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**TEST REPORT**

**China Harbour – China State Joint Venture**

**CONTRACT NO. CV/2009/02**  
**HANDLING OF SURPLUS PUBLIC FILL**  
**TUEN MUN AREA 38 FILL BANK**  
**MONTHLY EM&A REPORT NO.30**  
**(MAY 2012)**

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ENVIRON

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19 June 2012

By E-mail and Fax No.: 2695 3944

ETS-Testconsult Limited  
8/F, Block B  
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Attention: Mr. C. L. Lau

Dear Mr. Lau,

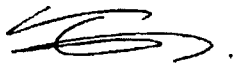
**Re: Contract No. CV/2009/02  
Handling of Surplus Public Fill – Tuen Mun Area 38 Fill Bank  
Monthly EM&A Report No. 30 for May 2012**

Reference is made to your submission of the draft Monthly EM&A Report for May 2012 for the captioned by E-mail on 18 June 2012.

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

Thank you very much for your attention and please do not hesitate to contact our Simon Lam or the undersigned should you have any queries.

Yours faithfully,



Tony Cheng  
Independent Environmental Checker

c.c. CEDD  
CHCSJV

Attn: Mr. Vincent Chu  
Attn: Mr. Dennis Tang

Fax No.: 2714 0113  
Fax No.: 2247 4108

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## **EXECUTIVE SUMMARY**

This monthly Environmental Monitoring and Audit (EM&A) report No.30 was prepared by Environmental Team (ET) of ETS-Testconsult Ltd (ETL) for the "Contract No. CV/2009/02 Handling of Surplus Public Fill – Tuen Mun Area 38 Fill Bank" (The Project).

This report documented the findings of EM&A Works conducted during the operation phase of Fill Bank at Tuen Mun Area 38 in May 2012.

### **Site Activities**

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

- Removal & delivery of public fill stockpiled material to Mainland
- Operation of the road water lorries and the road sweeper
- Maintenance of haul road within fill bank area
- Operation of the Tipping Halls (B2 & B3)

### **Environmental Monitoring Progress**

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

- 24-hour TSP Monitoring: 5 Occasions at 2 designated locations
- 1-hour TSP Monitoring: 17 Occasions at 2 designated locations
- Noise, Daytime: 10 Occasions at 2 designated locations
- Marine Water Quality Monitoring: 13 Occasions at 4 designated locations
- Weekly-site inspection: 4 Occasions

### **Air Monitoring**

Since the area for existing air monitoring station TM-A2 near Tipping Hall No.1 was handed over to EcoPark, air monitoring station TM-A2 was cancelled and the air monitoring was carried out at air monitoring station TM-RA2 (refer to Figure 1 attached) from 28 October 2008.

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

### **Noise Monitoring**

Since Lands Dept did not approve to carry out noise monitoring at their own area where the noise monitoring stations TM-N1 and TM-N2 located due to the security, noise monitoring carried out at two noise monitoring stations TM-RN1 and TM-RN2 (refer to the Figure 3 attached) temporarily from 18 December 2007 and before Lands Department's approval.

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

### **Marine Water Quality Monitoring**

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

### **Site Inspection**

Environmental site inspections conducted in this reporting month are presented as follows:

#### **Concerned Parties**

ET Weekly site inspection  
IEC site inspection

#### **Dates of Audit / Inspection**

10, 17, 24 and 31 May 2012  
10 and 24 May 2012

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



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

Three complaints received on 02, 12 and 14 May 2012 was forwarded by the CEDD on 16 May 2012 from public against the mud / debris and dust found at Lung Mun Road from the site truck leaving the Tuen Mun Area 38 Fill Bank. The complainant complained that the dust and waste generated caused an environmental nuisance. Refer the CEDD preliminary investigation, the unsatisfactory condition at Lung Mun Road is due to the muddy water adhered on the wheels of the dump trucks leaving the site of Tuen Mun Fill Bank. Due to the complaint, the Contractor has implemented control measures to reduce dust and waste impact to the environment but some improvement should be carried out. The Contractor replied to take more effort on cleaning of site haul road and public road, and also site truck before leaving the site. Complaint Investigation report of this event have been prepared and submit to EPD, RE, IEC and Contractor by ET.

No notification of summon and prosecution with respect to environmental issues was received in this monitoring month.

### **Future Key Issues**

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

- *Dust generation from activities on site, such as vehicular movements along unpaved area and rock crushing activities;*
- *Noise impact from operating equipment and machinery on site;*
- *Wastewater and surface runoff from the site discharged into nearby water body; and*
- *Storage and usage of chemicals / fuel and chemical waste / waste oil.*



## 1.0 INTRODUCTION

China Harbour – China State Joint Venture (CHCSJV) appointed Environmental Team (ET) of ETS-Testconsult Limited (ETL) to undertake the Environmental Monitoring and Audit (EM&A) for the “Contract No: CV/2009/02 – Handling of Surplus Public Fill – Tuen Mun Area 38 Fill Bank” (The Project).

In accordance with the Condition 5 of Part C of Environmental Permit (No.: EP-210/2005/A) (the EP), an EM&A programme as set out in the Project Profile should be implemented.

The EM&A programme requires environmental monitoring for air quality, water quality and environmental site inspections for air quality, 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 month and forthcoming months;
- Action and Limit levels for all environmental parameters;
- Event/Action Plans;
- Environmental mitigation measures, as recommended in the Project Profile; and
- Environmental requirements in contract documents.

Baseline monitoring was completed in May 2003 by Stanger Asia Ltd. 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 Tuen Mun Area 38 in May 2012.

## 2.0 PROJECT INFORMATION

### 2.1 Construction Programme

Details of construction programme are shown in Appendix G.

### 2.2 Project Organization and Management Structure

The organization chart and lines of communication with respect to the on-site environmental management and monitoring program are shown in Appendix A.

### 2.3 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	Mr. Lawrence NG Mr. CHU Tun Hon Mr. Wong Wa Kei Mr. LIU Chi Yuen	Engineer's Representative	2760 5835	2714 0113
IEC (Environ) *	Mr Tony Cheng	IEC	3743 0722	3548 6988
IEC (Materialab) *	Mr Joseph POON	IEC	2450 8238	2450 6138
Contractor (CHCSJV)	Mr. Wah Fung LOK	Contractor's Agent	9772 7055	2243 4089
ET (ETL)	Mr C. L. LAU	ET Leader	2946 7791	2695 3944

Remark (\*): Materialab was being as IEC of this Project until 31 January 2010 and was replaced by Environ from 01 February 2010.



### 3.0 CONSTRUCTION PROGRESS IN THIS REPORTING MONTH

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

- Removal & delivery of public fill stockpiled material to Mainland
- Operation of the road water lorries and the road sweeper
- Maintenance of haul road within fill bank area
- Operation of the Tipping Halls (B2 & B3)

### 4.0 AIR QUALITY MONITORING

#### 4.1 Monitoring Requirement

1-hr and 24-hr TSP levels were monitored in the reporting month. Table 4.3 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 are attached in Appendix B1.

Table 4.1 Air Quality Monitoring Equipment

<i>Equipment</i>	<i>Model and Make</i>
<i>HVS</i>	<i>Greasby GMWS2310</i>
<i>Calibrator</i>	<i>Tisch TE-5025A</i>

#### 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>One per six days</i>
<i>1-hr TSP</i>	<i>1 hr</i>	<i>Three times per six days</i>

#### 4.4 Monitoring Locations and Schedule

In accordance with the Project Profile, two air-quality monitoring stations, namely TM-A1 and TM-A2, were selected for the 1-hr TSP and 24-hr TSP sampling.

Since the area for existing air monitoring station TM-A2 near Tipping Hall No.1 was handed over to EcoPark, air monitoring station TM-A2 was cancelled and the air monitoring was carried out at air monitoring station TM-RA2 (refer to Figure 1 attached) from 28 October 2008.

The locations of monitoring stations are shown in Figure 1.

During the reporting month, 1-hr and 24-hr TSP monitoring were carried out as the schedule. The details for 24-hr and 1-hr TSP monitoring carried out in this reporting month are summarized in Appendix B2.





#### 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 Appendix D2 "General Technical Requirements of Environmental Monitoring" in the Environmental Monitoring and Audit Guidelines for Development Projects in Hong Kong published by EPD.

###### 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 is indicated on the flow rate chart.
- For TSP sampling, fiberglass filters (GA-55) 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 period of 1 hour / 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 recorded.
- 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%.

###### Maintenance & Calibration

- The 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 included wind speed and wind direction were directly extracted from Tuen Mun Station of Hong Kong Observatory during this reporting month. The wind data are presented in Appendix E.

#### 4.6 Action and Limit Levels

Table 4.3 shows the Action and Limit levels for 24-hr TSP and 1-hr TSP monitoring.

Table 4.3 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
TM-A1	192	260	344	500
TM-RA2	192	260	344	500



#### 4.7 Event-Action Plans

Please refer to Appendix F for details.

#### 4.8 Results and Observations

Totally 5 occasions of 24-hr TSP monitoring and 17 occasions of 1-hr TSP monitoring were carried out in this reporting period. All monitoring data of both 1-hr and 24-hr TSP monitoring is provided in Appendix B2. Graphical presentation of 1-hr and 24-hr TSP monitoring results for the reporting month is shown in Appendix B3. Wind data, including wind speed and wind direction, are annexed in Appendix E.

No exceedances of Action and Limit levels were recorded for 1-hr and 24-hr TSP monitoring in the reporting month.

Generally, the Contractor implemented sufficient dust mitigation measures, including operation of wheel washing facilities and road dampening by water bowsers on the main haul roads and unpaved areas.

### 5.0 MARINE WATER QUALITY MONITORING

#### 5.1 Monitoring Requirements

In accordance with the Project Profile, 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 two control monitoring stations (TM-FC1 and TM-FC2) and two impact monitoring stations (TM-FM1 and TM-FM2).

#### 5.2 Monitoring Locations

As stipulated in the EM&A requirement, there were four monitoring stations undertaken during the impact monitoring. Figure 2 shows the locations of the marine water quality monitoring stations.

#### 5.3 Monitoring Parameters and Frequency

Monitoring of the marine water quality parameters and frequency are listed in Table 5.1.

Table 5.1 Monitoring Parameters and Frequency of the marine water

Monitoring Station	Parameter	Frequency	No. of Depths
Control Stations: TM-FC1 and TM-FC2  Impact Stations: TM-FM1 and TM-FM2	Depth (m)	3 days/week, 2 tides/day	3 (Surface, mid-depth & bottom)
	Temperature (°C)		
	Dissolved Oxygen (mg/L and % saturation)		
	Turbidity (NTU)		
	Salinity (ppt)		
	Suspended solids (mg/L)		

#### 5.4 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 2100P) 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. At each sampling depth, duplicate readings of dissolved oxygen content and turbidity were taken. The probes were retrieved out of the water after first measurement and then redeployed for the second measurement. The difference between the two readings of each set was more than 25% of the value of the first reading while a third measurement would be conducted to ensure data precision.

#### **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, labeled 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 5.2. For the QA/QC procedures, one QC sample, one duplicate sample and one sample spike of every batch of 20 samples were analysis. The QA/QC results are summarized in Appendix K.

Table 5.2 Summary of testing procedures

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

### 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 2100P) after inserting the cell to the Turbidimeter. For DO, DOS and Salinity, measurements were conducted three days per week at both mid-ebb and mid-flood tides at three depths (i.e. 1m below surface, mid depth and 1m from seabed). 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 to be carried out.

Table 5.3 shows the equipment used for in-situ monitoring of water quality. The calibration certificates are attached in Appendix C1.

Table 5.3 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/005/04
Dissolved Oxygen (Saturation), Temperature, Salinity	YSI Dissolved Oxygen, Salinity & Temperature Meter, YSI Pro 2030	13/02/12 13/05/12	12/05/12 12/08/12	ET/EW/008/004 *
Turbidity	HACH Model 2100P Turbid Meter	13/04/12	12/07/12	ET/0505/007
Water Depth	Speedtech SM-5	----	----	EW/002/05

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

## 5.5 Action and Limit Levels

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

Table 5.4 Water Quality Action and Limit Levels

Parameter	Action Level	Limit Level
DO (mg/L)	<u>Surface &amp; Middle</u> <4.78 mg/L (5%-ile of baseline data)  <u>Bottom</u> <4.16 mg/L (5%-ile of baseline data)	<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)	>120% of the upstream control station's SS at the same tide on the same day	>130% of the upstream control station's SS at the same tide on the same day
Turbidity (NTU) (Depth-averaged)	>120% of the upstream control station's turbidity at the same tide on the same day	>130% of the upstream control station's turbidity at the same tide on the same day

## 5.6 Event and Action Plan

Please refer to the Appendix F for details.

## 5.7 Monitoring Duration and Period in this reporting month

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

Table 5.5 Time Schedule of Marine Water Quality Monitoring

May 2012						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		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		
		▼		▼		

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

The duration of marine water quality monitoring is detailed in Appendix C2.

## 5.8 Marine Water Quality Monitoring Results

Totally 13 occasions of marine water quality monitoring were carried out in this reporting period. The impact water quality measurement results are detailed in Appendix C2. Appendix C3 presents the water quality monitoring data and graphical presentations of monitoring results respectively.

The summary of marine water quality exceedances is shown in Table 5.6.

Table 5.6 Summary of Marine Water Quality Exceedances in this reporting month

Tide	Station	Exceedance Level	DO		Turbidity	SS	Total
			Surface & Middle	Bottom			
Mid-Ebb	TM-FM1	Action	0	0	0	0	0
		Limit	0	0	0	0	0
	TM-FM2	Action	0	0	0	0	0
		Limit	0	0	0	0	0
Mid-Flood	TM-FM1	Action	0	0	0	0	0
		Limit	0	0	0	0	0
	TM-FM2	Action	0	0	0	0	0
		Limit	0	0	0	0	0
Total		Action	0	0	0	0	0
		Limit	0	0	0	0	0

According to the summary of marine water monitoring results, no exceedances of Action and Limit levels were recorded for this reporting month.

## 6.0 Noise Monitoring

### 6.1 Monitoring Requirements

Noise monitoring was conducted at 2 designated monitoring stations as specified in the Sections 26.10 to 26.12 of the Particular Specification for good site practice.

The equipment, parameter, frequency, duration, methodology, calibration details, results and observations of the noise monitoring for the reporting month are presented in this section.



## 6.2 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 651:1979 (Type1) and 804:1985 (Type1), and speed in m/s was used to monitor the wind speed.

Table 6.1 summarizes noise monitoring equipment model being used. A copy of the calibration certificate for noise meter and calibrator are attached in Appendix D1.

Table 6.1 Noise Monitoring Equipment

<i>Equipment</i>	<i>Model</i>
<i>Integrating Sound Level Meter</i>	<i>Rion NL-31 Sound Level Meter</i>
<i>Calibrator</i>	<i>Castle GA607 Acoustic Calibrator</i>
<i>Portable Wind Speed Indicator</i>	<i>TSI Model 8340-M Air Velocity Meter</i>

## 6.3 Monitoring Parameters, Duration and Frequency

Duration, frequencies and parameters of noise measurement are presented in Table 6.2.

Table 6.2 Duration, Frequencies and Parameters of Noise Monitoring

<i>Time period</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><math>L_{eq}</math>, <math>L_{10}</math>, <math>L_{90}</math></i>	<i>Twice per week</i>

## 6.4 Monitoring Locations and Period

Since Lands Dept did not approve to carry out noise monitoring at their own area where the noise monitoring stations TM-N1 and TM-N2 located due to the security, noise monitoring carried out at two noise monitoring stations TM-RN1 and TM-RN2 (refer to the figure 3 attached) temporarily from 18 December 2007 and before Lands Department's approval.

The noise monitoring locations, TM-RN1 and TM-RN2 are shown in Figure 3. The noise measurement at TM-RN1 and TM-RN2 are façade measurement.

The noise-monitoring period of monitoring stations is summarized in Appendix D2.

## 6.5 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  $L_{eq}$ ,  $L_{10}$  and  $L_{90}$  were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- Free Field correction to the measurements should be made. 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.

## 6.6 Action and Limit Levels

The Action and Limit levels for noise levels derived as illustrated in Table 6.3.

Table 6.3 Action and Limit Levels for noise monitoring

<i>Time Period</i>	<i>Action *</i>	<i>Limit *</i>
0700-1900 hrs on normal weekdays	When one documented complaint is received	65 dB(A)

Remark (\*): The Action and Limit Levels refer to the Table 26.2 – Action and Limit Levels for Noise in the Particular Specification of Contract No.CV/2005/01.

## 6.7 Event-Action Plans

Please refer to the Appendix F for details.

## 6.8 Results and Observation

Totally 10 occasions of noise monitoring were carried out in this reporting month.

The detail of the noise monitoring is provided in Appendix D2. Graphical presentation of the monitoring result for the reporting month is shown in Appendix D3.

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

The major sources of noise pollution observed in this reporting month were noise from the traveling dump trucks and from the operation of site machines.

## 7.0 ENVIRONMENTAL AUDIT

### 7.1 Weekly Site Inspection

Weekly 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 month, four weekly site inspections were conducted on 10, 17, 24 and 31 May 2012. Summaries of weekly site inspection observations and recommendations in this month are described as follows:

#### *Air Quality*

- The major dust sources were dump truck movement on the unpaved haul roads and loading & unloading activities on various working platforms in the Fill Bank. The Contractor deployed water bowsers to dampen the haul roads and the working platforms;
- Wheel washing facilities were found operating during weekly site inspections. However, the Contractor was reminded to provide notice or manpower at site exit to inform the drivers to limit the vehicle speed and use the wheel washing facilities to wash away any dusty materials before leaving the site;
- The power of the engines of site equipment were off when not in use;
- Water spraying systems at tipping halls were found operated properly in this reporting month. However, the Contractor was still reminded to operate and maintain the water spraying system properly;
- Water trucks served to dampen the haul roads and on the ramp to the stockpiling area;
- The dump trucks were operating below the speed limit in the Fill Bank. There were sufficient speed limit signs on site to advise the drivers;
- The Contractor watered the haul road adequately and hence no fugitive dust was detected during site inspections in this reporting month;



- No fugitive dust was noted at unpaved areas and public roads in this reporting month. The Contractor was still reminded to improve the water spraying system to dampen unpaved areas and public roads; and
- No black smoke emission was noted observed from the PME during weekly site inspections in this reporting month. However, the Contractor was still reminded to maintain the site machine properly in order to avoid black smoke emission.

#### **Noise**

- The major noise source was dump truck traffic in the Fill Bank; and
- PMEs such as compressors and generators were operated with door closed.

#### **Water Quality**

- Follow up action to outstanding finding in the previous month, mud and sand accumulated near the drainage channel near tipping hall No.3 were cleaned up during the weekly site inspection on 10 May 2012;
- Ponding water was noted along the footpath near wheel washing bay during the weekly site inspections on 10 and 17 May 2012. The Contractor was reminded to clear the accumulated water in order to prevent mosquito breeding. During the subsequent weekly site inspection on 24 May 2012, the ponding water was cleared;
- Standing water was noted on the grass near the water truck filling station during the weekly site inspection on 12 April 2012. The Contractor was reminded to clear the standing water in order to prevent mosquito breeding. During the subsequent weekly site inspection on 19 April 2012, the standing water was cleared; and
- Water leakage was observed from a water tank at water truck filling station during the weekly site inspections on 10, 17, 24 and 24 May 2012. The Contractor was reminded to repair the water tank to avoid water leakage. Since the finding was still noted at the last weekly site inspection in this reporting month, it will be verified in the coming month.

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

- The chemical waste was stored in the Chemical Waste Storage Area (CWSA). The Contractor should dispose chemical wastes regularly to avoid over accumulation of chemical waste on site;
- Chemical containers accumulated at chemical waste storage area were collected by the licensed collector regularly; and
- Appropriate chemical labels were applied for all chemicals in the chemical waste storage area in this reporting month.
- A chemical bucket was noted discarded beside the haul road to Public Fill Area during the weekly site inspection on 10 May 2012. The Contractor was reminded to collect and store / dispose of the chemical bucket properly. During the subsequent weekly site inspection on 17 May 2012, the chemical bucket was collected; and
- Oil stains were noted on the ground from a repairing machine at Workshop during the weekly site inspection on 31 May 2012. The Contractor was reminded to clean up the oil stains and contaminated materials as chemical waste and also provide impermeable sheets for all repairing and maintenance works. Since the finding was noted at the last weekly site inspection in this reporting month, it will be verified in the coming month.

#### **Site Practices**

- C&D waste, such as idle tyres, plastics and wood, were noted discarded on the haul road to Public Fill Area during the weekly site inspection on 10 May 2012. The Contractor was reminded to collect and store / dispose of the wastes properly. During the subsequent weekly site inspection on 17 May 2012, the wastes were collected; and
- Rubbish skip near CREO was full of rubbish during the weekly site inspection on 31 May 2012. The Contractor was reminded to collect the rubbish regularly or if necessary. Since the finding was noted at the last weekly site inspection in this reporting month, it will be verified in the coming month.

## **7.2 Review of Environmental Monitoring Procedures**

The monitoring works conducted by the ET were inspected internally on a regular basis. The following observations have been recorded for the monitoring works:





### Air Quality Monitoring

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

### Water Quality Monitoring

- The monitoring team recorded the observations around the monitoring stations, which might affect the results; and
- Major water pollution sources were identified and recorded.

### Noise Monitoring

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

## 7.3 Status of Environmental Licensing and Permitting

All permits/licenses valid in this reporting month are summarized in Table 7.1.

Table 7.1 Summary of environmental licensing and permit status

Description	Permit No.	Valid Period		Section
		From	To	
Environmental Permit	EP-210/2005/A	15/12/08	---	Issued
Chemical Waste Producer	5296-421-C3577-03	18/12/09	---	Spent lubricating Oil, Spent Flammable Liquid, Spent Battery and Surplus Paint
Effluent Discharge License	WT00005978-2010	10/05/10	31/05/15	Discharge of Industrial Trade Effluent arising from public fill reception facilities, screen and sedimentation tank
Marine Dumping Permit	EP/MD/12-137	01/04/12	30/06/12	Approval for dumping 3,200,000 tons (approximately equal to 1,777,777 cu.m. bulked quantity) of Public Fill (Reclamation Materials) from Tseung Kwan O Area 137 Fill Bank, Tuen Mun Area 38 Fill Bank, Barging Point at Former Kai Tak Airport and MTR XRL Contracts 803A to D to designated dumping area at Guanghaiwan of Taishan

## 7.4 Implementation Status

### 7.4.1 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.

### 7.4.2 Implementation Status of Event and Action Plan

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

Apart from this, there was no exceedance on noise and marine water monitoring parameters recorded in this monitoring month. Hence no further actions were required.



### 7.4.3 Implementation Status of Environmental Complaint, Notification of Summon and Successful Prosecution Handling

Three complaints received on 02, 12 and 14 May 2012 was forwarded by the CEDD on 16 May 2012 from public against the mud / debris and dust found at Lung Mun Road from the site truck leaving the Tuen Mun Area 38 Fill Bank. The complainant complained that the dust and waste generated caused an environmental nuisance. Refer the CEDD preliminary investigation, the unsatisfactory condition at Lung Mun Road is due to the muddy water adhered on the wheels of the dump trucks leaving the site of Tuen Mun Fill Bank. Due to the complaint, the Contractor has implemented control measures to reduce dust and waste impact to the environment but some improvement should be carried out. The Contractor replied to take more effort on cleaning of site haul road and public road, and also site truck before leaving the site. Complaint Investigation report of this event have been prepared and submit to EPD, RE, IEC and Contractor by ET.

No notification of summon and successful prosecution was received in this reporting month. A summary of environmental complaints, notifications of summons and successful prosecutions was given in Table 7.2.

Table 7.2 Summary of Environmental Complaints and Prosecutions

Complaints logged		Summons served		Successful Prosecution	
May 2012	Cumulative	May 2012	Cumulative	May 2012	Cumulative
3	3	0	0	0	0

## 8.0 LANDSCAPE AND VISUAL

Landscape and visual site audit was carried out on a weekly basis to monitor environmental issues in order to ensure that all mitigation measures were implemented timely and properly. The findings in this reporting month were:

- The maximum stockpiling height at the Fill Bank was limited to a maximum of +40 mPD;
- The Contractor hydroseeded the outer slopes of the Fill Bank as far as practicable;
- The Contractor removed the stockpile of public fill in a sequence to allow the outer hydroseeded to be removed later than other portions as far as practicable;
- *Casuarina equisetifolia* were planted as buffer tree along the northern perimeter of the site. The height of *Casuarina equisetifolia* was maintained at least 3000mm above soil level; and
- Lighting was set to minimize night-time glare.

## 9.0 WASTE MANAGEMENT

### 9.1 Summary of Waste disposed of in this month

The actual amounts of different types of waste disposed of by the activities of the Project in the month are shown in Table 9.1

Table 9.1 Actual amounts of Waste generated in this reporting month

Waste Type	Actual Amount	Disposal Locations
Public Fill	0 m <sup>3</sup>	---
C&D Waste (general refuse)	0 m <sup>3</sup>	---
Chemical Waste	100 kg	Collected by licensed collector

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

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.



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 should be 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 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.

## **10.0 ENVIRONMENTAL NON-CONFORMANCE**

### **10.1 Summary of air quality, noise and marine water quality**

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

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

The noise level measured at the monitoring station complied with the Limit Level of 65dB(A). No complaint was received regarding noise issue in this reporting month.

### **10.2 Summary of Environmental Complaints**

Three complaints were received from public in this reporting month.

### **10.3 Summary of Notification of Summons and Prosecution**

There was no notification of summon and prosecution respect to environmental issues registered in this reporting month.

## **11.0 CONCLUSIONS AND RECOMMENDATIONS**

### **Conclusions**

Impact monitoring of air quality, noise and water quality were carried out at designated locations in this reporting month.

Impact monitoring of air quality were carried out at designated locations in accordance with the Project Profile in this reporting month.

According to the summary of air monitoring results, no exceedance of Action and Limit levels was recorded for 1-hr and 24-hr TSP monitoring in the reporting month.

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

The noise level measured at the monitoring station complied with the Limit Level of 65dB(A). No complaint was received regarding noise issue in this reporting month.



According to the weekly site inspections carried out in this reporting month, 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.

Three complaints were received in this reporting month. Complaint Investigation report of this event have been prepared and submit to EPD, RE, IEC and Contractor by ET.

No prosecution or notification of summons was received in this reporting month.

### **Recommendations**

According to the environmental site inspections performed in the reporting month, 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 bowsers;
- 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 construction 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 and permanent desilting chambers regularly; and
- Remove the stagnant water or provide approved pesticides for the stagnant water in the permanent desilting chambers, if any.

#### ***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 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.

#### ***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; and
- Maintain the hydroseeded slopes properly.



## 12.0 FUTURE KEY ISSUES

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

- Dust generation from activities on site, such as vehicular movements along unpaved area and rock crushing activities;
- Noise impact from operating equipment and machinery on site and
- Wastewater and surface runoff from the site discharged into nearby water body.

