

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

8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan Street, Fotan, Hong Kong

Tel : 2695 8318

E-mail : etl@ets-testconsult.com

Fax : 2695 3944

Web site : www.ets-testconsult.com

**TEST REPORT**

**China Harbour – China State Joint Venture**

**CONTRACT NO. CV/2009/02**

**HANDLING OF SURPLUS PUBLIC FILL**

**TSEUNG KWAN O AREA 137 FILL BANK**

**MONTHLY EM&A REPORT NO.46**

**(SEPTEMBER 2013)**

Prepared by:

LAW, Sau Yee  
Senior Environmental Officer

Checked by:

LAU, Chi Leung  
Environmental Team Leader

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By E-mail and Fax No.: 2695 3944

ETS-Testconsult Limited  
8/F, Block B  
Veristrong Industrial Centre  
34-36 Au Pui Wan Street  
Fo Tan, Hong Kong

Attention: Mr. C. L. Lau

Dear Mr. Lau,

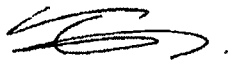
**Re: Contract No. CV/2009/02  
Handling of Surplus Public Fill – Tseung Kwan O Area 137 Fill Bank  
Monthly EM&A Report No. 46 for September 2013**

Reference is made to your submission of the draft Monthly EM&A Report for September 2013 for the captioned by E-mail on 10 October 2013.

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 Jason Lai or the undersigned should you have any queries.

Yours sincerely,



Tony Cheng  
Independent Environmental Checker

c.c. CEDD  
CHCSJV

Attn: Mr. Panda Liu / Mr. Jason Wong  
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.46 was prepared by ETS-Testconsult Ltd (ET) for the "Contract No: CV/2009/02 – Handling of Surplus Public Fill – Tseung Kwan O Area 137 Fill Bank" (The Project).

This report documented the findings of EM&A Works conducted during the operation phase of Fill Bank at Tseung Kwan O Area 137 in September 2013.

### **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
- Delivery of public fill received at the Chai Wan Public Fill Barging Point to TKO fill bank
- Operation of the tipping hall (A2 & A3)
- Operation at the queuing area for public truck lorries

### **Environmental Monitoring Progress**

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

- Noise Monitoring (Day-time): 1 Occasion at 1 designated location
- 24-hour TSP Monitoring: 5 Occasions at 2 designated locations
- 1-hour TSP Monitoring: 16 Occasions at 2 designated locations
- Marine Water Quality Monitoring: 12 Occasions at 2 designated locations
- Weekly-site inspection: 4 Occasions

### **Noise Monitoring**

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

### **Air Monitoring**

Since the old CREO was closed, dust monitoring station TKO-A2 located at old Combined Reception and Exit Office (CREO) was relocated to the new dust monitoring station TKO-A2a at the new CREO under the proposal by ET, approval by the ER and agreement by IC(E) and effective on 01 February 2011.

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

### **Marine Water Quality Monitoring**

Marine water quality monitoring on 23 September 2013 (Mid-Flood) was cancelled due to bad weather (Typhoon Signal No.8).

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

### **Site Inspection**

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

<u>Concerned Parties</u>	<u>Dates of Audit / Inspection</u>
ET Weekly site inspection	04, 11, 17 and 25 September 2013
IEC site inspection	11 and 17 September 2013

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.

### **Landscape and Visual**

The germination rate on the panels was satisfactory in this reporting month. The Contractor should properly maintain the hydroseeded panels.

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

No complaints and no notification of summons or successful prosecutions with respect to environmental issues were received in this reporting 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:

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



## 1.0 INTRODUCTION

China Harbour – 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 – Tseung Kwan O Area 137 Fill Bank" (The Project).

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

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

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

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

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

This report documented the findings of EM&A Works conducted during the operation phase of Fill Bank at Tseung Kwan O Area 137 in September 2013.

## 2.0 PROJECT INFORMATION

### 2.1 Scope of the Project

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

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



## 2.2 Site Description

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

## 2.3 Work Programme

Details of work programme are shown in Appendix I G.

## 2.4 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 I A.

## 2.5 Contact Details of Key Personnel

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

Table 2.1 Contact Details of Key Personnel

Organization	Name of Key Staff	Project Role	Tel. No.	Fax No.
CEDD	Mr. Lawrence Ng Mr. Liu Chi Yuen Mr. Liu Kai Chun Mr. Wong Kai Chung Mr. C T Chock	Engineer's Representative	2762 5545	2714 0113
IEC (Materialab) *	Mr Joseph Poon	IEC	2450 8238	2450 6138
IEC (ENVIRON) *	Mr Tony Cheng	IEC	3465 2888	3465 2899
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 WORK 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
- Delivery of public fill received at the Chai Wan Public Fill Barging Point to TKO fill bank
- Operation of the tipping hall (A1, A2 & A3)
- Operation at the queuing area for public truck lorries

## 4.0 AIR QUALITY MONITORING

### 4.1 Monitoring Requirement

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

### 4.2 Monitoring Equipment

Both 1-hour and 24-hour TSP air quality monitoring was performed using a GMWS2310 High Volume Air Sampler (HVS) located at each of the designated monitoring station. Table 4.1 summarizes the equipment used in the air quality monitoring programme. A copy of the calibration certificates for the HVS and calibrator are attached in Appendix I 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>Once every six days</i>
<i>1-hr TSP</i>	<i>1 hr</i>	<i>Three times per day every six days</i>

#### 4.4 Monitoring Locations

Since the old CREO was closed, dust monitoring station TKO-A2 located at old Combined Reception and Exit Office (CREO) was relocated to the new dust monitoring station TKO-A2a at the new CREO under the proposal by ET, approval by the ER and agreement by IC(E) and effective on 01 February 2011.

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

Table 4.3 Air quality monitoring locations

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

#### 4.5 Monitoring Methodology

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

##### Instrumentation

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

##### Installation

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

##### Operation/Analytical Procedures

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

- Prior to the commencement of the dust sampling, the flow rate of the high volume sampler was properly set (between 0.6m<sup>3</sup>/min and 1.7m<sup>3</sup>/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50. The flow rate was indicated on the flow rate chart.
- For TSP sampling, fiberglass filters (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 or 24 hours. Information was recorded on the record sheet, which included the starting time, the weather condition and the filter number (the initial weight of the filter paper can be found out by using the filter number.).
- After sampling, the filter was transferred from the filter holder of the HVS to a sealed plastic bag and sent to the laboratory for weighting. The elapsed time was also recoded.
- Before weighting, all filters were equilibrated in a desiccator for 24 hour with the temperature of  $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$  and the relative humidity (RH)  $<50\% \pm 5\%$ .
- All measurement procedures in Section 2.3 of the EM&A Manual were followed during the reporting month.

#### Maintenance & Calibration

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

#### **Wind Data Monitoring**

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

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

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

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

Monitoring Location	24-hr TSP ( $\mu\text{g}/\text{m}^3$ )		1-hr TSP ( $\mu\text{g}/\text{m}^3$ )	
	Action Level	Limit Level	Action Level	Limit Level
TKO-A1	210	260	376	500
TKO-A2 & TKO-A2a *	210	260	376	500

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

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

Please refer to Appendix I F for details.

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

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

Monitoring data of both 1-hour and 24-hour TSP monitoring carried out in this reporting month are summarized in Appendix I B2. Graphical presentation of 1-hour and 24-hour TSP monitoring results for the reporting month is shown in Appendix I B3. Wind data included wind speed and wind direction was extracted from Tseung Kwan O Station of Hong Kong Observatory during this reporting month and is presented in Appendix I E. Table 4.5 summarizes 1-hr TSP and 24-hr TSP monitoring results.



Table 4.5 Summary of 1-hr TSP and 24-hr TSP Monitoring Results

Air quality monitoring Stations	Location	Monitoring Period						
		24-hr TSP			1-hr TSP			
		Date	Result ( $\mu\text{g}/\text{m}^3$ )	Exceedance #	Date	Start Time	Result ( $\mu\text{g}/\text{m}^3$ )	Exceedance #
TKO-A1	Site Egress	06/09/13	116	X	02/09/13	13:35	286	X
					02/09/13	14:40	260	X
					04/09/13	10:15	247	X
		12/09/13	118	X	06/09/13	10:10	211	X
					09/09/13	08:25	225	X
					11/09/13	09:15	247	X
		18/09/13	125	X	13/09/13	13:00	260	X
					13/09/13	14:05	250	X
					16/09/13	13:40	285	X
		24/09/13	134	X	18/09/13	08:55	247	X
					23/09/13	14:20	217	X
					23/09/13	15:25	239	X
		30/09/13	138	X	25/09/13	09:30	228	X
					25/09/13	10:35	238	X
					27/09/13	11:36	233	X
---	---	---	30/09/13	13:20	230	X		
---	---	---	---	---	---	---		
TKO-A2a	New CREO	06/09/13	97	X	02/09/13	13:40	198	X
					02/09/13	14:45	204	X
					04/09/13	10:20	212	X
		12/09/13	106	X	06/09/13	10:15	185	X
					09/09/13	08:30	173	X
					11/09/13	09:10	188	X
		18/09/13	111	X	13/09/13	13:00	199	X
					13/09/13	14:10	212	X
					16/09/13	13:45	235	X
		24/09/13	125	X	18/09/13	09:00	205	X
					23/09/13	14:25	185	X
					23/09/13	15:30	212	X
		30/09/13	121	X	25/09/13	09:35	209	X
					25/09/13	10:40	205	X
					27/09/13	11:40	197	X
---	---	---	30/09/13	13:25	180	X		
---	---	---	---	---	---	---		
---	---	---	---	---	---	---		

Remark (\*): L=Limit Level exceedance, A=Action Level exceedance and X=not an exceedance

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

#### 4.8.2 Observation

Generally, the Contractor implemented sufficient dust mitigation measures, including operation of the mist spraying systems at the CEDD Combined Reception Office and the site egress area, wheel washing facilities, road dampening by water bowsers and automatic water sprinklers on the main haul roads. Furthermore, hydroseeded slopes on the stockpiling areas was maintained properly in order to prevent dust generation from wind erosion of the exposed surfaces. Other dust sources near TKO Area 137 also included operation of the C&DMSF at the PBR2 Project site, the temporary C&DMSF at Portion K and dumping activities at the SENT Landfill.



## 5.0 Noise Monitoring

### 5.1 Monitoring Requirements

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

### 5.2 Monitoring Equipment

An Integrating Sound Level Meter was used for noise monitoring. It was a Type 1 sound level meter capable of giving a continuous readout of the noise level reading including equivalent continuous sound pressure level ( $L_{eq}$ ) and percentile sound pressure level ( $L_x$ ). It complies with International Electro Technical Commission Publications 651:1979 (Type1) and 804:1985 (Type1), and speed in m/s was used to monitor the wind speed.

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

Table 5.1 Noise Monitoring Equipment

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

### 5.3 Monitoring Parameters, Duration and Frequency

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

Table 5.2 Duration, Frequencies and Parameters of Noise Monitoring

<i>Time 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>Once per month</i>

### 5.4 Monitoring Locations

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

Table 5.3 Noise Monitoring Locations

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

### 5.5 Monitoring Procedures and Calibration Details

#### Operation/Analysis Procedures

- The Sound Level Meter was set on a tripod at a height of 1.2m above the ground.
- For free field measurement, the meter was positioned away from any nearby reflective surfaces.
- The battery condition was checked to ensure the correct functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
  - *Frequency weighting: A*
  - *Time weighting : Fast*
  - *Time measurement : 30 mins*
- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94 dB at 1000HZ. If the difference in the calibration level before and after measurement was more than 1dB(A), the measurement would be considered invalid and repeat measurement would be required after re-calibration or repair of the equipment.
- The wind speed was frequently checked with a portable wind meter.





- During the monitoring period, the Leq, L10 and L90 were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- Correction factor of +3dB(A) should be made to the free Field measurements.
- Noise monitoring would be cancelled in the presence of fog, rain, wind with a steady speed exceeding 5m/s, or wind gusts exceeding 10m/s.

Maintenance and Calibration

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

**5.6 Action and Limit Levels**

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

Table 5.4 Action and Limit Levels for noise monitoring

Time Period	Time Period	Action	Limit
Normal hours	0700-1900 hrs on normal weekdays	When one documented complaint is received	75 dB(A)

**5.7 Event-Action Plans**

Please refer to the Appendix I F for details.

**5.8 Results and Observation**

**5.8.1 Results**

Only Day-time noise monitoring was carried out at monitoring station TKO-N1 in this reporting month. The detail of the noise monitoring is provided in Appendix I C2. Graphical presentation of the monitoring result for the reporting month is shown in Appendix I C3. A summary of the monitoring result is presented in Table 5.5.

Table 5.5 Summary of Impact Noise Level

Date	Start Sampling Time (hh:mm)	Noise Level dB (A) *		
		Leq(30min)	L10	L90
11/09/13	09:20	68.5	70.9	62.3

Remark: (\*): Correction factor of +3dB(A) was added to the measured results due to the free Field measurements.

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 monitoring.

**5.8.2 Observation**

The major noise source during the monitoring event was the dump truck traffic. Operation of the Fill Bank was from 08:00 to 21:00 from Monday to Sunday in the reporting month. Whereas the operation hours for barge activities in the TKO Basin was from 08:00 to 21:00. The monitoring result complied with the noise limit of 75dB(A).

**6.0 MARINE WATER QUALITY MONITORING**

**6.1 Monitoring Requirements**

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



## 6.2 Monitoring Locations

For the Reclamation Project, there were 4 Designated Monitoring Stations and 2 Designated Control Stations specified in the EM&A Manual. Upon the completion of the monitoring programme under Stage 2 reclamation works, the ET started monitoring events at the impact station M4 and the control station C1 from 18 May 2004 onwards. Figure 1 shows the location of the marine water quality monitoring stations. Table 6.1 describes the locations of the monitoring stations in the reporting month.

Table 6.1 Locations of Marine Water Monitoring Stations

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

## 6.3 Monitoring Parameters

Monitoring of the marine water quality parameters are listed in Table 6.2.

Table 6.2 Marine Water Quality Monitoring Parameters

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

## 6.4 Monitoring Frequency

The monitoring frequency of the marine water monitoring is summarized in Table 6.3.

Table 6.3 Monitoring frequency of the marine water

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

## 6.5 Monitoring Methodology and Equipment Used

### For Location of the monitoring stations

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

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

### For Water Depth measurement

#### Echo Sounder

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

### For In-situ Water Quality Measurement

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



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

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

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

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

**Turbidity Measurement Instrument**

A portable and weatherproof turbidity meter (HACH model 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. If the water depth is less than 6 m, the mid-depth station shall be omitted and if the water depth is below 3 m, only the mid depth station shall be monitored.

**Water Sampler**

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

**Water Container**

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

The summary of testing method of testing parameter as recommended by EIA or required by EPD, with the QA/QC results in accordance with the requirement of HOKLAS or international accredited scheme is shown in Table 6.4.

Table 6.4 Summary of testing procedures

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

**In-situ measurement**

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

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

Table 6.5 shows the equipment used for in-situ monitoring of water quality. The calibration certificates are attached in Appendix I D1.



Table 6.5 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 Pro2030	31/07/13	30/10/13	ET/EW/008/004 *
Turbidity	HACH Model 2100Q Turbid Meter	09/07/13	08/10/13	ET/0505/009 *
Water Depth	Speedtech SM-5	-----	-----	ET/EW/002/06

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

### 6.6 Action and Limit Level

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

Table 6.6 Water Quality Action and Limit Levels

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

### 6.7 Event and Action Plan

Please refer to the Appendix I F for details.

### 6.8 Monitoring Duration and Period in this reporting month

Marine water quality monitoring on 23 September 2013 (Mid-Flood) was cancelled due to bad weather (Typhoon Signal No.8).

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

Table 6.7 Time Schedule of Impact Marine Water Quality Monitoring

September 2013						
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 ▼					

Remarks: (▼) = Marine water quality monitoring carried out by ET.  
(▽) = Marine water quality monitoring on 23 September 2013 (Mid-Flood) was cancelled due to bad weather (Typhoon Signal No.8).

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



## 6.9 Marine Water Quality Monitoring Results

The impact water quality measurement results are detailed in Appendix I D2. Appendix I D3 presents the water quality monitoring data and graphical presentations of monitoring results respectively.

The summary of marine water quality exceedances is shown in Table 6.8.

Table 6.8 Summary of Impact Marine Water Quality Exceedances in this reporting month

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

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

## 7.0 IEC SITE AUDIT AND WEEKLY ET SITE INSPECTIONS

### 7.1 IEC Site Audit

7.1.1 During this reporting period, the IEC team conducted two independent site audits of the Contract CVI/2009/02 site (TKO Area 137 Fill Bank).

7.1.2 Findings of the site audit have been recorded on site checklists, copies of which were submitted to the Contractor for their further action as appropriate, and to the Client for their records. Key issues were highlighted to the Contractor's representative at the completion of each site audit to ensure that they were aware of the problem(s) identified and where necessary, to take immediate corrective actions. A copy of the completed checklists are appended to this report in Appendix I H.

Table 7.1 Dates of IEC Site Audits in this reporting month

Date of Audit	Work Period	Site Audit Checklist Submitted Under IEC's Ref No.
11 September 2013	Operation of TKO Area 137 Fill Bank	CEDPFRSFEM00_130911_TKOFB
17 September 2013		CEDPFRSFEM00_130917_TKOFB

7.1.3 The major findings recorded during the site audits conducted during this reporting period are summarized below. Full details are provided in the site audit checklists presented in Appendix I H.

Table 7.2 Key Findings of IEC Site Audits in this reporting month

Date	Key Findings	Action(s) Taken recommended by IEC	Action(s) Taken by the Contractor during the IEC audit	Rectification Status by IEC
11 September 2013	Oil stain was found on the bare ground at workshop. (Previous item)	The Contractor was reminded to clean up the oil stain properly.	Oil stain had been cleaned.	Closed
17 September 2013	No new finding was observed during the IEC site audit.			



## 7.2 Weekly ET Site Inspections

Weekly ET site inspections were carried out by ET to monitor the timely implementation of proper environmental pollution control and mitigation measures for the Project. In this reporting month, four weekly site inspections were conducted (04, 11, 17 and 25 September 2013).

Table 7.3 Key Findings of Weekly ET Site Audits in this reporting month

Date	Key Findings	Action(s) Taken recommended by ET	Action(s) Taken by the Contractor during the ET weekly site audit	Rectification Status by ET
04 September 2013	Chemical waste stored in the chemical waste storage area at workshop were found with chemical labels. (Previous item)	To provide appropriate chemical waste labels for the chemical wastes (e.g. cleaning fluids, solvents, lubrication oil and fuel) according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.	---	Follow-up
	Idle tyres were found discarded near workshop. (New item)	To store the tyres in an appropriate storage area or cover them properly.	---	Follow-up
11 September 2013	Chemical waste stored in the chemical waste storage area at workshop were found with chemical labels. (Previous item)	To provide appropriate chemical waste labels for the chemical wastes (e.g. cleaning fluids, solvents, lubrication oil and fuel) according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.	Chemical labels were provided for the chemical wastes stored in the chemical waste storage area at workshop.	Closed
	Idle tyres were found discarded near workshop. (Previous item)	To store the tyres in an appropriate storage area or cover them properly.	Idle tyres discarded near workshop were covered properly.	Closed
17 September 2013	No new finding was observed during the weekly ET site audit.			
25 September 2013	Enclosure of tipping hall No.2 and 3 were found damaged. (New item)	To repair the damaged parts of tipping halls as soon as possible.	---	Follow-up

## 7.3 Review of Environmental Monitoring Procedures

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

### Air Quality Monitoring

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

### Noise Monitoring

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

### Water Quality Monitoring

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



#### 7.4 Assessment of Environmental Monitoring Results

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

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

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

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

The Contractor usually disposed of non-inert waste, including general refuse and materials segregated from the existing stockpiles, to SENT landfill. Table 7.4 summarizes data on offsite waste disposal in this reporting month.

