than 160m, and a gap of about 80m shall be left open for access of barges. The silt curtain shall be properly maintained such that it can also serve the function of refuse containment boom to confine floating refuse.	Along the seafront	√			
▪ A waste collection vessel shall be deployed to remove floating debris.	Along the seafront	√			

Handling of Surplus Public Fill (2016-2018) – Tseung Kwan O Area 137 Fill Bank  
 Contract No.: CV/2015/07

Environmental Protection Measures	Location	Implementation Status			
		Implemented	Partially implemented	Not implemented	Not Applicable
<b>Landscape and Visual</b>					
<ul style="list-style-type: none"> <li>The design of the fill bank and platform heights adopted should allow the fill bank to fit into the general topography of the surrounding land. Straight edged slopes should be avoided.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>The maximum stockpiling height at the fill bank shall be limited to a maximum of +35.2mPD.</li> </ul>	Completed slopes	√			
<ul style="list-style-type: none"> <li>Surface of outer slopes of the fill bank shall preferably be hydroseeded or covered with geo-textile matting of appropriate colour (e.g. dark green / brown) once completed.</li> </ul>	Site boundary	√			
<ul style="list-style-type: none"> <li>The barging point and the C&amp;DMSF at the fill bank shall not be in operation from 07:00 pm to 08:00 am daily to avoid potential visual impact from glare.</li> </ul>	All areas	√			
<b>Other Environmental Factors</b>					
<ul style="list-style-type: none"> <li>C&amp;D waste sorted from mixed C&amp;D material shall be transfer to SENT landfill for disposal.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>Plan and stock construction materials carefully to minimise generation of waste.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>Any unused materials or those with remaining functional capacity should be recycled.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>All generators, fuel and oil storage are within bunded areas.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>Oil leakage from machinery, vehicle and plant is prevented.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>The Environmental Permit should be displaced conspicuously on site.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>Good site practices should be adopted to clean the rubbish and litter on a regular basis so as to prevent the rubbish and litter from dropping into the nearby environment.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>To encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to segregate this waste from other general refuse generated by the workforce.</li> </ul>	All areas	√			

## **Appendix J**

### **Site General Layout plan**



## **Appendix K**

### **Monitoring Schedule for the Coming Month**



**Contract No. CV/2015/07 Handling of Surplus Public Fill (2016-2018)**
**Tseung Kwan O Area 137**

**Time Schedule for Impact Water Quality Monitoring (WQM), Impact Air Monitoring (1-hr TSP, 24-hr TSP and 24-hr RSP), Weekly Site Inspection (Weekly SI) and Impact Noise Monitoring (NM)**