- END OF REPORT -

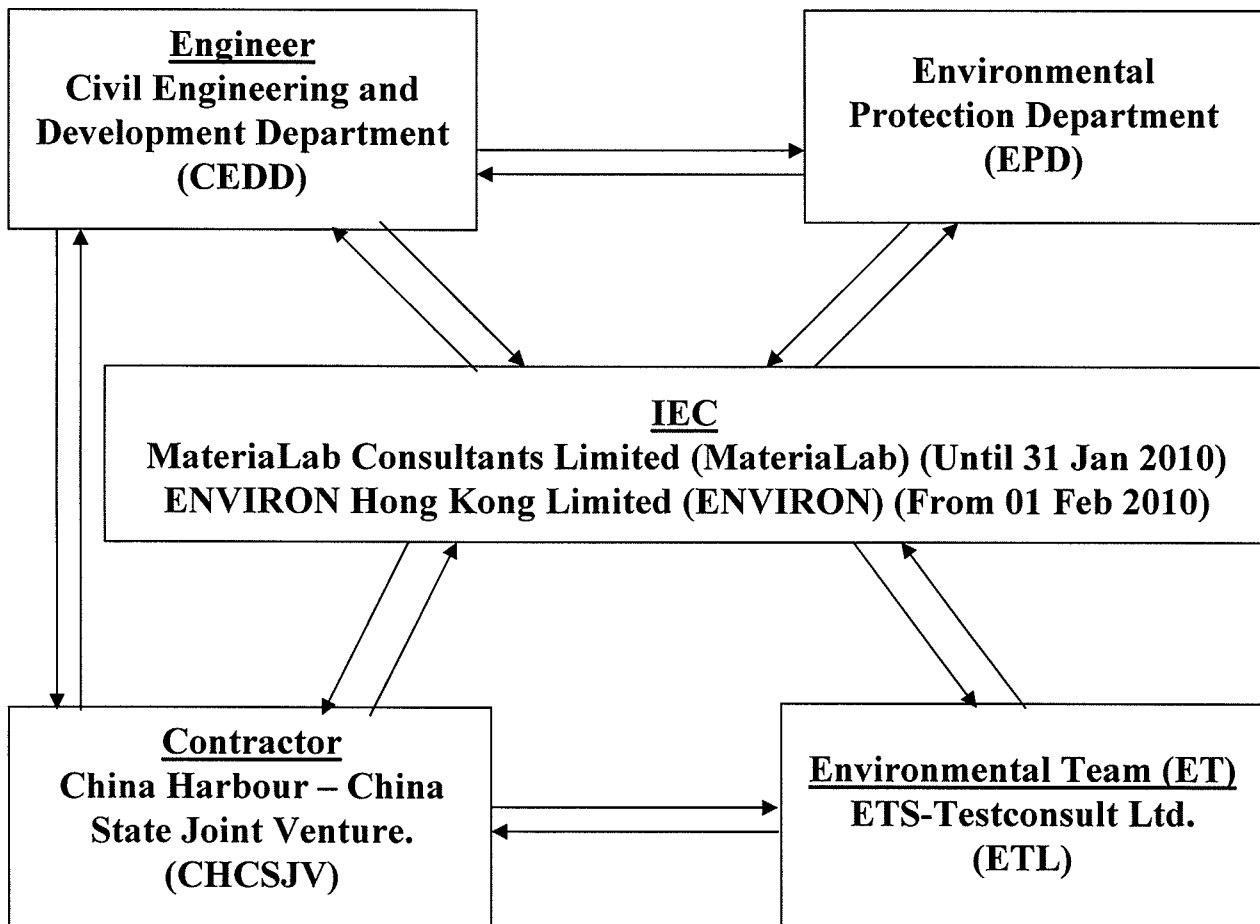


## **Appendix A**

### **Organization Chart and Lines of Communication**



# Lines of Communication







東業德勤测试顾问有限公司  
ETS-TESTCONSULT LIMITED

## **Appendix B1**

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



東業德勤測試顧問有限公司  
ETS-TESTCONSULT LIMITED

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Tel : 2695 8318 E-mail : etl@ets-testconsult.com  
Fax : 2695 3944 Web site : www.ets-testconsult.com

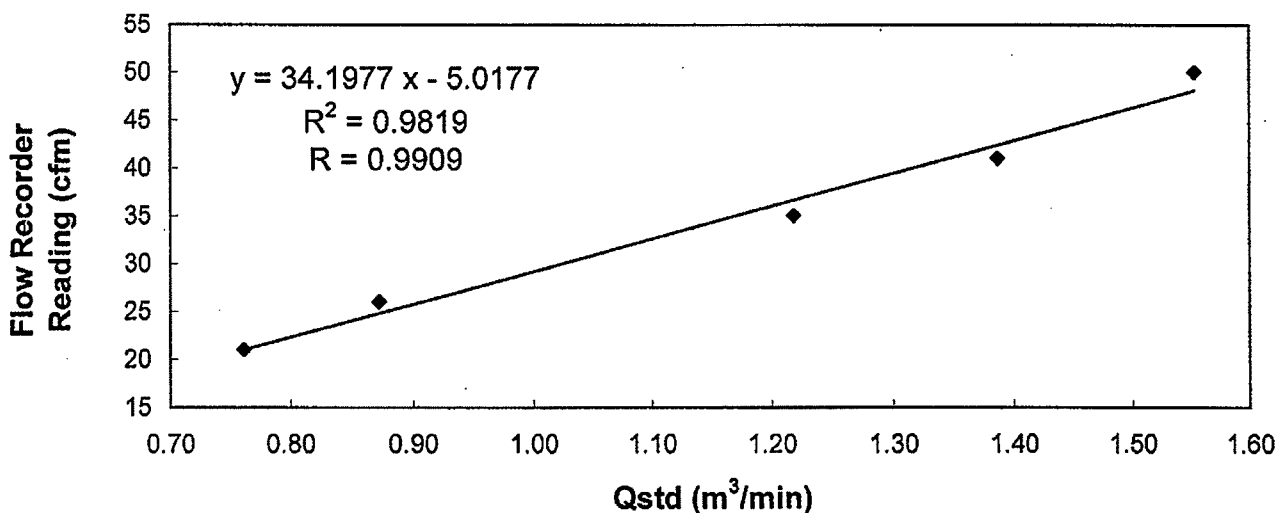
**TEST REPORT**

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

Manufacturer : Graseby GMW Date of Calibration : 24 March 2012  
Serial No. : 9795 ( ET / EA / 003 / 18 ) Calibration Due Date : 23 May 2012  
Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual

Results :	Flow recorder reading (cfm)	50	41	35	26	21
	Qstd (Actual flow rate, m <sup>3</sup> /min)	1.55	1.39	1.22	0.87	0.76
	Pressure :	765.81 mm Hg			Temp. :	291 K

**Sampler 9795 Calibration Curve**  
Site: Tuen Mun (A1)



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 : CHEUNG, Kai Chi  
(Site Technician)

Checked by : LAW, Sau Yee  
(Senior Environmental Officer)



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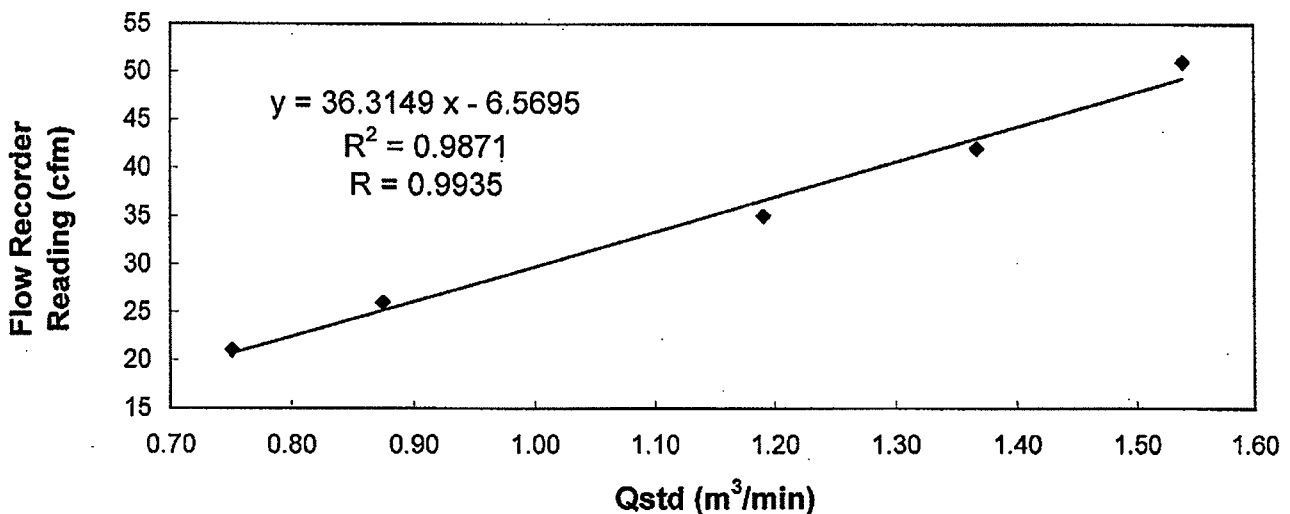
**TEST REPORT**

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

Manufacturer : Graseby GMW Date of Calibration : 17 May 2012  
Serial No. : 9795 ( ET / EA / 003 / 18 ) Calibration Due Date : 16 July 2012  
Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual

Results	Flow recorder reading (cfm)	51	42	35	26	21
	Qstd (Actual flow rate, m <sup>3</sup> /min)	1.54	1.37	1.19	0.87	0.75
	Pressure :	767.31 mm Hg		Temp. :	300 K	

**Sampler 9795 Calibration Curve**  
**Site: Tuen Mun (A1)**



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 : MAK Kei Wai  
MAK, Kei Wai  
(Assistant Supervisor)

Checked by : LAW Sau Yee  
LAW, Sau Yee  
(Senior Environmental Officer)



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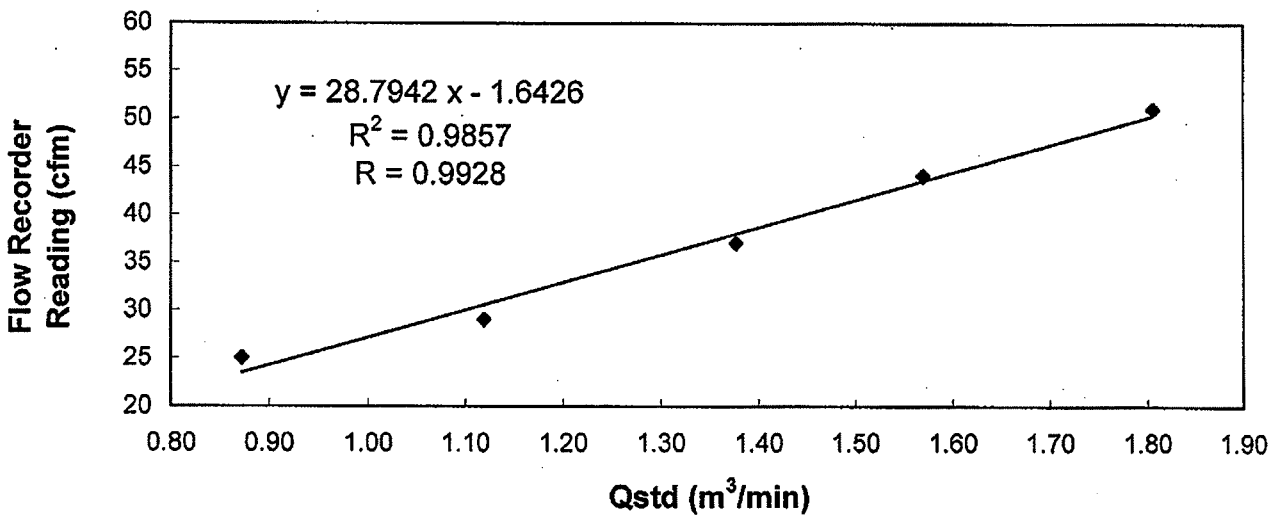
**TEST REPORT**

**Calibration Report  
of  
High Volume Air Sampler**

Manufacturer : Graseby GMW Date of Calibration : 24 March 2012  
Serial No. : 9864 (ET/EA/003/19) Calibration Due Date : 23 May 2012  
Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual

Results :	Flow recorder reading (cfm)	51	44	37	29	25
	Qstd (Actual flow rate, m <sup>3</sup> /min)	1.81	1.57	1.38	1.12	0.87
	Pressure : 765.81 mm Hg	Temp. : 291 K				

**Sampler 9864 Calibration Curve  
Site: Tuen Mun (A2)**



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 : Cheung Kai Chi  
CHEUNG, Kai Chi  
(Site Technician)

Checked by : Lau Sau Yee  
LAW, Sau Yee  
(Senior Environmental Officer)



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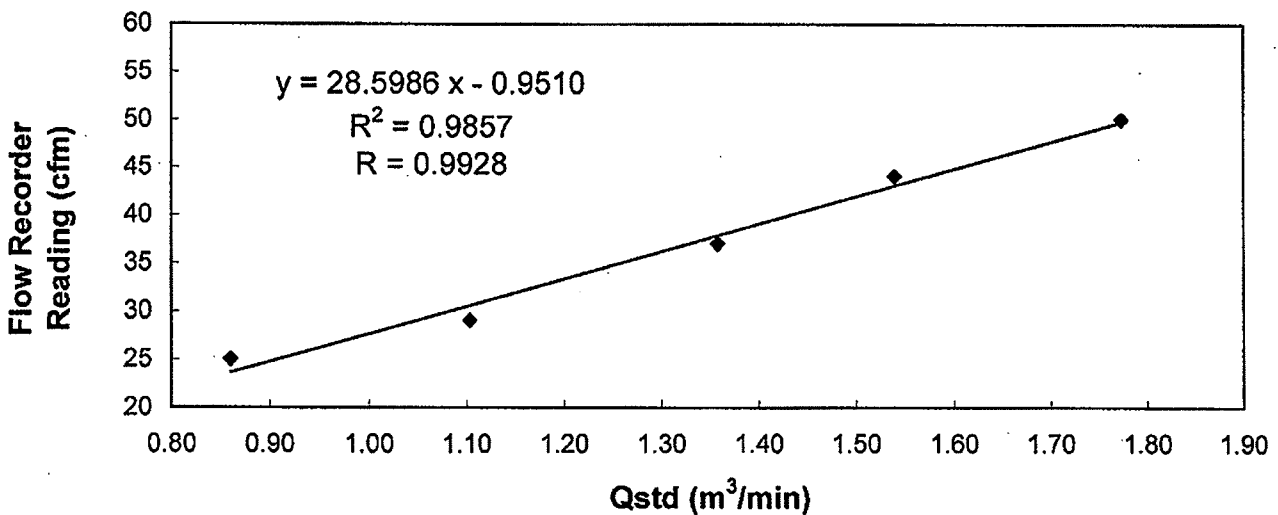
**TEST REPORT**

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

**Manufacturer** : Graseby GMW **Date of Calibration** : 17 May 2012  
**Serial No.** : 9864 (ET/EA/003/19) **Calibration Due Date** : 16 July 2012  
**Method** : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual

<b>Results</b>	Flow recorder reading (cfm)	50	44	37	29	25
	Qstd (Actual flow rate, m <sup>3</sup> /min)	1.77	1.54	1.36	1.10	0.86
Pressure :		767.31 mm Hg		Temp. :		300 K

**Sampler 9864 Calibration Curve**  
Site: Tuen Mun (A2)



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 : MAK, Kei Wai  
MAK, Kei Wai  
(Assistant Supervisor)

Checked by : LAW, Sau Yee  
LAW, Sau Yee  
(Senior Environmental Officer)

ET/EA/004/08



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AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - May 19, 2011 Rootsometer S/N 0438320 Ta (K) - 294  
 Operator Tisch Orifice I.D. - 1940 Pa (mm) - 754.38

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.4730	3.3	2.00
2	NA	NA	1.00	1.0390	6.4	4.00
3	NA	NA	1.00	0.9270	8.1	5.00
4	NA	NA	1.00	0.8860	8.9	5.50
5	NA	NA	1.00	0.7310	13.0	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
1.0017	0.6800	1.4185	0.9956	0.6759	0.8829
0.9975	0.9600	2.0061	0.9914	0.9542	1.2486
0.9952	1.0736	2.2429	0.9892	1.0671	1.3959
0.9942	1.1222	2.3524	0.9882	1.1153	1.4641
0.9887	1.3526	2.8371	0.9827	1.3444	1.7657
Qstd slope (m) = 2.10962			Qa slope (m) = 1.32101		
intercept (b) = -0.01785			intercept (b) = -0.01111		
coefficient (r) = 0.99997			coefficient (r) = 0.99997		
y axis = SQRT [H2O (Pa/760) (298/Ta)]			y axis = SQRT [H2O (Ta/Pa)]		

CALCULATIONS

Vstd = Diff. Vol [(Pa-Diff. Hg)/760] (298/Ta)  
 Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]  
 Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m { [SQRT (H2O (Pa/760) (298/Ta))] - b }  
 Qa = 1/m { [SQRT H2O (Ta/Pa)] - b }



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## **Appendix B2**

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

## Summary of 24-hr TSP Monitoring Results

Monitoring Station : TM-A1

Start Date	Start Time	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	Initial	Final		Initial	Final		Initial	Final	
05/05/12	15:00	06/05/12	15:00	18283.98	18307.98	24.00	1.0825	1.0825	1.0825	2.8222	3.0633	155
12/05/12	15:40	13/05/12	15:40	18311.98	18335.98	24.00	1.0825	1.0825	1.0825	2.8244	3.0679	156
18/05/12	09:00	19/05/12	09:00	18337.98	18361.98	24.00	1.0621	1.0621	1.0621	2.7921	3.0218	150
24/05/12	13:00	25/05/12	13:00	18365.98	18389.98	24.00	1.0621	1.0621	1.0621	2.8056	3.0470	158
30/05/12	09:00	31/05/12	09:00	18391.98	18415.98	24.00	1.0621	1.0621	1.0621	2.7804	3.0102	150

Monitoring Station : TM-RA2 \*

Start Date	Start Time	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	Initial	Final		Initial	Final		Initial	Final	
05/05/12	15:00	06/05/12	15:00	20319.98	20343.98	24.00	1.2031	1.2031	1.2031	2.8175	3.0625	141
12/05/12	15:30	13/05/12	15:30	20347.98	20371.98	24.00	1.2031	1.2031	1.2031	2.8285	3.0669	138
18/05/12	09:00	19/05/12	09:00	20373.98	20397.98	24.00	1.1872	1.1872	1.1872	2.7843	3.0247	141
24/05/12	13:00	25/05/12	13:00	20401.98	20425.98	24.00	1.1872	1.1872	1.1872	2.8194	3.0703	147
30/05/12	09:00	31/05/12	09:00	20427.98	20451.98	24.00	1.1872	1.1872	1.1872	2.8006	3.0438	142

Remark (\*): Since the area for existing air monitoring station TM-A2 near Tipping Hall No.1 was handed over to EcoPark, air monitoring station TM-A2 was cancelled and the air monitoring was carried out at air monitoring station TM-RA2 (refer to Figure 1 attached) from 28 October 2008.



## Summary of 1-hr TSP Monitoring Results

Monitoring Station : TM-A1		Location : Outside CEDD Site Office									
Date	Time		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> )
	Start	Finish	Initial	Final		Initial	Final		Initial	Final	
03/05/12	10:55	11:55	18280.98	18281.98	1.00	1.0825	1.0825	1.0825	2.6617	2.6816	306
03/05/12	15:40	16:40	18281.98	18282.98	1.00	1.0825	1.0825	1.0825	2.6542	2.6745	313
05/05/12	11:15	12:15	18282.98	18283.98	1.00	1.0825	1.0825	1.0825	2.8140	2.8319	276
08/05/12	09:25	10:25	18307.98	18308.98	1.00	1.0825	1.0825	1.0825	2.8410	2.8602	296
08/05/12	15:50	16:50	18308.98	18309.98	1.00	1.0825	1.0825	1.0825	2.8386	2.8605	337
10/05/12	13:00	14:00	18309.98	18310.98	1.00	1.0825	1.0825	1.0825	2.8201	2.8407	317
12/05/12	13:10	14:10	18310.98	18311.98	1.00	1.0825	1.0825	1.0825	2.8121	2.8326	316
15/05/12	13:00	14:00	18335.98	18336.98	1.00	1.0825	1.0825	1.0825	2.8141	2.8354	328
17/05/12	09:00	10:00	18336.98	18337.98	1.00	1.0825	1.0825	1.0825	2.8009	2.8210	309
19/05/12	14:00	15:00	18361.98	18362.98	1.00	1.0621	1.0621	1.0621	2.8019	2.8226	325
19/05/12	16:00	17:00	18362.98	18363.98	1.00	1.0621	1.0621	1.0621	2.7927	2.8117	298
22/05/12	10:15	11:15	18363.98	18364.98	1.00	1.0621	1.0621	1.0621	2.8127	2.8329	317
24/05/12	09:00	10:00	18364.98	18365.98	1.00	1.0621	1.0621	1.0621	2.8152	2.8361	328
26/05/12	13:30	14:30	18389.98	18390.98	1.00	1.0621	1.0621	1.0621	2.8198	2.8384	292
29/05/12	13:45	14:45	18390.98	18391.98	1.00	1.0621	1.0621	1.0621	2.7843	2.8046	319
31/05/12	13:00	14:00	18415.98	18416.98	1.00	1.0621	1.0621	1.0621	2.7992	2.8184	301
31/05/12	14:30	15:30	18416.98	18417.98	1.00	1.0621	1.0621	1.0621	2.7889	2.8075	292

Monitoring Station : TM-RA2 *		Location : Site Egress									
Date	Time		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> )
	Start	Finish	Initial	Final		Initial	Final		Initial	Final	
03/05/12	11:05	12:05	20316.98	20317.98	1.00	1.2031	1.2031	1.2031	2.6743	2.6954	292
03/05/12	15:50	16:50	20317.98	20318.98	1.00	1.2031	1.2031	1.2031	2.6664	2.6877	295
05/05/12	11:10	12:10	20318.98	20319.98	1.00	1.2031	1.2031	1.2031	2.8088	2.8278	263
08/05/12	09:30	10:30	20343.98	20344.98	1.00	1.2031	1.2031	1.2031	2.8340	2.8553	295
08/05/12	16:00	17:00	20344.98	20345.98	1.00	1.2031	1.2031	1.2031	2.8412	2.8642	319
10/05/12	13:00	14:00	20345.98	20346.98	1.00	1.2031	1.2031	1.2031	2.8117	2.8334	301
12/05/12	13:00	14:00	20346.98	20347.98	1.00	1.2031	1.2031	1.2031	2.8228	2.8441	295
15/05/12	13:10	14:10	20371.98	20372.98	1.00	1.2031	1.2031	1.2031	2.8098	2.8320	308
17/05/12	09:00	10:00	20372.98	20373.98	1.00	1.2031	1.2031	1.2031	2.8117	2.8327	291
19/05/12	14:05	15:05	20397.98	20398.98	1.00	1.1872	1.1872	1.1872	2.8117	2.8321	286
19/05/12	16:05	17:05	20398.98	20399.98	1.00	1.1872	1.1872	1.1872	2.8012	2.8214	284
22/05/12	10:25	11:25	20399.98	20400.98	1.00	1.1872	1.1872	1.1872	2.8088	2.8301	299
24/05/12	09:05	10:05	20400.98	20401.98	1.00	1.1872	1.1872	1.1872	2.8243	2.8444	282
26/05/12	13:40	14:40	20425.98	20426.98	1.00	1.1872	1.1872	1.1872	2.8126	2.8325	279
29/05/12	13:50	14:50	20426.98	20427.98	1.00	1.1872	1.1872	1.1872	2.7805	2.8026	310
31/05/12	13:00	14:00	20451.98	20452.98	1.00	1.1872	1.1872	1.1872	2.8060	2.8248	264
31/05/12	14:35	15:35	20452.98	20453.98	1.00	1.1872	1.1872	1.1872	2.7909	2.8110	282

Remark (\*): Since the area for existing air monitoring station TM-A2 near Tipping Hall No.1 was handed over to EcoPark, air monitoring station TM-A2 was cancelled and the air monitoring was carried out at air monitoring station TM-RA2 (refer to Figure 1 attached) from 28 October 2008.

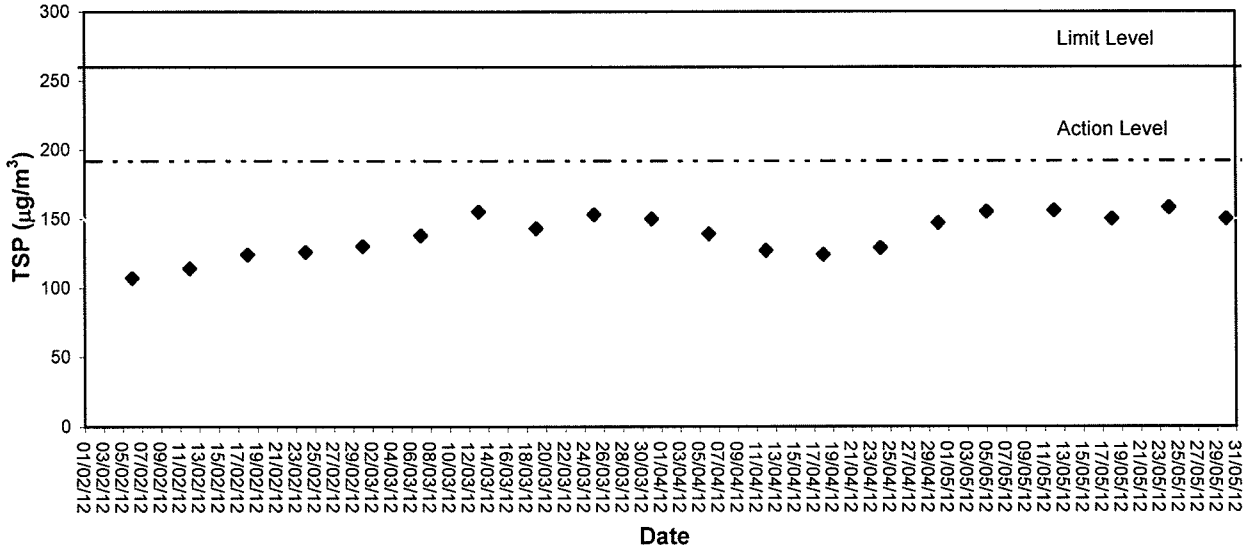


## **Appendix B3**

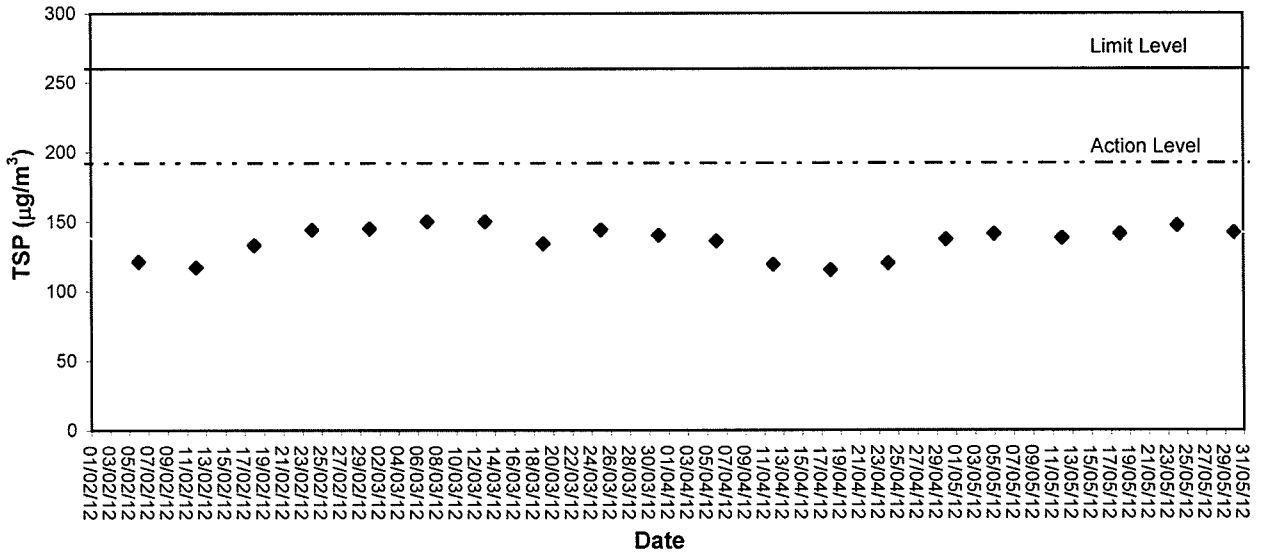
### **Graphical Plots of Impact Air Quality Monitoring Data**