Table 7.4 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	600 kg	Collected by licensed collector

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

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

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

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

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

#### 8.0 Status of Environmental Licensing and Permitting

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



Table 8.1 Summary of environmental licensing and permit status

Description	Permit No.	Valid Period		Section
		From	To	
Amended Environmental Permit	EP-134/2002/K	04/02/13	---	<ul style="list-style-type: none"> <li>▪ Site clearance</li> <li>▪ Construction of a temporary storm water system</li> <li>▪ Stockpiling of 6 million m3 of public fill</li> <li>▪ Setting up two barging points for transporting the stockpiled public fill by barges</li> <li>▪ Setting up a temporary barging point at the existing Explosive Off-loading Barging Point for the period of May 2004 to December 2004 for transporting the stockpiled public fill by barge</li> <li>▪ Construction of operation of a construction and Demolition Material Sorting Facility (C&amp;DMSF)</li> <li>▪ Setting up a Construction and Demolition Material Crushing Facility at the TKO Basin</li> <li>▪ Remove the temporary fill bank</li> </ul>
Chemical Waste Producer	5213-839-C3577-02	17/12/09	---	Spent Lubricating Oil, Spent Flammable Liquid, Spent Battery containing Heavy Metals and Surplus Paint
Effluent Discharge License	WT00005777-2010	12/05/10	31/05/15	Wastewater arising from the wheel washing bay, Sedimentation Tank & Desilting Tank
Marine Dumping Permit	EP/MD/14-023	01/07/13	30/09/13	Approval for dumping 2,500,000 tons (approximately equal to 1,388,888 cu.m. bulked quantity) of Public Fill (Reclamation Materials) from Tseung Kwan O Area 137 Fill Bank and Tuen Mun Area 38 Fill Bank to designated dumping area at Guanghaiwan of Taishan

## 9.0 ENVIRONMENTAL NON-CONFORMANCE

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

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

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

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

### 9.2 Summary of Environmental Complaints

No complaint was received in this reporting month.

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

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





## 10.0 IMPLEMENTATION STATUS

### 10.1 Implementation Status of Environmental Mitigation Measures

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

### 10.2 Implementation Status of Event and Action Plan

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

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

No complaint, notification of summon and successful prosecution was received in this reporting month. A summary of environmental complaints, notifications of summons and successful prosecutions was given in Table 10.1 and further details of the complaint could be found in the Complaint Log (Appendix I M).

Table 10.1 Summary of Environmental Complaints and Prosecutions

<i>Complaints logged</i>		<i>Summons served</i>		<i>Successful prosecution received</i>	
<i>September 2013</i>	<i>Cumulative</i>	<i>September 2013</i>	<i>Cumulative</i>	<i>September 2013</i>	<i>Cumulative</i>
0	5	0	0	0	0

## 11.0 CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

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

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

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

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

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

According to the ET weekly site inspections and IEC site audits 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.

### 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 bowlers;
- Erect adequate speed limit signs to advise the truck drivers of the speed limit;
- Operate mist spraying systems and automatic water sprinklers in the Fill Bank;
- Implement the dust mitigation measures for the site activities;
- Designate proper haul roads to ensure effective water spraying; and
- Ensure all vehicles to be washed before leaving the site egress by provision, operation and maintenance of automatic wheel washing facilities.

#### **Noise**

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

#### **Water Quality**

- Maintain the drainage system, including the trapezoidal channels, permanent desilting chambers, DP3 & DP4 regularly;
- Operate and maintain the silt curtains regularly;
- Operate the cleaning vessel within the TKO Basin regularly;
- Provide proper treatment for the oil discharge from the area near air monitoring station TKO-A1;
- Clean up the fill material on the concrete pavement at BHA frequently; and
- Remove the stagnant water or provide approved pesticides for the stagnant water in the permanent desilting chambers, if any.

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

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

#### **Landscape and Visual**

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

## **12.0 FUTURE KEY ISSUES**

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

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

- *Removal & delivery of public fill stockpiled material to Mainland*
- *Operation of the road water lorries and the road sweeper*
- *Delivery of public fill received at the Chai Wan Public Fill Barging Point to TKO fill bank*
- *Operation and maintenance of the tipping hall (A2 & A3)*
- *Operation of the queuing area for public truck lorries*



## 12.2 Key Issues for the Coming Month

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

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

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

#### Air Quality Impact

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

#### Noise

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

#### Water Quality Impact

- To maintain the drainage system in the Fill Bank;
- To ensure the cleanliness of oil interceptor bypass tanks and all the drainage channels;
- To maintain the existing silt trap to ensure good efficiency of wheel wash facilities;
- To repair, inspect and maintain the silt curtains regularly;
- To provide covers for the drip trays to avoid stagnant water pond due to rainfall;
- To provide proper treatment for oily water discharged from the area around air monitoring station TKO-A1;
- To deploy a cleaning vessel to remove floating rubbish in the TKO Basin;
- To clean up the concrete paved area at Portion I every night to avoid fill materials from being washed into the sea; and
- To avoid any stagnant water or provide insecticide to avoid mosquito breeding in the Fill Bank.

#### Chemical and Waste Management

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

## 12.3 Monitoring Schedule for the Coming Month

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

- END OF REPORT -



## Appendix I

### A

## Organization Chart and Lines of Communication

**JOINT VENTURE MANAGEMENT BOARD**  
**CHEN Fan Jian, WANG Yan, PAN Shu Jie, George CHAN**

- Project Director: **Yang Min**
- Project Manager: **Shum Hong Sang**
- Deputy Project Manager: **Zhou Chang Ying**

OA Team  
**Allan D Herrera**

Health & Safety Manager  
**S. L. So, Lawrence**

Environmental Engineer  
**Jimmy K.W. Ng**

Environmental Officer  
**Tang Hoi Fung**

Environmental Supervisor(s)  
**Sung Sau Yang**

Environmental Team Leader  
**C.L. Lau**

Environmental Team  
**ETS - Testconsult Ltd.**

Safety Advisor  
**John Lau, Chi Wing**

Contractor's Agent  
**Lok Wah Fung**

Project Representative (Mainland)  
**Yang Min**

Site Representative (Mainland)  
**Zhou Cheng Yong**

Assistant Project Manager (Mainland)  
**Lian Xue Bao**

Administration Manager  
**Ms. Becky Chan**  
**Sau Ngor**

Commercial Manager  
**K.S. Lo, Tom**  
**O.H. Chau, Irene**

Commercial  
**O.S. Michael Chan**

Administration  
**Ms. Eling Yu**

Site Clerk  
**Ms. Cindy Leung**

Amah  
**Ms. Cheung**

Amah  
**Ms. Huang**

Driver  
**Mr. Wong**

Driver  
**Mr. Tse**

Labour Relations Officer  
**To Ming Chu**

Contractor's Labour Officer  
**Chan Ho Ming**

Commercial  
**O.S. Michael Chan**

Commercial  
**O.S. Michael Chan**

OS Assistant  
**Cathy Chan**

OS Assistant  
**Cathy Chan**

OS Assistant  
**Cathy Chan**

OS Assistant  
**Cathy Chan**

OS Assistant  
**Cathy Chan**

OS Assistant  
**Cathy Chan**

**CONSTRUCTION & OPERATION TEAM**

Senior Planning Engineer  
**Stan CHEUNG**

Operation Manager (RO & CH)  
**Simon Pan**

Graduate Engineer  
**Jack Chan**

Operation Manager (IM & TM)  
**Zhou Chang Ying**

Assistant Operation Manager  
**Rang Ror Fung**

Graduate Engineer  
**Alan Lo**

Project Engineer  
**Tommy Chu**

Project Engineer  
**Tommy Chu**

Chief Surveyor  
**S. P. Kwok**

Survey Team (TKO & OB)  
**Wan Chit**

Survey Team (TM & MW)  
**Wan Chit**

Supervisor  
**Wan Chit**

Supervisor  
**Wan Chit**

Supervisor  
**Wan Chit**

Supervisor  
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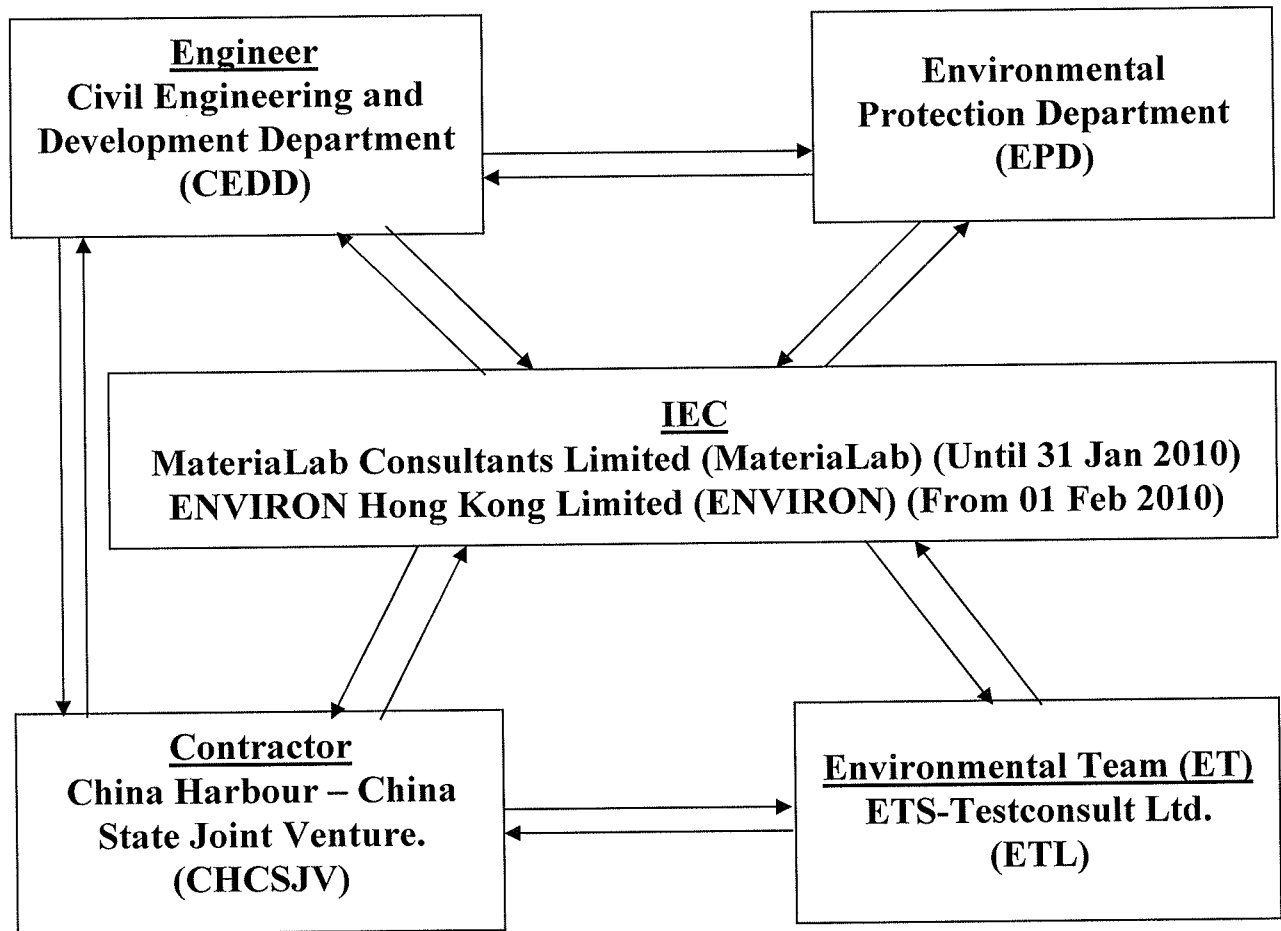
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# Lines of Communication





## **Appendix I**

### **B1**

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



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

8/F, Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan Street, Fotan, Hong Kong  
Tel : 2695 8318 E-mail : etl@ets-testconsult.com  
Fax : 2695 3944 Web site : www.ets-testconsult.com

**TEST REPORT**

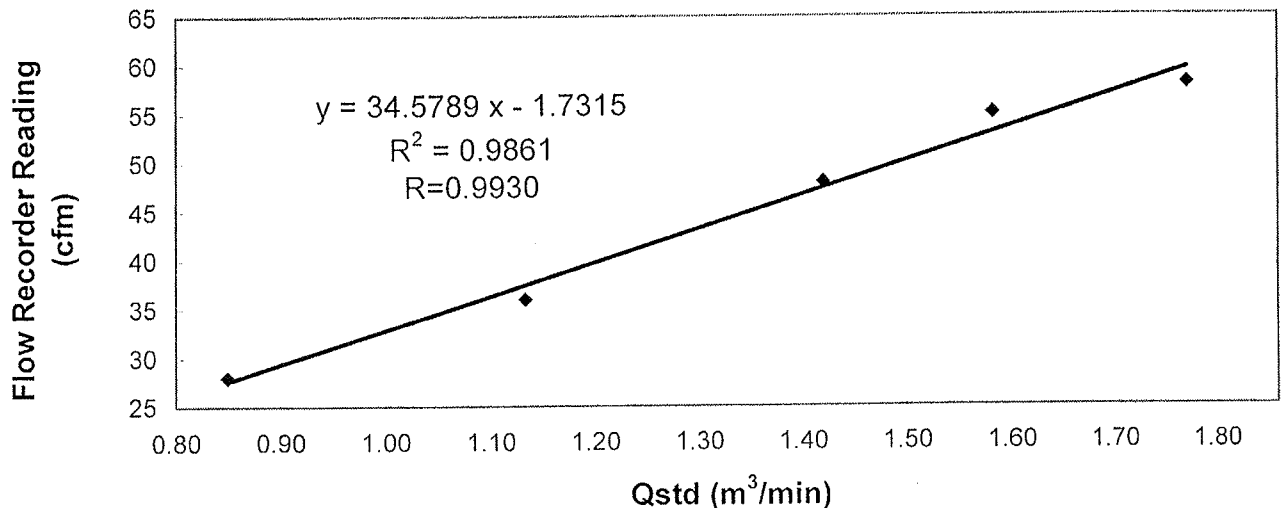
**Calibration Report  
of  
High Volume Air Sampler**

**Manufacturer** : Graseby GMW **Date of Calibration** : 08 July 2013  
**Serial No.** : 10581 ( ET / EA / 003 / 22 ) **Calibration Due Date** : 07 September 2013  
**Method** : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual

**Results** :

Flow recorder reading (cfm)	58	55	48	36	28
Qstd (Actual flow rate, m <sup>3</sup> /min)	1.77	1.58	1.42	1.13	0.85
Pressure :	757.56	mm Hg	Temp. :	304	K

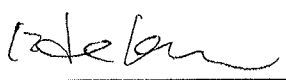
**Sampler 10581 Calibration Curve  
Site: Tseung Kwan O A-1**



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

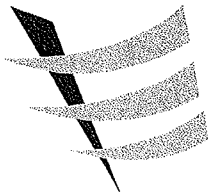
The high volume sampler complies\* / does-not-comply\* with the specified requirements and is deemed acceptable\* / unacceptable\* for use.

Calibrated by :   
KWAN, King Ming  
(Senior Site Technician)

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







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

8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan Street, Fotan, Hong Kong  
Tel : 2695 8318 E-mail : etl@ets-testconsult.com  
Fax : 2695 3944 Web site : www.ets-testconsult.com

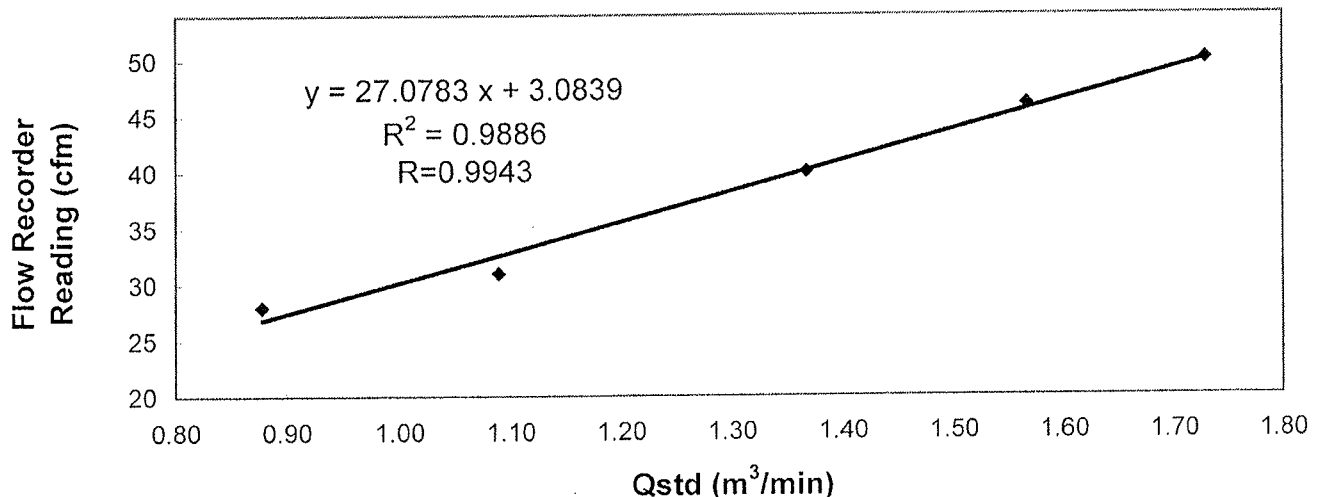
**TEST REPORT**

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

Manufacturer : Graseby GMW Date of Calibration : 08 July 2013  
Serial No. : 1172 (ET / EA / 003 / 11) Calibration Due Date : 07 September 2013  
Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual

Results	Flow recorder reading (cfm)	50	46	40	31	28
	Qstd (Actual flow rate, m <sup>3</sup> /min)	1.73	1.57	1.37	1.09	0.88
	Pressure :	757.56 mm Hg		Temp. :		304 K

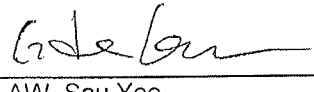
**Sampler 1172 Calibration Curve**  
Site: Tseung Kwan O A-2



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 :   
KWAN, King Ming  
(Senior Site Technician)

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



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

8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan Street, Fotan, Hong Kong  
Tel : 2695 8318 E-mail : etl@ets-testconsult.com  
Fax : 2695 3944 Web site : www.ets-testconsult.com

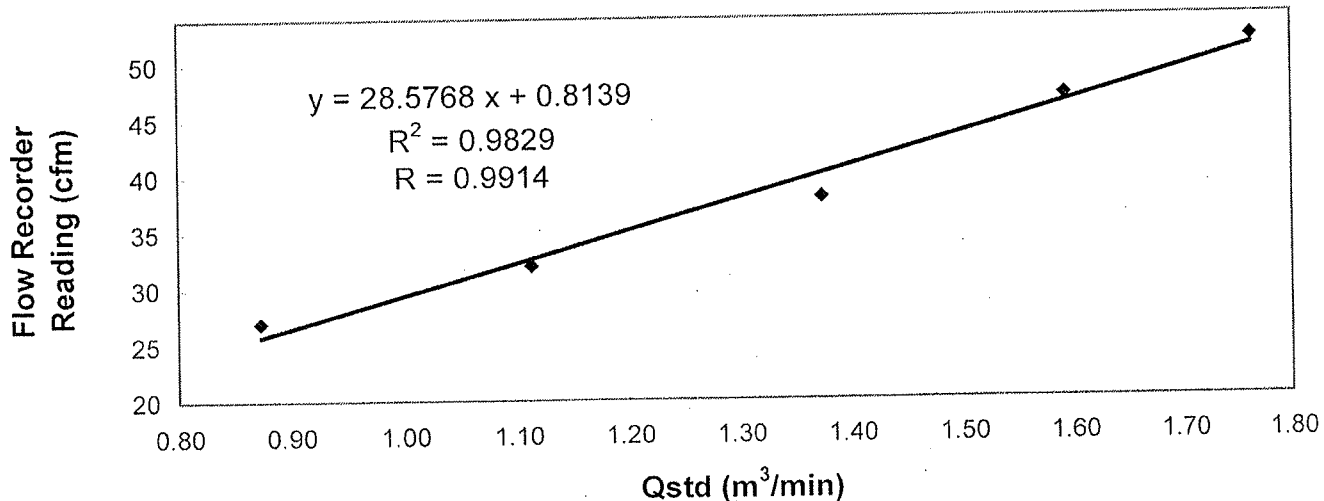
**TEST REPORT**

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

Manufacturer : Graseby GMW Date of Calibration : 06 September 2013  
Serial No. : 1172 (ET / EA / 003 / 11) Calibration Due Date : 05 November 2013  
Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual

Results	Flow recorder reading (cfm)	52	47	38	32	27
	Qstd (Actual flow rate, m <sup>3</sup> /min)	1.76	1.59	1.37	1.11	0.87
	Pressure :	762.06 mm Hg		Temp. :		299 K

**Sampler 1172 Calibration Curve**  
Site: Tseung Kwan O A-2



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 :   
KWAN, King Ming  
(Senior Site Technician)

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



TISCH ENVIRONMENTAL, INC.  
 145 SOUTH MIAMI AVE.  
 VILLAGE OF CLEVELAND, OH 45002  
 513.467.9000  
 877.263.7610 TOLL FREE  
 513.467.9009 FAX  
 WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - May 13, 2013 Rootmeter S/N 0438320 Ta (K) - 296  
 Operator Tisch Orifice I.D. - 2511 Pa (mm) - 753.11

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER	ORFICE
					DIFF Hg (mm)	DIFF H2O (in.)
1	NA	NA	1.00	1.4400	3.2	2.00
2	NA	NA	1.00	1.0110	6.4	4.00
3	NA	NA	1.00	0.9030	7.9	5.00
4	NA	NA	1.00	0.8630	8.8	5.50
5	NA	NA	1.00	0.7110	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
0.9934	0.6898	1.4125	0.9957	0.6915	0.8866
0.9892	0.9784	1.9976	0.9915	0.9807	1.2539
0.9871	1.0931	2.2334	0.9894	1.0957	1.4019
0.9860	1.1425	2.3424	0.9883	1.1452	1.4703
0.9808	1.3794	2.8251	0.9831	1.3827	1.7732
Qstd slope (m) = 2.05038			Qa slope (m) = 1.28391		
intercept (b) = -0.00442			intercept (b) = -0.00277		
coefficient (r) = 0.99995			coefficient (r) = 0.99995		
y axis = SQRT[H2O(Pa/760) (298/Ta)]			y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

$$Vstd = \text{Diff. Vol} [(Pa - \text{Diff. Hg}) / 760] (298 / Ta)$$

$$Qstd = Vstd / \text{Time}$$

$$Va = \text{Diff Vol} [(Pa - \text{Diff Hg}) / Pa]$$

$$Qa = Va / \text{Time}$$

For subsequent flow rate calculations:

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

$$Qa = 1/m \{ [\text{SQRT} \text{H2O}(\text{Ta}/\text{Pa})] - b \}$$



## **Appendix I**

### **B2**

## **Impact Air Quality Monitoring Results**

## Summary of 24-hr TSP Monitoring Results

Monitoring Station : TKO-A1  
Location : Site Egress

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	
06/09/13	11:15	07/09/13	11:15	20168.33	20192.33	24.00	1.0652	1.0652	1.0652	2.7551	2.9325	116
12/09/13	09:00	13/09/13	09:00	20194.33	20218.33	24.00	1.0652	1.0652	1.0652	2.7296	2.9105	118
18/09/13	10:00	19/09/13	10:00	20222.33	20246.33	24.00	1.0652	1.0652	1.0652	2.7581	2.9493	125
24/09/13	09:00	25/09/13	09:00	20248.33	20272.33	24.00	1.0652	1.0652	1.0652	2.7609	2.9663	134
30/09/13	17:35	01/10/13	17:35	20276.33	20290.33	24.00	1.0652	1.0652	1.0652	2.7557	2.9681	138

Monitoring Station : TKO-A2a  
Location : new CREO

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	
06/09/13	11:20	07/09/13	11:20	19384.44	19408.44	24.00	1.0913	1.0913	1.0913	2.7495	2.9015	97
12/09/13	09:00	13/09/13	09:00	19410.44	19434.44	24.00	1.0913	1.0913	1.0913	2.7304	2.8974	106
18/09/13	10:05	19/09/13	10:05	19438.44	19462.44	24.00	1.0913	1.0913	1.0913	2.7603	2.9347	111
24/09/13	09:00	25/09/13	09:00	19464.44	19488.44	24.00	1.0913	1.0913	1.0913	2.7634	2.9591	125
30/09/13	17:40	01/10/13	17:40	19492.44	19516.44	24.00	1.0913	1.0913	1.0913	2.7398	2.9300	121

## Summary of 1-hr TSP Monitoring Results

Monitoring Station : TKO-A1  
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	
02/09/13	13:35	14:35	20164.33	20165.33	1.00	1.0912	1.0912	1.0912	2.7327	2.7514	286
02/09/13	14:40	15:40	20165.33	20166.33	1.00	1.0912	1.0912	1.0912	2.7217	2.7387	260
04/09/13	10:15	11:15	20166.33	20167.33	1.00	1.0912	1.0912	1.0912	2.7320	2.7482	247
06/09/13	10:10	11:10	20167.33	20168.33	1.00	1.0652	1.0652	1.0652	2.7541	2.7676	211
09/09/13	08:25	09:25	20192.33	20193.33	1.00	1.0652	1.0652	1.0652	2.7306	2.7450	225
11/09/13	09:15	10:15	20193.33	20194.33	1.00	1.0652	1.0652	1.0652	2.7472	2.7630	247
13/09/13	13:00	14:00	20218.33	20219.33	1.00	1.0652	1.0652	1.0652	2.7327	2.7493	260
13/09/13	14:05	15:05	20219.33	20220.33	1.00	1.0652	1.0652	1.0652	2.7627	2.7787	250
16/09/13	13:40	14:40	20220.33	20221.33	1.00	1.0652	1.0652	1.0652	2.7521	2.7703	285
18/09/13	08:55	09:55	20221.33	20222.33	1.00	1.0652	1.0652	1.0652	2.7621	2.7779	247
23/09/13	14:20	15:20	20246.33	20247.33	1.00	1.0652	1.0652	1.0652	2.7512	2.7651	217
23/09/13	15:25	16:25	20247.33	20248.33	1.00	1.0652	1.0652	1.0652	2.7475	2.7628	239
25/09/13	09:30	10:30	20272.33	20273.33	1.00	1.0652	1.0652	1.0652	2.7598	2.7744	228
25/09/13	10:35	11:35	20274.33	20275.33	1.00	1.0652	1.0652	1.0652	2.7605	2.7757	238
27/09/13	11:36	12:36	20274.33	20275.33	1.00	1.0652	1.0652	1.0652	2.7592	2.7741	233
30/09/13	13:20	14:20	20275.33	20276.33	1.00	1.0652	1.0652	1.0652	2.7508	2.7655	230

Monitoring Station : TKO-A2a  
Location : New CREO

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	
02/09/13	13:40	14:40	19380.44	19381.44	1.00	1.1787	1.1787	1.1787	2.7292	2.7432	198
02/09/13	14:45	15:45	19381.44	19382.44	1.00	1.1787	1.1787	1.1787	2.7358	2.7502	204
04/09/13	10:20	11:20	19382.44	19383.44	1.00	1.1787	1.1787	1.1787	2.7229	2.7379	212
06/09/13	10:15	11:15	19383.44	19384.44	1.00	1.0913	1.0913	1.0913	2.7488	2.7609	185
09/09/13	08:30	09:30	19408.44	19409.44	1.00	1.0913	1.0913	1.0913	2.7449	2.7562	173
11/09/13	09:10	10:10	19409.44	19410.44	1.00	1.0913	1.0913	1.0913	2.7546	2.7669	188
13/09/13	13:00	14:00	19434.44	19435.44	1.00	1.0913	1.0913	1.0913	2.7559	2.7689	199
13/09/13	14:10	15:10	19435.44	19436.44	1.00	1.0913	1.0913	1.0913	2.7601	2.7740	212
16/09/13	13:45	14:45	19436.44	19437.44	1.00	1.0913	1.0913	1.0913	2.7509	2.7663	235
18/09/13	09:00	10:00	19437.44	19438.44	1.00	1.0913	1.0913	1.0913	2.7594	2.7728	205
23/09/13	14:25	15:25	19462.44	19463.44	1.00	1.0913	1.0913	1.0913	2.7488	2.7609	185
23/09/13	15:30	16:30	19463.44	19464.44	1.00	1.0913	1.0913	1.0913	2.7490	2.7629	212
25/09/13	09:35	10:35	19488.44	19489.44	1.00	1.0913	1.0913	1.0913	2.7613	2.7750	209
25/09/13	10:40	11:40	19489.44	19490.44	1.00	1.0913	1.0913	1.0913	2.7582	2.7716	205
27/09/13	11:40	12:40	19490.44	19491.44	1.00	1.0913	1.0913	1.0913	2.7613	2.7742	197
30/09/13	13:25	14:25	19491.44	19492.44	1.00	1.0913	1.0913	1.0913	2.7392	2.7510	180



## **Appendix I**

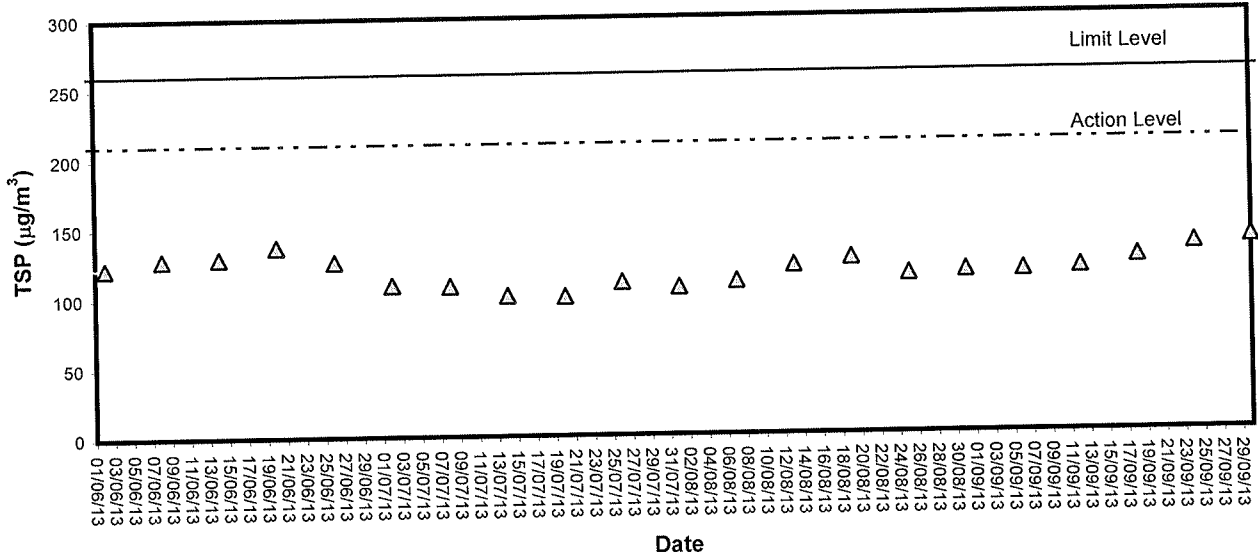
### **B3**

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

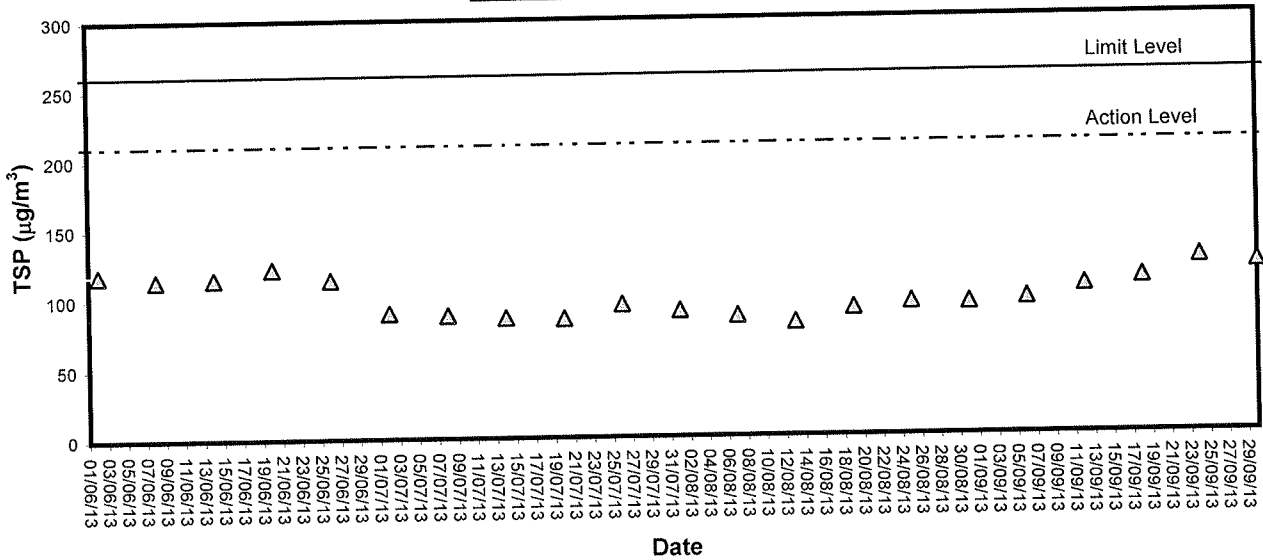




### 24-hour TSP level at TKO-A1

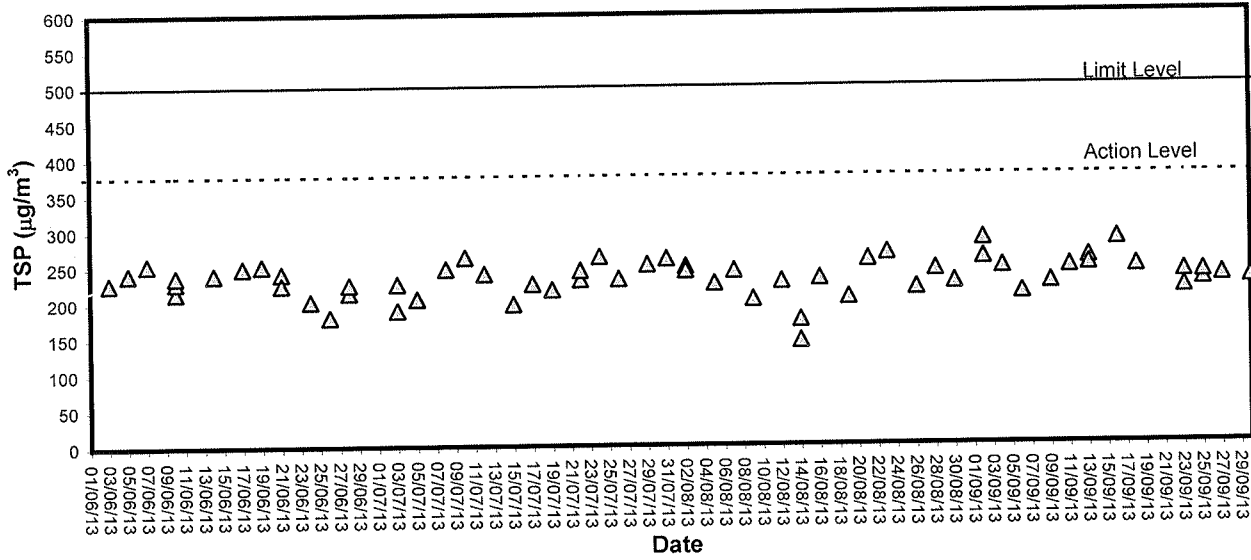


### 24-hour TSP level at TKO-A2a

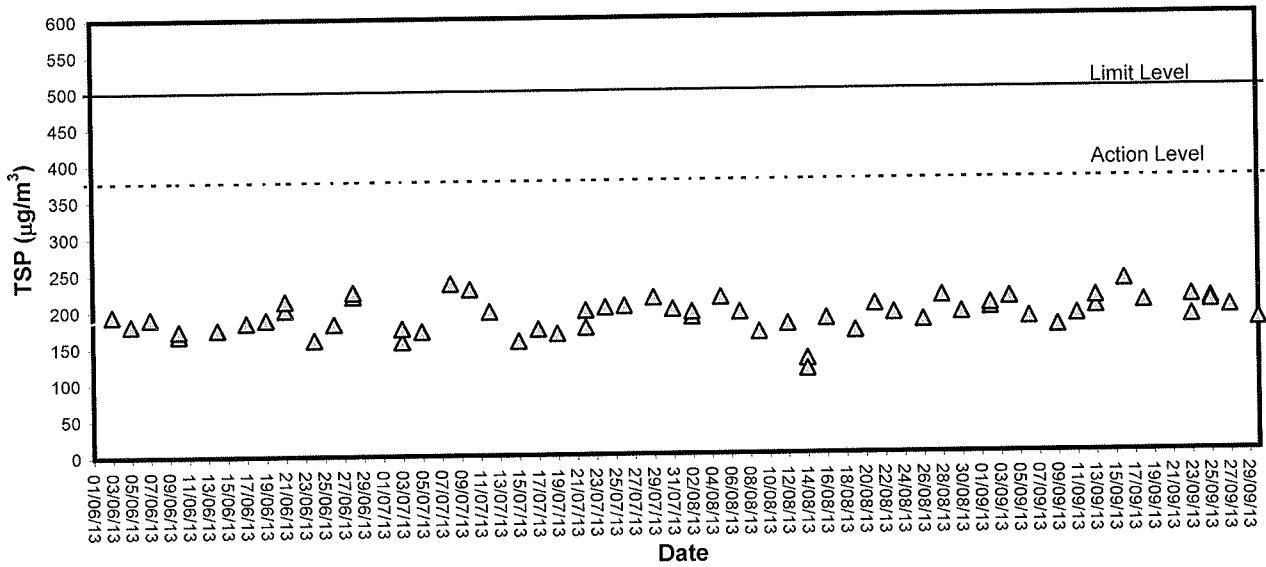




1-hour TSP level at TKO-A1



1-hour TSP level at TKO-A2a





## **Appendix I**

### **C1**

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



# Calibration Certificate

Certificate No. **34409**

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. :** Q31836

**Date of receipt :** 28-Jun-13

## Item Tested

**Description :** Sound Level Meter (ET/EN/003/15)

**Manufacturer :** Rion

**Model :** NL-52

**Serial No. :** 00620792

## Test Conditions

**Date of Test :** 3-Jul-13

**Ambient Temperature :** (23 ± 3)°C

**Supply Voltage :** --

**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 Type1 specification.

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

Main Test equipment used:

<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Traceable to</u>
S017	Multi-Function Generator	C127181	SCL-HKSAR
S024	Sound Level Calibrator	30620	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 :**   
Liam Wong

**Approved by :**   
Dorothy Cheuk

**Date:** 3-Jul-13

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 6646

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# Calibration Certificate

Certificate No. **34409**

Page 2 of 3 Pages

Results :

## 1. SPL Accuracy

UUT Setting			Applied Value (dB)	UUT Reading (dB)
Level Range (dB)	Weight	Response		
30 – 130	L <sub>A</sub>	Fast	94.0	93.8
		Slow		93.8
	L <sub>C</sub>	Fast		93.8
	L <sub>A</sub>	Fast	114.0	113.8
		Slow		113.8
	L <sub>C</sub>	Fast		113.8