**May 2019**

Sun	Mon	Tue	Wed	Thu	Fri	Sat
28 <b><u>24 hr TSP</u></b> <b><u>24-hr RSP</u></b>	29 <b><u>1-hr TSPX2</u></b> <b><u>WQM</u></b> Mid-ebb (08:28-10:28) Mid-flood (12:49-14:49)	30	1/5	2 <b><u>WQM</u></b> Mid-ebb (10:12-12:12) Mid-flood (15:55-17:55)	3 <b><u>1-hr TSPX1</u></b>	4 <b><u>24 hr TSP</u></b> <b><u>24-hr RSP</u></b> <b><u>WQM</u></b> Mid-ebb (10:08-12:08) Mid-flood (15:07-17:07)
5	6 <b><u>1-hr TSPX2</u></b> <b><u>NM</u></b> <b><u>WQM</u></b> Mid-flood (08:00-10:00) Mid-ebb (13:16-15:16)	7	8 <b><u>1-hr TSPX1</u></b> <b><u>Weekly SI (pm)</u></b> <b><u>WQM</u></b> Mid-flood (08:00-10:00) Mid-ebb (13:35-15:35)	9	10 <b><u>24 hr TSP</u></b> <b><u>24-hr RSP</u></b> <b><u>Weekly SI (pm)</u></b> <b><u>WQM</u></b> Mid-flood (08:00-10:00) Mid-ebb (15:17-17:17)	11
12	13	14 <b><u>WQM</u></b> Mid-ebb (08:00-10:00) Mid-flood (13:21-15:21)	15 <b><u>1-hr TSPX3</u></b> <b><u>Weekly SI (pm)</u></b>	16 <b><u>24 hr TSP</u></b> <b><u>24-hr RSP</u></b> <b><u>WQM</u></b> Mid-ebb (09:32-11:32) Mid-flood (15:38-17:38)	17 <b><u>1-hr TSPX2</u></b>	18 <b><u>WQM</u></b> Mid-ebb (10:54-12:54) Mid-flood (16:00-18:00)
19	20 <b><u>1-hr TSPX1</u></b> <b><u>WQM</u></b> Mid-flood (08:00-10:00) Mid-ebb (13:13-15:13)	21	22 <b><u>24 hr TSP</u></b> <b><u>24-hr RSP</u></b> <b><u>Weekly SI (pm)</u></b> <b><u>WQM</u></b> Mid-flood (08:00-10:00) Mid-ebb (13:33-15:33)	23	24 <b><u>1-hr TSPX2</u></b> <b><u>WQM</u></b> Mid-flood (08:00-10:00) Mid-ebb (14:59-16:59)	25
26	27 <b><u>1-hr TSPX1</u></b> <b><u>WQM</u></b> Mid-ebb (08:28-10:28) Mid-flood (12:49-14:49)	28 <b><u>24 hr TSP</u></b> <b><u>24-hr RSP</u></b>	29 <b><u>1-hr TSPX2</u></b> <b><u>Weekly SI (pm)</u></b> <b><u>WQM</u></b> Mid-ebb (08:26-10:26) Mid-flood (13:23-15:23)	30	31 <b><u>1-hr TSPX1</u></b> <b><u>WQM</u></b> Mid-ebb (09:37-11:37) Mid-flood (15:34-17:34)	1/6

Remark: Due to the tidal period in holiday, 01 & 13 May 2019 water monitoring was cancelled.