### 24-hour TSP level at TM-A1

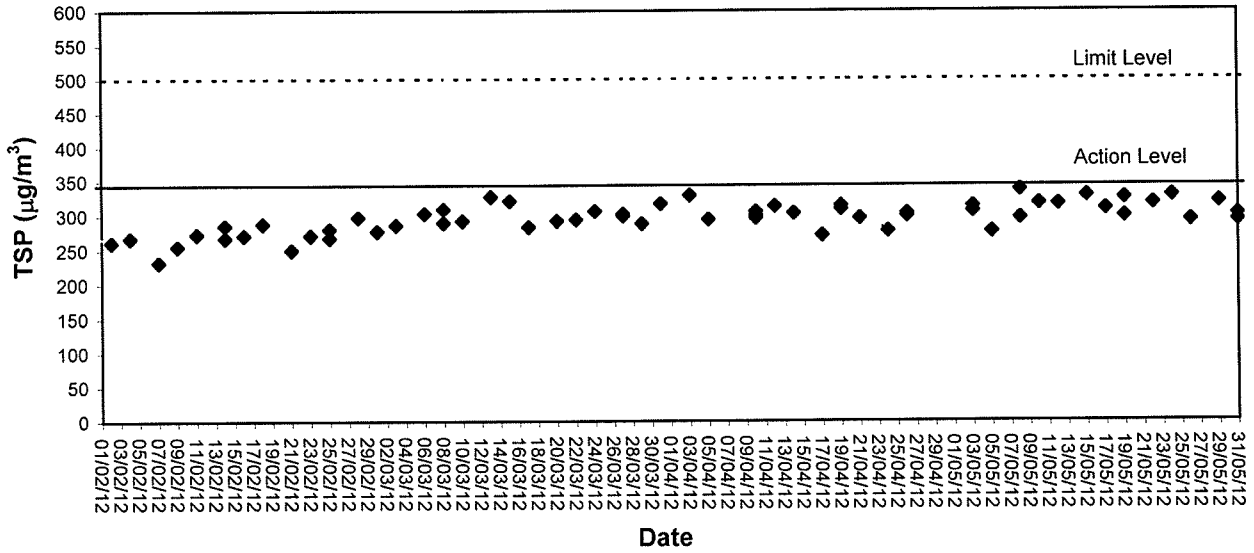


### 24-hour TSP level at TM-RA2

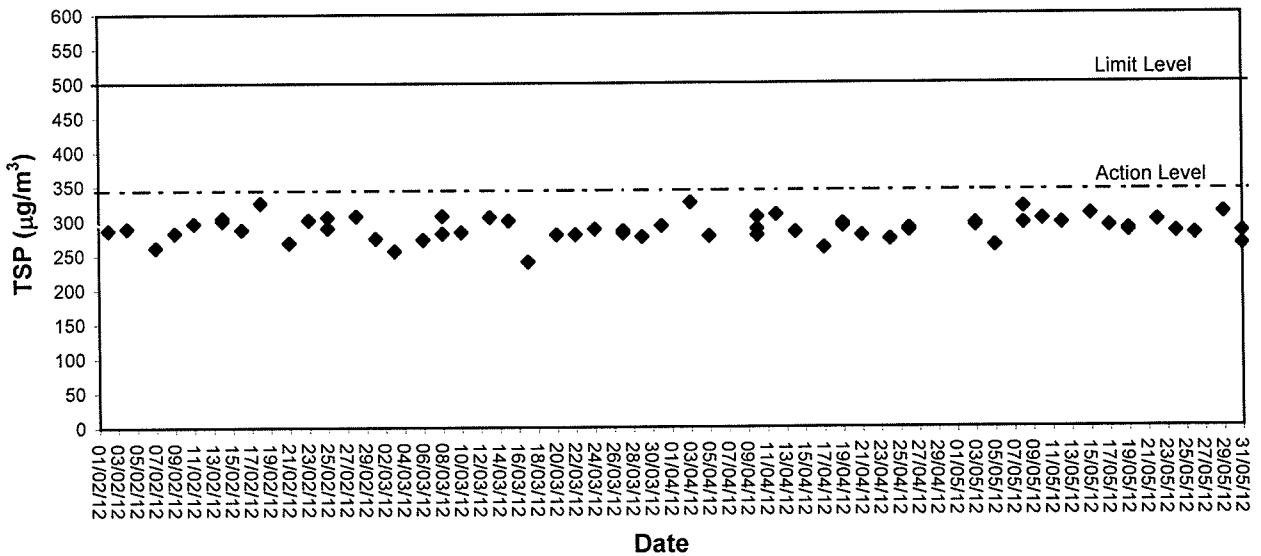




### 1-hour TSP level at TM-A1



### 1-hour TSP level at TM-RA2





## **Appendix C1**

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





### Internal Calibration Report of Dissolved Oxygen Meter

Equipment Ref. No. :	<u>ET/EW/008/004</u>	Manufacturer :	<u>YSI</u>
Model No. :	<u>Pro 2030</u>	Serial No. :	<u>10F 101978</u>
Date of Calibration :	<u>13/02/2012</u>	Calibration Due Date :	<u>12/05/2012</u>

#### Temperature Verification

Ref. No. of Reference Thermometer : ET/0521/001  
 Ref. No. of Water Bath : ---

		Temperature (°C)		
Reference Thermometer reading	Measured	20.2	Corrected	19.9
DO Meter reading	Measured	19.8	Difference	0.1

#### Standardization of sodium thiosulphate (Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>) solution

Reagent No. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> titrant	CPE/012/4.5/001/4	Reagent No. of 0.025N K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	CPE/012/4.4/001/7
		Trial 1	Trial 2
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		0.00	0.00
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		40.00	39.50
Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)		40.00	39.50
Normality of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02500	0.02532
Average Normality (N) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02516	
Acceptance criteria, Deviation		Less than ± 0.001N	

Calculation: Normality of Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>, N = 1 / ml Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> used

#### Linearity Checking

##### Determination of dissolved oxygen content by Winkler Titration \*

Purging Time (min)	2		5		10	
	1	2	1	2	1	2
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	0.00	11.10	22.10	0.00	7.40	12.20
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	11.10	22.10	29.60	7.40	12.20	17.10
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	11.10	11.00	7.50	7.40	4.80	4.90
Dissolved Oxygen (DO), mg/L	7.50	7.43	5.07	5.00	3.24	3.31
Acceptance criteria, Deviation	Less than + 0.3mg/L		Less than + 0.3mg/L		Less than + 0.3mg/L	

Calculation: DO (mg/L) = V x N x 8000/298

Purging time, min	DO meter reading, mg/L			Winkler Titration result *, mg/L			Difference (%) of DO Content
	1	2	Average	1	2	Average	
2	7.56	7.54	7.55	7.50	7.43	7.47	1.07
5	5.22	5.20	5.21	5.07	5.00	5.04	3.32
10	3.22	3.24	3.23	3.24	3.31	3.28	1.54
Linear regression coefficient				0.99807			



### Internal Calibration Report of Dissolved Oxygen Meter

**Zero Point Checking**

DO meter reading, mg/L	0.00
------------------------	------

**Salinity Checking**

Reagent No. of NaCl (10ppt)	CPE/012/4.7/001/17	Reagent No. of NaCl (30ppt)	CPE/012/4.8/001/17
-----------------------------	--------------------	-----------------------------	--------------------

**Determination of dissolved oxygen content by Winkler Titration \*\***

Salinity (ppt)	10		30	
	1	2	1	2
Trial				
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	0.00	11.50	23.10	33.60
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	11.50	23.10	33.60	44.00
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	11.50	11.60	10.50	10.40
Dissolved Oxygen (DO), mg/L	7.77	7.84	7.09	7.02
Acceptance criteria, Deviation	Less than + 0.3mg/L		Less than + 0.3mg/L	

Calculation:  $DO (mg/L) = V \times N \times 8000/298$

Salinity (ppt)	DO meter reading, mg/L			Winkler Titration result**, mg/L			Difference (%) of DO Content
	1	2	Average	1	2	Average	
10	7.72	7.76	7.74	7.77	7.84	7.81	0.90
30	7.10	7.08	7.09	7.09	7.02	7.06	0.42

**Acceptance Criteria**

- (1) Difference between temperature readings from temperature sensor of DO probe and reference thermometer : < 0.5 °C
- (2) Linear regression coefficient : >0.99
- (3) Zero checking: 0.0mg/L
- (4) Difference (%) of DO content from the meter reading and by winkler titration : within ± 5%

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

# Delete as appropriate

Calibrated by

: hde lmn

Approved by :

[Signature]





## Performance Check of Salinity Meter

Equipment Ref. No. : ET/EW/008/004      Manufacturer : YSI  
Model No. : Pro 2030      Serial No. : 10F 101978  
Date of Calibration : 13/02/2012      Due Date : 12/05/2012

Ref. No. of Salinity Standard used (30ppt)

S/001/3

Salinity Standard (ppt)	Measured Salinity (ppt)	Difference %
30	30.3	1.00

Acceptance Criteria

Difference : <10 %

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

Checked by : *Wai Lam*

Approved by : *[Signature]*



### Internal Calibration Report of Dissolved Oxygen Meter

Equipment Ref. No. : <u>ET/EW/008/004</u>	Manufacturer : <u>YSI</u>
Model No. : <u>Pro 2030</u>	Serial No. : <u>10F 101978</u>
Date of Calibration : <u>13/05/2012</u>	Calibration Due Date : <u>12/08/2012</u>

#### Temperature Verification

Ref. No. of Reference Thermometer : ET/0521/001

Ref. No. of Water Bath : ---

		Temperature (°C)		
Reference Thermometer reading	Measured	20.4	Corrected	20.0
DO Meter reading	Measured	19.9	Difference	0.1

#### Standardization of sodium thiosulphate (Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>) solution

Reagent No. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> titrant	CPE/012/4.5/001/5	Reagent No. of 0.025N K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	CPE/012/4.4/001/9
		Trial 1	Trial 2
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		0.00	0.00
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		39.80	40.00
Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)		39.80	40.00
Normality of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02513	0.02500
Average Normality (N) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02507	
Acceptance criteria, Deviation		Less than ± 0.001N	

Calculation: Normality of Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>, N = l / ml Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> used

#### Lineality Checking

##### Determination of dissolved oxygen content by Winkler Titration \*

Purging Time (min)	2		5		10	
	1	2	1	2	1	2
Trial						
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	0.00	10.50	21.00	0.00	7.80	12.40
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	10.50	21.00	28.70	7.80	12.40	16.90
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	10.50	10.50	7.70	7.80	4.60	4.50
Dissolved Oxygen (DO), mg/L	7.07	7.07	5.18	5.25	3.10	3.03
Acceptance criteria, Deviation	Less than + 0.3mg/L		Less than + 0.3mg/L		Less than + 0.3mg/L	

Calculation: DO (mg/L) = V x N x 8000/298

Purging time, min	DO meter reading, mg/L			Winkler Titration result *, mg/L			Difference (%) of DO Content
	1	2	Average	1	2	Average	
2	7.06	7.06	7.06	7.07	7.07	7.07	0.14
5	5.18	5.22	5.20	5.18	5.25	5.22	0.38
10	3.14	3.10	3.12	3.10	3.03	3.07	1.62
Linear regression coefficient				0.99807			





## Performance Check of Salinity Meter

Equipment Ref. No. : ET/EW/008/004      Manufacturer : YSI  
Model No. : Pro 2030      Serial No. : 10F 101978  
Date of Calibration : 13/05/2012      Due Date : 12/08/2012

Ref. No. of Salinity Standard used (30ppt)

S/001/3


Salinity Standard (ppt)	Measured Salinity (ppt)	Difference %
30	30.2	0.67

### Acceptance Criteria

Difference : <10 %

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

Checked by : 

Approved by : 



東業德勤測試顧問有限公司  
ETS-TESTCONSULT LIMITED

## **Appendix C2**

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

# Mid-Flood Tide

## Monitoring Station : TM-FC2

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	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
03/05/12	1600-1615	31/Cloudy	Surface	26.5	27.6	27.6	6.34	6.36	6.41	6.42	6.41	6.41	7.4	7.5		7.4	7.5	
					27.5	27.5	6.38	6.31	6.43	6.42	6.43	7.6	7.6		7.6	7.6		
					28.6	28.7	6.27	6.25	6.50	6.52	6.50	7.6	7.6		7.6	7.6		
					28.7	28.7	6.23	6.13	6.54	6.33	6.54	7.2	7.2		7.2	7.2		
					29.6	29.7	6.15	6.13	6.31	6.33	6.31	7.2	7.2		7.2	7.2		
					29.7	29.7	6.11	6.13	6.34	6.33	6.34	7.2	7.2		7.2	7.2		
05/05/12	1814-1830	26/Cloudy	Surface	25.5	26.8	26.8	6.82	6.85	6.67	6.70	6.67	6.74	7.5		6.67	6.70		
					26.8	26.8	6.88	6.78	6.72	6.55	6.72	7.6	7.6		7.6	7.6		
					26.7	26.7	6.72	6.70	6.52	6.55	6.52	7.8	7.8		7.8	7.8		
					26.6	26.6	6.68	6.77	6.47	6.51	6.47	7.4	7.4		7.4	7.4		
					26.7	26.8	6.79	6.77	6.54	6.51	6.54	7.6	7.6		7.6	7.6		
					26.8	26.8	6.75	6.40	6.54	6.43	6.54	6.8	6.8		6.8	6.8		
08/05/12	0738-0755	27/Fine	Surface	25.3	25.7	25.8	6.41	6.40	5.94	5.98	5.94	6.8	6.9		6.8	6.9		
					25.8	25.8	6.38	6.31	6.01	5.98	6.01	7.0	7.0		7.0	7.0		
					26.1	26.1	6.24	6.22	6.24	6.27	6.24	7.2	7.2		7.2	7.2		
					26.1	26.1	6.20	6.22	6.29	6.27	6.29	7.4	7.4		7.4	7.4		
					26.5	26.5	6.05	6.07	6.40	6.43	6.40	7.6	7.6		7.6	7.6		
					26.4	26.4	6.09	6.07	6.45	6.43	6.45	7.6	7.6		7.6	7.6		
10/05/12	0830-0845	30/Fine	Surface	27.3	20.2	20.2	7.18	7.20	7.29	7.28	7.29	8.2	8.3		8.2	8.3		
					21.4	21.4	6.14	6.12	7.78	7.77	7.78	8.4	8.4		8.4	8.4		
					21.5	21.5	6.10	6.12	7.75	7.77	7.75	8.6	8.6		8.6	8.6		
					21.8	21.8	6.22	6.24	8.10	8.12	8.10	9.0	9.0		9.0	9.0		
					21.7	21.7	6.25	6.24	8.14	8.12	8.14	9.2	9.2		9.2	9.2		
					25.2	25.3	6.69	6.67	6.61	6.63	6.61	7.6	7.6		7.6	7.6		
12/05/12	1126-1143	26/Cloudy	Surface	25.2	25.3	25.3	6.64	6.63	6.64	6.63	6.64	7.6	7.6		7.6	7.6		
					25.5	25.6	6.60	6.59	6.50	6.53	6.50	7.4	7.4		7.4	7.4		
					25.6	25.6	6.57	6.48	6.56	6.53	6.56	7.4	7.4		7.4	7.4		
					25.8	25.8	6.50	6.48	6.72	6.74	6.72	7.8	7.8		7.8	7.8		
					25.8	25.8	6.46	6.48	6.76	6.74	6.76	8.0	8.0		8.0	8.0		
					27.6	27.7	6.40	6.42	6.34	6.36	6.34	7.2	7.2		7.2	7.2		
15/05/12	1515-1530	31/Fine	Surface	26.8	27.7	27.7	6.43	6.42	6.37	6.36	6.37	7.3	7.3		7.3	7.3		
					28.6	28.7	6.34	6.33	6.46	6.48	6.46	7.4	7.4		7.4	7.4		
					28.7	28.7	6.31	6.18	6.49	6.57	6.49	7.6	7.6		7.6	7.6		
					29.8	29.8	6.20	6.18	6.56	6.57	6.56	7.6	7.6		7.6	7.6		
					29.7	29.7	6.16	6.26	6.58	6.96	6.58	7.8	7.8		7.8	7.8		
					20.6	20.6	6.27	6.26	6.97	6.96	6.97	7.8	7.8		7.8	7.8		
17/05/12	1600-1615	30/Cloudy	Surface	26.8	20.6	20.6	6.24	6.26	6.95	6.96	6.95	8.0	8.0		8.0	8.0		
					23.5	23.5	5.98	5.96	7.58	7.57	7.58	8.6	8.6		8.6	8.6		
					23.5	23.5	5.94	5.78	7.55	7.62	7.55	8.4	8.4		8.4	8.4		
					23.7	23.7	5.79	5.78	7.60	7.62	7.60	8.4	8.4		8.4	8.4		
					23.7	23.7	5.76	5.78	7.64	7.62	7.64	8.6	8.6		8.6	8.6		
					23.7	23.7	5.76	5.78	7.64	7.62	7.64	8.6	8.6		8.6	8.6		

# Mid-Flood Tide

## Monitoring Station : TM-FC2

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)		
			Surface	Middle		Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
19/05/12	1730-1745	30/Cloudy	Surface	1.0	27.0	19.2	19.2	6.15	6.13	86.2	85.9	6.54	6.52	7.6	7.5	8.4	7.43	7.94	8.9
						19.2		6.11		85.6		6.50		7.4					
						20.6	5.94	83.1	7.80	8.6									
22/05/12	1800-1815	28/Fine	Surface	1.0	26.6	20.7	20.7	5.97	5.96	83.5	83.3	7.94	7.82	8.8	8.7	7.5	6.44	7.94	8.9
						22.4		5.90		82.5		7.96		8.0					
						22.3	5.87	82.1	7.93	8.8									
24/05/12	0700-0715	28/Sunny	Middle	8.3	26.4	27.2	27.3	6.35	6.37	93.3	93.6	6.31	6.33	7.2	7.3	8.2	7.11	7.46	8.7
						27.3		6.38		93.8		6.35		7.4					
						28.1	6.27	91.9	6.42	7.4									
26/05/12	0830-0845	27/Cloudy	Bottom	15.6	26.2	28.9	29.0	6.15	6.13	89.8	89.5	6.53	6.55	7.6	7.7	7.6	6.40	7.8	8.8
						29.0		6.10		89.1		6.57		7.8					
						17.4	6.20	85.6	6.58	7.6									
29/05/12	1304-1323	26/Cloudy	Surface	1.0	25.5	17.4	17.4	6.17	6.19	85.1	85.4	6.55	6.57	7.6	7.6	7.5	6.40	7.8	8.8
						19.1		5.86		81.4		6.31		8.2					
						19.1	5.83	81.0	6.37	8.4									
31/05/12	1500-1515	29/Cloudy	Bottom	15.6	27.1	19.4	19.4	5.51	5.53	75.6	75.9	7.47	7.46	8.6	8.7	8.6	7.62	7.56	8.6
						19.4		5.55		76.1		7.45		8.8					
						27.1	6.42	91.5	6.42	7.2									
26/05/12	0830-0845	27/Cloudy	Middle	8.3	26.2	27.2	27.2	6.38	6.40	90.9	91.2	6.28	6.30	7.4	7.3	7.5	6.40	7.4	8.8
						27.8		6.30		89.6		6.31		8.2					
						27.8	6.27	89.2	6.41	8.4									
29/05/12	1304-1323	26/Cloudy	Surface	1.0	25.5	28.5	28.5	6.20	6.18	88.0	87.7	6.50	6.52	7.8	7.8	7.7	6.64	7.8	8.9
						28.5		6.15		87.3		6.53		7.8					
						25.4	6.65	92.4	6.50	7.4									
29/05/12	1304-1323	26/Cloudy	Middle	8.0	25.7	25.5	25.5	6.60	6.63	91.7	92.1	6.56	6.53	7.4	7.4	7.7	6.64	7.8	8.9
						25.7		6.51		90.5		6.65		7.6					
						25.7	6.47	89.9	6.70	7.8									
29/05/12	1304-1323	26/Cloudy	Bottom	15.0	25.8	25.8	25.8	6.38	6.40	88.7	88.9	6.76	6.73	8.0	7.9	8.5	7.42	8.0	9.0
						25.8		6.41		89.1		6.69		8.4					
						20.6	5.88	84.5	7.40	8.4									
31/05/12	1500-1515	29/Cloudy	Surface	1.0	27.8	20.6	20.6	5.84	5.86	83.9	84.2	7.44	7.42	8.6	8.5	8.6	7.62	7.56	8.8
						20.6		5.84		83.9		7.44		8.6					
						23.8	5.71	81.9	7.59	8.6									
31/05/12	1500-1515	29/Cloudy	Middle	8.3	27.1	23.8	23.8	5.67	5.69	81.4	81.7	7.56	7.58	8.6	8.6	8.6	7.62	7.56	8.8
						23.8		5.67		81.4		7.56		8.6					
						24.2	5.54	79.4	7.87	8.8									
31/05/12	1500-1515	29/Cloudy	Bottom	15.6	27.1	24.2	24.2	5.50	5.52	78.9	79.2	7.85	7.86	8.8	8.8	8.6	7.62	7.87	8.8
						24.2		5.50		78.9		7.85		8.8					

# Mid-Flood Tide

## Monitoring Station : TM-FM1

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)		
			Surface	Bottom		Value	Average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
03/05/12	1638-1653	31/Cloudy	Surface	1.0	25.5	27.5	27.6	6.55	6.56	6.40	6.42	94.3	94.5	6.40	6.42	7.4	7.4	7.6	
			Middle	8.6	26.2	28.6	28.6	6.44	6.43	94.6	91.9	6.44	6.53	7.4	7.5				
			Bottom	16.2	25.9	29.6	29.6	6.35	6.34	91.7	90.0	6.54	6.61	7.6	7.9				
05/05/12	1724-1741	26/Cloudy	Surface	1.0	25.5	26.6	26.7	6.90	6.89	94.4	95.7	95.9	95.7	6.80	6.83	8.0	7.9	7.9	
			Middle	8.6	25.5	26.7	26.7	6.79	6.76	95.5	94.0	6.80	6.67	7.6	7.7				
			Bottom	16.2	25.5	26.8	26.8	6.63	6.62	93.5	92.0	6.69	6.76	7.8	8.1				
08/05/12	0828-0846	27/Fine	Surface	1.0	25.3	25.8	25.9	6.48	6.50	91.7	89.7	89.4	89.7	6.12	6.15	7.0	7.0	7.3	
			Middle	8.5	25.3	26.3	26.3	6.35	6.33	89.9	87.3	6.17	6.33	7.4	7.3				
			Bottom	16.0	25.2	26.6	26.6	6.17	6.19	86.9	85.4	6.30	6.57	7.2	7.7				
10/05/12	0910-0925	30/Fine	Surface	1.0	27.2	20.1	20.1	7.05	7.07	96.7	96.9	96.7	96.9	7.34	7.32	8.4	8.3	8.8	
			Middle	8.7	26.9	21.2	21.2	6.29	6.28	97.1	85.9	7.30	8.03	8.2	8.9				
			Bottom	16.4	26.1	21.8	21.8	6.26	6.22	86.1	85.2	8.01	8.09	8.8	9.1				
12/05/12	1042-1059	26/Cloudy	Surface	1.0	25.1	25.3	25.4	6.70	6.69	93.1	92.9	93.1	92.9	6.60	6.59	7.6	7.6	7.6	
			Middle	8.4	25.0	25.5	25.6	6.60	6.59	91.7	91.5	6.63	6.59	7.8	7.6				
			Bottom	15.8	25.0	25.7	25.7	6.57	6.51	90.6	90.5	6.55	6.69	7.4	7.7				
15/05/12	1604-1619	31/Fine	Surface	1.0	26.8	27.6	27.6	6.58	6.60	95.1	95.4	95.1	95.4	6.33	6.36	7.4	7.4	7.6	
			Middle	8.7	26.6	28.6	28.7	6.50	6.49	93.9	93.7	6.44	6.46	7.6	7.7				
			Bottom	16.4	26.3	29.7	29.8	6.47	6.39	93.4	92.0	6.48	6.56	7.8	7.7				
17/05/12	1640-1655	30/Cloudy	Surface	1.0	26.8	20.5	20.4	6.29	6.27	88.6	88.4	88.6	88.4	7.04	7.06	8.0	7.9	8.5	
			Middle	8.6	26.1	23.5	23.5	5.82	5.80	88.1	81.2	7.07	7.76	7.8	8.7				
			Bottom	16.2	25.8	23.8	23.8	5.77	5.76	81.5	80.6	7.77	7.91	8.8	8.9				



# Mid-Flood Tide

## Monitoring Station : TM-FM1

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	
19/05/12	1810-1825	30/Cloudy	Surface	27.2	19.1	19.2	6.10	6.12	6.01	85.3	85.6	6.59	6.57	7.6	7.5	8.5		
					19.2		6.14			85.9		6.55		7.4				
					20.6	20.6	5.92	5.91		82.7	82.5	7.94	7.92	8.8	8.9			
22/05/12	1846-1901	28/Fine	Surface	26.5	20.6	20.6	5.89	5.87	5.87	82.2	81.9	7.90	8.06	9.0	9.1	7.5		
					22.6	22.6	5.85			81.6		8.07		9.2				
					27.3	27.3	6.44	6.46	6.39	94.7	95.0	6.41	6.40	7.6	7.6			
24/05/12	0740-0755	28/Sunny	Surface	26.8	27.3	27.3	6.48	6.32	6.01	95.3	86.5	6.39	6.97	7.8	7.8	8.4		
					28.2	28.2	6.33			92.7		6.47		7.6				
					19.2	19.2	5.79	5.78		79.9	79.8	7.55	7.57	8.4	8.5			
26/05/12	0917-0932	27/Cloudy	Surface	26.4	19.2	19.2	5.77	6.25	6.24	79.6	77.6	7.58	7.82	9.0	8.9	7.6		
					19.6	19.6	5.64	5.62	5.62	77.8		7.84		9.0				
					27.1	27.1	6.43	6.44		77.3		7.80		8.8				
29/05/12	1222-1237	26/Cloudy	Surface	26.0	27.0	27.0	6.45	6.34	6.39	91.9	91.8	6.33	6.35	7.4	7.4	7.6		
					27.8	27.8	6.36			90.4		6.42		7.4				
					27.7	27.7	6.32	6.34		89.9	90.2	6.44	6.43	7.6	7.6			
31/05/12	1540-1555	29/Cloudy	Surface	27.0	28.5	28.5	6.25	6.24	6.24	88.8	88.7	6.53	6.55	7.8	7.7	8.6		
					28.4	28.4	6.23			88.5		6.56		7.6				
					25.5	25.5	6.56	6.57	6.49	91.2	91.4	6.57	6.56	7.7	7.6			
29/05/12	1222-1237	26/Cloudy	Surface	26.0	25.6	25.6	6.58	6.42	6.29	89.4	89.2	6.62	6.64	7.4	7.5	7.6		
					25.7	25.7	6.43			88.9		6.66		7.6				
					25.7	25.7	6.40	6.29	6.29	87.7	87.5	6.77	6.79	7.6	7.7			
29/05/12	1222-1237	26/Cloudy	Surface	26.0	25.9	25.9	6.31	5.85	5.70	87.2	87.2	6.81	6.79	7.8	7.7	8.6		
					25.9	25.9	6.27			84.4		6.81		8.0				
					20.5	20.5	5.87	5.85	5.70	84.4	84.1	7.21	7.23	8.2	8.1			
31/05/12	1540-1555	29/Cloudy	Surface	27.0	20.4	20.4	5.83	5.56	5.48	83.8	79.7	7.24	7.69	8.6	8.6	8.6		
					23.7	23.7	5.57			79.9		7.67		8.6				
					23.7	23.7	5.54	5.48	5.48	79.4	79.7	7.70	7.69	8.6	8.6			
31/05/12	1540-1555	29/Cloudy	Surface	27.0	24.1	24.1	5.49	5.48	5.48	78.7	78.5	8.01	8.03	9.0	9.0	8.6		
					24.1	24.1	5.46			78.3		8.04		9.0				
					24.1	24.1	5.46			78.3		8.04		9.0				

# Mid-Flood Tide

## Monitoring Station : TM-FM2

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	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
03/05/12	1613-1628	31/Cloudy	Surface	26.5	27.6	27.6	6.52	6.54	6.46	6.48	6.46	6.48	7.6	7.6				
			Middle	26.2	28.7	28.7	6.46	6.44	6.56	6.58	6.49	6.49	7.6	7.6	7.9			
			Bottom	25.9	29.6	29.6	6.42	6.31	6.59	6.68	6.70	6.70	8.0	8.0	8.1			
05/05/12	1750-1807	26/Cloudy	Surface	25.5	26.8	26.8	6.89	6.92	6.70	6.73	6.70	6.73	7.8	7.9				
			Middle	25.5	26.9	26.9	6.75	6.73	6.61	6.68	6.61	6.61	7.6	7.6	7.8			
			Bottom	25.4	27.0	27.0	6.64	6.61	6.66	6.68	6.70	6.70	8.0	8.0	8.0			
08/05/12	0803-0820	27/Fine	Surface	25.2	25.8	25.8	6.54	6.52	6.09	6.07	6.05	6.07	6.8	6.9				
			Middle	25.3	26.2	26.2	6.41	6.39	6.27	6.30	6.27	6.27	7.4	7.3	7.3			
			Bottom	25.2	26.5	26.5	6.12	6.14	6.49	6.51	6.53	6.53	7.6	7.6	7.6			
10/05/12	0850-0905	30/Fine	Surface	27.2	20.2	20.2	7.10	7.12	7.44	7.42	7.40	7.42	8.4	8.4				
			Middle	27.0	21.2	21.2	6.30	6.32	7.79	7.78	7.79	7.79	8.8	8.8	8.77			
			Bottom	26.1	21.8	21.8	6.14	6.12	8.04	8.06	8.07	8.07	9.2	9.1	9.1			
12/05/12	1105-1121	26/Cloudy	Surface	25.1	25.4	25.4	6.77	6.80	6.53	6.52	6.53	6.52	7.4	7.4				
			Middle	25.0	25.6	25.6	6.70	6.68	6.47	6.51	6.47	6.47	7.6	7.6	7.6			
			Bottom	25.0	25.7	25.7	6.57	6.55	6.58	6.60	6.62	6.62	7.6	7.6	7.7			
15/05/12	1540-1555	31/Fine	Surface	26.8	27.7	27.7	6.47	6.49	6.40	6.42	6.40	6.42	7.6	7.6				
			Middle	26.5	28.7	28.7	6.40	6.39	6.51	6.52	6.51	6.51	7.8	7.9	7.8			
			Bottom	26.3	29.8	29.8	6.31	6.30	6.60	6.62	6.63	6.63	8.0	8.0	8.0			
17/05/12	1620-1635	30/Cloudy	Surface	26.8	20.6	20.6	6.35	6.37	7.11	7.13	7.11	7.13	8.0	8.0				
			Middle	26.0	23.4	23.4	5.95	5.93	7.43	7.42	7.43	7.43	8.6	8.5	8.4			
			Bottom	25.8	23.7	23.7	5.64	5.62	7.89	7.87	7.88	7.88	8.8	8.7	8.6			