IEC 651 Type 1 Spec. :  $\pm 0.7$  dB  
Uncertainty :  $\pm 0.2$  dB

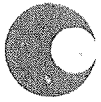
2. **Level Stability** : 0.0 dB  
IEC 651 Type 1 Spec. :  $\pm 0.3$  dB  
Uncertainty :  $\pm 0.1$  dB

## 3. Linearity

Differential level linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec.
30 – 130	84.0	83.8	0.0	$\pm 0.4$ dB
	94.0	93.8 (Ref.)	--	
	95.0	94.8	0.0	$\pm 0.2$ dB

Uncertainty :  $\pm 0.1$  dB



# Calibration Certificate

Certificate No. **34409**

Page 3 of 3 Pages

## 4. Frequency Weighting

A weighting

Frequency	Attenuation (dB)	IEC 651 Type 1 Spec.
31.5 Hz	-39.7	- 39.4 dB, ± 1.5 dB
63 Hz	-26.1	- 26.2 dB, ± 1.5 dB
125 Hz	-16.1	- 16.1 dB, ± 1 dB
250 Hz	-8.7	- 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	+1.0	+ 1.2 dB, ± 1 dB
4 kHz	+0.7	+ 1.0 dB, ± 1 dB
8 kHz	-1.2	- 1.1 dB, + 1.5 dB ~ - 3 dB
16 kHz	-8.6	- 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	50.0	50.0	--
1/10	50.0	50.0	± 0.5 dB
1/10 <sup>2</sup>	50.0	50.0	
1/10 <sup>3</sup>	50.0	50.0	± 1.0 dB
1/10 <sup>4</sup>	50.0	49.9	

Uncertainty : ± 0.1 dB

- Remarks:
1. UUT : Unit-Under-Test
  2. The uncertainty claimed is for a confidence probability of not less than 95%.
  3. Atmospheric Pressure : 1003 hPa

----- END -----

ET/EN/002/01



Hong Kong Calibration Ltd.  
香港校正有限公司

# Calibration Certificate

Certificate No. **27390**

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. :** Q22892

**Date of receipt :** 31-Oct-12

## Item Tested

**Description :** Sound Level Calibrator (ET/EN/002/01)

**Manufacturer :** Rion

**Model :** NC-73

**Serial No. :** 10196943

## Test Conditions

**Date of Test :** 16-Nov-12

**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).

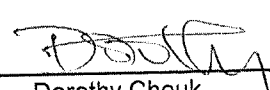
Main Test equipment used:

<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	16338	SCL-HKSAR
S031	6½ dgt. Multimeter	20032	NIM-PRC

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 :**   
Stephen Chu

**Approved by :**   
Dorothy Cheuk

**Date:** 16-Nov-12

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

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# Calibration Certificate

Certificate No. 27390

Page 2 of 2 Pages

Results :

## 1. Level Accuracy (at 1 kHz)

UUT Nominal Value	Measured Value	Mfr's Spec.
94 dB	94.12 dB	$\pm 1$ dB

Uncertainty :  $\pm 0.2$  dB

## 2. Frequency Accuracy

UUT Nominal Value	Measured Value	Mfr's Spec.
1 kHz	0.987 kHz	$\pm 2$ %

Uncertainty :  $\pm 0.1$  %

## 3. Level Stability : 0.0 dB

Uncertainty :  $\pm 0.01$  dB

## 4. Total Harmonic Distortion : $< 1.5$ %

Mfr's Spec. :  $< 3$  %

Uncertainty :  $\pm 2.3$  % of reading

- Remarks:
1. UUT : Unit-Under-Test
  2. The uncertainty claimed is for a confidence probability of not less than 95%.
  3. Atmospheric Pressure : 1007 hPa

----- END -----



## **Appendix I**

### **C2**

## **Impact Noise Monitoring Results**



## Day-time Noise Monitoring

Monitoring Location: TKO-N1 (Site Egress)

Date	Start Sampling Time (hh:mm)	Noise Level dB (A)			Wind Speed (m/s)	Weather Condition
		L <sub>eq(30min)</sub>	L <sub>10</sub>	L <sub>90</sub>		
11/09/13	09:20	68.5	70.9	62.3	0.1	Fine



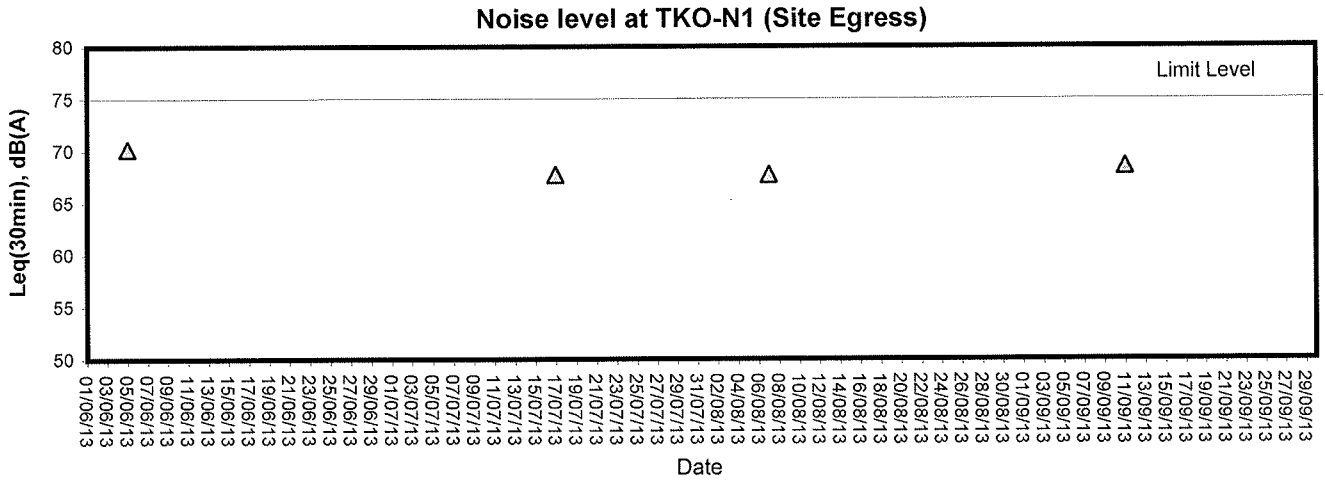
## **Appendix I**

### **C3**

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



## Noise Monitoring (Day-time)





## **Appendix I**

**D1**

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



## 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 : 31/07/2013      Due Date : 30/10/2013

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

S/001/4

Salinity Standard (ppt)	Measured Salinity (ppt)	Difference %
30.0	30.8	2.63

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 : 



### 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>31/07/2013</u>	Calibration Due Date : <u>30/10/2013</u>

**Temperature Verification**

Ref. No. of Reference Thermometer : ET/0521/008  
 Ref. No. of Water Bath : ---

	Temperature (°C)			
		Measured	Corrected	
Reference Thermometer reading	Measured	20.2	Corrected	19.8
DO Meter reading	Measured	19.7	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	<u>CPE/012/4.5/001/7</u>	Reagent No. of 0.025N K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	<u>CPE/012/4.4/001/20</u>
		Trial 1	Trial 2
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		0.10	0.00
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		10.55	10.40
Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)		10.45	10.40
Normality of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02392	0.02404
Average Normality (N) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02398	
Acceptance criteria, Deviation		Less than ± 0.001N	

Calculation: Normality of Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>, N = 0.25 / 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
Trial						
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	0.00	11.20	22.30	0.00	8.20	13.20
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	11.20	22.30	30.60	8.20	13.20	18.20
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	11.20	11.10	8.30	8.20	5.00	5.00
Dissolved Oxygen (DO), mg/L	7.21	7.15	5.34	5.28	3.22	3.22
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	7.22	7.11	7.17	7.21	7.15	7.18	0.14
5	5.36	5.15	5.26	5.34	5.28	5.31	0.95
10	3.34	3.12	3.23	3.22	3.22	3.22	0.31
Linear regression coefficient				0.9998			



### 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/012/4.7/002/07	Reagent No. of NaCl (30ppt)	CPE/012/4.8/002/07
-----------------------------	--------------------	-----------------------------	--------------------

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

Salinity (ppt)	10		30	
Trial	1	2	1	2
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	0.00	12.20	24.30	35.50
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	12.20	24.30	35.50	46.50
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	12.20	12.10	11.20	11.00
Dissolved Oxygen (DO), mg/L	7.85	7.79	7.21	7.08
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	7.86	7.91	7.89	7.85	7.79	7.82	0.89
30	7.24	7.29	7.27	7.21	7.08	7.15	1.66

**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 :

Approved by :





## Performance Check of Turbidity Meter


Equipment Ref. No. : ET/0505/009 Manufacturer : HACH  
Model No. : 2100Q Serial No. : 11060 C 010010  
Date of Calibration : 09/07/2013 Due Date : 08/10/2013

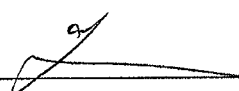
Gelex Vial Std	Theoretical Value (NTU)	Measured Value (NTU)	Difference %
0-10 NTU	5.56	5.72	-2.84
10-100 NTU	53.4	54.2	-1.49
100-1000 NTU	552	561	-1.62

Acceptance Criteria

Difference : ~~≤ 5%~~ - 5% to 5%

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

Checked by : 

Approved by : 



## **Appendix I**

### **D2**

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

# Mid-Flood Tide

## Monitoring Station : TKO-C1

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)	Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)			Turbidity (NTU)			Suspended Solids (mg/L)		
					Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Value	Average
02/09/13	1630-1645	28/Cloudy	Surface	27.7	25.8	25.9	5.69	5.72	83.8	78.5	2.41	2.43	3.6	3.6	3.9			
			Middle	27.5	26.1	6.03	6.04	73.1	88.8	2.45	2.87	3.6	3.9					
			Bottom	27.4	26.3	5.67	5.66	88.8	83.2	2.85	2.93	3.8	4.1					
04/09/13	1700-1718	26/Drizzle	Surface	25.6	23.0	23.0	5.74	5.75	79.8	80.0	2.32	2.33	3.6	3.4	3.7			
			Middle	25.5	23.2	6.02	6.03	80.1	83.7	2.34	2.80	3.2	3.9					
			Bottom	25.3	23.4	5.64	5.65	83.6	78.4	2.81	2.83	4.0	3.7					
06/09/13	1700-1718	26/Cloudy	Surface	25.7	23.3	23.3	5.71	5.74	78.2	79.8	2.82	2.46	3.6	3.3	3.6			
			Middle	25.6	23.4	5.96	5.94	79.4	82.4	2.44	2.89	3.4	3.7					
			Bottom	25.5	23.5	5.69	5.68	80.2	78.7	2.88	2.96	3.8	3.7					
09/09/13	0800-0815	28/Fine	Surface	27.0	27.0	27.0	6.03	6.05	78.4	88.4	2.94	3.44	4.4	4.4	4.7			
			Middle	27.0	27.1	5.89	5.90	88.7	86.0	3.48	3.94	4.4	4.7					
			Bottom	26.7	27.4	5.84	5.82	85.9	84.7	3.93	4.09	4.6	4.9					
11/09/13	0930-0948	28/Fine	Surface	27.2	27.1	27.1	6.01	6.02	84.4	88.1	4.10	3.87	4.8	4.8	4.9			
			Middle	27.0	27.2	5.99	6.00	87.5	87.6	3.86	3.94	4.8	4.8					
			Bottom	26.8	27.3	5.73	5.74	86.1	83.6	3.93	4.04	4.6	5.1					
13/09/13	1230-1245	27/Fine	Surface	27.4	26.3	26.3	6.24	6.22	83.7	87.1	4.04	2.18	5.0	3.4	3.5			
			Middle	27.3	26.4	6.17	6.18	87.4	86.6	2.16	2.57	5.2	3.7					
			Bottom	27.2	26.5	6.10	6.09	85.0	85.3	2.20	3.19	3.6	3.3					
16/09/13	1530-1546	29/Fine	Surface	27.6	26.5	26.5	6.14	6.12	86.8	89.1	3.20	3.19	4.4	4.3	4.6			
			Middle	27.5	26.7	6.16	6.18	89.4	90.0	3.17	3.38	4.2	4.5					
			Bottom	27.5	26.8	5.93	5.92	89.7	86.2	3.36	3.55	4.4	4.9					
18/09/13	1630-1647	28/Fine	Surface	27.4	26.6	26.6	5.97	6.00	86.1	87.3	3.51	3.25	5.0	4.4	4.6			
			Middle	27.2	26.7	5.86	5.85	86.8	85.2	3.24	3.39	4.4	4.5					
			Bottom	27.2	26.8	5.64	5.66	87.7	82.3	3.26	3.82	4.4	4.9					



# Mid-Flood Tide



東業德勘測試驗有限公司  
ETS-TESTCONSULT LIMITED

Monitoring Station : TKO-M4

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)	Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)			Turbidity (NTU)			Suspended Solids (mg/L)		
					Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Value	Average
02/09/13	1813-1830	28/Cloudy	Surface	27.6	26.0	26.0	5.77	5.79	5.71	85.0	85.3	2.52	2.53	3.6	3.7	3.8		
			Middle	27.5	26.1	26.1	5.66	5.62	83.3	82.7	2.73	2.74	3.8	3.9				
			Bottom	27.4	26.2	26.2	5.91	5.92	86.9	87.1	2.79	2.80	3.6	3.7				
04/09/13	1843-1900	26/Drizzle	Surface	25.6	23.1	23.1	5.77	5.78	5.72	80.3	80.4	2.42	2.43	3.6	3.4			
			Middle	25.4	23.2	23.2	5.64	5.65	78.3	78.5	2.76	2.75	3.8	3.7				
			Bottom	25.3	23.3	23.4	5.94	5.94	82.4	82.3	2.81	2.81	4.0	3.9				
06/09/13	1842-1900	26/Cloudy	Surface	25.6	23.2	23.2	5.68	5.70	5.63	79.1	79.4	2.55	2.56	3.2	3.3			
			Middle	25.5	23.3	23.3	5.58	5.57	77.5	77.3	2.76	2.78	3.4	3.4				
			Bottom	25.3	23.3	23.4	5.82	5.84	80.7	80.9	2.82	2.84	3.8	3.7				
09/09/13	0943-1000	28/Fine	Surface	27.6	27.1	27.1	6.80	6.82	6.82	100.1	100.7	1.80	1.82	3.2	3.3			
			Middle	27.3	27.2	27.2	6.81	6.82	101.2	100.0	1.56	1.57	2.6	2.7				
			Bottom	27.1	27.2	27.2	6.54	6.57	96.2	96.6	1.72	1.73	2.8	2.9				
11/09/13	1111-1130	28/Fine	Surface	27.6	27.1	27.2	6.75	6.74	6.68	99.8	99.7	1.07	1.08	2.2	2.3			
			Middle	27.3	27.3	27.3	6.63	6.62	97.2	97.1	1.16	1.12	2.4	2.5				
			Bottom	27.1	27.3	27.3	6.56	6.55	96.4	96.3	1.24	1.25	2.6	2.5				
13/09/13	1415-1430	27/Fine	Surface	27.3	26.3	26.3	6.52	6.55	6.45	91.3	91.7	2.14	2.15	3.0	3.1			
			Middle	27.2	26.4	26.4	6.30	6.34	88.2	88.8	2.47	2.49	3.6	3.7				
			Bottom	27.1	26.6	26.6	6.24	6.22	87.4	87.1	2.99	3.00	4.2	4.1				
16/09/13	1715-1730	29/Fine	Surface	27.6	26.6	26.6	6.08	6.05	6.02	88.5	88.1	2.93	2.92	3.6	3.7			
			Middle	27.5	26.7	26.7	5.97	5.98	86.9	87.1	2.80	2.82	3.8	3.8				
			Bottom	27.4	26.9	26.9	5.88	5.87	85.6	85.5	2.99	2.99	3.2	3.3				
18/09/13	1815-1830	28/Fine	Surface	27.4	26.5	26.5	5.93	5.94	5.91	86.2	86.4	2.77	2.79	3.6	3.7			
			Middle	27.3	26.6	26.6	5.87	5.88	85.4	85.6	2.87	2.88	4.0	3.9				
			Bottom	27.2	26.7	26.7	5.70	5.72	82.9	83.2	2.45	2.46	3.6	3.7				

# Mid-Flood Tide

Monitoring Station : TKO-M4

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)		Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)			
			Surface	Middle		Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Depth-average	Value	Average
23/09/13	---	---	Surface	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
			Middle	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
			Bottom	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
25/09/13	1045-1100	29/Cloudy	Surface	1.0	27.7	26.7	26.7	6.10	6.10	85.1	85.0	2.76	2.74	3.6	3.7	3.9		
			Middle	4.6	27.6	26.9	26.9	5.88	5.89	82.6	82.8	2.90	2.94	4.0	3.9			
			Bottom	8.2	27.5	27.0	27.0	5.94	5.94	82.9	83.9	2.98	3.09	4.2	4.1			
			Surface	1.0	28.1	27.8	27.9	5.75	5.77	85.0	85.3	2.48	2.51	3.4	3.5			
			Middle	4.6	28.0	28.0	28.0	5.70	5.70	84.2	84.1	2.71	2.74	3.8	3.8			
			Bottom	8.2	27.9	28.1	28.2	5.61	5.60	82.9	82.8	3.04	3.07	4.0	4.1			
27/09/13	1813-1830	28/Fine	Surface	1.0	28.4	28.4	28.4	6.27	6.26	91.8	91.6	2.92	2.94	4.0	3.9	4.1		
			Middle	4.6	28.0	28.0	28.0	5.69	5.70	84.0	84.1	2.77	2.77	3.8	3.8			
			Bottom	8.2	27.9	28.2	28.2	5.59	5.60	82.6	82.8	3.09	3.07	4.2	4.1			
			Surface	1.0	28.4	28.4	28.4	6.24	6.26	91.4	91.6	2.96	2.94	4.0	3.9			
			Middle	4.9	28.2	28.6	28.6	5.94	5.92	87.0	86.7	3.08	3.07	4.2	4.1			
			Bottom	8.8	28.0	28.7	28.7	5.80	5.82	85.0	85.3	3.11	3.13	4.4	4.3			
30/09/13	1645-1700	29/Drizzle	Surface	1.0	28.4	28.3	28.3	6.24	6.26	91.4	91.6	2.96	2.94	4.0	3.9	4.1		
			Middle	4.9	28.2	28.5	28.5	5.90	5.92	86.4	86.7	3.05	3.07	4.0	4.1			
30/09/13	1645-1700	29/Drizzle	Bottom	8.8	28.0	28.7	28.7	5.84	5.82	85.6	85.3	3.15	3.13	4.2	4.3			