## **Appendix L**

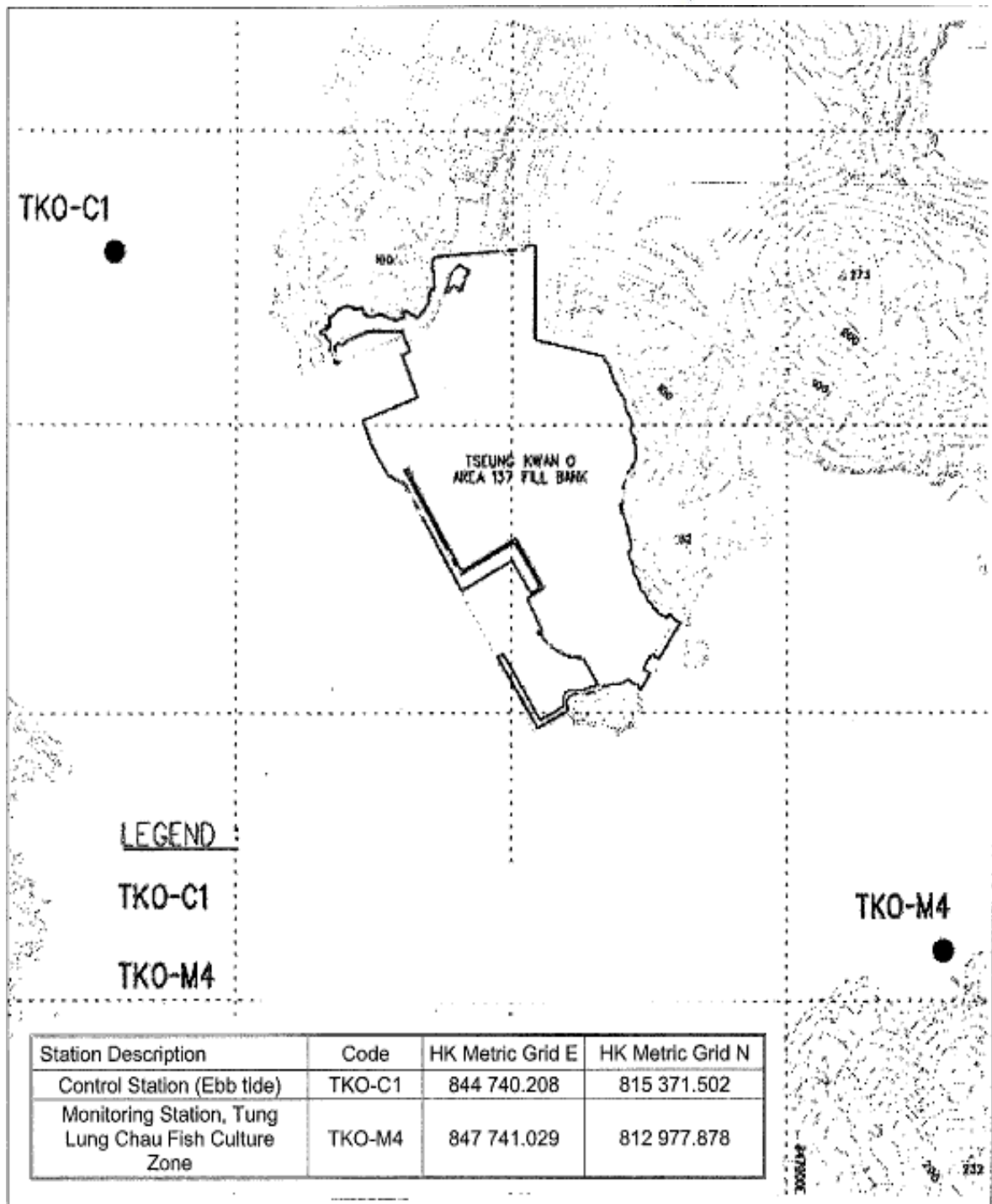
### **Complaint Log**

## Complaint Logs

Log Ref.	Location	Received Date	Details of Complaint	Investigation / Mitigation Action	Status
001	Barge handling area (BHA) at Tseung Kwan O 137	15 May 2017	One complaint received on 15 May 2017, which was forwarded to ET on 11 August 2017, from CEDD (Complaint NCF-N08/RE/00014875-17 Sent By CSO[RN]3 [CASE#2-3943858817 Int.Comm. – WS170513A57354] against illegal dumping at sea without permit in TKO137 fill bank.	<p>Refer to the ET site investigation on 14 August 2017, the contractor clarified that the contractor conducted vessel loading test at Tseung Kwan O 137 Fill bank on 13 May 2017 and the material was then unloaded from the vessels.</p> <p>Follow up action to complaint by ET and contractor: Contractor under the valid dumping permit to dump fill materials and the site works shall be complied with the relevant environmental protection and pollution control ordinances.</p> <p>ET reminded contractor that the dump fill material under the valid dumping permit should be checked and confirmed. In addition, record should be kept for ET reference.</p> <p>Details of Action(s) Taken by the Contactor:</p> <ul style="list-style-type: none"> <li>• The contractor started to dump fill materials from 19 May 2017 after receiving the valid dumping permit.</li> <li>• The contractor dump fill materials were followed by the valid dumping permit and the permit was kept apply every three month</li> <li>• The contractor kept the permit for ET reference.</li> </ul>	Closed