# Mid-Flood Tide

## Monitoring Station : TM-FM2

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	Value	Average
19/05/12	1750-1805	30/Cloudy	Surface	27.1	19.1	19.1	6.17	6.16	86.3	86.1	6.60	6.62	7.6	7.7	8.5			
			Middle	26.4	20.6	5.78	5.76	80.6	80.4	7.98	7.97	8.8	8.8					
			Bottom	25.8	22.6	5.74	5.73	80.1	79.9	8.01	8.03	9.2	9.0					
22/05/12	1823-1838	28/Fine	Surface	26.6	27.3	27.3	6.40	6.42	94.0	94.3	6.47	6.45	7.6	7.5	7.7			
			Middle	26.4	28.1	6.35	6.34	93.0	92.8	6.56	6.58	7.6	7.6					
			Bottom	26.2	28.2	6.32	6.16	92.6	89.9	6.59	6.68	8.0	7.9					
24/05/12	0720-0735	28/Sunny	Surface	26.8	17.4	17.4	6.18	6.20	86.0	85.8	7.02	7.04	8.0	7.9	8.5			
			Middle	26.5	19.3	5.87	5.92	85.5	81.3	7.06	7.62	8.6	8.7					
			Bottom	26.1	19.6	5.70	5.69	87.7	78.5	7.79	7.78	8.8	8.8					
26/05/12	0855-0910	27/Cloudy	Surface	26.4	27.0	27.0	6.37	6.39	90.8	91.0	6.30	6.32	7.4	7.3	7.5			
			Middle	26.2	27.7	6.28	6.26	89.3	89.0	6.43	6.42	7.6	7.6					
			Bottom	26.0	28.5	6.17	6.15	87.6	87.3	6.37	6.39	7.6	7.7					
29/05/12	1243-1258	26/Cloudy	Surface	26.1	25.7	25.7	6.61	6.64	91.9	92.3	6.48	6.50	7.4	7.5	7.7			
			Middle	26.0	25.9	6.53	6.52	90.8	90.6	6.69	6.67	7.8	7.9					
			Bottom	25.9	26.1	6.44	6.46	90.1	89.8	6.56	6.60	7.6	7.8					
31/05/12	1520-1535	29/Cloudy	Surface	27.8	20.6	20.6	5.93	5.91	85.7	85.2	7.17	7.19	8.0	8.1	8.8			
			Middle	27.1	23.7	5.69	5.67	81.7	81.4	7.94	7.92	8.8	9.0					
			Bottom	27.1	24.2	5.60	5.59	80.4	80.2	7.98	7.97	9.2	9.2					

# Mid-Flood Tide

## Monitoring Station : TM-FC1

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	Value	Average
03/05/12	1702-1718	31/Cloudy	Surface	26.5	27.6	6.47	6.46	93.2	93.0	6.32	6.34	7.2	7.3	7.5				
			Middle	26.1	29.0	6.44	6.31	92.7	90.2	6.36	6.46	7.4	7.6					
			Bottom	25.7	30.2	6.32	6.12	89.9	86.9	6.48	6.56	7.6	7.7					
05/05/12	1700-1717	26/Cloudy	Surface	25.5	26.7	6.10	6.95	86.6	96.6	6.57	6.70	8.0	8.0	7.7				
			Middle	25.6	27.0	6.92	6.83	96.2	95.0	6.67	6.56	8.0	7.7					
			Bottom	25.5	27.2	6.97	6.72	95.9	93.4	6.72	6.53	7.6	7.3					
08/05/12	0853-0910	27/Fine	Surface	25.4	26.0	6.81	6.57	94.7	90.6	6.50	6.21	7.2	7.2	7.5				
			Middle	25.3	26.5	6.69	6.36	93.7	87.7	6.55	6.41	7.2	7.5					
			Bottom	25.2	26.7	6.74	6.11	90.3	84.3	6.23	6.60	7.4	7.8					
10/05/12	0930-0945	30/Fine	Surface	27.2	20.0	6.14	7.08	84.7	97.1	6.62	7.81	8.8	8.7	9.3				
			Middle	26.8	21.1	7.09	6.38	97.2	87.4	7.79	8.36	8.6	9.4					
			Bottom	26.1	21.7	6.37	6.17	87.2	84.5	8.37	8.82	9.4	9.7					
12/05/12	1020-1036	26/Cloudy	Surface	25.3	25.6	6.66	6.79	84.2	94.3	8.80	6.54	7.6	7.5	7.6				
			Middle	25.2	25.7	6.19	6.68	94.7	92.8	6.52	6.41	7.4	7.4					
			Bottom	25.1	25.9	6.81	6.51	93.9	90.5	6.39	6.71	7.4	7.8					
15/05/12	1630-1645	31/Fine	Surface	26.8	27.6	6.54	6.55	90.1	94.6	6.74	6.27	7.2	7.3	7.4				
			Middle	26.4	29.0	6.56	6.43	94.4	92.9	6.25	6.38	7.4	7.4					
			Bottom	26.1	30.3	6.44	6.29	93.0	90.6	6.36	6.47	7.4	7.6					
17/05/12	1700-1715	30/Cloudy	Surface	26.9	20.5	6.27	6.32	90.8	89.1	6.45	7.58	8.8	8.7	9.0				
			Middle	26.1	23.5	6.30	5.92	89.3	83.0	7.59	8.11	8.6	9.1					
			Bottom	25.8	23.8	5.94	5.83	88.8	81.6	8.12	8.28	9.0	9.4					

# Mid-Flood Tide

## Monitoring Station : TM-FC1

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	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
19/05/12	1830-1845	30/Cloudy	Surface	27.3	19.0	19.1	6.04	6.06	5.96	84.5	84.7	6.76	6.77	7.9	8.0	8.6		
			Middle	26.6	19.1	6.07	5.87	84.9	7.82	7.85	7.8	7.8	8.8					
			Bottom	25.7	20.5	5.85	5.76	81.9	8.02	8.06	8.04	9.1						
22/05/12	1910-1925	28/Fine	Surface	26.5	27.2	27.2	6.47	6.49	6.39	95.1	95.4	6.33	6.35	7.6	7.6	7.6		
			Middle	26.2	28.3	6.32	6.30	92.0	6.48	6.50	7.5	7.6	7.6					
			Bottom	26.0	28.4	6.28	6.11	89.5	6.67	6.65	7.8	7.8						
24/05/12	0800-0815	28/Sunny	Surface	26.8	17.3	17.3	6.19	6.17	6.05	85.7	85.4	7.20	7.22	8.0	8.2	8.7		
			Middle	26.6	19.4	5.90	5.92	81.6	7.94	7.90	7.92	8.9	9.0					
			Bottom	26.2	19.6	5.81	5.80	80.4	8.27	8.30	8.29	9.1	9.0					
26/05/12	0940-0955	27/Cloudy	Surface	26.3	27.0	27.1	6.51	6.49	6.40	92.8	92.5	6.24	6.26	7.6	7.6	7.6		
			Middle	26.1	27.9	6.33	6.32	90.0	6.36	6.40	6.38	7.4	7.4	7.5				
			Bottom	25.9	28.8	6.21	6.19	88.2	6.47	6.51	6.49	7.6	7.6					
29/05/12	1200-1216	26/Cloudy	Surface	26.0	25.7	25.8	6.59	6.61	6.55	91.6	91.9	6.41	6.44	7.2	7.1	7.4		
			Middle	26.0	25.9	6.46	6.48	89.8	6.55	6.67	6.71	7.4	7.4	7.5				
			Bottom	25.9	26.0	6.37	6.37	88.5	6.74	6.77	7.7	7.8						
31/05/12	1600-1615	29/Cloudy	Surface	27.8	20.3	20.3	5.92	5.94	5.78	85.1	85.3	7.33	7.32	8.4	8.3	8.7		
			Middle	27.1	23.4	5.60	5.62	80.3	7.79	7.76	7.78	8.8	8.7	8.6				
			Bottom	26.9	23.9	5.51	5.49	79.0	8.20	8.17	8.19	9.2	9.0					



**Monitoring Station : TM-FC1**

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	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
03/05/12	0942-1000	28/Cloudy	Surface	26.3	27.5	27.6	6.43	6.41	6.27	6.29	6.27	6.29	7.2	7.3				
			Middle	25.9	28.9	29.0	6.39	6.26	6.30	6.38	6.36	6.38	7.4	7.6	7.6			
			Bottom	25.6	30.2	30.2	6.28	6.08	6.40	6.48	6.47	6.48	7.6	7.9				
05/05/12	1230-1247	25/Drizzle	Surface	25.5	26.6	26.7	6.10	6.83	86.1	86.4	86.1	86.4	8.0	8.1				
			Middle	25.4	26.8	26.9	6.80	6.70	94.5	93.1	6.81	6.64	8.0	7.7	7.9			
			Bottom	25.4	26.9	27.0	6.86	6.53	95.4	90.8	6.85	6.77	8.2	7.9				
08/05/12	1400-1418	30/Fine	Surface	25.6	26.0	26.1	6.67	6.48	89.1	89.4	89.1	89.4	7.2	7.4				
			Middle	25.5	26.5	26.6	6.50	6.29	89.7	86.7	6.46	6.59	7.6	7.7	7.7			
			Bottom	25.3	26.8	26.7	6.30	6.02	86.9	83.1	6.56	6.73	7.6	7.9				
10/05/12	1630-1645	30/Fine	Surface	27.5	20.1	20.1	6.00	7.17	82.8	98.3	83.4	80.6	9.0	9.0				
			Middle	27.0	20.9	21.0	6.04	6.52	83.4	89.4	6.70	8.96	9.0	9.8	9.6			
			Bottom	26.0	21.7	21.8	6.27	5.97	86.5	81.7	6.61	9.23	8.0	10.0	10.0			
12/05/12	1700-1716	29/Cloudy	Surface	25.3	25.4	25.5	5.99	6.67	98.0	92.6	98.0	6.66	7.6	7.7				
			Middle	25.3	25.7	25.8	6.65	6.52	92.4	90.6	6.68	6.69	7.8	7.7	7.8			
			Bottom	25.1	25.9	26.0	6.50	6.40	90.7	88.9	6.65	6.82	7.6	7.9				
15/05/12	1012-1030	29/Fine	Surface	26.6	27.6	27.6	6.42	6.46	88.5	93.3	6.22	6.24	7.2	7.2				
			Middle	26.3	29.0	29.0	6.47	6.31	93.4	91.1	6.26	6.33	7.2	7.4	7.4			
			Bottom	26.0	30.2	30.3	6.33	6.07	91.4	87.4	6.31	6.42	7.4	7.5				
17/05/12	1100-1115	30/Cloudy	Surface	26.7	20.6	20.6	6.04	6.14	87.0	86.5	6.44	7.94	8.8	8.8				
			Middle	26.0	23.4	23.5	6.12	5.89	86.2	82.3	7.90	8.26	8.8	9.1	9.1			
			Bottom	25.8	23.6	23.7	6.15	5.72	86.7	80.0	8.27	8.38	9.2	9.3	9.3			

**Mid-Ebb Tide**

**Monitoring Station : TM-FC1**

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)		
			Surface	Middle		Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
19/05/12	1300-1315	30/Cloudy	Surface	1.0	27.0	19.1	19.1	6.12	6.10	85.6	85.3	7.12	7.14	8.0	8.1	8.7			
						19.1	6.07	84.9	7.15	8.2									
			Middle	11.3	26.4	20.4	20.4	5.72	5.70	79.7	79.5	7.95	7.97	8.8	8.9				
						20.4	5.68	79.2	7.98	9.0									
			Bottom	21.6	25.7	22.6	22.6	5.70	5.72	79.5	79.7	8.19	8.17	9.2	9.2				
						22.6	5.73	79.9	8.15	9.2									
22/05/12	1413-1430	28/Fine	Surface	1.0	26.5	27.1	27.1	6.40	6.42	94.1	94.3	6.27	6.29	7.2	7.3	7.5			
						27.1	6.43	94.5	6.31	7.4									
			Middle	11.7	26.3	28.3	28.3	6.25	6.23	91.6	91.3	6.42	6.44	7.4	7.5				
						28.3	6.21	91.0	6.46	7.6									
			Bottom	22.4	26.0	29.2	29.3	6.09	6.07	88.9	88.6	6.57	6.59	7.6	7.7				
						29.3	6.04	88.2	6.60	7.8									
24/05/12	1500-1515	30/Sunny	Surface	1.0	27.3	17.5	17.5	6.26	6.25	86.7	86.6	7.54	7.52	8.6	8.5	8.8			
						17.5	6.24	86.4	7.50	8.4									
			Middle	11.3	26.5	19.4	19.4	5.84	5.82	80.8	80.5	7.87	7.86	8.8	8.7				
						19.4	5.79	80.1	7.84	8.6									
			Bottom	21.6	26.0	19.8	19.8	5.75	5.77	79.5	79.8	8.59	8.58	9.4	9.3				
						19.8	5.79	80.0	8.56	9.2									
26/05/12	1639-1655	29/Cloudy	Surface	1.0	26.4	27.0	27.0	6.40	6.42	90.9	91.1	6.31	6.33	7.6	7.5	7.6			
						27.0	6.43	91.3	6.34	7.4									
			Middle	11.7	26.2	27.8	27.8	6.21	6.19	88.2	87.9	6.42	6.44	7.4	7.5				
						27.8	6.17	87.6	6.45	7.6									
			Bottom	22.4	25.9	28.8	28.8	6.28	6.30	89.2	89.5	6.54	6.56	7.6	7.7				
						28.7	6.32	89.7	6.58	7.8									
29/05/12	0818-0830	26/Cloudy	Surface	1.0	26.2	25.6	25.7	6.24	6.27	87.4	87.8	6.61	6.63	7.4	7.5	7.6			
						25.7	6.29	88.1	6.65	7.6									
			Middle	11.5	26.2	25.8	25.9	6.01	6.04	84.1	84.5	6.44	6.48	7.4	7.5				
						25.9	6.06	84.8	6.52	7.6									
			Bottom	22.0	26.1	25.9	25.9	5.93	5.90	83.0	82.6	6.83	6.86	7.8	7.9				
						25.9	5.87	82.2	6.88	8.0									
31/05/12	0930-0945	29/Cloudy	Surface	1.0	27.6	20.4	20.4	6.02	6.04	86.2	86.5	7.84	7.82	8.8	8.9	9.5			
						20.4	6.05	86.7	7.80	9.0									
			Middle	11.2	27.2	23.2	23.2	5.77	5.76	82.7	82.5	8.92	8.94	9.6	9.7				
						23.1	5.74	82.2	8.95	9.8									
			Bottom	21.4	27.2	24.0	24.0	5.59	5.58	80.1	79.9	8.99	9.01	9.8	9.9				
						24.0	5.57	79.7	9.02	10.0									

# Mid-Ebb Tide

## Monitoring Station : TM-FM1

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	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
03/05/12	0917-0932	28/Cloudy	Surface	26.3	27.5	27.5	6.50	6.49	6.34	93.6	93.4	6.36	7.4	7.5				
			Middle	26.1	28.7	28.6	6.47	6.39	6.37	91.5	91.3	6.46	7.6	7.6	7.6			
			Bottom	25.8	29.6	28.7	6.40	6.29	6.48	91.1	89.3	6.56	7.8	7.8	7.8			
05/05/12	1255-1311	25/Drizzle	Surface	25.4	26.5	26.5	6.83	6.80	6.91	94.9	94.5	6.94	8.2	8.3				
			Middle	25.4	26.6	26.6	6.77	6.64	6.97	94.1	92.3	6.80	8.4	7.7	7.9			
			Bottom	25.4	26.8	26.7	6.66	6.48	6.82	92.5	90.1	6.68	7.6	7.7	7.9			
08/05/12	1426-1445	30/Fine	Surface	25.5	26.0	26.0	6.41	6.43	6.28	88.5	88.7	6.31	7.2	7.4				
			Middle	25.5	26.4	26.3	6.44	6.32	6.50	88.8	87.2	6.49	7.6	7.5	7.6			
			Bottom	25.4	26.6	26.6	6.29	6.14	6.47	87.5	84.7	6.64	7.4	7.8	7.6			
10/05/12	1610-1625	30/Fine	Surface	27.5	20.4	20.4	6.12	7.24	6.66	84.5	99.2	7.78	8.8	8.8				
			Middle	26.9	21.1	21.1	6.15	6.33	7.76	99.0	86.7	8.52	9.6	9.6	9.3			
			Bottom	25.9	21.9	21.9	6.34	6.07	8.50	86.8	83.0	8.66	9.6	9.6	9.6			
12/05/12	1722-1740	29/Cloudy	Surface	25.2	25.6	25.6	6.08	6.59	6.66	91.8	91.6	6.68	7.6	7.8				
			Middle	25.1	25.7	25.7	6.05	6.46	6.70	91.3	89.8	6.77	8.0	8.0	8.0			
			Bottom	25.1	25.8	25.7	6.61	6.33	6.82	89.5	87.9	6.85	8.0	8.1	8.1			
15/05/12	0947-1002	29/Fine	Surface	26.6	27.6	27.6	6.30	6.55	6.31	87.6	94.6	6.33	7.4	7.5				
			Middle	26.4	28.6	28.6	6.56	6.46	6.35	94.8	93.2	6.42	7.6	7.5	7.5			
			Bottom	26.1	29.7	29.6	6.44	6.32	6.43	93.4	91.1	6.53	7.4	7.6	7.6			
17/05/12	1040-1055	30/Cloudy	Surface	26.7	20.7	20.7	6.31	6.16	6.51	90.9	86.7	7.38	8.6	8.5				
			Middle	25.9	23.4	23.4	6.17	5.92	7.37	86.9	83.0	7.94	8.4	8.8	8.8			
			Bottom	25.8	23.7	23.6	6.14	5.78	7.92	86.5	80.9	8.02	8.8	9.1	9.1			



# Mid-Ebb Tide

## Monitoring Station : TM-FM1

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	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
19/05/12	1240-1255	30/Cloudy	Surface	27.1	19.2	19.2	6.05	6.06	5.87	84.6	84.8	6.94	6.92	7.8	7.9	8.5		
					19.2	20.5	6.07	5.67	84.9	79.0	6.90	7.86	8.0	8.8				
					20.5	20.6	5.69	5.65	79.3	78.7	7.87	8.8	8.8					
22/05/12	1348-1403	28/Fine	Surface	26.6	22.7	22.7	5.60	5.62	5.62	78.0	78.3	8.02	8.05	9.0	8.9	7.3		
					22.6	27.2	5.64	6.45	80.7	8.8	7.4	7.5						
					27.2	27.3	6.48	6.47	94.8	95.1	6.32	6.34	7.6	8.4				
24/05/12	1440-1455	30/Sunny	Surface	27.4	17.6	17.6	6.17	6.15	6.03	85.4	85.2	7.32	7.34	8.4	8.4	8.7		
					17.6	19.5	6.13	5.92	84.9	81.8	7.68	7.67	8.8	8.6				
					19.5	19.4	5.90	5.92	82.0	77.3	7.65	8.02	8.4	9.0				
26/05/12	1616-1631	29/Cloudy	Surface	26.4	27.0	27.1	6.48	6.50	6.42	92.3	92.6	6.40	6.42	7.6	7.6	7.8		
					27.1	27.7	6.51	6.34	90.3	90.1	6.43	6.50	7.6	7.8				
					27.7	27.6	6.35	6.32	89.9	88.0	6.49	6.60	8.0	8.0				
29/05/12	0759-0813	26/Cloudy	Surface	26.2	28.5	28.5	6.20	6.19	6.19	87.6	87.8	6.61	6.60	8.0	8.0	7.9		
					28.5	25.4	6.17	6.23	87.6	87.2	6.70	6.69	8.0	8.0				
					25.4	25.5	6.26	6.10	86.8	85.4	6.67	6.61	7.6	7.6				
31/05/12	0910-0925	29/Cloudy	Surface	27.5	25.7	25.7	5.92	5.94	5.78	82.9	83.2	6.85	6.89	8.0	8.1	9.1		
					25.7	20.5	5.96	5.96	83.4	85.6	6.91	7.55	8.2	8.6				
					20.4	23.4	5.97	5.60	75.3	80.4	7.56	8.06	8.4	9.1				
			Middle	27.2	23.4	23.4	5.62	5.47	5.47	80.7	80.4	8.07	8.06	9.2	9.1	9.5		
					23.4	24.1	5.58	5.47	80.1	78.4	8.04	8.38	9.4	9.6				
					24.1	24.2	5.48	5.45	78.6	78.2	8.39	8.36	9.6	9.6				



**Monitoring Station :** TM-FM2

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	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
03/05/12	0855-0910	28/Cloudy	Surface	26.3	27.6	27.6	6.44	6.46	6.42	92.7	93.0	93.0	6.44	6.42	6.42	7.4	7.3	
			Middle	26.1	28.7	28.7	6.48	6.37	6.42	93.3	91.1	91.1	6.40	6.52	6.51	7.2	7.6	7.5
			Bottom	25.8	29.7	29.7	6.38	6.26	6.26	90.9	88.8	88.8	6.53	6.60	6.60	7.6	7.7	
05/05/12	1320-1338	25/Drizzle	Surface	25.4	26.6	26.6	6.90	6.93	6.85	95.9	96.3	96.3	6.89	6.91	6.91	8.0	8.1	
			Middle	25.4	26.7	26.7	6.95	6.77	6.85	96.6	94.0	94.0	6.93	6.73	6.81	8.2	7.8	7.9
			Bottom	25.3	26.8	26.8	6.79	6.59	6.59	94.3	91.6	91.6	6.76	6.78	6.78	8.0	7.9	
08/05/12	1454-1511	30/Fine	Surface	25.6	26.0	26.0	6.61	6.40	6.32	91.8	88.3	88.3	6.81	6.25	6.25	7.8	7.1	
			Middle	25.5	26.4	26.4	6.57	6.24	6.32	91.3	86.1	86.1	6.74	6.45	6.44	7.2	7.6	7.5
			Bottom	25.4	26.6	26.6	6.42	6.12	6.12	88.5	84.4	84.4	6.22	6.62	6.62	7.6	7.6	
10/05/12	1550-1605	30/Fine	Surface	27.4	20.4	20.4	6.14	7.16	6.73	84.7	98.1	98.1	6.94	7.92	7.92	8.8	8.8	
			Middle	26.9	21.2	21.2	6.09	6.31	6.31	84.0	86.3	86.3	7.90	8.65	8.4	8.8	9.5	9.33
			Bottom	26.0	21.9	21.9	6.07	6.09	6.09	98.3	83.3	83.3	8.66	8.76	8.76	9.6	9.7	
12/05/12	1748-1805	29/Cloudy	Surface	25.2	25.5	25.5	6.54	6.56	6.49	90.9	91.2	91.2	6.61	6.63	6.63	7.6	7.7	
			Middle	25.1	25.7	25.7	6.58	6.42	6.42	91.4	89.1	89.1	6.65	6.74	6.73	7.8	7.8	7.9
			Bottom	25.1	25.8	25.8	6.40	6.30	6.30	88.9	87.5	87.5	6.71	6.83	6.83	8.0	8.1	
15/05/12	0925-0940	29/Fine	Surface	26.6	27.6	27.6	6.27	6.43	6.38	87.9	92.9	92.9	6.85	6.39	6.39	7.4	7.5	
			Middle	26.4	28.7	28.7	6.41	6.34	6.34	92.6	91.5	91.5	6.41	6.49	6.49	7.6	7.7	7.7
			Bottom	26.2	29.7	29.7	6.45	6.22	6.22	91.7	89.6	89.6	6.47	6.60	6.60	7.8	7.9	
17/05/12	1020-1035	30/Cloudy	Surface	26.6	20.7	20.7	6.24	6.18	5.97	89.9	87.0	87.0	6.58	7.48	7.48	8.6	8.5	
			Middle	25.9	23.4	23.4	6.19	5.76	5.76	87.2	80.6	80.6	7.46	7.88	7.84	8.4	8.8	8.8
			Bottom	25.8	23.6	23.6	6.16	5.68	5.68	80.9	79.4	79.4	7.87	8.16	8.16	8.8	9.1	

**Mid-Ebb Tide**

**Monitoring Station : TM-FM2**

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	
19/05/12	1220-1235	30/Cloudy	Surface	27.0	19.2	19.2	6.08	6.06	5.94	84.1	84.8	6.87	6.86	7.8	7.8	8.5		
					20.5	20.5	5.83	5.81	81.1	7.65	7.67	7.8	8.6	8.7				
					20.4	20.4	5.79	5.66	78.9	7.97	7.96	9.0	9.0					
22/05/12	1325-1340	28/Fine	Bottom	25.8	22.7	22.7	5.68	5.66	5.66	93.1	93.4	6.34	6.36	7.2	7.3			
					27.3	27.3	6.33	6.35	6.27	6.37	6.37	7.4	7.4					
					27.2	27.2	6.21	6.20	6.48	6.46	6.49	7.6	7.6					
24/05/12	1420-1435	30/Sunny	Middle	26.4	28.1	28.1	6.18	6.20	6.07	90.9	90.7	6.57	6.60	7.8	7.8			
					28.1	28.1	6.18	6.07	6.07	6.04	6.09	6.37	6.37	8.2	8.2			
					29.0	29.0	6.09	6.13	5.98	6.11	7.25	7.25	8.8	8.9				
26/05/12	1554-1609	29/Cloudy	Surface	26.2	17.6	17.6	6.43	6.45	6.50	85.1	84.9	6.37	6.38	7.4	7.5			
					19.5	19.5	5.85	5.83	6.29	5.81	5.83	6.39	6.39	7.6	7.7			
					19.8	19.8	5.72	5.74	6.46	5.75	5.74	6.44	6.46	7.8	7.8			
29/05/12	0737-0751	26/Cloudy	Surface	26.1	27.0	27.0	6.47	6.56	6.20	93.4	93.2	6.48	6.44	6.61	6.61			
					27.7	27.7	6.57	6.12	6.61	6.53	6.55	6.58	6.58	7.4	7.5			
					25.8	25.8	6.14	5.85	5.85	6.24	6.27	6.63	6.63	7.6	7.6			
31/05/12	0850-0905	29/Cloudy	Surface	27.2	24.1	24.1	5.54	5.56	5.75	88.8	88.5	6.42	6.44	7.4	7.6			
					24.0	24.0	5.51	5.49	5.49	5.83	5.85	6.46	6.46	7.8	7.9			
					24.1	24.1	5.47	5.49	5.49	82.0	81.8	6.77	6.79	8.0	8.0			