**Mid-Ebb Tide**

**Monitoring Station : TKO-C1**

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)			Turbidity (NTU)			Suspended Solids (mg/L)		
			Surface	Middle		Bottom	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average
02/09/13	0930-0945	27/Cloudy	Surface	1.0	27.6	25.8	25.8	5.62	5.65	82.8	83.3	2.46	2.48	3.2	3.4	3.9			
			Middle	10.0	27.4	26.0	26.1	5.68	5.99	83.7	88.1	2.50	2.92	3.6	4.1				
			Bottom	19.0	27.3	26.2	26.2	5.98	5.59	88.1	82.3	2.90	2.98	4.0	4.3				
04/09/13	1100-1118	26/Drizzle	Surface	1.0	25.7	23.1	23.1	5.60	5.63	82.4	78.3	2.97	2.50	3.6	3.7	3.9			
			Middle	9.9	25.6	23.2	23.2	5.58	5.95	77.8	82.5	2.48	2.94	3.8	4.1				
			Bottom	18.8	25.4	23.3	23.4	5.94	5.57	82.5	77.2	2.92	3.00	4.0	3.9				
06/09/13	1200-1218	26/Cloudy	Surface	1.0	25.8	23.2	23.2	5.56	5.68	77.3	79.0	3.01	2.55	3.2	3.3	3.6			
			Middle	9.8	25.7	23.3	23.4	5.61	5.88	77.1	81.6	2.99	2.98	3.4	3.7				
			Bottom	18.6	25.6	23.4	23.5	5.71	5.62	79.4	77.9	2.53	3.05	3.6	3.9				
09/09/13	1330-1348	30/Fine	Surface	1.0	27.1	27.0	27.0	5.94	5.93	86.8	86.7	3.96	3.95	4.4	4.5	4.7			
			Middle	10.8	26.9	27.1	27.1	5.92	5.91	86.6	86.1	3.94	4.03	4.6	4.7				
			Bottom	20.5	26.7	27.3	27.4	5.90	5.65	86.1	82.2	4.02	4.12	4.6	4.9				
11/09/13	1500-1518	28/Fine	Surface	1.0	27.3	27.1	27.2	5.64	5.93	82.2	86.7	4.11	3.91	4.4	4.5	4.8			
			Middle	10.6	27.1	27.2	27.3	5.66	5.91	86.8	86.3	3.92	3.99	4.6	4.9				
			Bottom	20.2	26.9	27.3	27.4	5.92	5.65	86.2	82.4	3.98	4.09	4.8	4.9				
13/09/13	1700-1715	29/Fine	Surface	1.0	27.3	26.2	26.3	5.66	6.19	82.5	86.7	4.09	2.85	5.0	3.9	4.1			
			Middle	9.8	27.2	26.4	26.5	6.18	6.02	86.6	84.3	2.83	2.95	4.0	4.1				
			Bottom	18.6	27.2	26.5	26.6	6.20	5.94	84.0	83.2	2.87	3.18	4.2	4.3				
16/09/13	0830-0847	27/Fine	Surface	1.0	27.7	26.6	26.6	5.98	6.04	82.6	88.0	3.20	3.28	4.4	4.1	4.5			
			Middle	10.2	27.5	26.6	26.7	6.01	5.89	83.8	85.8	3.27	3.42	4.0	4.5				
			Bottom	19.4	27.5	26.7	26.9	6.07	5.69	85.9	82.8	3.40	3.85	4.4	4.9				
18/09/13	1030-1047	28/Fine	Surface	1.0	27.5	26.4	26.5	5.70	5.95	82.9	86.5	3.87	3.34	5.0	4.3	4.5			
			Middle	9.9	27.3	26.5	26.6	5.92	5.80	86.1	84.4	3.33	3.48	4.2	4.5				
			Bottom	18.8	27.2	26.6	26.8	5.98	5.60	86.9	81.5	3.35	3.91	4.4	4.7				

# Mid-Ebb Tide

## Monitoring Station : TKO-C1

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)			Turbidity (NTU)			Suspended Solids (mg/L)		
			Surface	Middle		Bottom	Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average
23/09/13	1330-1350	29/Fine	Surface	1.0	27.9	27.7	27.7	5.39	5.40	80.0	80.2	3.47	3.49	4.4	4.4	4.7			
			Middle	9.9	27.9	27.9	5.20	5.19	77.5	77.4	3.66	3.68	4.6	4.7					
			Bottom	18.7	27.8	28.0	5.18	5.03	77.3	75.1	3.69	4.00	4.8	4.9					
25/09/13	1430-1445	30/Cloudy	Surface	1.0	27.7	26.7	26.7	6.06	6.08	85.1	85.3	2.33	2.35	3.6	3.5	3.8			
			Middle	9.9	27.6	26.8	6.09	5.95	83.4	83.6	2.66	2.65	3.6	3.7					
			Bottom	18.8	27.5	27.0	5.96	5.84	83.7	82.0	2.94	2.93	3.8	4.1					
27/09/13	0803-0818	26/Fine	Surface	1.0	27.9	27.9	27.9	5.86	5.70	81.7	84.2	2.90	2.89	4.0	3.9	4.1			
			Middle	9.7	27.8	28.0	5.72	5.60	82.3	82.8	2.96	3.11	4.2	4.1					
			Bottom	18.4	27.6	28.1	5.61	5.50	82.6	81.2	3.14	3.45	4.4	4.3					
30/09/13	0830-0845	29/Cloudy	Surface	1.0	28.0	28.6	28.6	5.51	6.06	81.4	88.7	3.48	3.26	4.2	4.3	4.6			
			Middle	9.8	28.0	28.5	6.07	5.87	88.9	86.0	3.27	3.68	4.4	4.9					
			Bottom	18.6	27.9	28.8	6.04	5.67	88.4	83.0	3.25	3.62	4.8	4.7					



# Mid-Ebb Tide



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

## Monitoring Station : TKO-M4

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)	Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)		
					Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average
02/09/13	1113-1130	27/Cloudy	Surface	27.7	25.9	25.9	5.70	5.72	5.64	84.0	84.3	2.57	2.58	3.6	3.8		
					25.8	5.74	84.6	2.59	4.0	4.0							
					26.0	5.59	82.3	2.78	2.79	3.6	3.8						
04/09/13	1242-1300	26/Drizzle	Bottom	27.5	26.0	26.0	5.51	5.55	5.85	81.1	81.7	2.79	2.74	3.9			
					26.2	5.84	85.9	2.84	2.85	3.8	3.9						
					26.2	5.86	86.2	2.86	4.0	4.0							
06/09/13	1342-1400	26/Cloudy	Surface	25.5	22.9	23.0	5.68	5.70	5.62	79.0	79.3	2.59	2.60	3.8			
					23.0	5.72	79.5	2.61	4.0	4.0							
					23.1	5.57	77.3	2.80	2.82	4.0	4.0						
09/09/13	1511-1530	30/Fine	Bottom	27.2	23.1	23.1	5.49	5.53	5.78	76.2	76.8	2.83	2.88	3.7			
					23.2	5.82	80.7	2.86	2.88	3.6	3.8						
					23.3	5.84	80.9	2.89	4.0	4.0							
11/09/13	1641-1700	28/Fine	Surface	27.0	23.2	23.3	5.63	5.65	5.59	78.2	78.5	2.64	2.65	2.8			
					23.3	5.67	78.8	2.66	2.4	2.4							
					23.4	5.53	76.8	2.85	2.87	3.6	3.7						
13/09/13	1845-1900	29/Fine	Middle	27.3	23.5	23.5	5.51	5.52	5.86	80.7	80.8	2.88	2.88	3.5			
					23.5	5.77	80.0	2.91	2.93	4.0	4.0						
					23.5	5.79	80.2	2.94	2.8	2.8							
16/09/13	1015-1030	27/Fine	Surface	27.8	27.1	27.2	6.84	6.83	6.77	101.2	101.1	1.15	1.16	2.6			
					27.2	6.82	100.9	1.17	2.4	2.4							
					27.1	6.72	98.6	1.24	1.25	2.8	2.6						
18/09/13	1215-1230	28/Fine	Bottom	27.5	27.2	27.2	6.70	6.71	6.64	98.3	98.5	1.26	1.25	2.7			
					27.2	6.65	97.8	1.32	1.33	2.4	2.6						
					27.2	6.62	97.5	1.34	2.4	2.6							
18/09/13	1215-1230	28/Fine	Surface	27.3	27.2	27.2	6.66	6.65	6.59	98.4	98.3	1.12	1.13	2.5			
					27.1	6.64	98.2	1.14	2.4	2.4							
					27.2	6.54	95.9	1.21	1.17	2.2	2.3						
18/09/13	1215-1230	28/Fine	Middle	27.0	27.2	27.2	6.52	6.53	6.46	95.6	95.8	1.13	1.13	2.6			
					27.2	6.47	95.2	1.29	1.30	2.6	2.7						
					27.3	6.45	94.8	1.31	2.8	2.8							
18/09/13	1215-1230	28/Fine	Bottom	27.3	26.4	26.4	5.89	5.90	5.84	82.5	82.6	2.30	2.31	3.6			
					26.3	5.91	82.7	2.32	3.6	3.6							
					26.5	5.77	80.8	3.06	3.05	4.0	4.0						
18/09/13	1215-1230	28/Fine	Surface	27.1	26.6	26.6	5.78	5.78	5.84	80.9	80.9	3.04	3.05	3.8			
					26.5	5.94	83.2	3.24	3.22	4.4	4.4						
					26.6	5.90	82.6	3.20	4.4	4.4							
18/09/13	1215-1230	28/Fine	Middle	27.8	26.7	26.7	5.97	5.98	5.92	86.9	87.1	2.80	2.82	3.8			
					26.7	5.99	87.2	2.84	4.0	4.0							
					26.7	5.91	86.1	2.90	2.91	4.0	4.1						
18/09/13	1215-1230	28/Fine	Bottom	27.5	26.7	26.7	5.93	5.92	5.86	86.3	86.2	2.92	2.91	3.8			
					26.9	5.78	83.6	2.48	2.49	3.6	3.8						
					26.9	5.88	84.2	2.50	4.0	4.0							
18/09/13	1215-1230	28/Fine	Surface	27.6	26.5	26.6	5.88	5.89	5.86	85.5	85.7	2.86	2.88	3.8			
					26.6	5.90	85.8	2.86	4.0	4.0							
					26.6	5.82	84.7	2.90	2.97	3.6	3.8						
18/09/13	1215-1230	28/Fine	Middle	27.5	26.7	26.7	5.84	5.83	5.86	85.0	84.9	2.98	2.97	3.7			
					26.7	5.84	85.0	2.98	3.4	3.4							
					26.8	5.65	82.2	2.54	2.55	3.6	3.5						
18/09/13	1215-1230	28/Fine	Bottom	27.3	26.9	26.9	5.69	5.67	5.67	82.7	82.5	2.56	2.55	3.5			
					26.9	5.69	82.7	2.56	3.6	3.6							
					26.9	5.69	82.7	2.56	3.6	3.6							

**Mid-Ebb Tide**

**Monitoring Station : TKO-M4**

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)			Turbidity (NTU)			Suspended Solids (mg/L)		
			Surface	Middle		Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
23/09/13	1511-1530	29/Fine	Surface	1.0	27.9	27.7	27.7	5.24	5.25	78.0	78.2	3.24	3.23	4.2	4.3	3.15	3.9	4.1	4.1
			Middle	4.3	27.9	27.9	5.14	5.14	76.6	76.6	3.22	3.16	4.4	4.0					
			Bottom	7.5	27.8	28.0	5.01	5.02	74.7	74.9	3.18	3.04	3.8	3.8					
25/09/13	1615-1630	30/Cloudy	Surface	1.0	27.6	26.7	26.7	6.11	6.12	85.8	86.0	2.46	2.48	3.6	3.8	2.48	4.0	4.0	3.8
			Middle	4.4	27.6	26.9	6.05	6.06	86.1	85.0	2.50	2.61	4.0	4.0					
			Bottom	7.8	27.5	27.1	5.93	5.95	83.3	83.6	2.33	2.35	3.4	3.5					
27/09/13	0924-0938	26/Fine	Surface	1.0	28.0	27.7	27.8	5.86	5.84	86.6	86.3	2.67	2.64	3.6	3.8	2.64	4.0	4.0	3.8
			Middle	4.3	27.9	27.8	5.78	5.77	86.0	85.1	2.61	2.84	4.0	3.9					
			Bottom	7.6	27.8	27.8	5.75	5.64	84.9	83.4	2.78	2.78	3.8	3.8					
30/09/13	1005-1025	29/Cloudy	Surface	1.0	28.1	28.6	28.6	6.24	6.22	91.4	91.1	3.02	3.04	4.0	4.0	3.04	4.0	4.0	4.1
			Middle	4.4	28.0	28.7	5.75	5.77	90.8	84.4	3.05	2.98	4.0	4.0					
			Bottom	7.8	27.9	28.8	5.70	5.72	83.5	83.8	3.21	3.23	4.2	4.3					

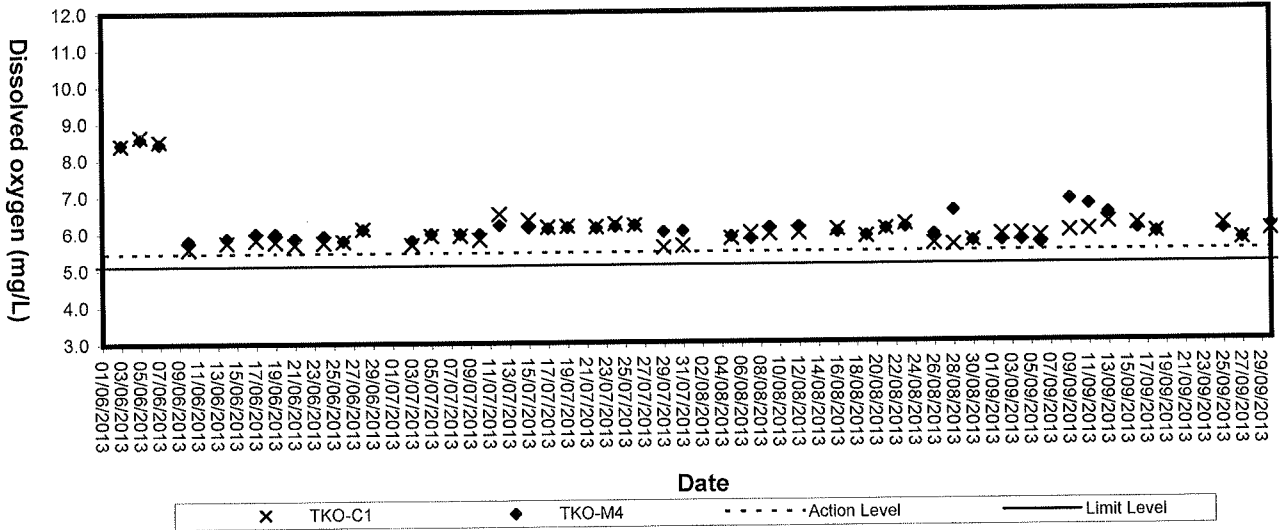
## **Appendix I**

### **D3**

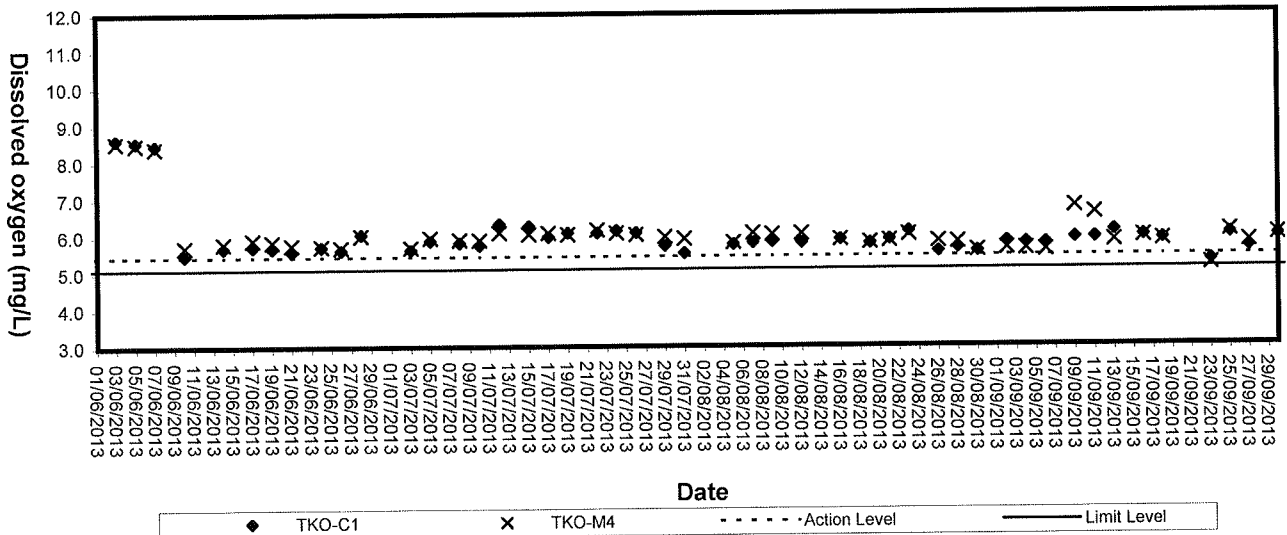
## **Graphical Plots of Impact Marine Water Quality Monitoring Data**