002	Tseung Kwan O 137 Fill Bank	12 Oct 2017	One complaint received on 12 October 2017, which was forwarded to ET on 18 October 2017, from public against dust emission at the fill bank and discharge of muddy water to the seafront.	<p>Refer to the ET weekly site inspection on 18 October 2017, no defective observation related to dust emission and discharge of water was recorded during the investigation.</p> <p>Details of Action(s) Taken by the Contactor:</p> <ul style="list-style-type: none"> <li>• Regular water spraying by water lorries is provided for dust suppression inside the Fill Bank;</li> <li>• Mist spraying systems at the site entrance are operated properly;</li> <li>• Site vehicles are washed to remove any dusty materials from their bodies and wheels by using high pressure water jet manually at the entrance of work site before leaving;</li> <li>• All dusty material is sprayed with water prior to loading, unloading or transfer so as to maintain the material wet;</li> <li>• Site vehicle for transporting materials are covered properly by using clean tarpaulin sheets;</li> <li>• Regular cleaning at the site haul road is provided to minimize the fugitive dust emission;</li> <li>• Silt curtains are provided at the outward side of the basin near the Fill Bank;</li> <li>• Drainage systems are adequate and maintained to prevent flooding and overflow;</li> <li>• Catchpits, sand and silt removal facilities and intercepting channels are maintained and functioning properly.</li> </ul>	Closed