**Mid-Ebb Tide**



東業德動測試顧問有限公司  
ETS-TESTCONSULT LIMITED

**Monitoring Station : TM-FC2**

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	
03/05/12	0830-0845	28/Cloudy	Surface	26.3	27.6	27.6	6.31	6.33	6.34	6.35	90.9	91.2	6.34	6.35	7.4	7.4	7.6	
			Middle	26.1	28.6	28.6	6.27	6.26	6.42	6.44	89.7	89.5	6.36	6.42	7.4	7.5		
			Bottom	25.8	29.7	29.7	6.16	6.14	6.54	6.56	87.5	87.2	6.46	6.46	7.6	7.8		
05/05/12	1343-1400	25/Drizzle	Surface	25.4	26.5	26.5	6.92	6.90	6.80	6.82	96.2	95.8	6.80	6.82	8.0	8.0	7.8	
			Middle	25.4	26.6	26.6	6.83	6.81	6.98	6.70	94.9	94.6	6.84	6.70	7.8	7.7		
			Bottom	25.4	26.7	26.7	6.78	6.69	6.71	6.63	94.2	92.9	6.68	6.65	7.6	7.8		
08/05/12	1518-1535	30/Fine	Surface	25.5	25.9	25.9	6.32	6.35	6.25	6.22	87.2	87.6	6.25	6.22	7.2	7.3	7.6	
			Middle	25.5	26.3	26.3	6.22	6.20	6.38	6.44	85.8	85.5	6.18	6.38	7.4	7.5		
			Bottom	25.5	26.4	26.4	6.06	6.08	6.60	6.63	85.2	83.9	6.44	6.44	7.6	7.9		
10/05/12	1530-1545	30/Fine	Surface	27.4	20.4	20.4	7.26	7.27	7.82	7.81	99.6	99.8	7.82	7.81	8.8	8.8	9.1	
			Middle	26.9	21.2	21.2	6.37	6.35	8.29	8.28	99.9	87.0	7.79	8.29	8.8	9.3		
			Bottom	26.0	21.9	21.9	6.04	6.06	8.27	8.32	86.7	82.9	8.29	8.26	9.2	9.3		
12/05/12	1812-1830	29/Cloudy	Surface	25.2	25.3	25.3	6.52	6.50	6.71	6.73	90.6	90.3	6.71	6.73	7.8	7.8	8.0	
			Middle	25.2	25.6	25.6	6.47	6.36	6.80	6.82	88.6	88.4	6.74	6.80	7.8	8.0		
			Bottom	25.1	25.7	25.7	6.38	6.26	6.83	6.92	88.1	86.9	6.80	6.83	8.0	8.1		
15/05/12	0900-0915	29/Fine	Surface	26.6	27.7	27.7	6.37	6.36	6.32	6.34	92.0	91.8	6.32	6.34	7.2	7.3	7.6	
			Middle	26.4	28.6	28.6	6.27	6.25	6.45	6.47	91.6	90.2	6.36	6.45	7.4	7.6		
			Bottom	26.1	29.7	29.7	6.16	6.15	6.48	6.55	89.8	88.5	6.48	6.48	7.6	7.9		
17/05/12	1000-1015	30/Cloudy	Surface	26.6	20.6	20.6	6.21	6.23	7.12	7.14	88.3	87.7	7.12	7.14	8.2	8.2	8.5	
			Middle	26.0	23.3	23.3	5.82	5.81	7.57	7.56	87.5	81.2	7.16	7.57	8.2	8.6		
			Bottom	25.8	23.6	23.6	5.67	5.66	7.68	7.67	81.0	79.1	7.54	7.54	8.6	8.8		

# Mid-Ebb Tide



東業 德動 測 試 顧 問 有 限 公 司  
ETS-TESTCONSULT LIMITED

## Monitoring Station : TM-FC2

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	
19/05/12	1200-1215	30/Cloudy	Surface	26.9	19.2	6.14	6.16	85.9	86.1	6.79	6.78	7.6	7.5	8.1				
			Middle	26.5	20.5	5.87	5.86	81.9	81.8	6.76	7.20	7.4	8.1					
			Bottom	25.7	22.5	5.75	5.77	80.2	80.4	7.44	7.42	8.4	8.6					
22/05/12	1300-1315	28/Fine	Surface	26.7	27.3	6.30	6.31	92.6	92.8	6.26	6.28	7.2	7.3	7.4				
			Middle	26.5	28.1	6.24	6.22	91.4	91.1	6.35	6.38	7.4	7.5					
			Bottom	26.2	29.0	6.12	6.10	89.4	89.1	6.49	6.51	7.4	7.5					
24/05/12	1400-1415	30/Sunny	Surface	27.5	17.7	6.08	6.22	86.7	86.5	7.11	7.13	8.0	8.1	8.6				
			Middle	26.5	19.4	5.77	5.76	79.7	79.5	7.74	7.72	8.8	8.8					
			Bottom	26.1	19.7	5.63	5.65	77.8	78.0	7.99	7.98	9.0	8.9					
26/05/12	1530-1545	29/Cloudy	Surface	26.5	27.1	6.37	6.41	90.8	91.3	6.34	6.35	7.6	7.6	7.5				
			Middle	26.3	27.7	6.52	6.51	92.7	92.6	6.40	6.43	7.4	7.5					
			Bottom	26.1	28.5	6.35	6.33	90.2	89.9	6.31	6.32	7.4	7.5					
29/05/12	0715-0730	26/Cloudy	Surface	26.2	25.5	6.22	6.20	87.1	86.8	6.68	6.70	7.8	7.9	7.9				
			Middle	26.0	25.7	6.12	6.10	85.7	85.4	6.53	6.55	7.6	7.6					
			Bottom	26.1	25.9	5.88	5.91	82.3	82.7	6.78	6.81	8.0	8.2					
31/05/12	0830-0845	29/Cloudy	Surface	27.6	20.6	5.94	5.92	85.4	85.1	7.40	7.42	8.2	8.3	8.7				
			Middle	27.3	23.7	5.80	5.82	83.2	83.5	7.59	7.58	8.6	8.6					
			Bottom	27.2	24.0	5.40	5.39	77.6	77.4	8.11	8.10	9.0	9.1					

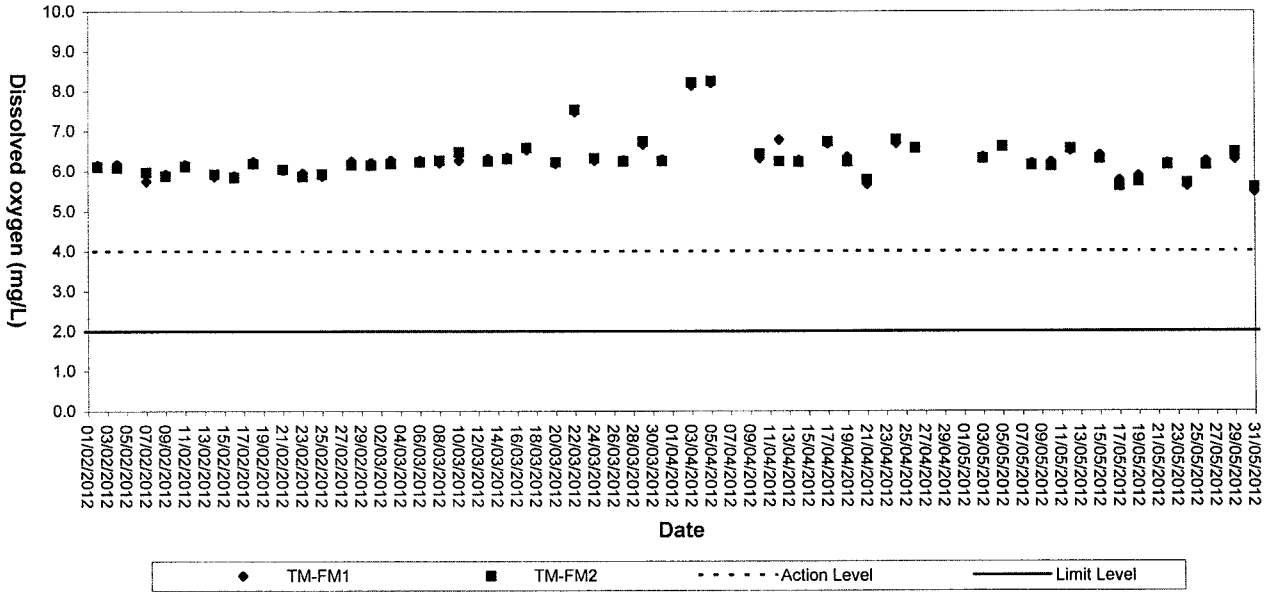


## **Appendix C3**

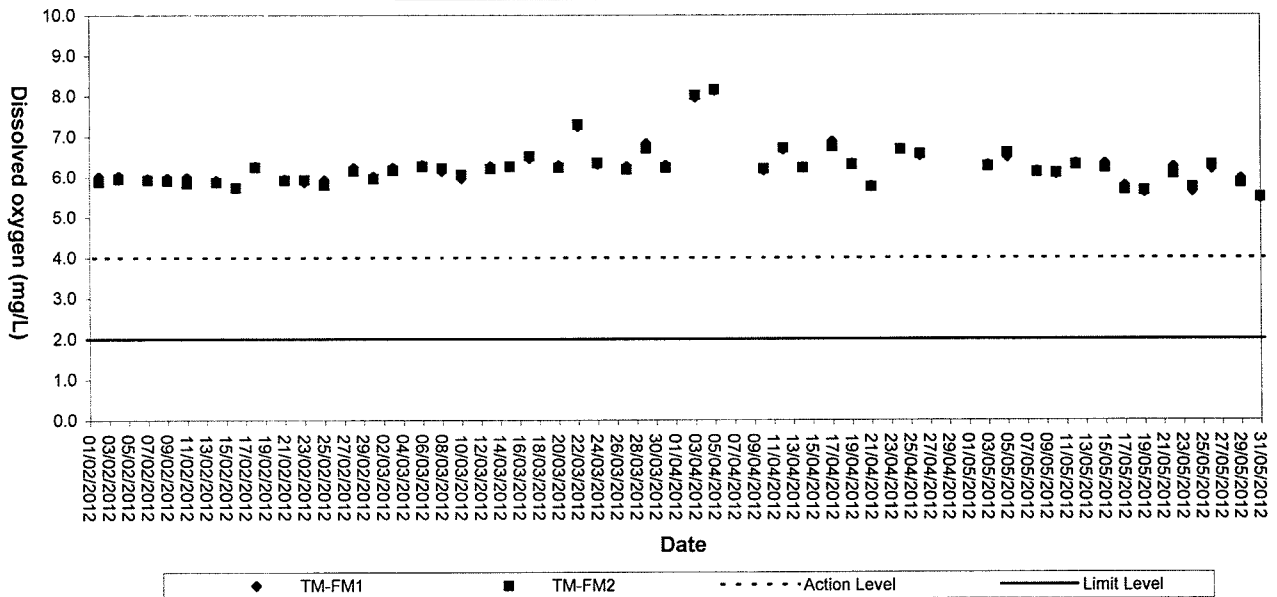
### **Graphical Plots of Impact Marine Water Quality Monitoring Data**



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

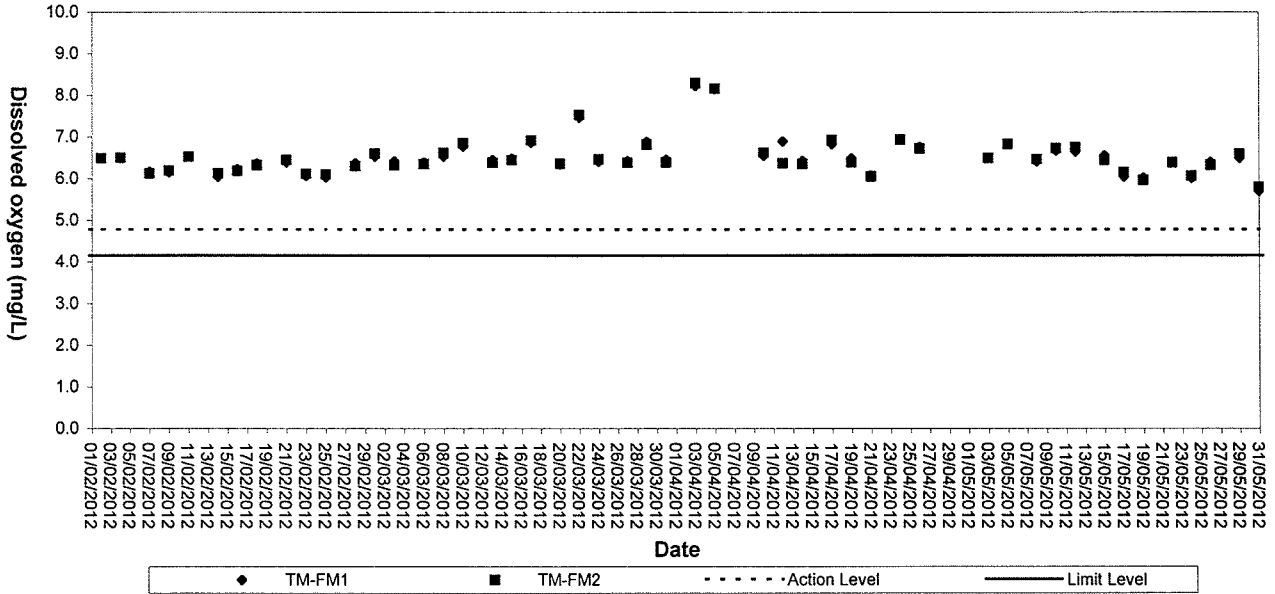


### Dissolved Oxygen (Bottom) at Mid-Ebb Tide

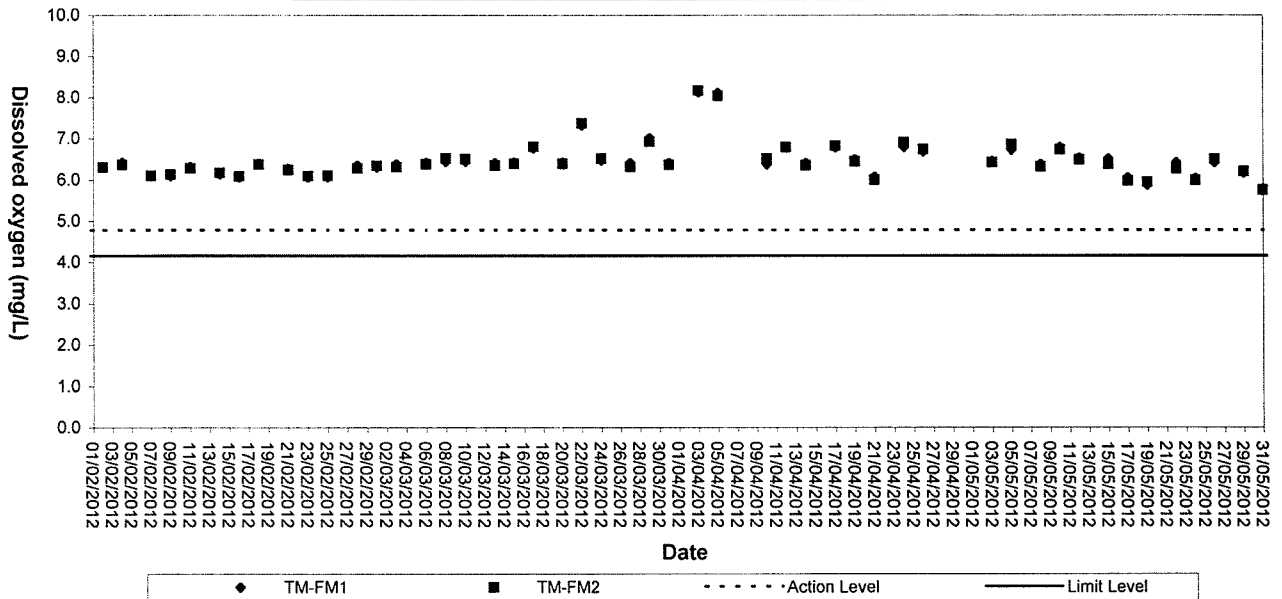




### Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



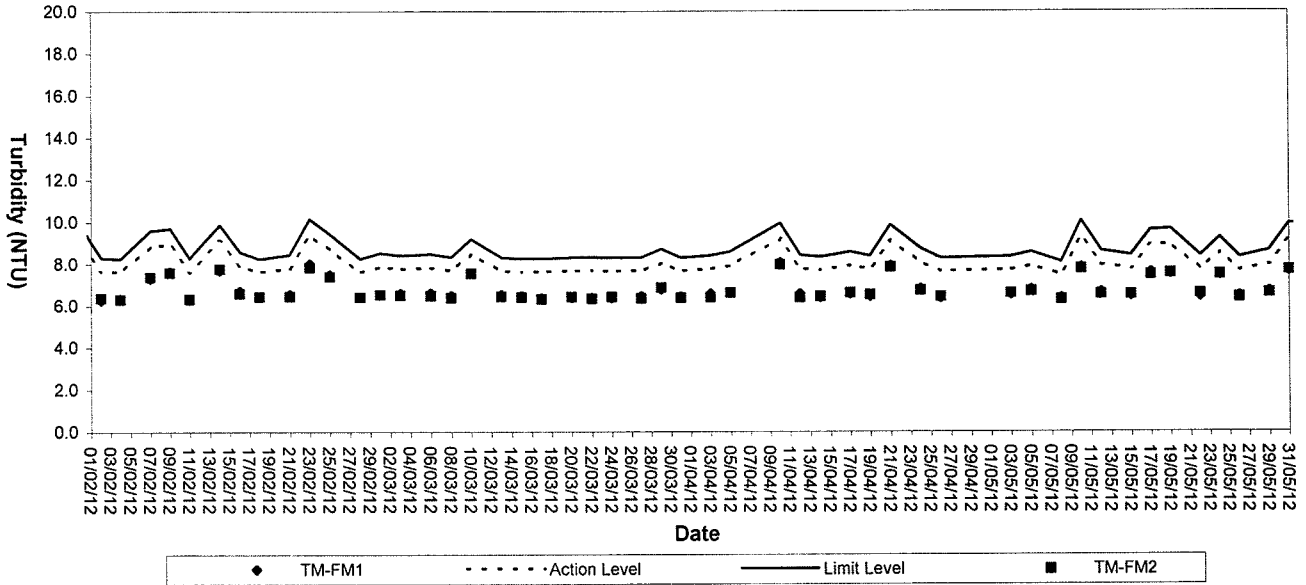
### Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



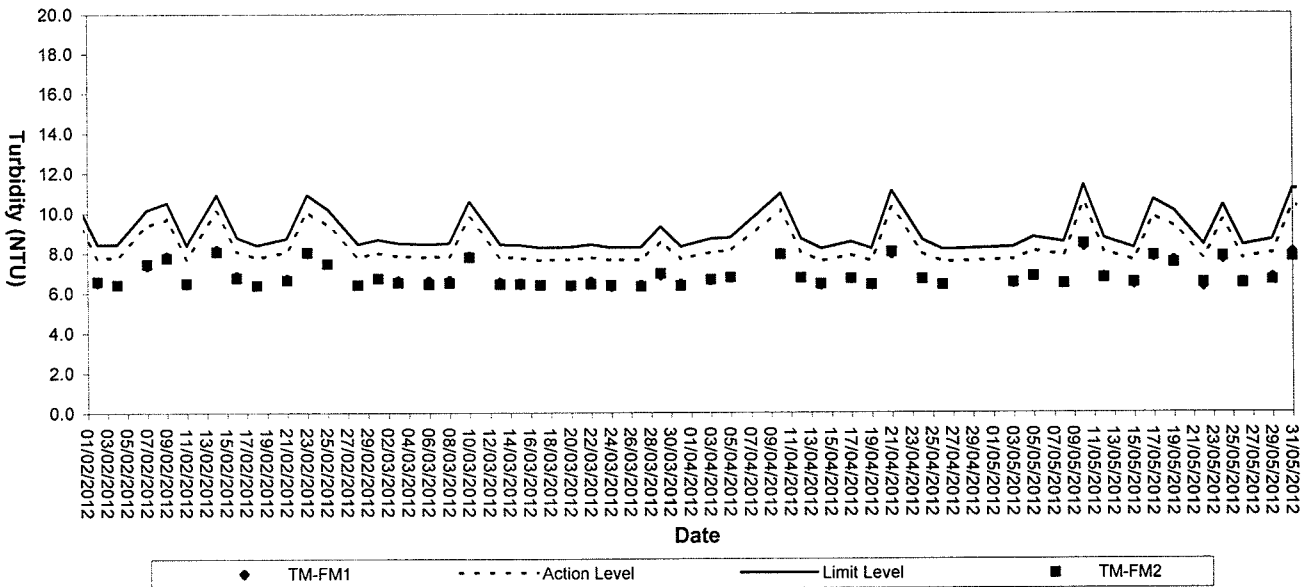




### Turbidity (Depth-average) at Mid-Flood Tide

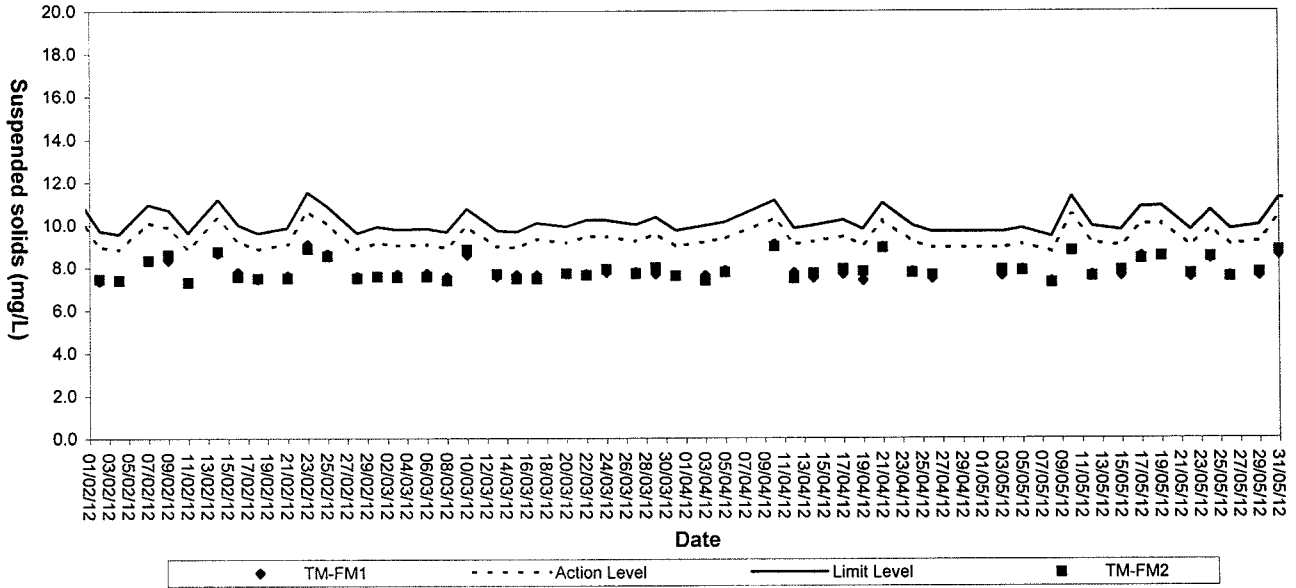


### Turbidity (Depth-average) at Mid-Ebb Tide

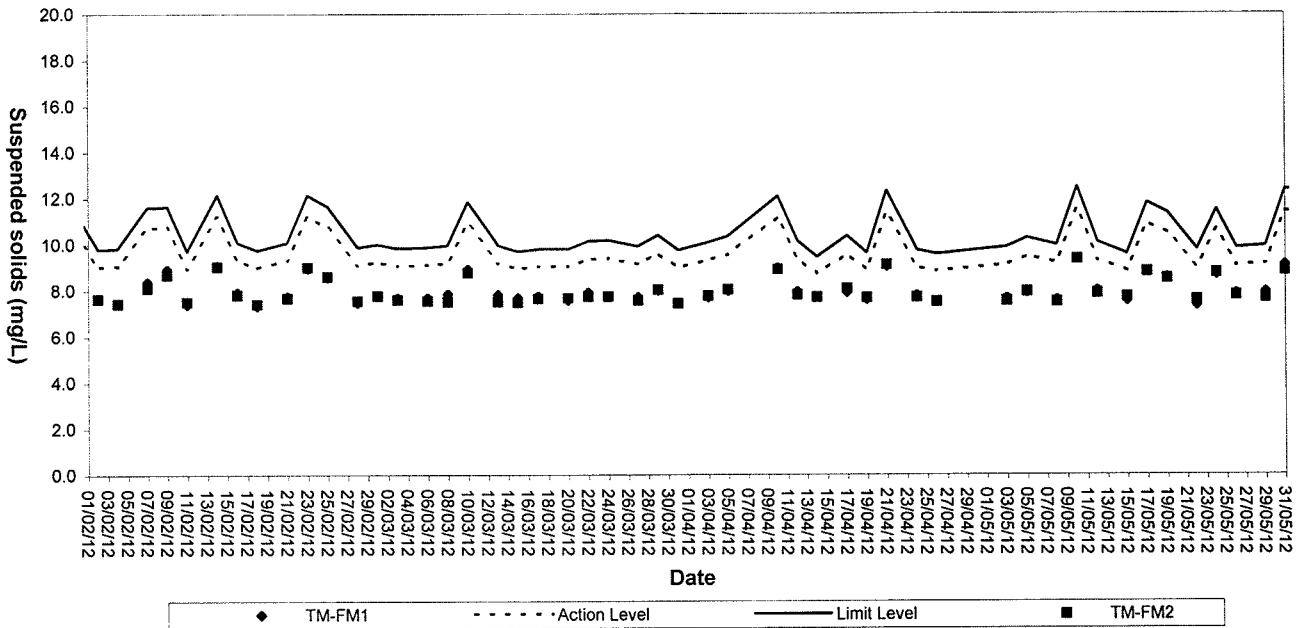




### Suspended solids (Depth-average) at Mid-Flood Tide



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





## **Appendix D1**

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



# Calibration Certificate

Certificate No. **16578**

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. :** Q12677

**Date of receipt :** 2-Nov-11

## Item Tested

**Description :** Sound Level Calibrator

**Manufacturer :** Rion

**Model :** NC-73

**Serial No. :** 10196943

## Test Conditions

**Date of Test :** 7-Nov-11

**Supply Voltage :** --

**Ambient Temperature :** (23 ± 3)°C

**Relative Humidity :** (50 ± 25) %

## Test Specifications

Calibration check.

Ref. Document/Procedure : F21, Z02.

## Test Results

All results were within the manufacturer's specification.

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

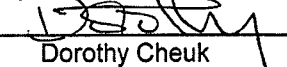
Main Test equipment used:

<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Traceable to</u>
S014	Spectrum Analyzer	13535	NIM-PRC & SCL-HKSAR
S024	Sound Level Calibrator	15136	NIM-PRC & SCL-HKSAR
S041	Universal Counter	15610	SCL-HKSAR
S206	Sound Level Meter	04462	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).  
The test results apply to the above Unit-Under-Test only

**Calibrated by :**   
P. F. Wong

**Approved by :**   
Dorothy Cheuk

**Date:** 7-Nov-11



# Calibration Certificate

Certificate No. 16578

Page 2 of 2 Pages

Results :

**1. Level Accuracy (at 1 kHz)**

UUT Nominal Value	Measured Value	Mfr's Spec.
94 dB	94.21 dB	$\pm 1$ dB

Uncertainty :  $\pm 0.2$  dB

**2. Frequency Accuracy**

UUT Nominal Value	Measured Value	Mfr's Spec.
1 kHz	0.989 kHz	$\pm 2$ %

Uncertainty :  $\pm 0.1$  %

**3. Level Stability : 0.0 dB**

Uncertainty :  $\pm 0.01$  dB

**4. Total Harmonic Distortion :  $< 0.4$  %**

Mfr's Spec. :  $< 3$  %

Uncertainty :  $\pm 2.3$  % of reading

Remark : 1. UUT : Unit-Under-Test

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

3. The above measured values were the mean of 3 measurements.

4. Atmospheric Pressure : 1 005 hPa

----- END -----



# Calibration Certificate

Certificate No. **15347**

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. :** Q12215

**Date of receipt :** 7-Sep-11

## Item Tested

**Description :** Precision Integrating Sound Level Meter (ET/EN/003/13)

**Manufacturer :** Rion

**Model :** NL-31

**Serial No. :** 00593620

## Test Conditions

**Date of Test :** 8-Sep-11

**Supply Voltage :** --

**Ambient Temperature :** (23 ± 3)°C

**Relative Humidity :** (50 ± 25) %

## Test Specifications

Calibration check.

Ref. Document/Procedure : Z01.

## Test Results

All results were within the IEC 651 Type1 and IEC 804 Type2 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>
S017A	Multi-Function Generator	07279	SCL-HKSAR
S024	Sound Level Calibrator	04062	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).