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

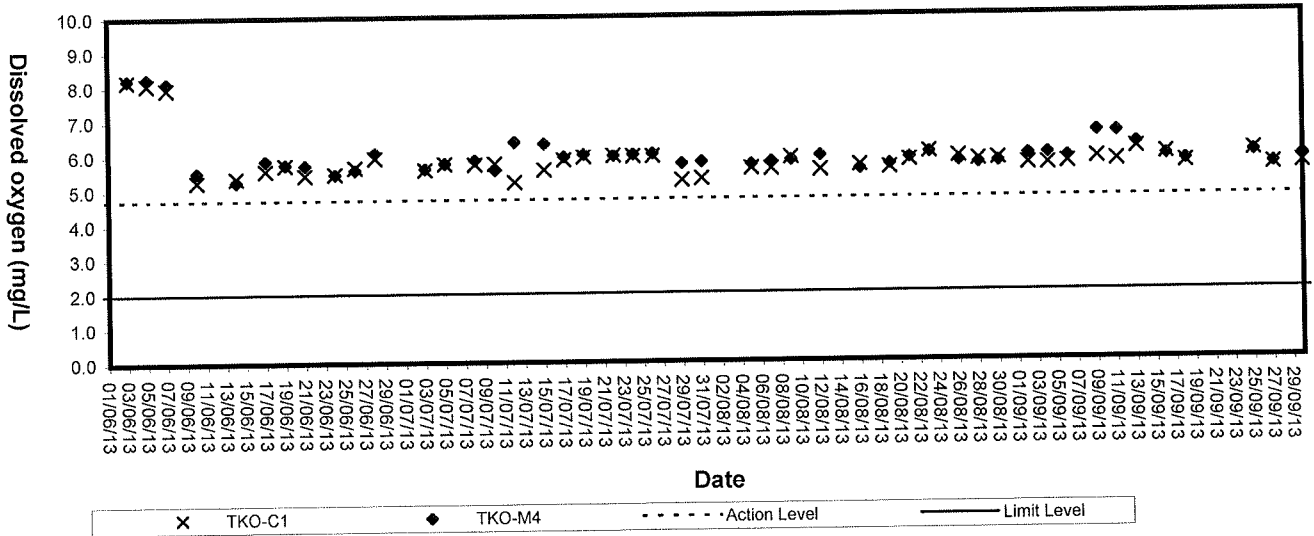


### Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide

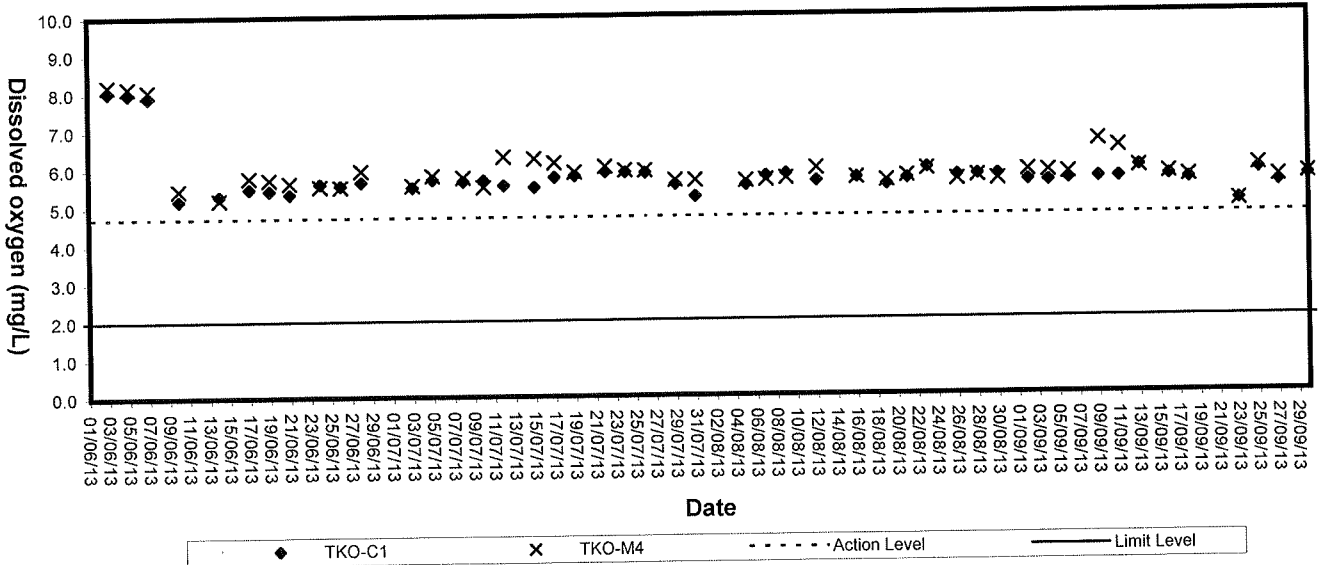




### Dissolved Oxygen (Bottom) at Mid-Flood Tide

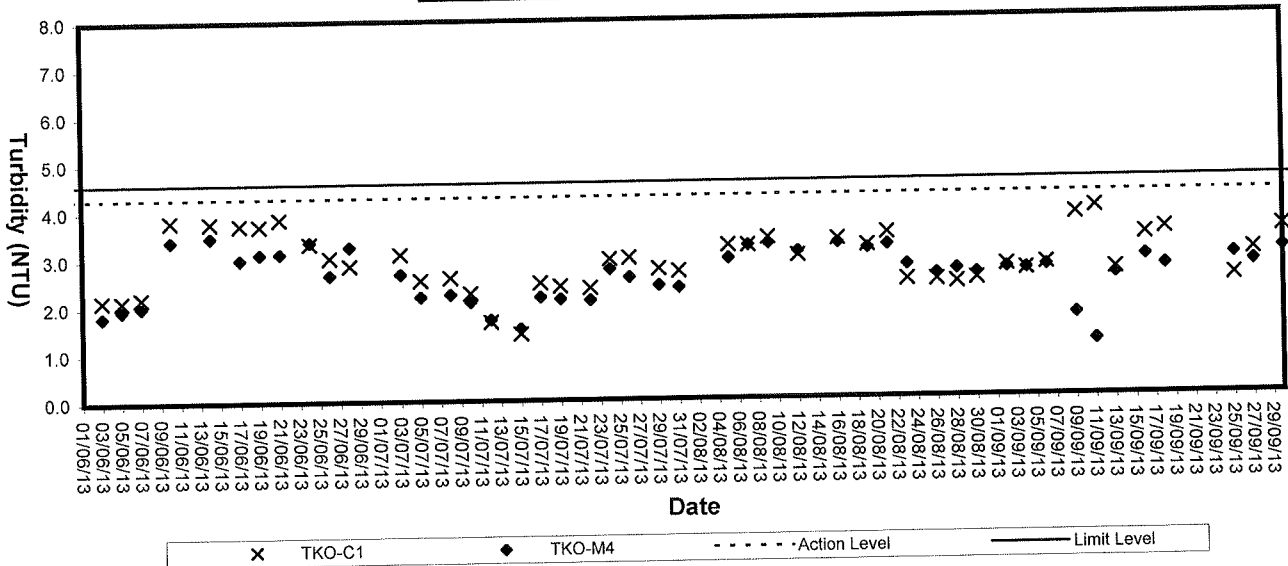


### Dissolved Oxygen (Bottom) at Mid-Ebb Tide

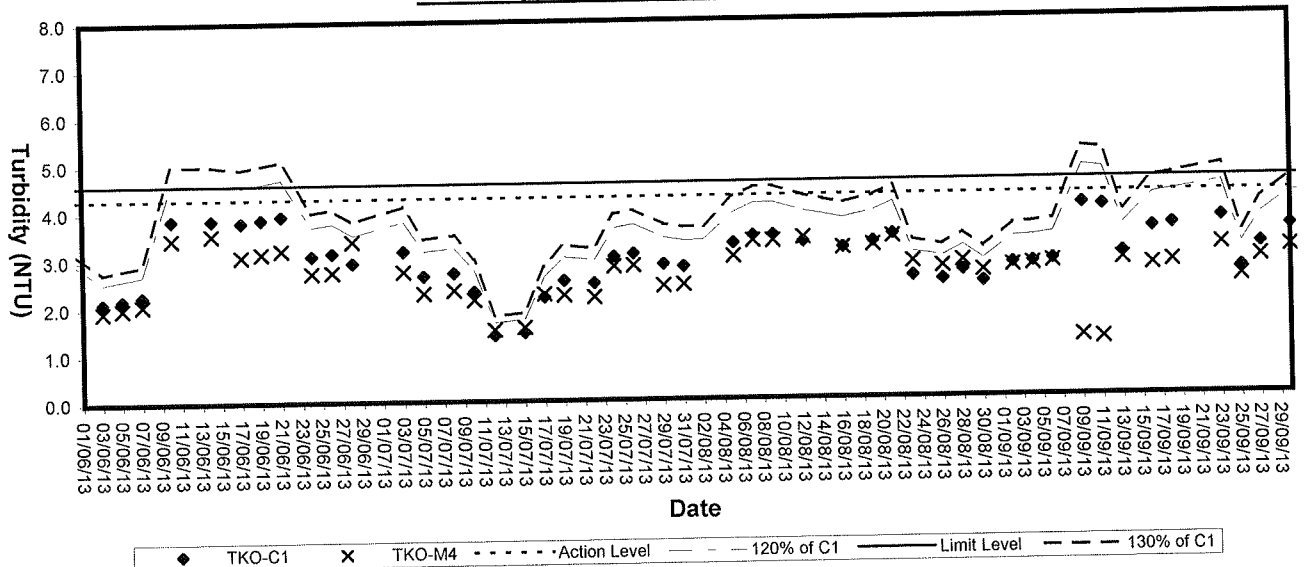




### Turbidity (Depth-average) at Mid-Flood Tide

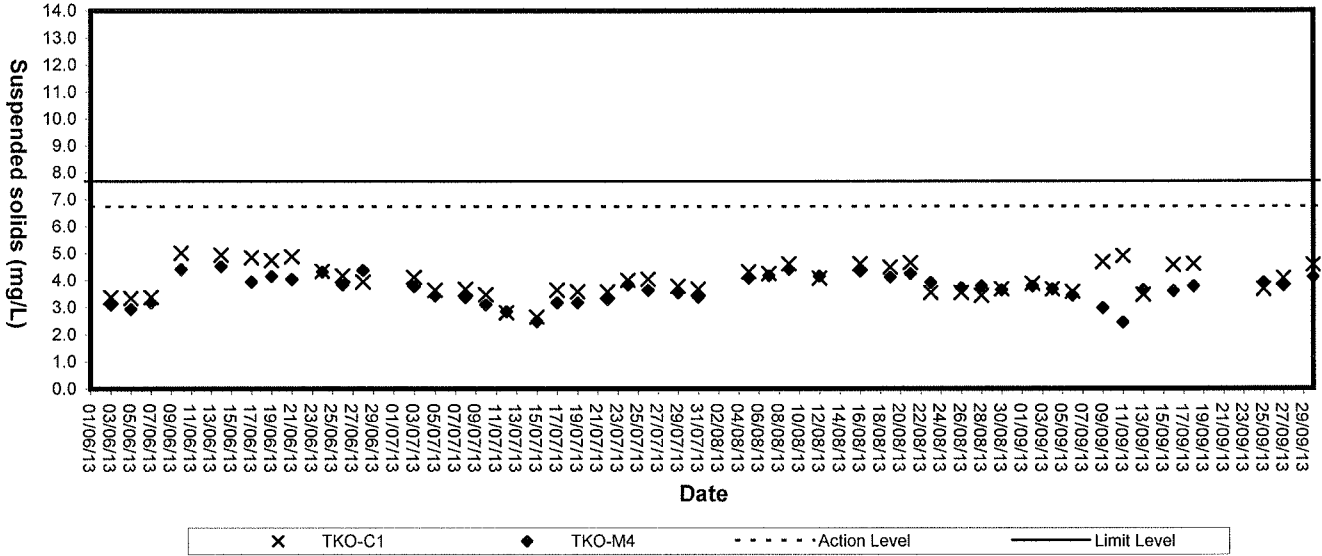


### Turbidity (Depth-average) at Mid-Ebb Tide

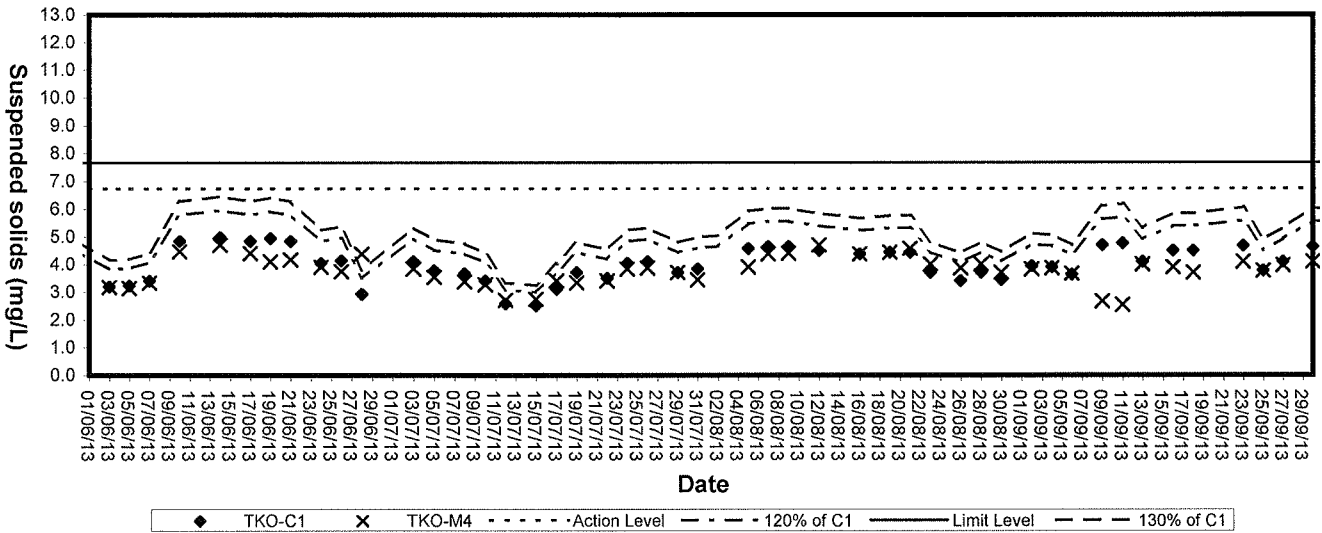




### Suspended solids (Depth-average) at Mid-Flood Tide



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



## **Appendix I**

### **E**

#### **Weather Condition**



**Extract of Meteorological Observations for Tseung Kwan O Automatic Weather Station, September 2013**

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. (%)
Sep 1	*****	30.3	26.6	23.8	24.2	99	88	68
Sep 2	*****	30.4	26.9	24.6	24.6	98	88	71
Sep 3	*****	29.5	25.8	24.4	24.4	98	92	69
Sep 4	*****	26.4	24.8	23.9	24.2	98	97	90
Sep 5	*****	25.5	24.1	23.2	23.4	99	96	87
Sep 6	*****	29.2	25.8	23.3	23.5	98	88	69
Sep 7	*****	31.2	26.9	24.2	23.5	96	83	55
Sep 8	*****	30.9	27.4	24.4	23.8	94	81	63
Sep 9	*****	30.9	27.7	25.8	23.8	93	80	60
Sep 10	*****	32.0	28.2	26.1	24.7	93	82	63
Sep 11	*****	30.1	27.8	26.3	25.1	95	85	73
Sep 12	*****	32.0	28.1	25.9	24.5	94	82	61
Sep 13	*****	31.7	27.1	25.4	24.4	94	86	66
Sep 14	*****	31.5	27.3	24.7	24.0	94	83	62
Sep 15	*****	33.3	28.2	24.8	24.5	98	82	58
Sep 16	*****	31.6	28.6	25.9	23.5	95	75	59
Sep 17	*****	31.2	28.3	27.0	21.4	80	67	52
Sep 18	*****	30.7	27.8	26.1	22.3	83	73	57
Sep 19	*****	32.7	28.4	25.4	23.5	91	76	52
Sep 20	*****	33.2	28.2	25.6	24.4	95	81	57
Sep 21	*****	35.7	30.7	26.5	21.3	82	58	42
Sep 22	*****	30.7	27.5	25.1	22.6	94	76	53
Sep 23	*****	29.8	27.4	24.8	25.5	98	90	79
Sep 24	*****	30.0	28.0	27.1	25.2	91	84	77
Sep 25	*****	31.0	27.9	25.7	23.6	90	78	62
Sep 26	*****	30.4	26.6	22.6	22.4	95	79	60
Sep 27	*****	28.7	25.4	21.9	21.3	95	78	61
Sep 28	*****	28.6	26.1	24.0	22.4	94	81	64
Sep 29	*****	27.1	24.8	23.4	21.6	96	83	70
Sep 30	*****	26.9	25.4	23.4	23.3	97	88	79
<b>Mean</b>	*****	30.4	27.1	24.8	23.6	94	82	65
<b>Maximum</b>	*****	35.7	30.7	27.1	25.5	99	97	90
<b>Minimum</b>	*****	25.5	24.1	21.9	21.3	80	58	42

### Extract of Meteorological Observations for Tseung Kwan O Automatic Weather Station, September 2013

Date	Total Rainfall (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
Sep 1	1.5	240	4.5
Sep 2	0.0	100	4.2
Sep 3	3.5	040	3.9
Sep 4	64.5	020	5.1
Sep 5	110.5	160	4.7
Sep 6	0.0	020	7.7
Sep 7	0.0	030	7.6
Sep 8	0.0	020	7.4
Sep 9	0.0	020	8.9
Sep 10	0.0	030	7.2
Sep 11	0.0	030	7.4
Sep 12	0.0	020	8.2
Sep 13	0.0	040	7.1
Sep 14	0.0	070#	5.7#
Sep 15	0.0	080	4.9
Sep 16	1.5	070	9.3
Sep 17	0.0	070	10.8
Sep 18	0.0	140	9.5
Sep 19	0.0	020	7.6
Sep 20	0.0	310	3.9
Sep 21	0.0	350	9.4
Sep 22	43.0	350	13.3
Sep 23	46.0	200	9.0
Sep 24	0.0	130	8.7
Sep 25	0.0	030	7.9
Sep 26	2.5	030	9.1
Sep 27	0.0	070	7.4
Sep 28	0.5	050	7.5
Sep 29	3.5	360	6.3
Sep 30	4.5	020	8.2
<b>Mean</b>	-----	030#	7.4#
<b>Total</b>	281.5	---	-----
<b>Maximum</b>	110.5	---	13.3#
<b>Minimum</b>	0.0	---	3.9#

\*\*\* unavailable

# missing (less than 24 hourly observations a day)

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



## **Appendix I**

### **F**

## **Event-Action Plans**

## EVENT/ACTION PLAN FOR AIR QUALITY EXCEEDANCE

EVENT	ACTION			
	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 the 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			Contractor
	ET Leader	IC(E)	ER	
<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

### ACTION

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

## EVENT AND ACTION PLAN FOR WATER QUALITY EXCEEDANCE

Event	ACTION			
	ET Leader	Contractor	ER	IEC
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>8. 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>



## **Appendix I**

### **G**

## **Works Programme**

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

Site Location : Tseung Kwan O Area 137 Fill Bank

ID	Activity	Original Duration	Start	Finish
S101000	Taking Over the Existing Facilities	0	19/01/2010	
S102000	Operation	1096	19/01/2010	18/01/2013
S103000	Operation and Maintenance of Tipping Halls	1096	19/01/2010	18/01/2013
S104000	Provision and Operation of a Crushing Plant	1096	19/01/2010	18/01/2013
S105000	Handing Over the Facilities to the Employer	0		18/01/2013
A101000	Removal of Stockpile Area A3	100	19/01/2010	28/04/2010
A102000	Site Formation	7	22/04/2010	28/04/2010
A103000	Provision of New Combined Reception and Exit Offices	90	29/04/2010	27/07/2010
A104000	Provision of Inspection Platform	60	28/07/2010	25/09/2010
A105000	Provision of Measurement Systems	60	28/07/2010	25/09/2010
A106000	Provision of Surveillance Systems	60	28/07/2010	25/09/2010
A107000	Provision of Wheel Washing Facilities	60	28/07/2010	25/09/2010
A109000	Testing, Commissioning & Handover	21	14/09/2010	10/04/2010
A109100	Removal of Existing Combined Reception & Exit Offices & other Facilities A3	14	10/05/2010	18/10/2010
A109200	Removal of Existing Combined Reception & Exit Offices & other Facilities A6	14	10/05/2010	18/10/2010
A201000	Removal of Stockpile Area at Portion A6	316	19/01/2010	30/11/2010
A209100	Construction of Access Road at Portion A6	60	20/10/2010	18/12/2010
A209200	Construction of Access Road at Portion A3	61	19/10/2010	18/12/2010



## **Appendix I**

### **H**

#### **IEC's Site Audit Records**

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

Inspection

Date: 11 September 2013

Time: 10:30

Location: TKO Area 137

Checklist No. CEDPFRSFEM00\_130911\_TKOFB

Inspected by C Y WONG

CEDD: JASON LAI

IEC: KM KWAN

ET: SW SUNG

Contractor: SW SUNG

**PART A: GENERAL INFORMATION**

Weather:  Sunny  Fine  Cloudy  Rainy

Temperature: 28 °C

Humidity:  High  Moderate  Low

Wind:  Strong  Breeze  Light  Calm

**PART B: SITE AUDIT**

**Section 1: Water Quality**

		Not Obs.	Yes	No	Follow up	N/A	Photo/Remarks
1.01	Is an effluent discharge license obtained for the Project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.02	Is the effluent discharged in accordance with the discharge licence?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.03	Is the discharge of turbid water avoided?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.04	Are temporary intercepting drains provided at the stockpiling area to divert polluted stormwater to the intercepting channels?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.05	Are all catchpits, sand and silt removal facilities, and the drainage and intercepting channels on site properly maintained?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.06	Is the stormwater intercepting system effective to collect of runoff and remove suspended solids before discharge?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.07	Is water retained in receptacles and standing water avoided to prevent mosquito breeding?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.08	Is the material properly covered to prevent washed away especially before rainstorm?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.09	Is the temporary slope surface covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD when rainstorm is imminent or forecast?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.10	Is the final slope surface treated by compaction, followed by hydroseeding or other suitable surface stabiliser approved by CEDD to prevent washing away of stockpiled material?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.11	Is a wheel washing bay with high pressure water jets provided at the site exit?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.12	Is sand and silt settled out or removed before being discharged into storm drains?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.13	Are the manholes covered and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.14	Is sewage from toilets discharged in to a foul sewer, or chemical toilets provided?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.15	Is sewage from chemical toilets collected by a licensed contractor for disposal and maintenance of these facilities?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.16	Are tipping halls enclosed with top and 3-sides to prevent spillage of material into marine water?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.17	Is silt curtain provided at the outward side at the TKO basin near the barging point?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.18	Is a waste collection vessel deployed to remove floating debris?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.19	Is foam, oil, grease, scum, litter or other objectionable matters avoided on the water in vicinity of the barging facilities during the work activities?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.20	Are the barges 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 washing?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