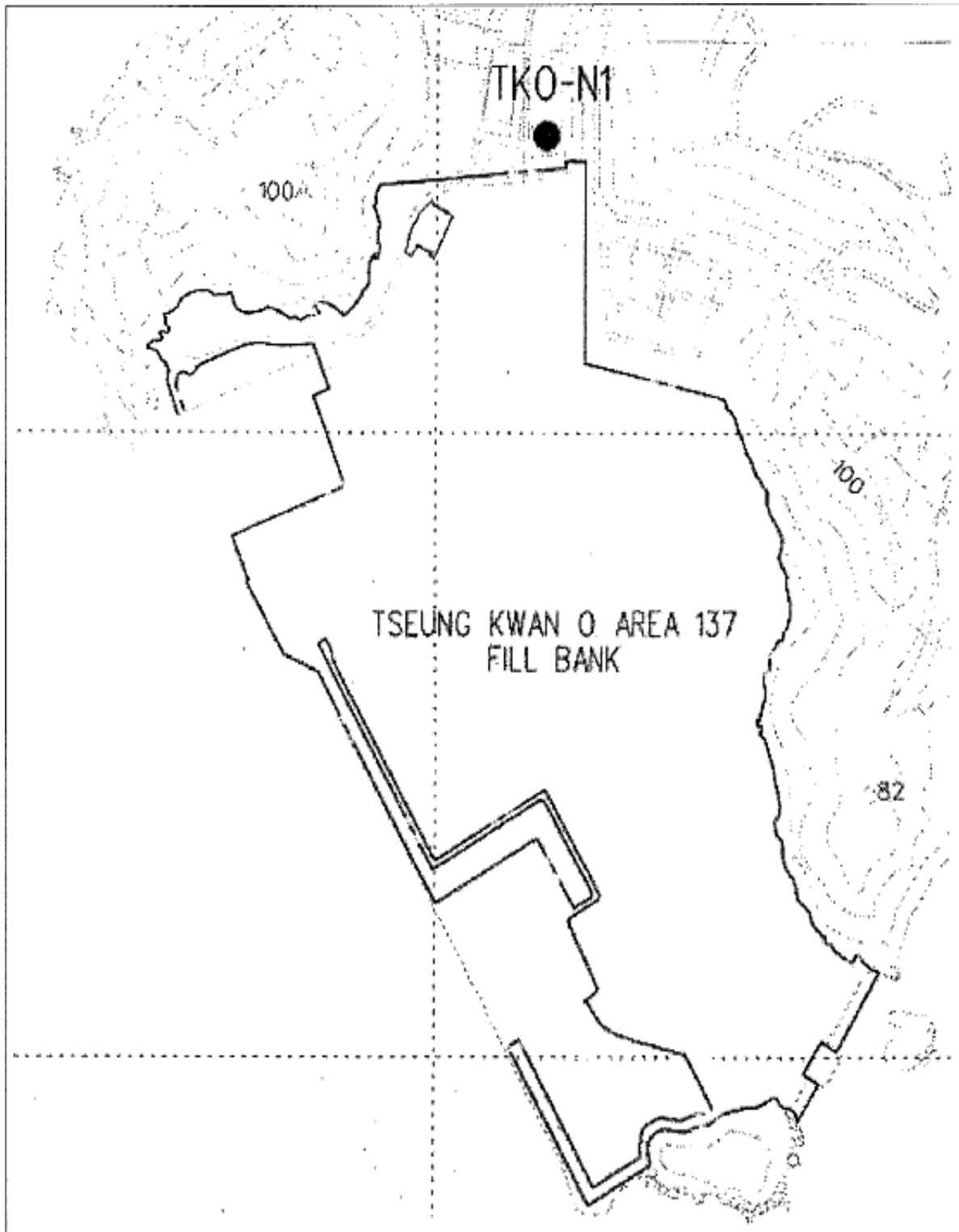
003	Tseung Kwan O 137 Fill Bank	09 April 2018	One complaint received on 09 April 2018, which was forwarded to ET on 18 April 2018, from public against the rocks and debris deposited on the road surface along Wan Po Road near TKO137 Fill Bank. The complainant complained that waste generated caused an environmental nuisance.	<p>Refer to the ET site investigation on 20 April 2018, the condition of Wan Po Road near TKO137 Fill Bank was found satisfactory. (Photos on ET follow-up investigation at TKO137 Fill Bank on 20 April 2018).</p> <p>Details of Action(s) Taken by the Contactor:</p> <ul style="list-style-type: none"> <li>• Regular cleaning on Wan Po Road and the access road at the site exit by haul road cleaning team to remove mud and gravel is arranged eight times per month;</li> <li>• Regular water spraying by water lorries is provided for road cleaning at Wan Po Road;</li> <li>• Site vehicles are washed to remove any dusty materials from their bodies and wheels by using high pressure water jet manually at the entrance of work site before leaving;</li> <li>• Site vehicles for transporting materials are covered properly by using clean tarpaulin sheets;</li> <li>• Regular cleaning at the site haul road is provided.</li> </ul>	Closed
004	Tseung Kwan O 137 Fill Bank	13 January 2019	One complaint received on 13 January 2019, which was forwarded to ET on 16 January 2019, from EPD (NCF-N08/RE/00001348-19) against 將軍澳 137 堆填區內，缸車池污水，不經處理，直接排到河道，河道係直接流出大海，極度嚴重影響周遭環境生態，污染程度極為嚴重，促請政府有關部門嚴正跟進！	<p>After received the details of the complaint from the Contractor on 16 January 2019, ET have performed a site investigation on 21 January 2019 to investigate this event. During the site inspection, no muddy water was observed discharged from the Fill Bank to nearby environment.</p> <p>Besides, refer to the marine water monitoring results during that period, no exceedance was recorded on Turbidity and Suspended Solids. This reflects that this occurrence did not affect the condition of marine water near the TKO137 Fill Bank.</p> <p>Details of Action(s) Taken by the Contactor:</p> <ul style="list-style-type: none"> <li>• Drainage system were adequate and well maintained to prevent flooding and overflow;</li> <li>• Sand and silt removal facilities, e.g. silting screen, were provided before the discharge point;</li> <li>• Temporary intercepting drains were used at the stockpiling area to divert polluted stormwater to the intercepting channels. Earth bunds and sand bay barriers were used to assist the diversion of polluted stormwater to the intercepting channels;</li> <li>• Catchpits and intercepting channels were maintained, and the deposited silt and grit were removed weekly and on a need basis especially at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times;</li> </ul>	Closed