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

**Calibrated by :**   
P. F. Wong

**Approved by :**   
Dorothy Cheuk

**Date:** 8-Sep-11

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 8846



# Calibration Certificate

Certificate No. 15347

Page 2 of 3 Pages

Results :

## 1. SPL Accuracy

UUT Setting			Applied Value (dB)	UUT Reading (dB)
Level Range (dB)	Weight	Response		
20 - 100	L <sub>A</sub>	Fast	94.0	93.7
		Slow		93.7
	L <sub>C</sub>	Fast		93.9
	L <sub>p</sub>	Fast		93.9
30 - 120	L <sub>A</sub>	Fast	94.0	93.7
		Slow		93.7
	L <sub>C</sub>	Fast		93.8
	L <sub>p</sub>	Fast		93.8
30 - 120	L <sub>A</sub>	Fast	114.0	113.6
		Slow		113.6
	L <sub>C</sub>	Fast		113.7
	L <sub>p</sub>	Fast		113.7

IEC 651 Type 1 Spec. :  $\pm 0.7$  dB

Uncertainty :  $\pm 0.1$  dB

## 2. Level Stability : 0.1 dB

IEC 651 Type 1 Spec. :  $\pm 0.3$  dB

Uncertainty :  $\pm 0.1$  dB

## 3. Linearity

### 3.1 Level Linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec. (Primary Indicator Range) $\pm 0.7$ dB
130	114.0	113.7	0.0	
130	104.0	103.7	0.0	
120	94.0	93.7(Ref.)	--	
110	84.0	83.7	0.0	
100	74.0	73.8	+0.1	
90	64.0	63.8	+0.1	
80	54.0	53.5	-0.2	

Uncertainty :  $\pm 0.1$  dB



# Calibration Certificate

Certificate No. 15347

Page 3 of 3 Pages

## 3.2 Differential level linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec.
120	84.0	83.7	0.0	± 0.4 dB
	94.0	93.7 (Ref.)	--	
	95.0	94.7	0.0	± 0.2 dB

Uncertainty : ± 0.1 dB

## 4. Frequency Weighting

A weighting

Frequency	Attenuation (dB)	IEC 651 Type 1 Spec.
31.5 Hz	-39.5	- 39.4 dB, ± 1.5 dB
63 Hz	-26.3	- 26.2 dB, ± 1.5 dB
125 Hz	-16.2	- 16.1 dB, ± 1 dB
250 Hz	-8.6	- 8.6 dB, ± 1 dB
500 Hz	-3.2	- 3.2 dB, ± 1 dB
1 kHz	0.0 (Ref.)	0 dB, ± 1 dB
2 kHz	+1.4	+ 1.2 dB, ± 1 dB
4 kHz	+1.2	+ 1.0 dB, ± 1 dB
8 kHz	-1.1	- 1.1 dB, + 1.5 dB ~ - 3 dB
16 kHz	-6.6	- 6.6 dB, + 3 dB ~ - ∞

Uncertainty : ± 0.1 dB

## 5. Time Averaging

Applied Burst duty Factor	Applied Leq Value (dB)	UUT Reading (dB)	IEC 804 Type 1 Spec.
continuous	40.0	40.0	--
1/10	40.0	39.9	± 0.5 dB
1/10 <sup>2</sup>	40.0	39.9	
1/10 <sup>3</sup>	40.0	39.9	± 1.0 dB
1/10 <sup>4</sup>	40.0	40.0	

Uncertainty : ± 0.1 dB

Remark : 1. UUT : Unit-Under-Test

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

3. Atmospheric Pressure : 1 000 hPa.

4. The internal calibration reference of UUT was drifted from 94.0 dB to 94.5 dB





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## **Appendix D2**

### **Impact Noise Monitoring Results**

## Day-time Noise Monitoring

### Monitoring Location: TM-RN1 \*

Date	Start Sampling Time (hh:mm)	Noise Level dB (A)			Wind Speed (m/s)	Weather Condition
		L <sub>eq</sub> (30min)	L <sub>10</sub>	L <sub>90</sub>		
03/05/12	10:10	58.7	60.1	53.6	0.4	Cloudy
05/05/12	10:00	60.7	62.8	58.9	0.5	Cloudy
08/05/12	09:35	60.5	63.4	54.2	0.2	Fine
10/05/12	14:25	58.3	60.0	54.1	0.7	Fine
15/05/12	16:50	56.6	57.9	53.7	0.4	Fine
17/05/12	09:00	56.6	57.4	52.1	0.7	Cloudy
22/05/12	10:45	57.6	58.8	52.6	0.8	Fine
24/05/12	09:15	57.9	59.2	55.4	0.9	Sunny
29/05/12	15:30	61.3	62.5	58.8	0.5	Cloudy
31/05/12	13:45	56.9	57.9	53.4	0.7	Cloudy

Remark: Since Lands Department did not approve us to enter their own area where the noise monitoring stations TM-N1 and TM-N2 located due to the security, noise monitoring was temporarily carried out at noise monitoring stations TM-RN1 and TM-RN2 (refer to the figure 3 attached) in this reporting month.

### Monitoring Location: TM-RN2 \*

Date	Start Sampling Time (hh:mm)	Noise Level dB (A)			Wind Speed (m/s)	Weather Condition
		L <sub>eq</sub> (30min)	L <sub>10</sub>	L <sub>90</sub>		
03/05/12	10:15	59.1	60.8	54.1	0.3	Cloudy
05/05/12	10:30	61.2	63.9	59.3	0.5	Cloudy
08/05/12	10:05	61.2	64.0	54.5	0.2	Fine
10/05/12	14:30	57.1	58.4	54.0	0.9	Fine
15/05/12	17:25	59.2	61.1	54.5	0.5	Fine
17/05/12	13:00	56.9	57.7	52.5	0.7	Cloudy
22/05/12	11:20	58.0	59.4	53.1	0.9	Fine
24/05/12	13:00	58.3	59.7	56.0	0.7	Sunny
29/05/12	16:00	61.8	62.9	59.0	0.5	Cloudy
31/05/12	14:20	56.6	57.5	53.1	0.9	Cloudy

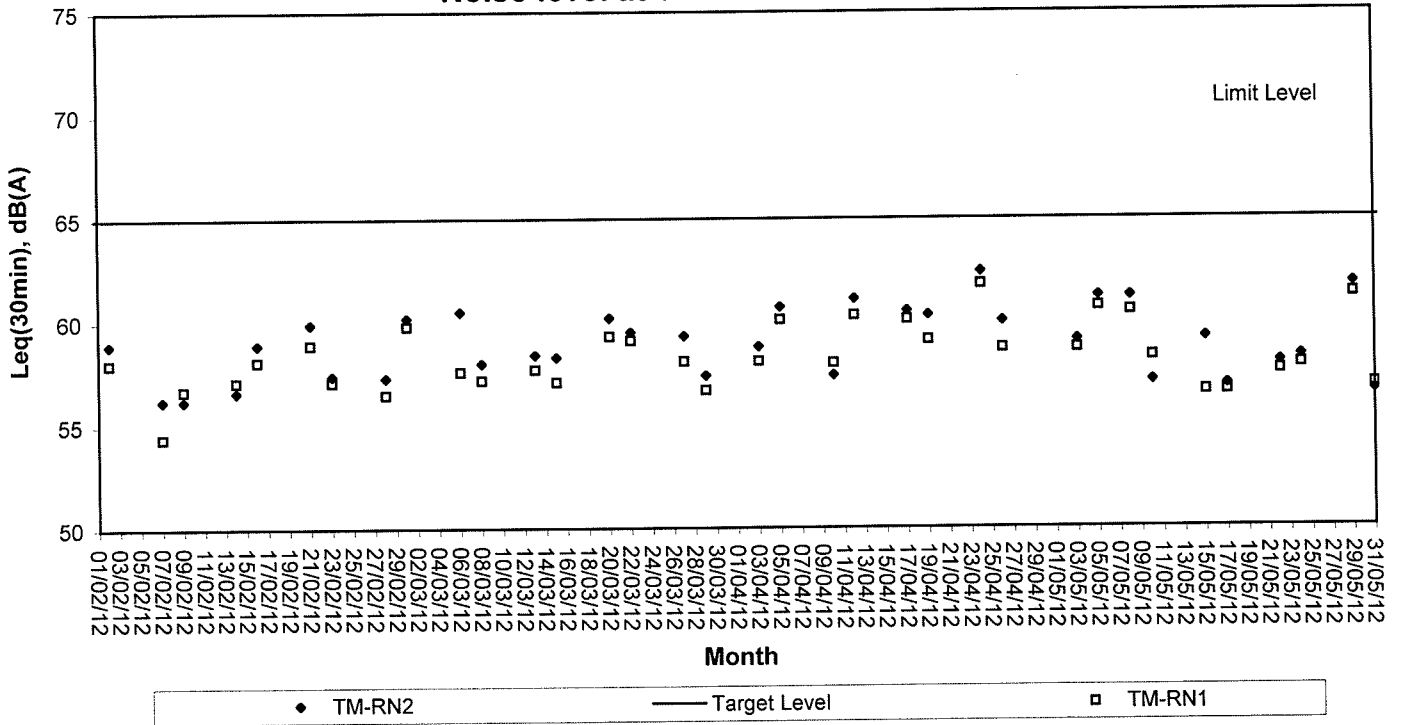
Remark: Since Lands Department did not approve us to enter their own area where the noise monitoring stations TM-N1 and TM-N2 located due to the security, noise monitoring was temporarily carried out at two noise monitoring stations TM-RN1 and TM-RN2 (refer to the figure 3 attached) in this reporting month.

## Appendix D3

### Graphical Plots of Impact Noise Monitoring Data

## Noise Monitoring (Day-time)

**Noise level at TM-RN1 and TM-RN2**





## **Appendix E**

### **Weather Condition**

## Extract of Meteorological Observations for Tuen Mun Automatic Weather Station, May 2012

Date	Mean Pressure at M.S.L. (hPa)	Air Temperature			Mean Dew Point Temperature (deg C)	Relative Humidity		
		Max. (deg C)	Mean (deg C)	Min. (deg C)		Max. (%)	Mean (%)	Min. (%)
May 1	*****	30.6	28.5	26.7	23.6	83	75	66
May 2	*****	31.9	29.2	27.4	23.8	81	74	61
May 3	*****	31.7	28.8	27.0	23.9	84	76	63
May 4	*****	32.5	28.5	25.2	24.1	88	78	63
May 5	*****	26.5	25.3	24.4	21.8	87	81	74
May 6	*****	29.8	26.4	24.4	21.1	82	73	62
May 7	*****	32.0	27.3	24.3	21.6	82	72	54
May 8	*****	32.3	28.8	25.7	22.8	85	71	50
May 9	*****	32.8	29.5	26.9	23.6	85	71	57
May 10	*****	33.5	29.7	26.9	23.8	86	71	53
May 11	*****	29.0	26.9	25.6	22.4	87	77	67
May 12	*****	29.1	27.1	25.3	22.1	80	74	65
May 13	*****	31.7	27.1	25.0	23.0	87	79	55
May 14	*****	32.9	28.7	25.4	23.9	88	76	60
May 15	*****	32.5	28.7	26.4	23.6	83	74	56
May 16	*****	29.3	27.4	26.4	23.0	86	77	68
May 17	*****	30.3	27.7	25.9	22.9	82	75	64
May 18	*****	27.5	25.6	24.6	22.9	89	85	77
May 19	*****	33.2	27.1	24.5	23.3	88	80	55
May 20	*****	33.4	27.7	25.3	23.1	88	77	53
May 21	*****	29.4	26.6	25.4	20.0	80	67	52
May 22	*****	29.2	26.5	24.2	17.5	70	58	44
May 23	*****	30.4	26.7	24.4	18.9	71	62	51
May 24	*****	30.9	27.4	24.8	20.8	76	67	55
May 25	*****	31.5	28.4	25.6	22.1	79	69	57
May 26	*****	30.1	27.9	27.0	22.8	81	74	65
May 27	*****	30.2	27.8	26.2	22.6	80	74	63
May 28	*****	30.7	27.0	25.3	22.5	87	76	63
May 29	*****	27.9	26.6	25.5	20.9	77	71	63
May 30	*****	30.8	27.2	25.5	21.9	81	73	57
May 31	*****	29.9	27.2	25.9	21.8	82	72	61
<b>Mean</b>	*****	30.8	27.6	25.6	22.3	83	74	60
<b>Maximum</b>	*****	33.5	29.7	27.4	24.1	89	85	77
<b>Minimum</b>	*****	26.5	25.3	24.2	17.5	70	58	44

## Extract of Meteorological Observations for Tuen Mun Automatic Weather Station, May 2012

Date	Total Rainfall (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
May 1	0.5	***	*****
May 2	0.0	***	*****
May 3	0.0	***	*****
May 4	8.0	***	*****
May 5	7.0	***	*****
May 6	0.0	***	*****
May 7	0.0	***	*****
May 8	0.0	***	*****
May 9	0.0	***	*****
May 10	0.5	***	*****
May 11	3.5	***	*****
May 12	0.0	***	*****
May 13	12.0	***	*****
May 14	1.0	***	*****
May 15	0.0	***	*****
May 16	1.0	***	*****
May 17	0.0	***	*****
May 18	41.5	***	*****
May 19	4.0	***	*****
May 20	12.5	***	*****
May 21	0.0	***	*****
May 22	0.0	***	*****
May 23	0.0	***	*****
May 24	0.0	***	*****
May 25	0.0	***	*****
May 26	0.0	***	*****
May 27	0.0	***	*****
May 28	1.5	***	*****
May 29	0.0	***	*****
May 30	0.0	***	*****
May 31	1.0	***	*****
<b>Mean</b>	-----	***	*****
<b>Total</b>	94.0	---	-----
<b>Maximum</b>	41.5	---	*****
<b>Minimum</b>	0.0	---	*****

\*\*\* unavailable

# missing (less than 24 hourly observations a day)

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

	ACTION			
EVENT	ET Leader	IC(E)	ER	Contractor
<b>ACTION LEVEL</b>				
1. Exceedance for one sample	<ol style="list-style-type: none"> <li>1. Identify source, investigate the causes of exceedance and propose remedial measures</li> <li>2. Inform ER, IC(E) and Contractor</li> <li>3. Repeat measurement to confirm finding</li> <li>4. Increase monitoring frequency to daily</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by the ET</li> <li>2. Check contractor's working method</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify Contractor</li> </ol>	<ol style="list-style-type: none"> <li>1. Rectify any unacceptable practise</li> <li>2. Amend working methods if appropriate</li> </ol>
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. Inform IC(E) and Contractor</li> <li>3. Repeat measurements to confirm finding</li> <li>4. Increase monitoring frequency to daily</li> <li>5. Discuss with IC(E) and Contractor on remedial actions</li> <li>6. If exceedance continues, arrange meeting with IC(E) and ER.</li> <li>7. If exceedance stops, cease additional monitoring</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by the ET</li> <li>2. Check Contractor's working method</li> <li>3. Discuss with ET and Contractor on possible remedial measures</li> <li>4. Advise the ER on the effectiveness of the proposed remedial measures</li> <li>5. Supervise 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. Ensure remedial measures properly implemented</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit proposals for remedial actions to IC(E) within 3 working days of notification</li> <li>2. Implement the agreed proposals</li> <li>3. Amend proposal if appropriate</li> </ol>
<b>LIMIT LEVEL</b>				
1. Exceedance for one sample	<ol style="list-style-type: none"> <li>1. Identify source, investigate the causes of exceedance and propose remedial measures</li> <li>2. Inform ER, Contractor and EPD</li> <li>3. Repeat measurement to confirm finding</li> <li>4. Increase monitoring frequency to daily</li> <li>5. Assess the effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by the ET</li> <li>2. Check Contractor's working method</li> <li>3. Discuss with ET and Contractor on possible remedial measures</li> <li>4. Advise the ER on the effectiveness of the proposed remedial measures</li> <li>5. Supervise 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. Ensure remedial measures properly implemented</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. Amend proposal if appropriate.</li> </ol>

## EVENT/ACTION PLAN FOR AIR QUALITY EXCEEDANCE

EVENT	ACTION			
	ET Leader	IC(E)	ER	Contractor
<p>2. Exceedance for two or more consecutive samples</p>	<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 analysed 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>

## EVENT AND ACTION PLAN FOR WATER QUALITY EXCEEDANCE

Event	ACTION			IEC
	ET Leader	Contractor	ER	
<p>Action level being exceeded by one sampling day</p>	<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 practice;</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

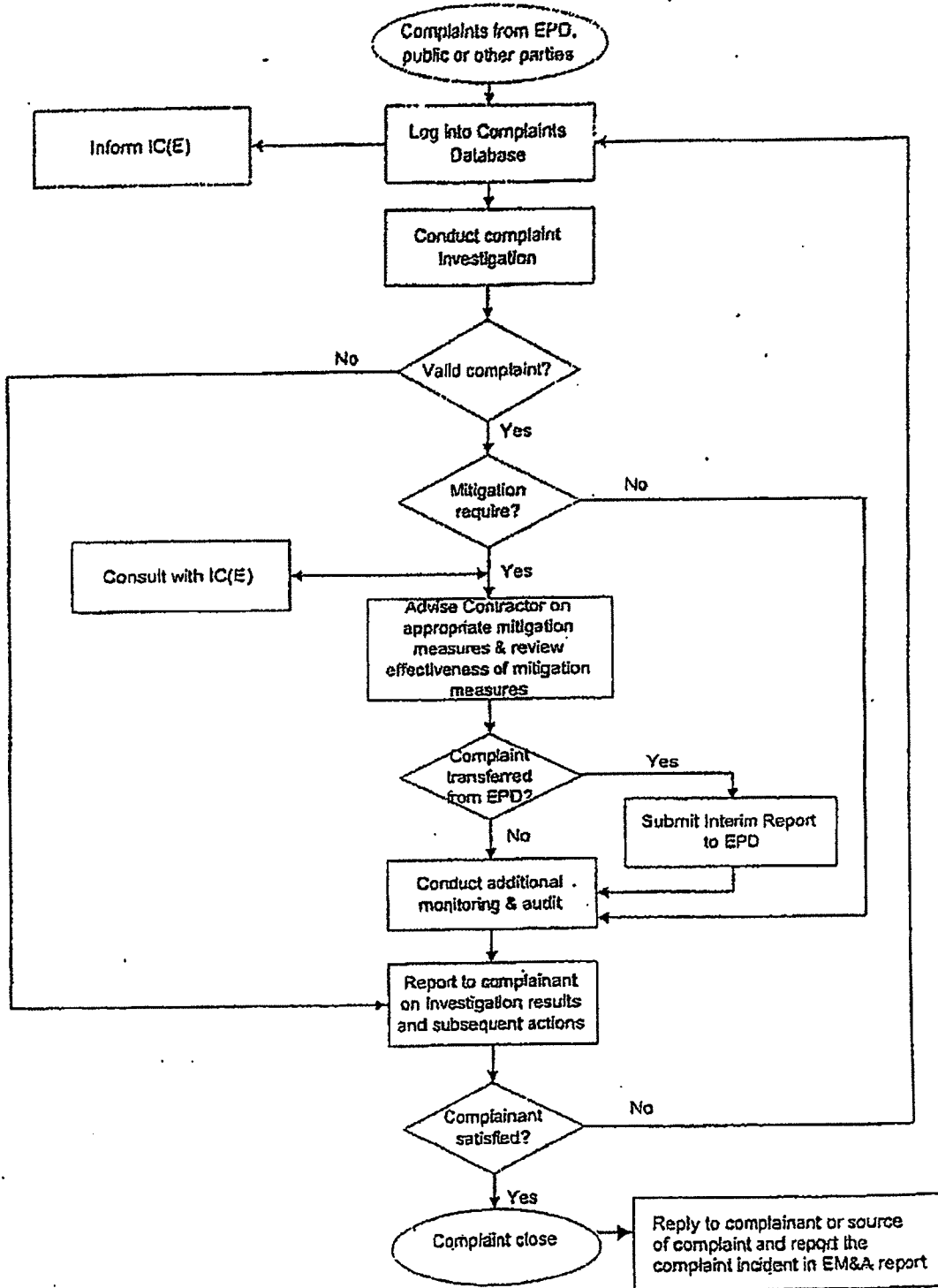
Event	ACTION		
	ET Leader	Contractor	ER
<p>Action level being exceeded by more than one consecutive sampling days</p>	<ol style="list-style-type: none"> <li>1. Identify source(s) of impact;</li> <li>2. Repeat in-situ measurement to confirm findings</li> <li>3. Notify Contractor in writing within 24 hours of identification</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 and Contractor within 4 working of identification of an exceedance</li> <li>8. Ensure mitigation measures are implemented;</li> <li>9. Prepare to increase the monitoring frequency to daily;</li> <li>10. Repeat measurement on next day of exceedance.</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify IEC and ER in writing within 24 hours of identification of 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 measures to IEC and ER 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. 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 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 measures to IEC and ER 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>
			IEC
			<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			IEC
	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>6. Ensure remedial measures are properly implemented</li> <li>4. Assess the effectiveness of the implemented mitigation measures;</li> <li>5. 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>



Contract No. CV/2009/02  
 Handling of Surplus Public Fill

Figure 4  
 Environmental Complaint Handling Procedure –  
 Tuen Mun Area 38 Fill Bank



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## **Appendix G**

### **Construction Programme**

Master Programme of Contract No. CV/2009/02 - Handling of Surplus Public Fill

Site Location : Tuen Mun Area 38 Fill Bank

ID	Activity	Original Duration	Start	Finish
S201000	Takeing Over the Existing Facilities	0	19/01/2010	
S202000	Operation	1096	19/01/2010	18/01/2013
S203000	Operation and Maintenance Tipping Halls	1096	19/01/2010	18/01/2013
S204000	Handing Over the Facilities to the Employer	0		18/01/2013






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## **Appendix H**

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

CEDD Contract No.: CV2009/02  
 Handling of Surplus Public Fill - Tuen Mun Area 38 Fill Bank

Inspection Date : 10/5/12  
 Time : 10:15  
 Weather : Sunny / Fine / Cloudy / Overcast / Drizzle / Rain / Storm / Hazy  
 Wind : Calm / Light Breeze / Strong  
 Temperature : 30°C  
 Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:			
Name:	Mr. ALAN LO	Alan Lo	Alan Lo
Title	ALOW/P3	Graduate Engineer	E.T

Implementation Stages*		Remark
<b>Environmental Checklist</b>		
<b>Fugitive Dust Emission</b>		
✓		Dust control / mitigation measures shall be provided to prevent dust nuisance.
✓		Water sprays shall be provided and used to dampen materials.
✓		All stockpile of aggregate or spoil should be enclosed or covered and water applied in dry or windy condition.
✓		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.
✓		Unpaved areas should be watered regularly to avoid dust generation.
✓		The designated site main haul road shall be paved or regular watering.
✓		The haul road inside the site and public road around the site entrance should be kept clean and free from dust.
✓		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.
✓		The temporary slope surfaces shall be covered with impermeable sheet or sprayed with water.
✓		Vehicle and equipment should be switched off while not in use.
✓		All plant and equipment should be well maintained e.g. without black smoke emission.
✓		Open burning should be prohibited.
<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.
✓		The constructions works should be scheduled to minimize noise nuisance.
✓		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.
✓		Compressors and generators should operate with door closed.
✓		Machines and plants that may be in intermittent use should be shut down between work periods or should be frotted down to a minimum.
✓		Noisy equipment and mobile plant shall always be site away from NSRs.

Environmental Checklist	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Water Quality</b>				
Drainage system and the sand / silt removal facilities should be adequate and well maintained to prevent flooding and overflow, especially after rain storms.	√			
The stormwater intercepting system shall be effective to collect of runoff and remove suspended solids before discharge.	√			
Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding.		√		Item 3
The material shall be properly covered to prevent washed away especially before rainstorm.	√			
The temporary slope surfaces shall be covered with impermeable sheet or sprayed with water.	√			
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.	√			
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 hardcore 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.	√			
Tipping halls enclosed with top and 3-side to prevent spillage of material into marine water.	√			
The barges shall be in tight 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.	√			
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.	√			
Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer.	√			
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.	√			
A waste collection vessel shall be deployed to remove floating debris.	√			
<b>Landscape and Visual</b>				
The maximum stockpiling height at the fill bank shall be limited to a maximum of +40mPD.	√			
Surface of outer slopes of the Fill Bank shall preferably be hydroseeded.	√			
Stockpile of public fill shall be removed in a sequence to allow the outer hydroseeded to be removed later than other portions as far as practicable.	√			
Casuarina equisetifolia were planted as buffer tree along the northern perimeter of the Site. The height of Casuarina equisetifolia was maintained at least 3m above soil level.	√			
Lighting shall be set to minimise night-time glare.	√			

Implementation Stages*	Implementation Stages*		Remark
	Yes	No	
<b>Waste Management</b>			
<b>Construction Waste Management</b>			
✓			Relevant licence / permits for disposal of construction waste or excavated materials available for inspection.
✓			Excavated material to be generated from construction works to be re-used on-site as far as practicable to reduce off-site disposal.
✓			Mud and debris should be removed from waterworks access roads and associated drainage systems.
✓			Provision of sufficient waste disposal points and regular collection for disposal. Appropriate measures should be employed to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers.
✓			Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal.
✓			Prior to disposal of C&D waste, recyclable materials should be salvaged for reuse (such as wood and metal) and inert waste utilised as public fill to minimise the quantity of waste to be disposed of to landfill.
✓			In order to monitor the disposal of C&D material and solid wastes at public filling areas and landfills, and to control fly-tipping, a tip-ticket system should be included as one of the contractual requirements.
✓			Any soil contaminated with chemicals/oils shall be removed from site and the void created shall be filled with suitable materials.
<b>Chemical Waste Management</b>			
✓			It is required to register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.
✓			After use, chemical wastes (e.g. cleaning fluids, solvents, lubrication oil and fuel) should be handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.
✓			Spent chemicals should be stored and collected by an approved operator for disposal at the Chemical Waste Treatment Facility or other licensed facility in accordance with the Chemical Waste (General) Regulation.
✓			Chemical wastes should be separated for special handling and appropriate treatment at the Chemical Waste Treatment Facility.
✓			Chemical wastes including waste oil should be stored properly in designated areas, e.g. chemical waste storage area.
✓			The designated chemical waste storage area should only be used for storing chemical wastes.
✓			The set-up of chemical waste storage area should
✓			Be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition.
✓			Be enclosed on at least 3 sides and securely closed.
✓			Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest.
✓			Have adequate ventilation.
✓			Be covered to prevent rainfall entering (water collected within the bund must be tested and disposal as chemical waste if necessary).
✓			Be arranged so that incompatible materials are adequately separated.