		Not Obs.	Yes	No	Follow up	N/A	Photo/Remarks
1.21	Are all vessels used for transportation of fill material provided with tight fitting seals to their bottom openings to prevent leakage of material during transport?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.22	Are barges not be filled to a level which may cause the overflow of material during loading or transportation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.23	Is barge effluent properly collected and treated before disposal?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.24	Are adequate environmental control measures provided to prevent/ avoid dropping of fill material into the sea during the transfer?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.25	Is there any buffer distance at least 100m maintained between the boundary of the public fill stockpiling area and the sea front?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.26	Is oil intercept in addition of sand/silt removal facilities provided at the car parking area?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.27	Is oil interceptor provided at workshop?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.28	Is oil leakage prevented from all generator, fuel and oil storage?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.29	Is wastewater collected from canteen kitchens, including that from basins, sinks and floor drains properly discharged into foul sewers via grease traps?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>Section 2: Air Quality</b>							
2.01	Is dust control/ mitigation measures implemented to prevent dust nuisance?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.02	Are water sprays provided and used to dampen materials?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.03	Are all vehicles restricted to maximum speed 10km per hour?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.04	Is the load on vehicles watered and covered entirely by clean impervious sheeting?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.05	Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.06	Are the unpaved areas watered regularly to avoid dust generation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.07	Are the worksites with active dusty operations watered regularly (at least three times per day) to avoid dust generation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.08	Is the designated site main haul road watered regularly (at least three times per day)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.09	Is the haul road inside the site and public road around the site entrance kept clean and free from dust?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.10	Is the site haul road covered with concrete, bituminous materials, hardcores or metal plates?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.11	Are there any wheel washing facilities including high-pressure water jet provided at the entrance of work site?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.12	Are vehicles washed to remove any dusty materials from its bodies and wheels before leaving the fill bank?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.13	Are the vehicles and equipments switched off while not in use?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.14	Are all plants and equipments well maintained? (e.g. without black smoke emission)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.15	Is the open burning prohibited?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.16	Is regular cleaning and watering the site provided to minimise the fugitive dust emissions?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.17	Is the temporary slope surface covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.18	Is the final slope surface treated by compaction, followed by hydroseeding or other suitable surface stabiliser approved by CEDD?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.19	Are conveyor belts, conveyor transfer points and hopper discharge areas fitted with windboards, belt cleaners or enclosed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.20	Are belt scraper installed and equipped with bottom plates to prevent falling of material from the return belt?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

	Not Obs.	Yes	No	Follow up	N/A	Photo/ Remarks
2.21	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.22	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Section 3: Noise</b>						
3.01	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.02	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.03	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.05	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.06	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.07	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.08	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.09	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.10	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Section 4: Waste/Chemical Management</b>						
4.01	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.02	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.03	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.04	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.05	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.06	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.07	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.08	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.09	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.10	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.11	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.12	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.13	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	



	Not Obs.	Yes	No	Follow up	N/A	Photo/ Remarks
4.14	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.15	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.16	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.17	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.18	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.19	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.20	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.21	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.22	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.23	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.24	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.25	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.26	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.27	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.28	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.29	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.30	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.31	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.32	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.33	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Section 5: Landscape &amp; Visual</b>						
5.01	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.02	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.03	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.05	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Not Obs.	Yes	No	Follow up	N/A	Photo/Remarks
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**Section 6: Others**

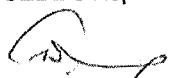


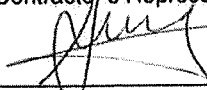
6.01	Is the fill bank site restricted access by the general public?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6.02	Is environmental permit displaced conspicuously on site?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**Section 7: Follow-up for the Previous Environmental Inspection on date** 20.08.13 **(Ref No. CEDPFRSFEM00\_130820\_TKOFB)**

Is the situation in item <u>Fu①</u> improved / rectified?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>closed ipz</u>
Is the situation in item _____ improved / rectified?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the situation in item _____ improved / rectified?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the situation in item _____ improved / rectified?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the situation in item _____ improved / rectified?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**Remarks:**

Follow-up:  
 - Fu①, oil stain at workshop had been removed.  
 During this inspection:  
 - NO new observation is recorded.

Signature: CEDD's Representative	Signature: IEC Auditor	Signature: ET Auditor	Signature: Contractor's Representative
			
Name: <u>WONG CHEUK YIN</u>	Name: <u>K CLM</u>	Name: <u>K.M. Chan</u>	Name: <u>S.W. SUI</u>
Date: <u>11.9.2013</u>	Date: <u>11. Sep. 2013</u>	Date: <u>11. SEP. 2013</u>	Date: <u>11/9/13</u>

Contract No.: CV/2009/02

Inspection Date: 11 September 2013

(1) Follow-up the previous inspection

Checklist No.: CEDPFRSFEM00\_130820\_TKOFB

Before



Photo 1

Workshop

Oil stain is found on the bare ground at workshop.  
The Contractor is reminded to clean up the oil stain properly.

After



Photo 2

Workshop

Oil stain had been cleaned. (Closed)

(2) Observation during site inspection

Checklist No.: CEDPFRSFEM00\_130911\_TKOFB



Photo 3 and 4

No new environmental observation is recorded.



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

Inspection Date: 17 September 2013

Time: 10:30

Location: TKO Area 137

Checklist No. CEDPFRSFEM00\_130917\_TKOFB

Inspected by

CEDD: C KWOO

IEC: JASON LAM

ET: KW MAK

Contractor: SW SUNG

**PART A: GENERAL INFORMATION**

Weather:  Sunny  Fine  Cloudy  Rainy

Temperature: 31 °C

Humidity:  High  Moderate  Low

Wind:  Strong  Breeze  Light  Calm

**PART B: SITE AUDIT**

		Not Obs.	Yes	No	Follow up	N/A	Photo/Remarks
<b>Section 1: Water Quality</b>							
1.01	Is an effluent discharge license obtained for the Project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.02	Is the effluent discharged in accordance with the discharge licence?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.03	Is the discharge of turbid water avoided?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.04	Are temporary intercepting drains provided at the stockpiling area to divert polluted stormwater to the intercepting channels?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.05	Are all catchpits, sand and silt removal facilities, and the drainage and intercepting channels on site properly maintained?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.06	Is the stormwater intercepting system effective to collect of runoff and remove suspended solids before discharge?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.07	Is water retained in receptacles and standing water avoided to prevent mosquito breeding?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.08	Is the material properly covered to prevent washed away especially before rainstorm?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.09	Is the temporary slope surface covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD when rainstorm is imminent or forecast?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.10	Is the final slope surface treated by compaction, followed by hydroseeding or other suitable surface stabiliser approved by CEDD to prevent washing away of stockpiled material?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.11	Is a wheel washing bay with high pressure water jets provided at the site exit?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.12	Is sand and silt settled out or removed before being discharged into storm drains?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.13	Are the manholes covered and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.14	Is sewage from toilets discharged in to a foul sewer, or chemical toilets provided?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.15	Is sewage from chemical toilets collected by a licensed contractor for disposal and maintenance of these facilities?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.16	Are tipping halls enclosed with top and 3-sides to prevent spillage of material into marine water?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.17	Is silt curtain provided at the outward side at the TKO basin near the barging point?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.18	Is a waste collection vessel deployed to remove floating debris?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.19	Is foam, oil, grease, scum, litter or other objectionable matters avoided on the water in vicinity of the barging facilities during the work activities?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.20	Are the barges in right size such that adequate clearance in 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 washing?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

	Not Obs.	Yes	No	Follow up	N/A	Photo/Remarks
1.21	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.22	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.23	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.24	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.25	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.26	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.27	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.28	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.29	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>Section 2: Air Quality</b>						
2.01	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.02	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.03	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.04	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.05	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.06	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.07	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.08	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.09	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.10	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.11	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.12	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.13	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.14	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.15	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.16	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.17	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.18	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.19	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.20	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

		Not Obs.	Yes	No	Follow up	N/A	Photo/Remarks
2.21	Is a buffer zone of at least 100m provided between the edge of the stockpiling area and the TVB Broadcast and production Centre in the TKO Industrial Estate?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.22	Is site fencing of 2.4m high erected along the entire northern boundary of the site?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Section 3: Noise</b>							
3.01	Are the approved method of working, equipment and sound reducing measures adopted?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.02	Are the site activities scheduled to minimize noise nuisance?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.03	Are all plants well maintained and in good condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.04	Are the Powered mechanical plant (PME) covered or shielded by appropriate acoustic materials?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.05	Are air compressors and hand held breakers fitted with valid noise emission labels during operation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.06	Are the compressors and generators operated with door closed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.07	Are idle machines and plants shut down or throttled down?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.08	Are noisy equipment and mobile plant sited away from NSRs?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.09	Are the works within 10m from the western boundary of the Clearwater Bay Country Park not allowed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.10	Is the operation hours of the fill bank restricted to 8:00 a.m. to 11:00 p.m.?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Section 4: Waste/Chemical Management</b>							
4.01	Are recycle bins for paper, plastic bottles and aluminium cans provided at the site office area?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.02	Are the recyclable wastes reused on site or collected by the licensed waste recycling agents?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.03	Is relevant license/permit for disposal of construction waste or excavated material, if generated from the site, available for inspection?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.04	Is excavated material, if generated from the site, reused on-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.05	Is mud and debris removed from waterworks access roads and associated drainage systems?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.06	Is sufficient waste disposal points and regular collection for disposal provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.07	Are appropriate measures employed to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.08	Is there any 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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.09	Is the disposal of C&D waste, recyclable materials salvaged for reuse and inert waste utilised as public fill to minimize the quality of waste to be disposed of to landfill?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.10	Is trip ticket system implemented for the disposal of construction wastes, in order to monitor the disposal of C&D material and solid wastes at public filling areas and landfills, and to control fly-tipping?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.11	Is soil contaminated with chemicals/oils removed from site and the void created shall be filled with suitable materials?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.12	Is the Contractor registered as a chemical waste producer? The waste Disposal Ordinance (Cap354) and its subsidiary regulations in particular the waste disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.13	Are chemical wastes handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical wastes after use?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

	Not Obs.	Yes	No	Follow up	N/A	Photo/ Remarks
4.14	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.15	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.16	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.17	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.18	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.19	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.20	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.21	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.22	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.23	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.24	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.25	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.26	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.27	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.28	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.29	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.30	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.31	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.32	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.33	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Section 5: Landscape &amp; Visual</b>						
5.01	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.02	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.03	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.05	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Not Obs.	Yes	No	Follow up	N/A	Photo/Remarks
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**Section 6: Others**

6.01 Is the fill bank site restricted access by the general public?

Not Obs.  Yes  No  Follow up  N/A

6.02 Is environmental permit displaced conspicuously on site?

Not Obs.  Yes  No  Follow up  N/A

**Section 7: Follow-up for the Previous Environmental Inspection on date** 11.09.13 (Ref No. CEDPFRSFEM00\_130911\_TKOFB)

Is the situation in item \_\_\_\_\_ improved / rectified?

Not Obs.  Yes  No  Follow up  N/A

*No follow-up*

Is the situation in item \_\_\_\_\_ improved / rectified?

Not Obs.  Yes  No  Follow up  N/A

Is the situation in item \_\_\_\_\_ improved / rectified?

Not Obs.  Yes  No  Follow up  N/A

Is the situation in item \_\_\_\_\_ improved / rectified?

Not Obs.  Yes  No  Follow up  N/A

Is the situation in item \_\_\_\_\_ improved / rectified?

Not Obs.  Yes  No  Follow up  N/A

**Remarks:**

- NO adverse environmental observation is recorded.

Signature: CEDD's Representative	Signature: IEC Auditor	Signature: ET Auditor	Signature: Contractor's Representative
Name: C.K. Joo	Name: Jason	Name: Mak	Name: [Signature]
Date: 17-09-2013	Date: 17.09.2013	Date: 17/9/13	Date: 17/9/13



Contract No.: CV/2009/02

Inspection Date: 17 September 2013

Observation during site inspection

Checklist No.: CEDPFRSFEM00\_130917\_TKOFB

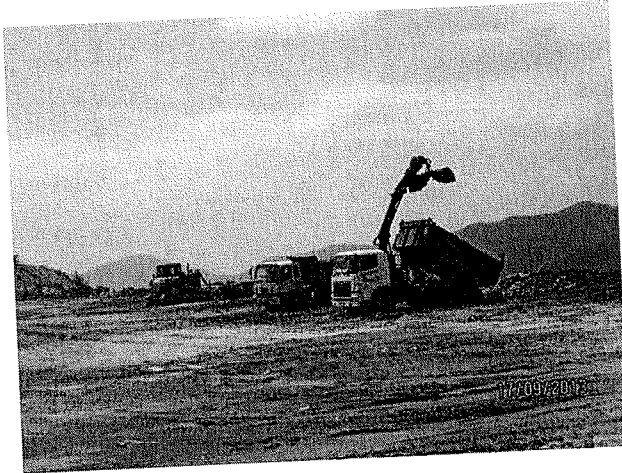


Photo 1 and 2

No adverse environmental observation is recorded.

## Appendix I


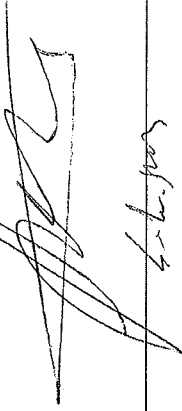
I

### Weekly ET's Site Inspection Record



CEDD Contract No.: CV/2009/02  
Handling of Surplus Public Fill - Tseung Kwan O Fill Bank

Inspection Date : 4/9/13  
 Time : 10:25  
 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:		 Mark Hei Wai	Mark
Name:	C.K. Wong	Li Kam Hung	Mark Hei Wai
Title	Flow/ps	Pro S.C.	E.T

Environmental Checklist	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Fugitive Dust Emission</b>				
<ul style="list-style-type: none"> <li>▪ Dust control / mitigation measures shall be provided to prevent dust nuisance.</li> <li>▪ A buffer zone of at least 100m shall be maintained between the edge of the stockpiling area and the nearest ASRs at the TKO Industrial Estate. Within the buffer zone, no dusty material shall be stockpiled and no loading / unloading and similar activities should be allowed.</li> <li>▪ Water sprays shall be provided and used to dampen materials.</li> <li>▪ Regular cleaning and watering the site shall be provided to minimize the fugitive dust emissions.</li> <li>▪ All vehicles shall be restrict to a maximum speed of 10 km per hour.</li> <li>▪ Any vehicle with open load carrying area used for moving materials which has the potential to create dust shall have properly fitting side and tail boards. Material having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin.</li> <li>▪ The designated site main haul road shall be paved or regular watering.</li> <li>▪ Frequent watering of work site shall be at least three times per day.</li> <li>▪ Wheel washing facilities including high-pressure water jet shall be provided at the entrance of work site.</li> <li>▪ Every vehicle shall be washed to remove any dusty materials from its body and wheels before leaving the fill bank.</li> <li>▪ All plant and equipment should be well maintained e.g. without black smoke emission.</li> <li>▪ Open burning should be prohibited.</li> <li>▪ The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD.</li> <li>▪ Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shot concrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.</li> <li>▪ When fill material is transfer by belt conveyor systems, the conveyors shall be enclosed on top and 2 sides.</li> <li>▪ The belt scraper shall be equipped with bottom plates or other similar means to prevent falling of material from the return belt.</li> <li>▪ The level of stockpiling belt conveyor shall be adjustable such that the vertical distance between the belt conveyor and the material landing point is maintained at no more than 1m.</li> </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>	√			

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


Environmental Checklist		Implementation Stages*		Remark
		Yes	No	
<b>Landscape and Visual</b>				
<ul style="list-style-type: none"> <li>▪ The design of the fill bank and platform heights adopted should allow the fill bank to fit into the general topography of the surrounding land. Straight edged slopes should be avoided.</li> <li>▪ The maximum stockpiling height at the fill bank shall be limited to a maximum of +35.2mPD.</li> <li>▪ Surface of outer slopes of the fill bank shall preferably be hydroseeded or covered with geo-textile matting of appropriate colour (e.g. dark green / brown) once completed.</li> <li>▪ The barging point and the C&amp;DMSF at the fill bank shall not be in operation from 07:00 pm to 08:00 am daily to avoid potential visual impact from glare.</li> </ul>	√			
<b>Other Environmental Factors</b>				
<ul style="list-style-type: none"> <li>▪ C&amp;D waste sorted from mixed C&amp;D material shall be removed from the temporary buffer storage area on a daily basis and transfer to SENT landfill for disposal.</li> <li>▪ Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.</li> <li>▪ Any unused materials or those with remaining functional capacity should be recycled and stored properly.</li> <li>▪ All generators, fuel and oil storage are within bundle areas.</li> <li>▪ Oil leakage from machinery, vehicle and plant is prevented.</li> <li>▪ The Environmental Permit should be displaced conspicuously on site.</li> <li>▪ Good site practices should be adopted to clean the rubbish and litter on a regular basis so as to prevent the rubbish and litter from dropping into the nearby environment.</li> <li>▪ To encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to segregate this waste from other general refuse generated by the workforce.</li> </ul>	√	√		Item 2

**Summary of the Weekly Site Inspection:**

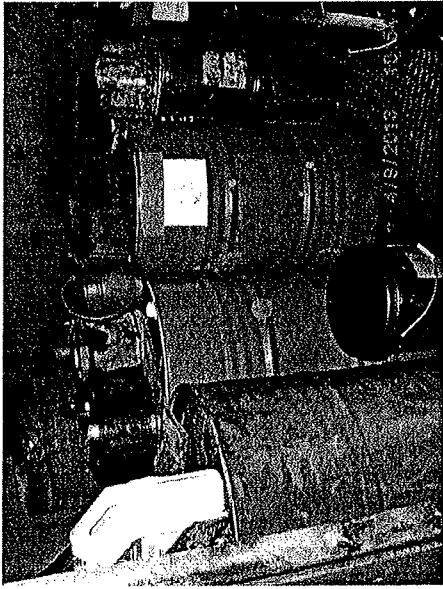

Item	Details of defective works or observations	Proposed Follow Up Action	Photo Ref.	Further Action Required (Yes/No)	Target Completion Date
1	Follow-up action to item 2 on 28/08/13, chemical wastes stored in the chemical waste storage area at workshop were still found with chemical labels.	To provide appropriate chemical waste labels for the chemical wastes (e.g. cleaning fluids, solvents, lubrication oil and fuel) according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.	130904_001	Yes	11/09/13
2	Idle tyres were found discarded near workshop.	To store the tyres in an appropriate storage area or cover them properly.	130904_002	Yes	11/09/13

Remark

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Name	Title	Signature	Date
Linda Law	Senior Environmental Officer		04 September 2013

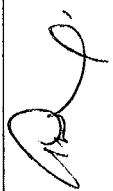
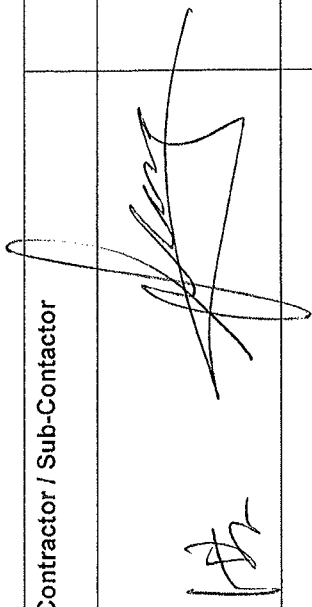

**Photos**

 <p>Photo 130904_001 (Chemical waste storage area at workshop)</p>	 <p>Photo 130904_002 (Workshop)</p>	
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CEDD Contract No.: CV/2009/02  
 Handling of Surplus Public Fill - Tseung Kwun O Fill Bank

Inspection Date : 11. Sep. 2013  
 Time : 10:30  
 Weather : Sunny / Fine / Cloudy / Overcast / Drizzle / Rain / Storm / Hazy  
 Wind : Calm / Light / Breeze / Strong  
 Temperature : 28°C  
 Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:			
Name:	Hoong CHEUK YIN	Li Kam Hung S.V. Suck	K. M. Lam
Title	Stons Ps.	S.S. AGO	ET