## Figures



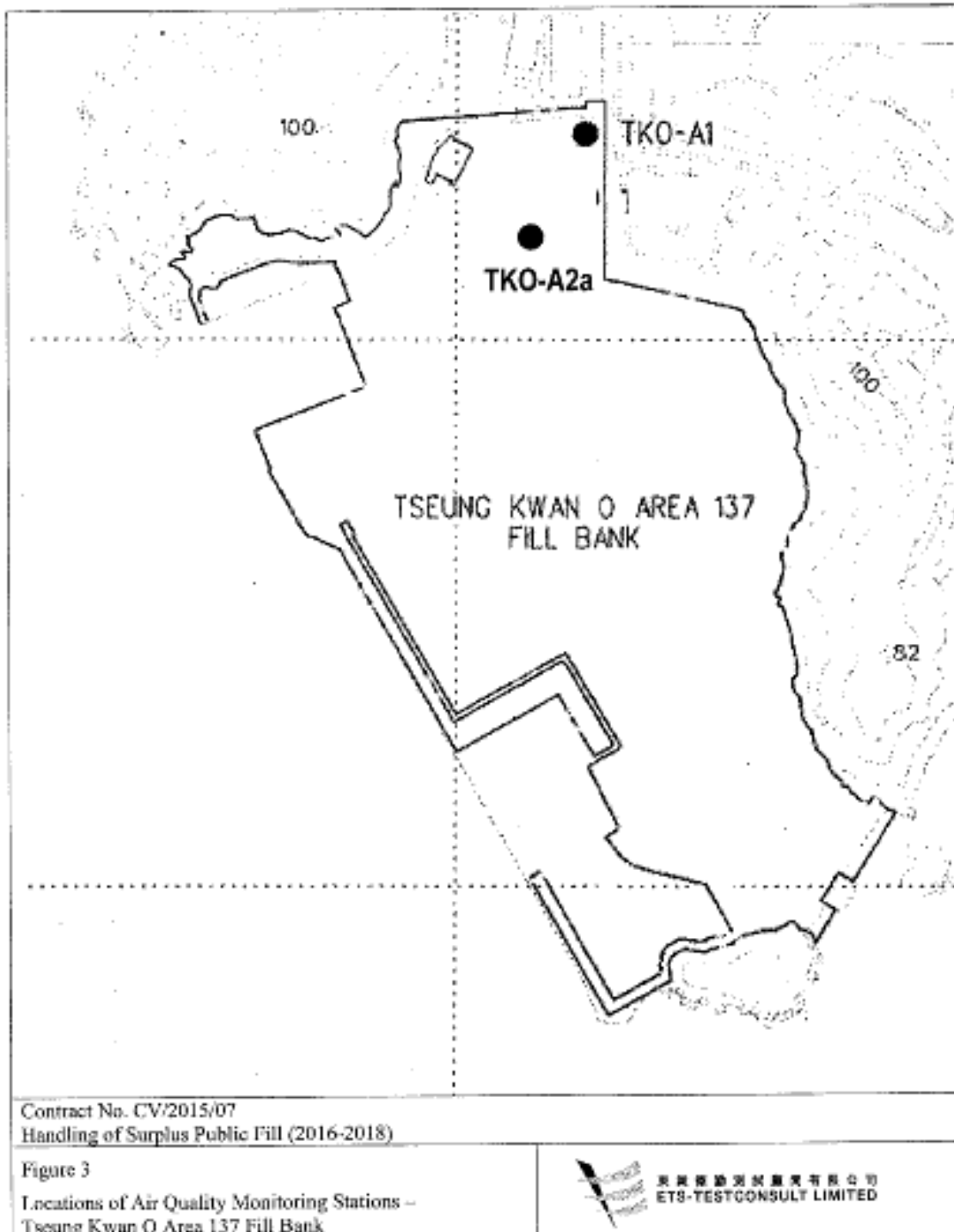
Contract No. CV/2015/07  
Handling of Surplus Public Fill (2016-2018)

Figure 1  
Locations of Water Quality Monitoring Stations –  
Tseung Kwan O Area 137 Fill Bank