Environmental Checklist	Implementation Stages*			Remark
	Yes	No	N/A	
• Warning panels should be displayed at the waste storage area.	✓			
• Waste storage area should be cleaned and maintained regularly.	✓			
• Chemical waste should be transported by a registered chemical waste collector to a facility licensed to receive chemical waste.	✓			
• All generators, fuel and oil storage should be within bundle areas.	✓			
• Oil leakage from machinery, vehicle and plant should be prevented.	✓			
• In the event of chemical waste / dangerous goods / chemicals spillage or leakage, the procedures as outlined in the Spillage Response Plan should be followed.	✓			
• The dangerous goods / chemical spillage or leakage procedures (including equipments) should be in place.	✓			
<b>Good Site Practices</b>				
• Nomination of approved personnel, such as site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site.	✓			
• Training of site personnel in proper waste management and chemical handling procedures should be provided.	✓			
• 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.	✓			
• Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	✓			
• The Environmental Permit should be displayed conspicuously on site.	✓			
• Construction noise permits should be posted at site entrance or available for site inspection.			✓	
• Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.	✓			
• Chemical storage area provided with lock and located on sealed areas.	✓			
• All chemicals should be placed at the banded area with adequate band capacity (>110% of largest tank).			✓	Item 5
• Any unused chemicals or those with remaining functional capacity should be recycled.	✓			
• Regular cleaning and maintenance programme for waste storage area, drainage systems, silt traps, sumps and oil interceptors.	✓			
• 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.	✓			
• A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be used, e.g. trip ticket system for chemical waste disposal. Quantities could be determined by weighing each load or other suitable methods.	✓			
• A collection area should be provided where waste can be stored and loaded prior to removal from site. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light material. If an open area is unavoidable for the storage or loading/unloading of wastes, then the area should be banded and all the polluted surface run-off collected within this area should be diverted into wastewater treatment system.			✓	Item 4

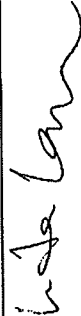


**Summary of the Weekly Site Inspection:**

Item	Details of defective works or observations	Proposed Follow Up Action	Photo Ref.	Further Action Required (Yes/No)	Target Completion Date
1	Follow up action to item 2 on 19/04/12 and item 1 on 26/04/12, mud and silt accumulated inside the main drainage channel near tipping hall No.3 were cleaned up.	---	120510_001	No	---
2	Water leakage was noted from a water tank at water truck filling station.	To repair the water tank to avoid water leakage.	120510_002	Yes	17/05/12
3	Standing water was noted accumulated on the pavement near the wheel washing bay.	To clear the standing water or apply pesticide to avoid mosquito breeding.	120510_003	Yes	17/05/12
4	C&D waste (e.g. idle tyres, plastic and wood) was noted discarded on the haul road to Public Fill Area.	To collect and dispose of the waste properly.	120510_004, 120510_005	Yes	17/05/12
5	A chemical bucket was noted discarded beside the haul road to Public Fill Area.	To collect and store / dispose of the chemical bucket properly.	120510_006	Yes	17/05/12

Remark

--

	Name	Title	Signature	Date
Checked by	Linda Law	Senior Environmental Officer		11 May 2012

**Photos**



Photo 120510\_001 (Main drainage channel)



Photo 120510\_002 (Water truck filling station)



Photo 120510\_002 (Pavement near the wheel washing bay)

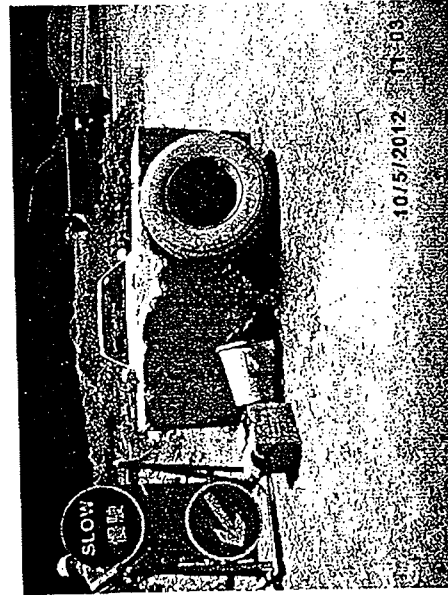


Photo 120510\_004 (Haul road to Public Fill Area)



Photo 120510\_005 (Haul road to Public Fill Area)

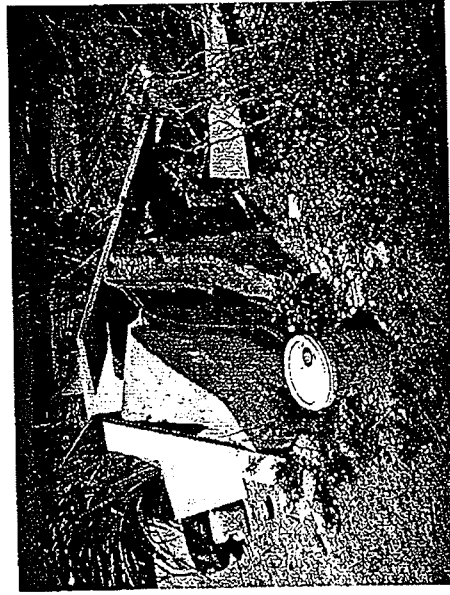

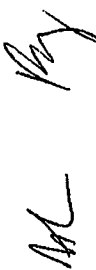
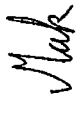


Photo 120510\_006 (Haul road to Public Fill Area)

CEDD Contract No.: CV/2009/02  
 Handling of Surplus Public Fill - Tuen Mun Area 38 Fill Bank

Inspection Date : 17/5/12  
 Time : 14:00  
 Weather : Sunny / Fine / Cloudy / Overcast / Drizzle / Rain / Storm / Hazy  
 Wind : Calm / Light / Breeze / Strong  
 Temperature : 30°C  
 Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:			
Name:	ALAN LO	Alan Lo Fungken Fan	Alan Lo Wan
Title	AEOW/P3	Graduate Engineer	E.T

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.	✓			
• Water sprays shall be provided and used to dampen materials.	✓			
• All stockpile of aggregate or spoil should be enclosed or covered and water applied in dry or windy condition.	✓			
• 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.	✓			
• Unpaved areas should be watered regularly to avoid dust generation.	✓			
• The designated site main haul road shall be paved or regular watering.	✓			
• The haul road inside the site and public road around the site entrance should be kept clean and free from dust.	✓			
• 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.	✓			
• The temporary slope surfaces shall be covered with impermeable sheet or sprayed with water.	✓			
• Vehicle and equipment should be switched off while not in use.	✓			
• All plant and equipment should be well maintained e.g. without black smoke emission.	✓			
• Open burning should be prohibited.	✓			
<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.	✓			
• The constructions works should be scheduled to minimize noise nuisance.	✓			
• 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.	✓			
• Compressors and generators should operate with door closed.	✓			
• 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.	✓			

Implementation Stages*		Remark
<b>Water Quality</b>		
✓		Drainage system and the sand / silt removal facilities should be adequate and well maintained to prevent flooding and overflow, especially after rain storms.
✓		The stormwater intercepting system shall be effective to collect of runoff and remove suspended solids before discharge.
	✓	Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding.
✓		The material shall be properly covered to prevent washed away especially before rainstorm.
✓		The temporary slope surfaces shall be covered with impermeable sheet or sprayed with water.
✓		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.
✓		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.
✓		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.
✓		Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer.
✓		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.
✓		A waste collection vessel shall be deployed to remove floating debris.
<b>Landscape and Visual</b>		
✓		The maximum stockpiling height at the fill bank shall be limited to a maximum of +40mPD.
✓		Surface of outer slopes of the Fill Bank shall preferably be hydroseeded.
✓		Stockpile of public fill shall be removed in a sequence to allow the outer hydroseeded to be removed later than other portions as far as practicable.
✓		Casuarina equisetifolia were planted as buffer tree along the northern perimeter of the Site. The height of Casuarina equisetifolia was maintained at least 3m above soil level.
✓		Lighting shall be set to minimise night-time glare.

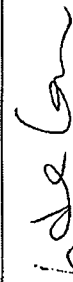
Environmental Checklist	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Waste Management</b>				
<b>Construction Waste Management</b>				
Relevant licence / permits for disposal of construction waste or excavated materials available for inspection.	√			
Excavated material to be generated from construction works to be re-used on-site as far as practicable to reduce off-site disposal.	√			
Mud and debris should be removed from waterworks access roads and associated drainage systems.	√			
Provision of sufficient waste disposal points and regular collection for disposal. Appropriate measures should be employed to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers.	√			
Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal.	√			
Prior to disposal of C&D waste, recyclable materials should be salvaged for reuse (such as wood and metal) and inert waste utilised as public fill to minimise the quantity of waste to be disposed of to landfill.	√			
In order to monitor the disposal of C&D material and solid wastes at public filling areas and landfills, and to control fly-tipping, a trip-ticket system should be included as one of the contractual requirements.	√			
Any soil contaminated with chemicals/oils shall be removed from site and the void created shall be filled with suitable materials.	√			
<b>Chemical Waste Management</b>				
It is required to register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.	√			
After use, chemical wastes (e.g. cleaning fluids, solvents, lubrication oil and fuel) should be handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.	√			
Spent chemicals should be stored and collected by an approved operator for disposal at the Chemical Waste Treatment Facility or other licensed facility in accordance with the Chemical Waste (General) Regulation.	√			
Chemical wastes should be separated for special handling and appropriate treatment at the Chemical Waste Treatment Facility.	√			
Chemical wastes including waste oil should be stored properly in designated areas, e.g. chemical waste storage area.	√			
The designated chemical waste storage area should only be used for storing chemical wastes.	√			
The set-up of chemical waste storage area should				
Be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition.	√			
Be enclosed on at least 3 sides and securely closed.	√			
Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest.	√			
Have adequate ventilation.	√			
Be covered to prevent rainfall entering (water collected within the bund must be tested and disposal as chemical waste if necessary).	√			
Be arranged so that incompatible materials are adequately separated.	√			

Environmental Checklist		Implementation Stages*		Remark
		Yes	No	
Warning panels should be displayed at the waste storage area.		√		
Waste storage area should be cleaned and maintained regularly.		√		
Chemical waste should be transported by a registered chemical waste collector to a facility licensed to receive chemical waste.		√		
All generators, fuel and oil storage should be within bundle areas.		√		
Oil leakage from machinery, vehicle and plant should be prevented.		√		
In the event of chemical waste / dangerous goods / chemicals spillage or leakage, the procedures as outlined in the Spillage Response Plan should be followed.		√		
The dangerous goods / chemical spillage or leakage procedures (including equipments) should be in place.		√		
<b>Good Site Practices</b>				
Nomination of approved personnel, such as site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site.		√		
Training of site personnel in proper waste management and chemical handling procedures should be provided.		√		
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.		√		
Proper storage and site practices to minimise the potential for damage or contamination of construction materials.		√		
The Environmental Permit should be displayed conspicuously on site.		√		
Construction noise permits should be posted at site entrance or available for site inspection.			√	
Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.		√		
Chemical storage area provided with lock and located on sealed areas.		√		
All chemicals should be placed at the banded area with adequate band capacity (>110% of largest tank).		√		
Any unused chemicals or those with remaining functional capacity should be recycled.		√		
Regular cleaning and maintenance programme for waste storage area, drainage systems, silt traps, sumps and oil interceptors.		√		
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.		√		
A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be used, e.g. trip ticket system for chemical waste disposal. Quantities could be determined by weighing each load or other suitable methods.		√		
A collection area should be provided where waste can be stored and loaded prior to removal from site. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light material. If an open area is unavoidable for the storage or loading/unloading of wastes, then the area should be banded and all the polluted surface run-off collected within this area should be diverted into wastewater treatment system.		√		

**Summary of the Weekly Site Inspection:**

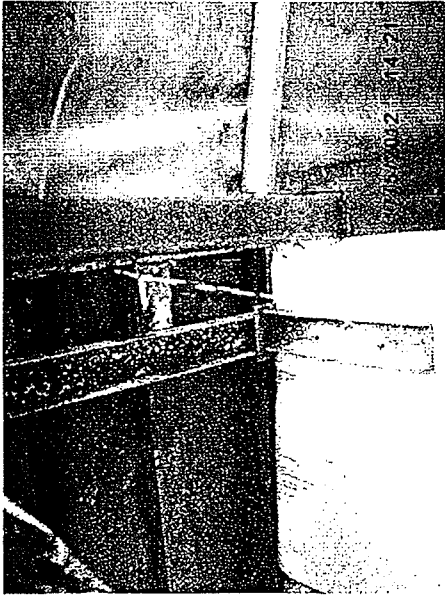
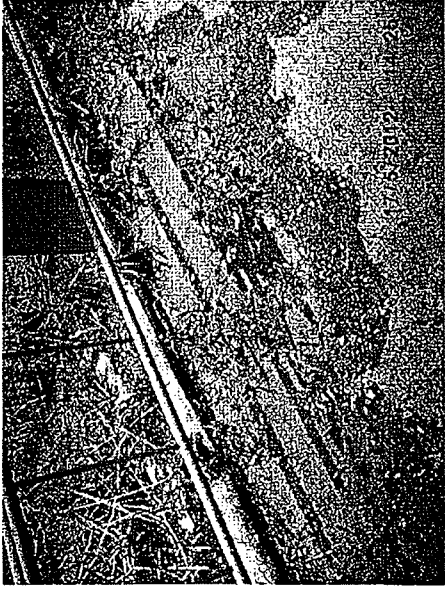

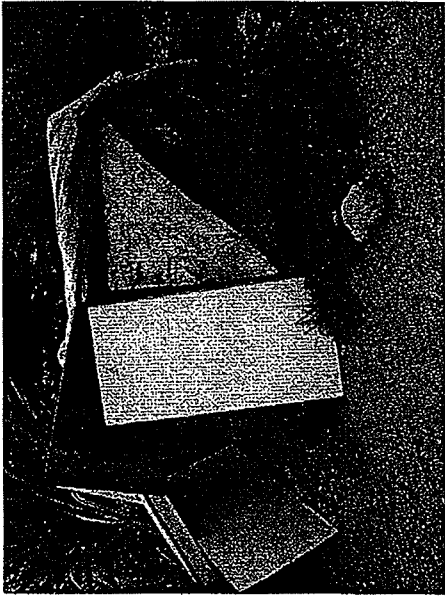
Item	Details of defective works or observations	Proposed Follow Up Action	Photo Ref.	Further Action Required (Yes/No)	Target Completion Date
1	Follow up action to item 2 on 10/05/12, water leakage was still noted from a water tank at water truck filling station.	To repair the water tank to avoid water leakage.	120517_001	Yes	24/05/12
2	Follow up action to item 3 on 10/05/12, standing water was still noted accumulated on the pavement near the wheel washing bay.	To clear the standing water or apply pesticide to avoid mosquito breeding.	120517_002	Yes	24/05/12
3	Follow up action to item 4 on 10/05/12, C&D waste (e.g. idle tyres, plastic and wood) discarded on the haul road to Public Fill Area were collected and stored properly.	--	120517_003	No	---
4	Follow up action to item 5 on 10/05/12, the chemical bucket discarded beside the haul road to Public Fill Area was collected.	--	120517_004	No	---

Remark

	Name	Title	Signature	Date
Checked by	Linda Law	Senior Environmental Officer		17 May 2012



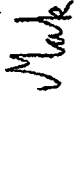


**Photos**

 <p>Photo 120517_001 (Water truck filling station)</p>	 <p>Photo 120517_002 (Pavement near the wheel washing bay)</p>	 <p>Photo 120517_002 (Haul road to Public Fill Area)</p>
 <p>Photo 120517_004 (Haul road to Public Fill Area)</p>		

CEDD Contract No.: CV/2009/02  
Handling of Surplus Public Fill - Tuen Mun Area 38 Fill Bank

Inspection Date : 24 May 2012  
 Time : 10:30  
 Weather : Sunny+Fine+Cloudy+Overcast+Drizzle+Rain+Storm+Hazy  
 Wind : Calm+Light+Breeze+Strong  
 Temperature : 27°C  
 Humidity : High+Moderate+Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:			
Name:	C.T. CHAN	Alan Lo Graduate Safety Supervisor	Mark Hei Wai
Title	Ins/83	Engineer	E.T

CEDD Contract No.: CV/2009/02  
Handling of Surplus Public Fill - Tuen Mun Area 38 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.	✓			
• Water sprays shall be provided and used to dampen materials.	✓			
• All stockpile of aggregate or spoil should be enclosed or covered and water applied in dry or windy condition.	✓			
• 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.	✓			
• Unpaved areas should be watered regularly to avoid dust generation.	✓			
• The designated site main haul road shall be paved or regular watering.	✓			
• The haul road inside the site and public road around the site entrance should be kept clean and free from dust.	✓			
• 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.	✓			
• The temporary slope surfaces shall be covered with impermeable sheet or sprayed with water.	✓			
• Vehicle and equipment should be switched off while not in use.	✓			
• All plant and equipment should be well maintained e.g. without black smoke emission.	✓			
• Open burning should be prohibited.	✓			
<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.	✓			
• The constructions works should be scheduled to minimize noise nuisance.	✓			
• 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.	✓			
• Compressors and generators should operate with door closed.	✓			
• 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	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Waste Management</b>				
<b>Construction Waste Management</b>				
Relevant licence / permits for disposal of construction waste or excavated materials available for inspection.	√			
Excavated material to be generated from construction works to be re-used on-site as far as practicable to reduce off-site disposal.	√			
Mud and debris should be removed from waterworks access roads and associated drainage systems.	√			
Provision of sufficient waste disposal points and regular collection for disposal. Appropriate measures should be employed to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers.	√			
Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal.	√			
Prior to disposal of C&D waste, recyclable materials should be salvaged for reuse (such as wood and metal) and inert waste utilised as public fill to minimise the quantity of waste to be disposed of to landfill.	√			
In order to monitor the disposal of C&D material and solid wastes at public filling areas and landfills, and to control fly-tipping, a trip-ticket system should be included as one of the contractual requirements.	√			
Any soil contaminated with chemicals/oils shall be removed from site and the void created shall be filled with suitable materials.	√			
<b>Chemical Waste Management</b>				
It is required to register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap. 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.	√			
After use, chemical wastes (e.g. cleaning fluids, solvents, lubrication oil and fuel) should be handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.	√			
Spent chemicals should be stored and collected by an approved operator for disposal at the Chemical Waste Treatment Facility or other licensed facility in accordance with the Chemical Waste (General) Regulation.	√			
Chemical wastes should be separated for special handling and appropriate treatment at the Chemical Waste Treatment Facility.	√			
Chemical wastes including waste oil should be stored properly in designated areas, e.g. chemical waste storage area.	√			
The designated chemical waste storage area should only be used for storing chemical wastes.	√			
The set-up of chemical waste storage area should				
Be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition.	√			
Be enclosed on at least 3 sides and securely closed.	√			
Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest.	√			
Have adequate ventilation.	√			
Be covered to prevent rainfall entering (water collected within the bund must be tested and disposal as chemical waste if necessary).	√			
Be arranged so that incompatible materials are adequately separated.	√			


CEDD Contract No.: CV/2009/02  
 Handling of Surplus Public Fill - Tuen Mun Area 38 Fill Bank

Environmental Checklist	Implementation Stages*		Remark
	Yes	No	
	N/A		
Warming panels should be displayed at the waste storage area.	√		
Waste storage area should be cleaned and maintained regularly.	√		
Chemical waste should be transported by a registered chemical waste collector to a facility licensed to receive chemical waste.	√		
All generators, fuel and oil storage should be within bundle areas.	√		
Oil leakage from machinery, vehicle and plant should be prevented.	√		
In the event of chemical waste / dangerous goods / chemicals spillage or leakage, the procedures as outlined in the Spillage Response Plan should be followed.	√		
The dangerous goods / chemical spillage or leakage procedures (including equipments) should be in place.	√		
<b>Good Site Practices</b>			
Nomination of approved personnel, such as site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site.	√		
Training of site personnel in proper waste management and chemical handling procedures should be provided.	√		
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.	√		
Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	√		
The Environmental Permit should be displaced conspicuously on site.	√		
Construction noise permits should be posted at site entrance or available for site inspection.	√		√
Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.	√		
Chemical storage area provided with lock and located on sealed areas.	√		
All chemicals should be placed at the banded area with adequate band capacity (>110% of largest tank).	√		
Any unused chemicals or those with remaining functional capacity should be recycled.	√		
Regular cleaning and maintenance programme for waste storage area, drainage systems, silt traps, sumps and oil interceptors.	√		
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.	√		
A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be used, e.g. trip ticket system for chemical waste disposal. Quantities could be determined by weighing each load or other suitable methods.	√		
A collection area should be provided where waste can be stored and loaded prior to removal from site. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light material. If an open area is unavoidable for the storage or loading/unloading of wastes, then the area should be bunded and all the polluted surface run-off collected within this area should be diverted into wastewater treatment system.	√		

**Summary of the Weekly Site Inspection:**

Item	Details of defective works or observations	Proposed Follow Up Action	Photo Ref.	Further Action Required (Yes/No)	Target Completion Date
1	Follow up action to item 2 on 10/05/12 and item 1 on 17/05/12, water leakage was still noted from a water tank at water truck filling station.	To repair the water tank to avoid water leakage.	120524_001	Yes	31/05/12
2	Follow up action to item 3 on 10/05/12 and item 2 on 17/05/12, standing water accumulated on the pavement near the wheel washing bay was cleaned up.	---	120524_002	No	---

Remark

Name	Title	Signature	Date
Linda Law	Senior Environmental Officer		24 May 2012

Photos

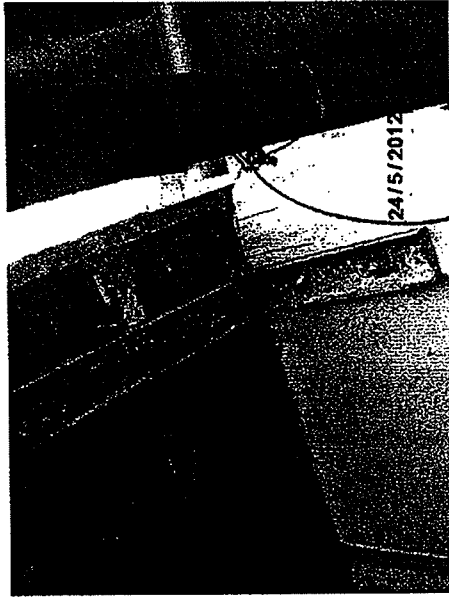


Photo 120524\_001 (Water truck filling station)



Photo 120524\_002 (Pavement near the wheel washing bay)





CEDD Contract No.: CV2009/02  
Handling of Surplus Public Fill - Tuen Mun Area 38 Fill Bank

Inspection Date : 31/5/12




Time : 10:30

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:	S. J. CHAN	Alan Lo Fung Kwan Fong	Mak Sei Man
Title	Area / P3	Graduate Engineer A.G. (S.S.)	E.T

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.	√			
▪ Water sprays shall be provided and used to dampen materials.	√			
▪ All stockpile of aggregate or spoil should be enclosed or covered and water applied in dry or windy condition.	√			
▪ 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.	√			
▪ Unpaved areas should be watered regularly to avoid dust generation.	√			
▪ The designated site main haul road shall be paved or regular watering.	√			
▪ The haul road inside the site and public road around the site entrance should be kept clean and free from dust.	√			
▪ 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.	√			
▪ The temporary slope surfaces shall be covered with impermeable sheet or sprayed with water.	√			
▪ Vehicle and equipment should be switched off while not in use.	√			
▪ All plant and equipment should be well maintained e.g. without black smoke emission.	√			
▪ Open burning should be prohibited.	√			
<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.	√			
▪ The constructions works should be scheduled to minimize noise nuisance.	√			
▪ 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.	√			
▪ Compressors and generators should operate with door closed.	√			
▪ 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	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Water Quality</b>				
Drainage system and the sand / silt removal facilities should be adequate and well maintained to prevent flooding and overflow, especially after rain storms.	✓			
The stormwater intercepting system shall be effective to collect of runoff and remove suspended solids before discharge.	✓			
Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding.	✓			
The material shall be properly covered to prevent washed away especially before rainstorm.	✓			
The temporary slope surfaces shall be covered with impermeable sheet or sprayed with water.	✓			
Final slope surfaces, especially those facing to the north of the site shall be treated by hydroseeding, vegetation planting or sealing with shotcrete, 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 hardcore 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.	✓			
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.	✓			
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.	✓			
Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer.	✓			
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.	✓			
A waste collection vessel shall be deployed to remove floating debris.	✓			
<b>Landscape and Visual</b>				
The maximum stockpiling height at the fill bank shall be limited to a maximum of +40mPD.	✓			
Surface of outer slopes of the Fill Bank shall preferably be hydroseeded.	✓			
Stockpile of public fill shall be removed in a sequence to allow the outer hydroseeded to be removed later than other portions as far as practicable.	✓			
Casuarina equisetifolia were planted as buffer tree along the northern perimeter of the Site. The height of Casuarina equisetifolia was maintained at least 3m above soil level.	✓			
Lighting shall be set to minimise night-time glare.	✓			

Implementation Stages*		Remark
<b>Environmental Checklist</b>		
<b>Waste Management</b>		
<b>Construction Waste Management</b>		
✓		Relevant licence / permits for disposal of construction waste or excavated materials available for inspection.
✓		Excavated material to be generated from construction works to be re-used on-site as far as practicable to reduce off-site disposal.
✓		Mud and debris should be removed from waterworks access roads and associated drainage systems.
✓		Provision of sufficient waste disposal points and regular collection for disposal. Appropriate measures should be employed to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers.
✓		Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal.
✓		Prior to disposal of C&D waste, recyclable materials should be salvaged for reuse (such as wood and metal) and inert waste utilised as public fill to minimise the quantity of waste to be disposed of to landfill.
✓		In order to monitor the disposal of C&D material and solid wastes at public filling areas and landfills, and to control fly-tipping, a trip-ticket system should be included as one of the contractual requirements.
	✓	Any soil contaminated with chemicals/oils shall be removed from site and the void created shall be filled with suitable materials.
<b>Chemical Waste Management</b>		
✓		It is required to register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.
✓		After use, chemical wastes (e.g. cleaning fluids, solvents, lubrication oil and fuel) should be handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.
✓		Spent chemicals should be stored and collected by an approved operator for disposal at the Chemical Waste Treatment Facility or other licensed facility in accordance with the Chemical Waste (General) Regulation.
✓		Chemical wastes should be separated for special handling and appropriate treatment at the Chemical Waste Treatment Facility.
✓		Chemical wastes including waste oil should be stored properly in designated areas, e.g. chemical waste storage area.
✓		The designated chemical waste storage area should only be used for storing chemical wastes.
✓		The set-up of chemical waste storage area should
✓		Be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition.
✓		Be enclosed on at least 3 sides and securely closed.
✓		Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest.
✓		Have adequate ventilation.
✓		Be covered to prevent rainfall entering (water collected within the bund must be tested and disposed as chemical waste if necessary).
✓		Be arranged so that incompatible materials are adequately separated.
		Item 3


Environmental Checklist	Implementation Stages*			Remark
	Yes	No	N/A	
Warning panels should be displayed at the waste storage area.	√			
Waste storage area should be cleaned and maintained regularly.	√			
Chemical waste should be transported by a registered chemical waste collector to a facility licensed to receive chemical waste.	√			
All generators, fuel and oil storage should be within bundle areas.	√			
Oil leakage from machinery, vehicle and plant should be prevented.		√		Item 3
In the event of chemical waste / dangerous goods / chemicals spillage or leakage, the procedures as outlined in the Spillage Response Plan should be followed.	√			
The dangerous goods / chemical spillage or leakage procedures (including equipments) should be in place.	√			
<b>Good Site Practices</b>				
Nomination of approved personnel, such as site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site.	√			
Training of site personnel in proper waste management and chemical handling procedures should be provided.	√			
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.	√			
Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	√			
The Environmental Permit should be displayed conspicuously on site.	√			
Construction noise permits should be posted at site entrance or available for site inspection.			√	
Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.	√			
Chemical storage area provided with lock and located on sealed areas.	√			
All chemicals should be placed at the banded area with adequate band capacity (>10% of largest tank).	√			
Any unused chemicals or those with remaining functional capacity should be recycled.	√			
Regular cleaning and maintenance programme for waste storage area, drainage systems, silt traps, sumps and oil interceptors.	√			
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.	√			
A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be used, e.g. trip ticket system for chemical waste disposal. Quantities could be determined by weighing each load or other suitable methods.	√			
A collection area should be provided where waste can be stored and loaded prior to removal from site. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light material. If an open area is unavoidable for the storage or loading/unloading of wastes, then the area should be banded and all the polluted surface run-off collected within this area should be diverted into wastewater treatment system.		√		Item 2

**Summary of the Weekly Site Inspection:**

Item	Details of defective works or observations	Proposed Follow Up Action	Photo Ref.	Further Action Required (Yes/No)	Target Completion Date
1	Follow up action to item 2 on 10/05/12 and item 1 on 17/05/12, water leakage was still noted from a water tank at water truck filling station.	To repair the water tank to avoid water leakage.	120531_001	Yes	07/06/12
2	Rubbish skip near CREO was full of rubbish.	To collect the rubbish inside the rubbish skip regularly.	120531_002	Yes	07/06/12
3	Oil stains were noted on the ground from a repairing machine at Workshop.	To clean up the oil stains and contaminated materials as chemical waste. Impermeable sheet should be provided for all repairing and maintenance works.	120531_003	Yes	07/06/12

Remark

--

Name	Title	Signature	Date
Linda Law	Senior Environmental Officer		31 May 2012

Photos

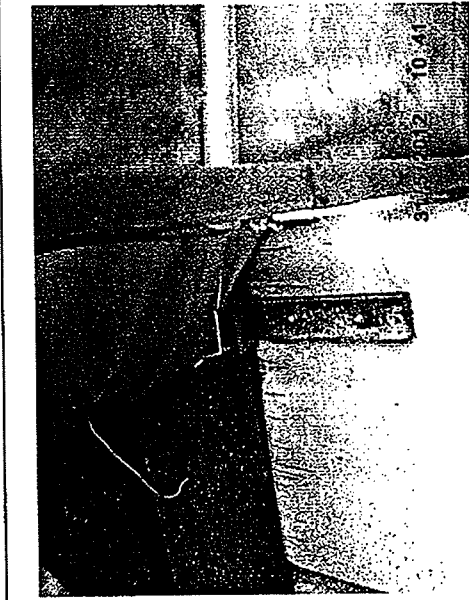


Photo 120531\_001 (Water truck filling station)

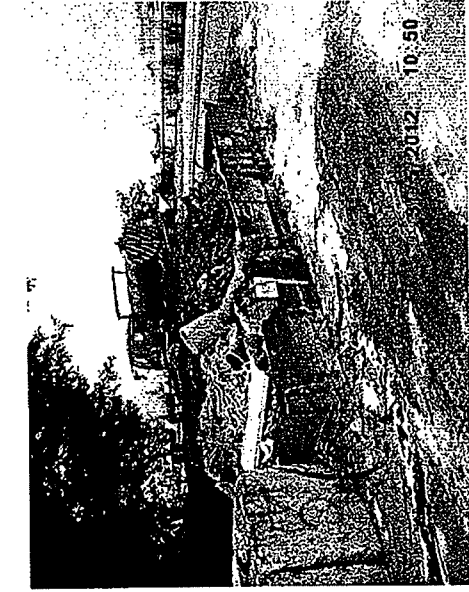


Photo 120531\_002 (Rubbish skip near CREO)

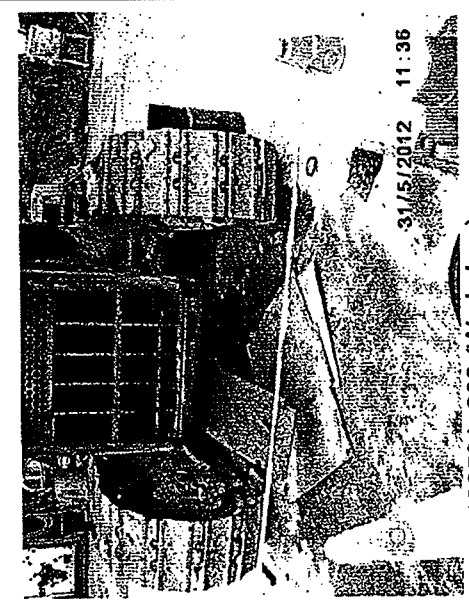


Photo 120531\_003 (Workshop)

## **Appendix I**

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





## Environmental Mitigation Implementation Schedule

	Location	Implementation Status		
		Implemented	Partially implemented	Not implemented
<b>Air Quality</b>				
<ul style="list-style-type: none"> <li>▪ Dust control / mitigation measures shall be provided to prevent dust nuisance.</li> <li>▪ Water sprays shall be provided and used to dampen materials.</li> <li>▪ All stockpile of aggregate or spoil should be enclosed or covered and water applied in dry or windy condition.</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>▪ Unpaved areas should be watered regularly to avoid dust generation.</li> <li>▪ The designated site main haul road shall be paved or regular watering.</li> <li>▪ The public road around the site entrance should be kept clean and free from dust.</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>▪ The temporary slope surfaces shall be covered with impermeable sheet or sprayed with water.</li> <li>▪ Vehicle and equipment should be switched off while not in use.</li> <li>▪ All plant and equipment should be well maintained e.g. without black smoke emission.</li> <li>▪ Open burning should be prohibited.</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 Protection Measures	Location	Implementation Status		
		Implemented	Partially implemented	Not implemented
<b>Water Quality</b>				
<ul style="list-style-type: none"> <li>• The existing / realigned intercepting channels and the sand / silt removal facilities shall be used and maintained.</li> <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> <li>• The stormwater intercepting system shall be effective to collect of runoff and remove suspended solids before discharge.</li> <li>• The material shall be properly covered to prevent washed away especially before rainstorm.</li> <li>• Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding.</li> <li>• The temporary slope surfaces shall be covered with impermeable sheet or sprayed with water.</li> <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> <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> <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> <li>• Sewage from toilets shall be discharged in to a foul sewer, or chemical toilets shall be provided.</li> <li>• The chemical toilets (if use) shall be provided by a licensed contractor, who will be responsible for disposal and maintenance of these facilities.</li> <li>• Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer.</li> <li>• A waste collection vessel shall be deployed to remove floating debris.</li> </ul>		√		
<b>Landscape and Visual</b>				
<ul style="list-style-type: none"> <li>• The maximum stockpiling height at the fill bank shall be limited to a maximum of +40mPD.</li> <li>• Surface of outer slopes of the Fill Bank shall preferably be hydroseeded.</li> <li>• Stockpile of public fill shall be removed in a sequence to allow the outer hydroseeded to be removed later than other portions as far as practicable.</li> <li>• Casuarina equisetifolia were planted as buffer tree along the northern perimeter of the Site. The height of Casuarina equisetifolia was maintained at least 3m above soil level.</li> <li>• Lighting shall be set to minimise night-time glare.</li> </ul>		√		
<b>Waste Management</b>				
<b>Construction Waste Management</b>				
<ul style="list-style-type: none"> <li>• Relevant licence / permits for disposal of construction waste or excavated materials available for inspection.</li> <li>• Excavated material to be generated from construction works to be re-used on-site as far as practicable to reduce off-site disposal.</li> </ul>		√		





Environmental Protection Measures	Location	Implementation Status		
		Implemented	Partially implemented	Not implemented
• Chemical waste should be transported by a registered chemical waste collector to a facility licensed to receive chemical waste.	All areas	√		
• All generators, fuel and oil storage should be within bundle areas.	All areas	√		
• Oil leakage from machinery, vehicle and plant should be prevented.	All areas		√	
• In the event of chemical waste / dangerous goods / chemicals spillage or leakage, the procedures as outlined in the Spillage Response Plan should be followed.	All areas	√		
• The dangerous goods / chemical spillage or leakage procedures (including equipments) should be in place.	All areas	√		
<b>Good Site Practices</b>				
• Nomination of approved personnel, such as site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site.	All areas	√		
• Training of site personnel in proper waste management and chemical handling procedures should be provided.	All areas	√		
• 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.	All areas	√		
• Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	All areas	√		
• The Environmental Permit should be displaced conspicuously on site.	Site Entrance	√		
• Construction noise permits should be posted at site entrance or available for site inspection.	Site Entrance			√
• Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.	All areas	√		
• Chemical storage area provided with lock and located on sealed areas.	Chemical Storage Area	√		
• All chemicals should be placed at the banded area with adequate band capacity (>110% of largest tank).	Chemical Storage Area	√		
• Any unused chemicals or those with remaining functional capacity should be recycled.	All areas	√		
• Regular cleaning and maintenance programme for waste storage area, drainage systems, silt traps, sumps and oil interceptors.	All areas	√		
• 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.	All areas	√		
• A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be used, e.g. trip ticket system for chemical waste disposal. Quantities could be determined by weighing each load or other suitable methods.	All areas	√		
• A collection area should be provided where waste can be stored and loaded prior to removal from site. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light material. If an open area is unavoidable for the storage or loading/unloading of wastes, then the area should be banded and all the polluted surface run-off collected within this area should be diverted into wastewater treatment system.	All areas		√	
• Remove wastes in a timely manner.	All areas		√	



## **Appendix J**

### **Site General Layout plan**

NOTES:  
 1. ALL DIMENSIONS ARE IN METERS.  
 2. ALL DIMENSIONS ARE TO BE TAKEN FROM THE CENTERLINE OF THE ROAD OR FROM THE CENTERLINE OF THE CANAL OR FROM THE CENTERLINE OF THE RIVER.  
 3. ALL DIMENSIONS ARE TO BE TAKEN FROM THE CENTERLINE OF THE ROAD OR FROM THE CENTERLINE OF THE CANAL OR FROM THE CENTERLINE OF THE RIVER.

**LEGEND**

- SITE BOUNDARY
- - - - - EXISTING MARKING
- - - - - EXISTING FENCING
- - - - - EXISTING UTILITY
- - - - - EXISTING BUILDING WALL
- - - - - EXISTING WALL

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**HANDLING OF SURPLUS PUBLIC FILL**

Project No. **FM10056-16**

Scale: 1:1000

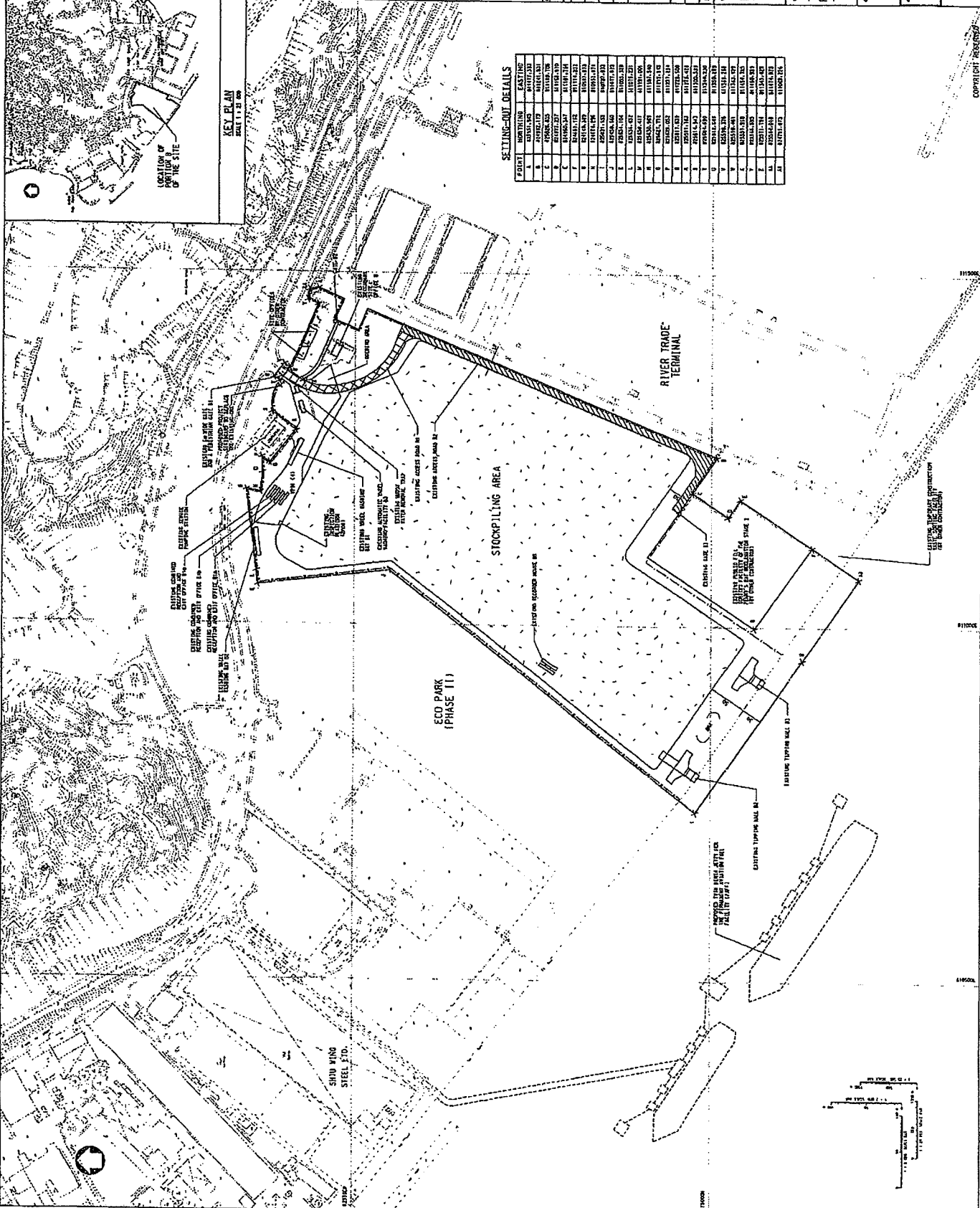
Sheet: 16 of 16

Project Name: **TUEN MUN AREA 38 FILL BANK - GENERAL LAYOUT**

Client: **CIVIL ENGINEERING DEPARTMENT**

Contract No. **CEPD/01/2007**

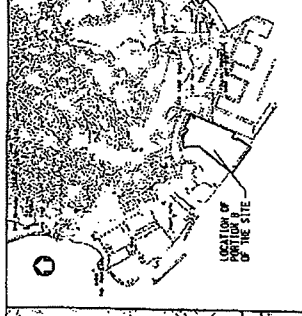
Contractor: **CEPD DEVELOPMENT DEPARTMENT**



**SETTING-OUT DETAILS**

POINT NO.	COORDINATES (Easting, Northing)	DESCRIPTION
1	478000.00, 115000.00	Corner of Eco Park
2	478000.00, 115000.00	Corner of Eco Park
3	478000.00, 115000.00	Corner of Eco Park
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96	478000.00, 115000.00	Corner of Eco Park
97	478000.00, 115000.00	Corner of Eco Park
98	478000.00, 115000.00	Corner of Eco Park
99	478000.00, 115000.00	Corner of Eco Park
100	478000.00, 115000.00	Corner of Eco Park

**KEY PLAN**  
 SCALE 1:1000



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## **Appendix K**

### **QA/QC Results of Laboratory Analysis**

## QA/QC Results of Laboratory Analysis of Total Suspended Solids

Sampling Date	QC Sample Analysis	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
03/05/12	107.8	FC1-S	0.0	FM2-M	105.5
	102.4	FM2-B	4.9	EM1-S	106.8
	98.8	EM1-M	5.1	EC2-B	89.7
05/05/12	106.4	FC1-S	4.9	FM2-M	108.6
	95.1	FM2-B	4.9	EM1-S	96.6
	1102.0	EM1-M	0.0	EC2-B	93.8
08/05/12	98.7	FC1-S	0.0	FM2-M	103.9
	97.3	FM2-B	0.0	EM1-S	98.3
	98.0	EM1-M	5.1	EC2-B	103.7
10/05/12	104.2	FC1-S	8.7	FM2-M	103.3
	105.2	FM2-B	0.0	EM1-S	103.7
	104.2	EM1-M	4.1	EC2-B	98.4
12/05/12	97.3	FC1-S	5.1	FM2-M	101.7
	103.2	FM2-B	5.1	EM1-S	100.0
	94.8	EM1-M	0.0	EC2-B	96.1
15/05/12	93.7	FC1-S	5.4	FM2-M	100.0
	97.9	FM2-B	0.0	EM1-S	94.6
	98.6	EM1-M	0.0	EC2-B	103.4
17/05/12	95.8	FC1-S	8.7	FM2-M	98.2
	106.2	FM2-B	4.4	EM1-S	102.9
	1060	EM1-M	4.4	EC2-B	103.0
19/05/12	95.6	FC1-S	0.0	FM2-M	101.9
	103.2	FM2-B	4.3	EM1-S	95.7
	93.8	EM1-M	8.7	EC2-B	98.0
22/05/12	105.3	FC1-S	0.0	FM2-M	94.5
	92.8	FM2-B	0.0	EM1-S	101.4
	103.7	EM1-M	0.0	EC2-B	96.7
24/05/12	93.4	FC1-S	0.0	FM2-M	96.3
	99.8	FM2-B	0.0	EM1-S	96.8
	93.4	EM1-M	8.7	EC2-B	89.1
26/05/12	100.6	FC1-S	2.0	FC1-S	93.3
	92.9	FM2-B	0.0	FM2-B	90.4
	99.8	EM1-M	0.0	EM1-M	103.0
29/05/12	101.7	FC1-S	0.0	FC1-S	91.5
	103.6	FM2-B	5.1	FM2-B	95.1
	92.6	EM1-M	5.1	EM1-M	84.3
31/05/12	102.8	FC1-S	0.0	FC1-S	101.6
	100.8	FM2-B	4.3	FM2-B	98.1
	93.8	EM1-M	4.3	EM1-M	100.0

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between -10% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.





## **Appendix M**

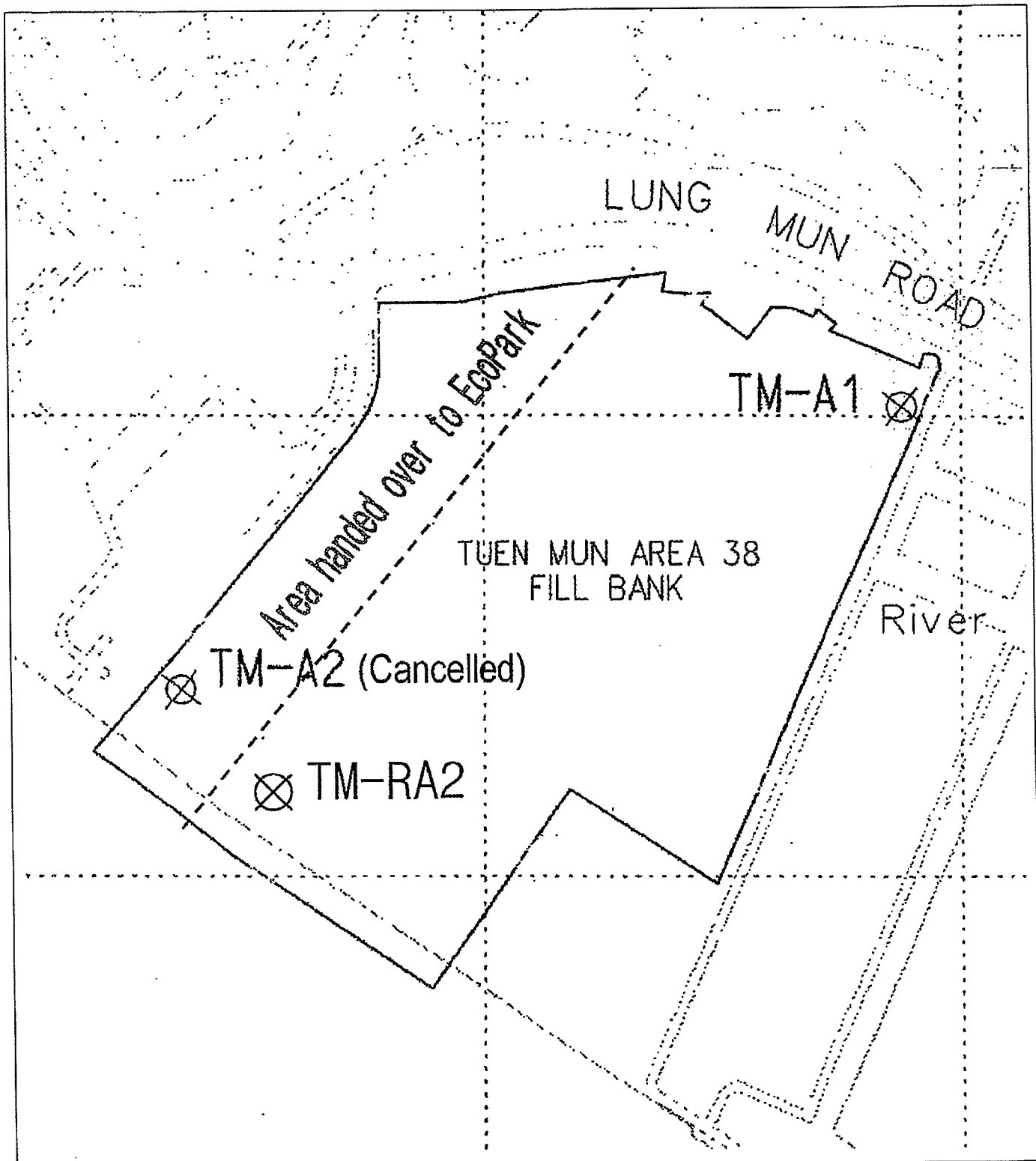
### **Complaint Log**

## Complaint Logs

Log Ref.	Location	Received Date	Details of Complaint	Investigation / Mitigation Action	Status
001	Lung Mun Road near Site Entrance	16 May 2012	Three complaints received in May 2012 was forwarded by the CEDD on 16 May 2012 from public against the mud / debris and dust found at Lung Mun Road from the site truck leaving the Tuen Mun Area 38 Fill Bank. The complainant complained that the dust and waste generated caused an environmental nuisance.	<p>Refer the CEDD preliminary investigation, the unsatisfactory condition at Lung Mun Road is due to the muddy water adhered on the wheels of the dump trucks leaving the site of Tuen Mun Fill Bank.</p> <p>Refer to the ET site investigation on 19 May 2012, silt and debris were found on Lung Mun Road although road sweeper was carried out road cleaning on Lung Mun Road. The Contractor was reminded to increase the road cleaning frequency and improve the cleaning efficiency of the road sweeper. The Contractor replied that additional mitigation measures to cleanup the mud/debris adhered on the wheels of site truck, such as installation of steel mesh and GRP grating after wheel washing facilities, will be implemented, and additional road sweeper and water spraying will be arranged if necessary.</p> <p>During the ET follow-up investigation on 24 May 2012, the condition was found improved.</p> <p><b>Details of Action(s) Taken by the Contactor</b></p> <ol style="list-style-type: none"> <li>Regular water spraying by water lorries is provided for dust suppression on Lung Mun Road of the Fill Bank (at least three times during fine day and ten times during rainy day); (Refer to attachment 2)</li> <li>Regular cleaning on Lung Mun Road by road sweeper to remove mud and gravel is arranged four times on each working day;</li> <li>Mist spraying systems and automatic wheel washing facilities at the site entrance are operated properly;</li> <li>Site vehicles are washed to remove any dusty materials from their bodies and wheels at the entrance of work site before leaving;</li> <li>Steel mesh and GRP grating are installed after wheel washing facilities to remove the silt/mud on their wheels;</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> </ol>	Closed

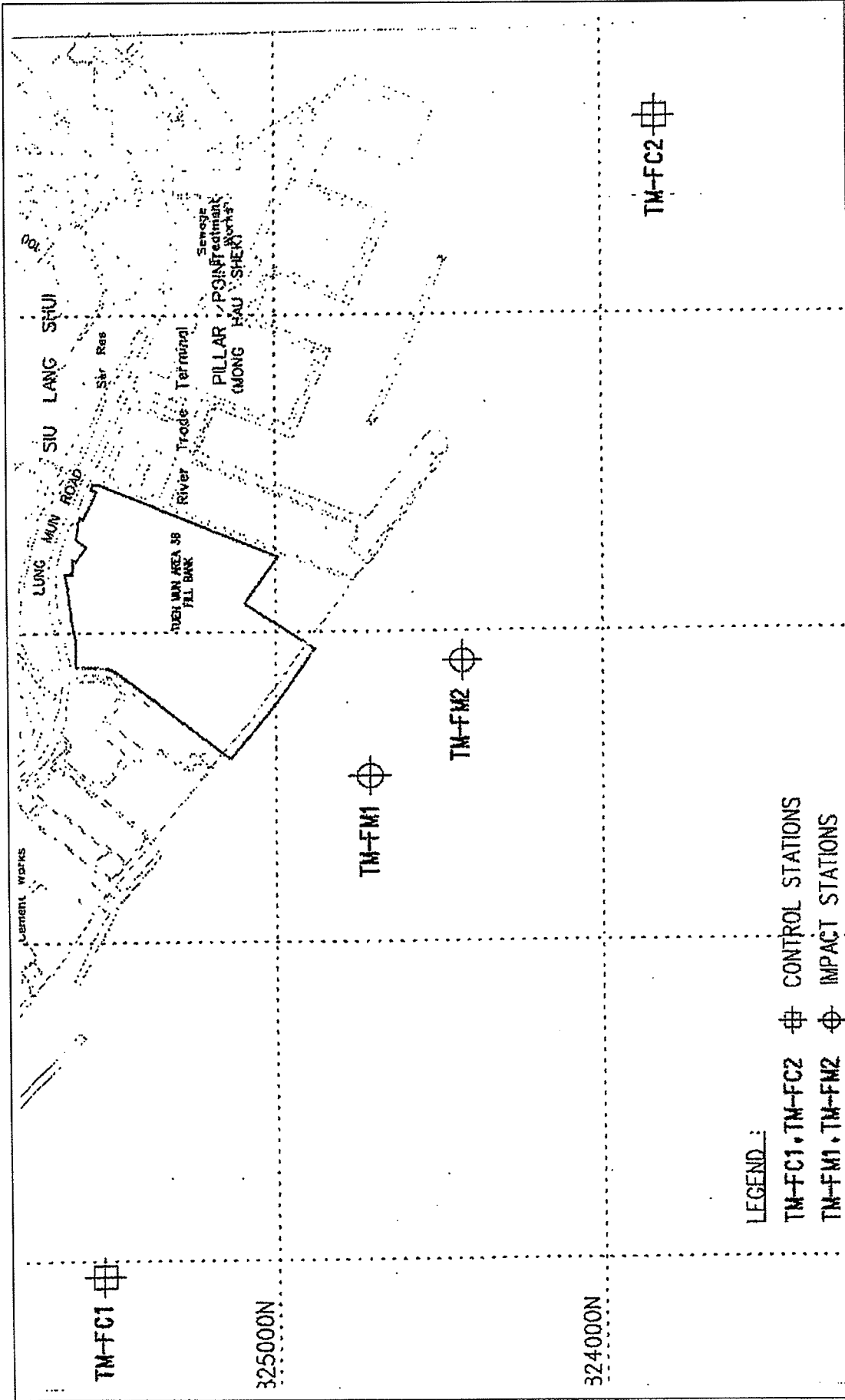


## Figures



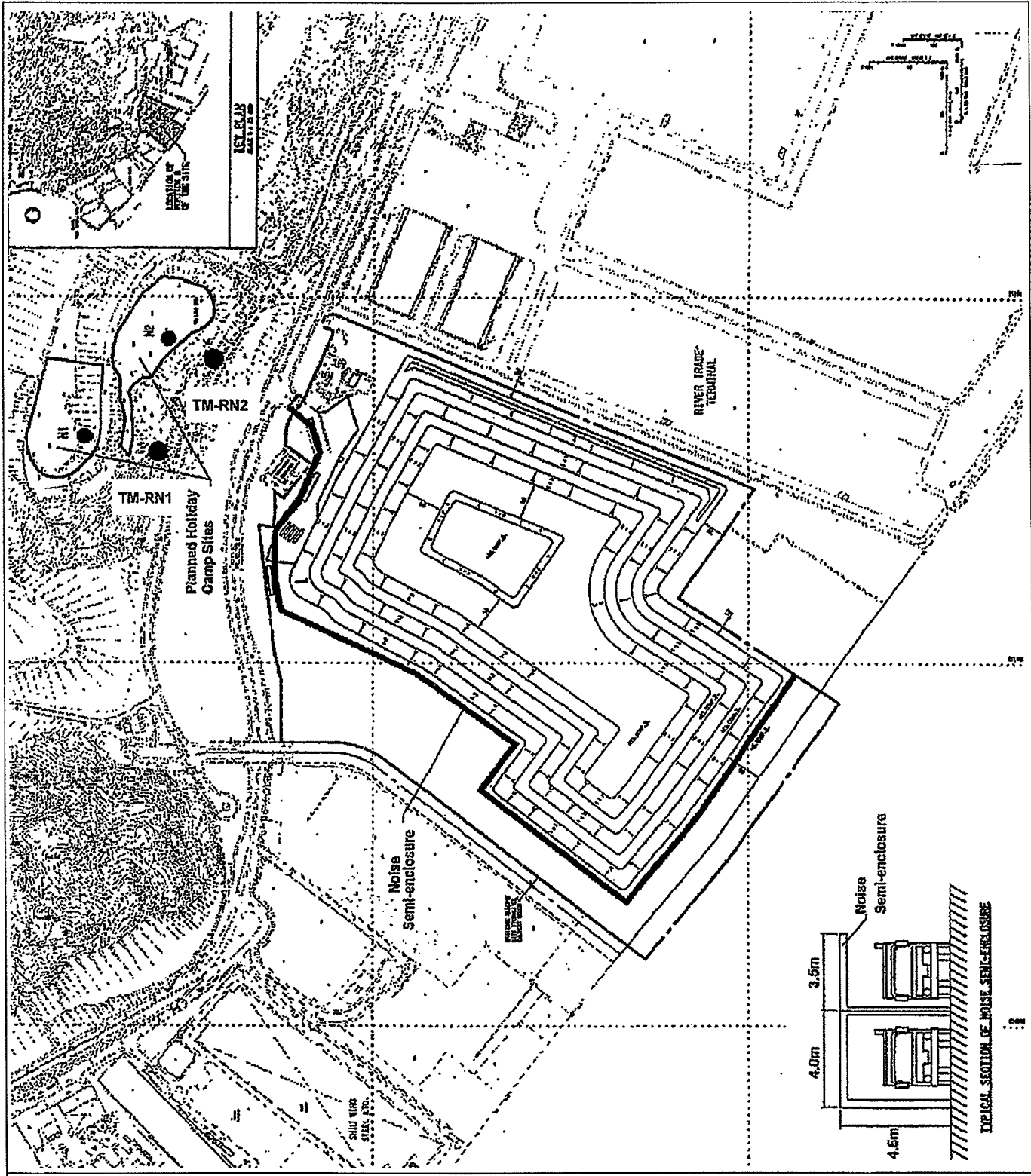
Contract No. CV/2009/02  
 Handling of Surplus Public Fill

Figure 1  
 Locations of Air Quality Monitoring Stations –  
 Tuen Mun Area 38 Fill Bank



Contract No. CV/2009/02  
 Handling of Surplus Public Fill

Figure 2  
 Locations of Water Quality Monitoring Station –  
 Tuen Mun Area 38 Fill Bank



Contract No. CV/2009/02  
 Handling of Surplus Public Fill

Figure 3  
 Locations of Noise Quality Monitoring Stations –  
 Tuen Mun Area 38 Fill Bank



東業德勤測試顧問有限公司  
 ETS-TESTCONSULT LIMITED