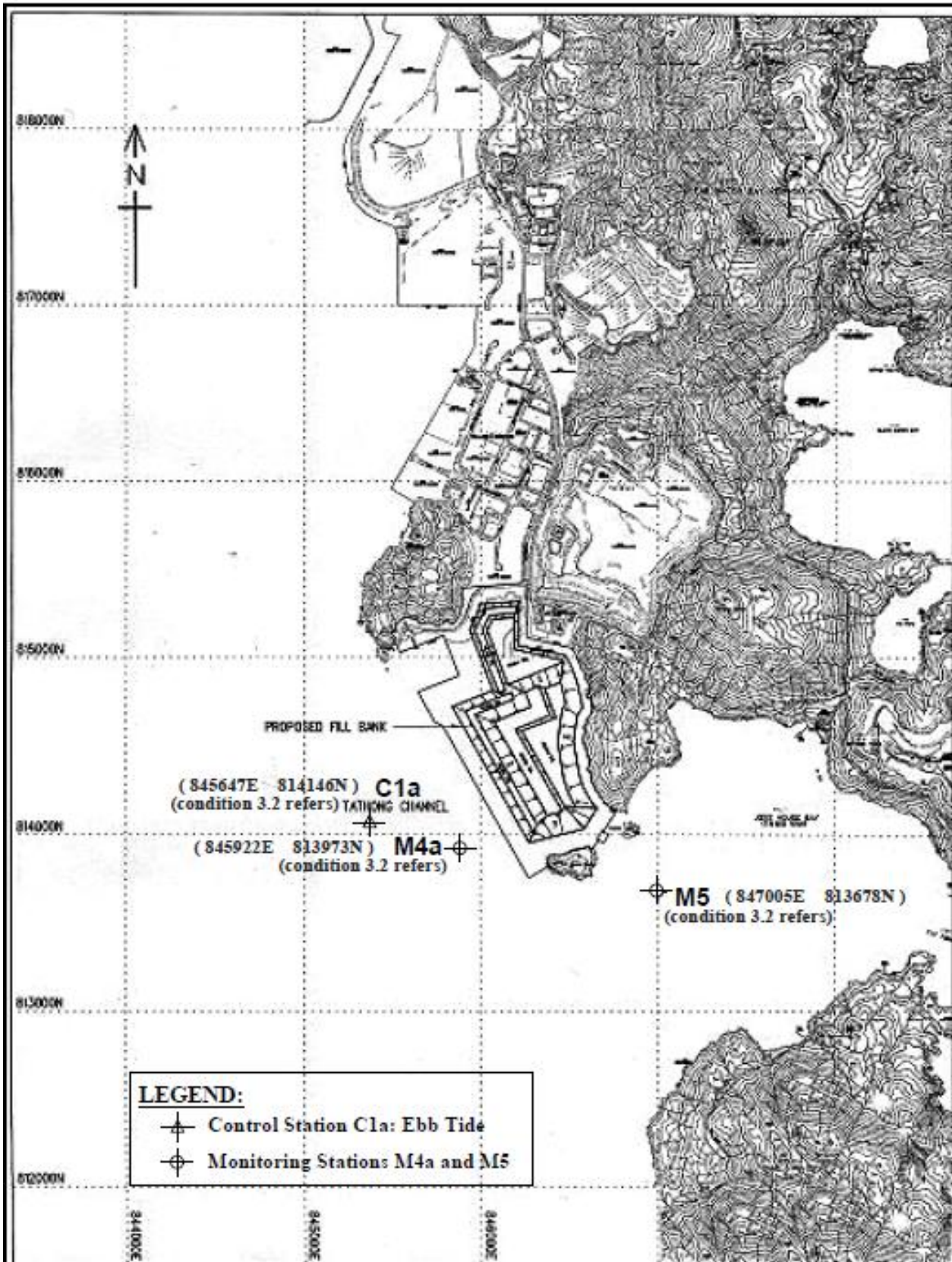


Contract No. CV/2015/07  
Handling of Surplus Public Fill (2016-2018)

Figure 2  
Location of Noise Monitoring Station –  
Tseung Kwan O Area 137 Fill Bank







Contract No. CV/2015/07  
 Handling of Surplus Public Fill(2016-2018)

Figure 4  
 Locations of Additional Water Quality Monitoring Stations (3RS  
 project)  
 Tseung Kwan O Area 137 Fill Bank



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