Environmental Checklist	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Fugitive Dust Emission</b>				
<ul style="list-style-type: none"> <li>▪ Dust control / mitigation measures shall be provided to prevent dust nuisance.</li> <li>▪ A buffer zone of at least 100m shall be maintained between the edge of the stockpiling area and the nearest ASRs at the TKO Industrial Estate. Within the buffer zone, no dusty material shall be stockpiled and no loading / unloading and similar activities should be allowed.</li> <li>▪ Water sprays shall be provided and used to dampen materials.</li> <li>▪ Regular cleaning and watering the site shall be provided to minimize the fugitive dust emissions.</li> <li>▪ All vehicles shall be restrict to a maximum speed of 10 km per hour.</li> <li>▪ Any vehicle with open load carrying area used for moving materials which has the potential to create dust shall have properly fitting side and tail boards. Material having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin.</li> <li>▪ The designated site main haul road shall be paved or regular watering.</li> <li>▪ Frequent watering of work site shall be at least three times per day.</li> <li>▪ Wheel washing facilities including high-pressure water jet shall be provided at the entrance of work site.</li> <li>▪ Every vehicle shall be washed to remove any dusty materials from its body and wheels before leaving the fill bank.</li> <li>▪ All plant and equipment should be well maintained e.g. without black smoke emission.</li> <li>▪ Open burning should be prohibited.</li> <li>▪ The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD.</li> <li>▪ Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shot concrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.</li> <li>▪ When fill material is transfer by belt conveyor systems, the conveyors shall be enclosed on top and 2 sides.</li> <li>▪ The belt scraper shall be equipped with bottom plates or other similar means to prevent falling of material from the return belt.</li> <li>▪ The level of stockpiling belt conveyor shall be adjustable such that the vertical distance between the belt conveyor and the material landing point is maintained at no more than 1m.</li> </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 NSFRs.</li> </ul>	√			

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


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

**Summary of the Weekly Site Inspection:**

Item	Details of defective works or observations	Proposed Follow Up Action	Photo Ref.	Further Action Required (Yes/No)	Target Completion Date
1	Follow-up action to item 2 on 28/08/13 and item 1 on 04/09/13, chemical labels were provided for the chemical wastes stored in the chemical waste storage area at workshop.	---	130911_001	No	---
2	Follow-up action to item 2 on 04/09/13, idle tyres discarded near workshop were covered properly.	---	130911_002	No	---

Remark

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Name	Title	Signature	Date
Linda Law	Senior Environmental Officer		11 September 2013

**Photos**



Photo 130911\_001 (Chemical waste storage area at workshop) (Improved)

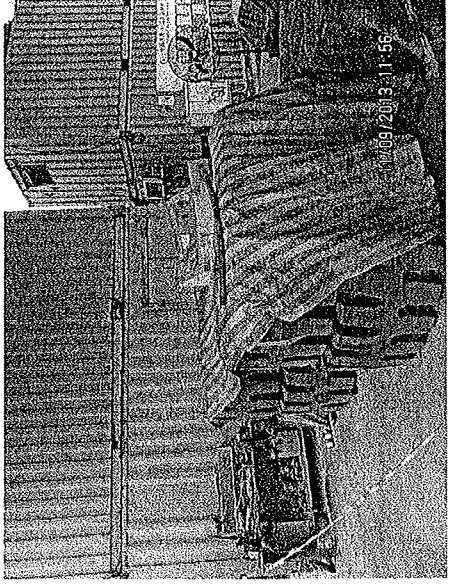



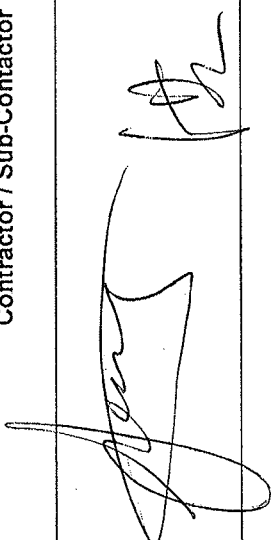

Photo 130911\_002 (Workshop) (Improved)



CEDD Contract No.: CV/2009/02  
Handling of Surplus Public Fill - Tseung Kwan O Fill Bank

Inspection Date : 17/9/13  
 Time : 10:50  
 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:	C. K. Woo C.T. Lin Duncan Lam	Sun Juy Wilson Wong	Nak Kei Wan
Title	Always TOWP's Acc/P301	CEO SS.	E.T



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



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


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

**Summary of the Weekly Site Inspection:**

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

Remark

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Name	Title	Signature	Date
Linda Law	Senior Environmental Officer		17 September 2013

Photos


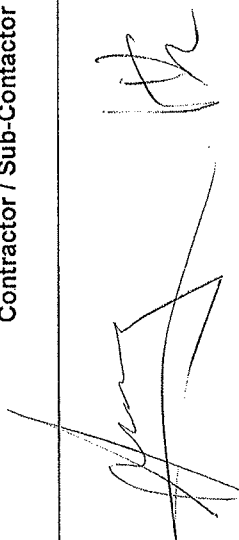

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CEDD Contract No.: CV/2009/02  
Handling of Surplus Public Fill - T-seung Kwun O Fill Bank

Inspection Date : 25/9/13  
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:	C. K. Lo H.K. LO C.F.Lin	W. Kwan W. Kwan	Mak Hei Wan
Title	AE/PS IO/PS	AGO 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.	✓			Item 1
▪ A buffer zone of at least 100m shall be maintained between the edge of the stockpiling area and the nearest ASRs at the TKO Industrial Estate. Within the buffer zone, no dusty material shall be stockpiled and no loading / unloading and similar activities should be allowed.	✓			
▪ Water sprays shall be provided and used to dampen materials.	✓			
▪ Regular cleaning and watering the site shall be provided to minimize the fugitive dust emissions.	✓			
▪ All vehicles shall be restricted to a maximum speed of 10 km per hour.	✓			
▪ Any vehicle with open load carrying area used for moving materials which has the potential to create dust shall have properly fitting side and tail boards. Material having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin.	✓			
▪ The designated site main haul road shall be paved or regular watering.	✓			
▪ Frequent watering of work site shall be at least three times per day.	✓			
▪ Wheel washing facilities including high-pressure water jet shall be provided at the entrance of work site.	✓			
▪ Every vehicle shall be washed to remove any dusty materials from its body and wheels before leaving the fill bank.	✓			
▪ All plant and equipment should be well maintained e.g. without black smoke emission.	✓			
▪ Open burning should be prohibited.	✓			
▪ The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD.	✓			
▪ Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shot concrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.	✓			
▪ When fill material is transfer by belt conveyor systems, the conveyors shall be enclosed on top and 2 sides.	✓			
▪ The belt scraper shall be equipped with bottom plates or other similar means to prevent falling of material from the return belt.	✓			
▪ The level of stockpiling belt conveyor shall be adjustable such that the vertical distance between the belt conveyor and the material landing point is maintained at no more than 1m.	✓			
<b>Noise Impact</b>				
▪ The approved method of working, equipment and sound-reducing measures (e.g. use of silenced type of equipment, etc.) shall be adapted.	✓			
▪ Only well maintained plant should be operated on-site and plant should be serviced regularly during the construction works.	✓			
▪ Powered mechanical equipment (PME) should be covered or shielded by appropriate acoustic materials.	✓			
▪ Air compressors and hand held breakers should have noise labels.	✓			
▪ Machines and plants that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.	✓			
▪ Noisy equipment and mobile plant shall always be site away from NSRs.	✓			

Implementation Stages*	Remark	
	Yes	No / N/A
<b>Water Quality</b>		
Drainage system should be adequate and well maintained to prevent flooding and overflow, especially after rain storms.	✓	
The permanent drainage channels should have sediment basin, traps and baffles and maintain properly.	✓	
Temporary intercepting drains should be used at the stockpiling area to divert polluted stormwater to the intercepting channels. Earth bunds and sand bay barriers shall be used to assist the diversion of polluted stormwater to the intercepting channels.	✓	
Manholes should be covered and sealed.	✓	
Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding.	✓	
A buffer distance of at least 100m shall be maintained between the boundary of the public fill stockpiling area and the sea front.	✓	
A buffer distance of at least 20m shall be maintained between the boundary of the C&DMSF and the seafront.	✓	
The stormwater intercepting system shall be effective to collect of runoff and remove suspended solids before discharge.	✓	
The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD.	✓	
Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shotconcrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.	✓	
Existing and newly constructed Catchpits, sand and silt removal facilities and intercepting channels shall be maintained, and the deposited silt and grit shall be removed weekly and on a need basis especially at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.	✓	
A wheel washing bay shall be provided at the site exit and wash-water shall have sand and silt settled out or removed before being discharged into storm drains.	✓	
The section of construction road between wheel washing bay and the public road shall be paved with concrete, bituminous materials or hardcores to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.	✓	
Sewage from toilets shall be discharged in to a foul sewer, or chemical toilets shall be provided. The chemical toilets (if use) shall be provided by a licensed contractor, who will be responsible for disposal and maintenance of these facilities.	✓	
Oil intercept in addition of sand / silt removal facilities shall be provided at the car parking areas.	✓	
Oil interceptor shall be provided at work shop.	✓	
Tipping halls enclosed with top and 3-side to prevent spillage of material into marine water.	✓	Item 1
The barges shall be in right size such that adequate clearance is maintained between the vessels and the seabed at all states of the tide to ensure the undue turbidity is not generated by turbulence from vessel movement or propeller wash.	✓	
All vessels used for transportation of fill material shall have tight fitting seals to their bottom openings to prevent leakage of material during transport.	✓	
Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer.	✓	
Barges shall not be filled to a level which may cause the overflow of material during loading or transportation. Barge effluents shall be properly collected and treated before disposal.	✓	
The work activities shall not cause any visible foam, oil, grease, scum, litter or other objectionable matters to be present on the water in the vicinity of the barging facilities.	✓	
Existing silt curtain at the outward side of the basin near the Barging Handling Area throughout the period shall be repair, maintain and service when there is public fill intake by barges to the Fill Bank in accordance with PS Clause 1.68. The total length of the silt curtains shall not be less than 160m, and a gap of about 80m shall be left open for access of barges. The silt curtain shall be properly maintained such that it can also serve the function of refuse containment boom to confine floating refuse.	✓	
A waste collection vessel shall be deployed to remove floating debris.	✓	

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




**Summary of the Weekly Site Inspection:**

Item	Details of defective works or observations	Proposed Follow Up Action	Photo Ref.	Further Action Required (Yes/No)	Target Completion Date
1	Enclosure of tipping hall No.2 and 3 were found damaged.	To repair the damaged parts of tipping halls as soon as possible.	130925_001 and 130925_002	Yes	02/10/13

Remark

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Name	Title	Signature	Date
Linda Law	Senior Environmental Officer		25 September 2013

Photos



Photo 130925\_001 (Tipping hall No.2)

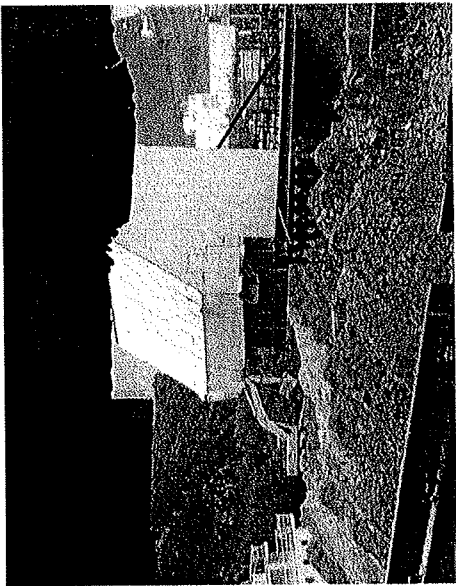


Photo 130925\_002 (Tipping hall No.3)

## Appendix I

### J

## Implementation Schedule of Mitigation Measures







## **Appendix I**

### **K**

#### **Site General Layout plan**



## **Appendix I**

**L**

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





**Contract No. CV/2009/02 Handling of Surplus Public Fill  
Tseung Kwan O Area137**

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

**October 2013**

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	30 <u>1-hr &amp; 24 hr TSP</u> <u>WQM</u> Mid-ebb (08:00 -10:00) Mid-flood (15:00 -17:00)	1 / 10	2 <u>1-hr TSP</u> <u>Weekly SI</u> <u>WQM</u> Mid-ebb (10:00 -12:00) Mid-flood (16:00 -18:00)	3	4 <u>1-hr TSP</u> <u>WQM</u> Mid-ebb (11:00 -13:00) Mid-flood (17:00 -19:00)	5
6 <u>24 hr TSP</u>	7 <u>1-hr TSP</u> <u>WQM</u> Mid-flood (08:00-10:00) Mid-ebb (12:30-14:30)	8	9 <u>1-hr TSP</u> <u>Weekly SI</u> <u>NM</u> <u>WQM</u> Mid-flood (08:30-10:30) Mid-ebb (14:00-16:00)	10	11 <u>1-hr TSP</u> <u>WQM</u> Mid-flood (11:00-13:00) Mid-ebb (16:00-18:00)	12 <u>24 hr TSP</u>
13	14	15	16 <u>1-hr TSP x 3</u> <u>Weekly SI</u> <u>WQM</u> Mid-ebb (09:00 -11:00) Mid-flood (15:30 -17:30)	17	18 <u>1-hr &amp; 24 hr TSP</u> <u>WQM</u> Mid-ebb (10:30 -12:30) Mid-flood (16:30 -18:30)	19
20	21 <u>1-hr TSP</u> <u>WQM</u> Mid-flood (08:00-10:00) Mid-ebb (12:30-14:30)	22	23 <u>1-hr TSP</u> <u>Weekly SI</u> <u>WQM</u> Mid-flood (08:00-10:00) Mid-ebb (13:30-15:30)	24 <u>24 hr TSP</u>	25 <u>1-hr TSP x 2</u> <u>WQM</u> Mid-flood (10:00-12:00) Mid-ebb (15:00-16:30)	26
27	28 <u>1-hr TSP</u> <u>WQM</u> Mid-flood (13:30-15:30) Mid-ebb (19:00-21:00)	29	30 <u>1-hr &amp; 24 hr TSP</u> <u>Weekly SI</u> <u>WQM</u> Mid-ebb (08:00 -10:00) Mid-flood (14:30 -16:30)	31		



## **Appendix I**

### **M**

## **Complaint Log**

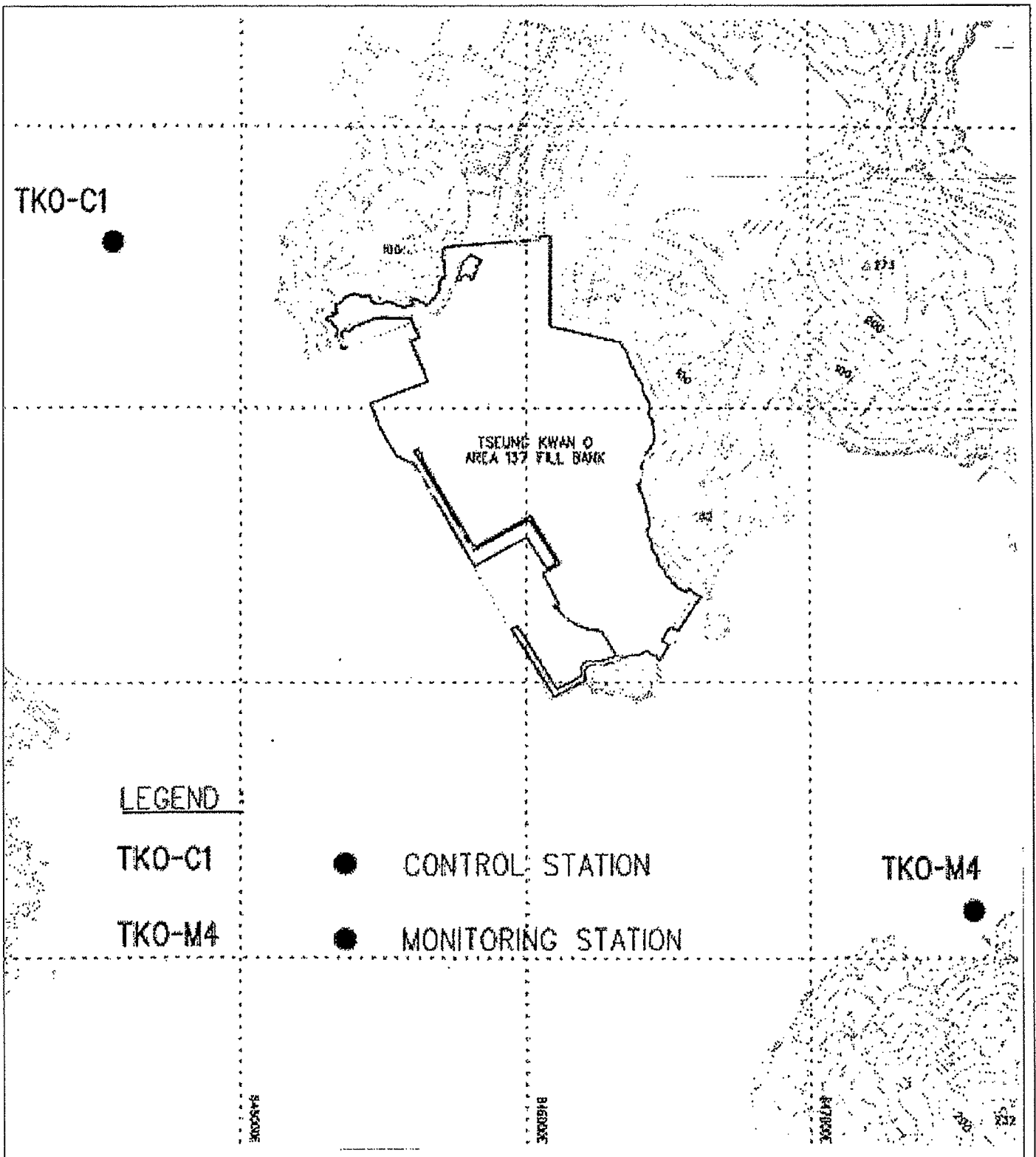
## Complaint Logs

Log Ref.	Location	Received Date	Details of Complaint	Investigation / Mitigation Action	Status
001	Working Area of the Fill Bank	25 August 2010	Three complaints received on 06 and 08 Aug 2010 was forwarded by the EPD on 25 August 2010 (Ref No.: (3) in EP3/N08/RE/00013438-10) from a citizen against dust emission at working area of the Fill Bank which caused by no water spray. The complainant complained that the dust generated caused an environmental nuisance.	<p>In response to the complaint, EPD had taken site investigations on 12 Aug 2010. During the site investigation, some improvements in the situation were noted by EPD and EPD reminded the Contractor to implement appropriate dust control measures as suggested in the EIA report to minimize dust impact to the environment, such as increasing the frequency of watering and spraying the site area especially during dry weather.</p> <p>Besides, a complaint Investigation report of this event have prepared by ET. From the investigation report, it noted that water spraying in the Fill Bank was not sufficient during the weekly site inspection on 07 Aug 2010 but there was no exceedance in air quality on 07 and 08 Aug 2010. Nevertheless, in view of our observation on site, the Contractor was still urged to increase the frequency of watering in the Project site especially during dry weather condition in order to enhance the air quality of the Project site. During the subsequently weekly site inspection on 14 Aug 2010, no more dust emission was observed in the Project site. It believed that the Contractor had provided as much as dust control measures to mitigate the problem and the air quality was further improved.</p>	Closed
002	Working Area of the Fill Bank	20 September 2011	Two complaints received on 24 and 29 August 2011 was forwarded by the EPD on 20 September 2011 (Ref No.: (2) in EP3/N08/RE/00017553-11) from public against dust emission at TKO137 Fill Bank. The complainant complained that the dust generated caused an environmental nuisance.	<p>Refer the EPD site investigation, no excessive emission of dust was revealed from the TKO137 Fill Bank. However, the Contractor was reminded to take more effort on the dust depression measures in the site area.</p> <p>Besides, a complaint Investigation report of this event have prepared by ET. From the investigation report, it noted that no fugitive dust emission was observed at TKO137 Fill Bank during the weekly site inspection on 24 and 31 August 2011 and no air quality exceedance was recorded during the dust monitoring period from 24 to 31 August 2011. Generally, the Contractor has implemented dust control measures to reduce dust impact to the environment but some improvement should be carried out. The Contractor should take more effort on the frequency of watering on site especially during dry weather.</p>	Closed



## Appendix I

### Figures

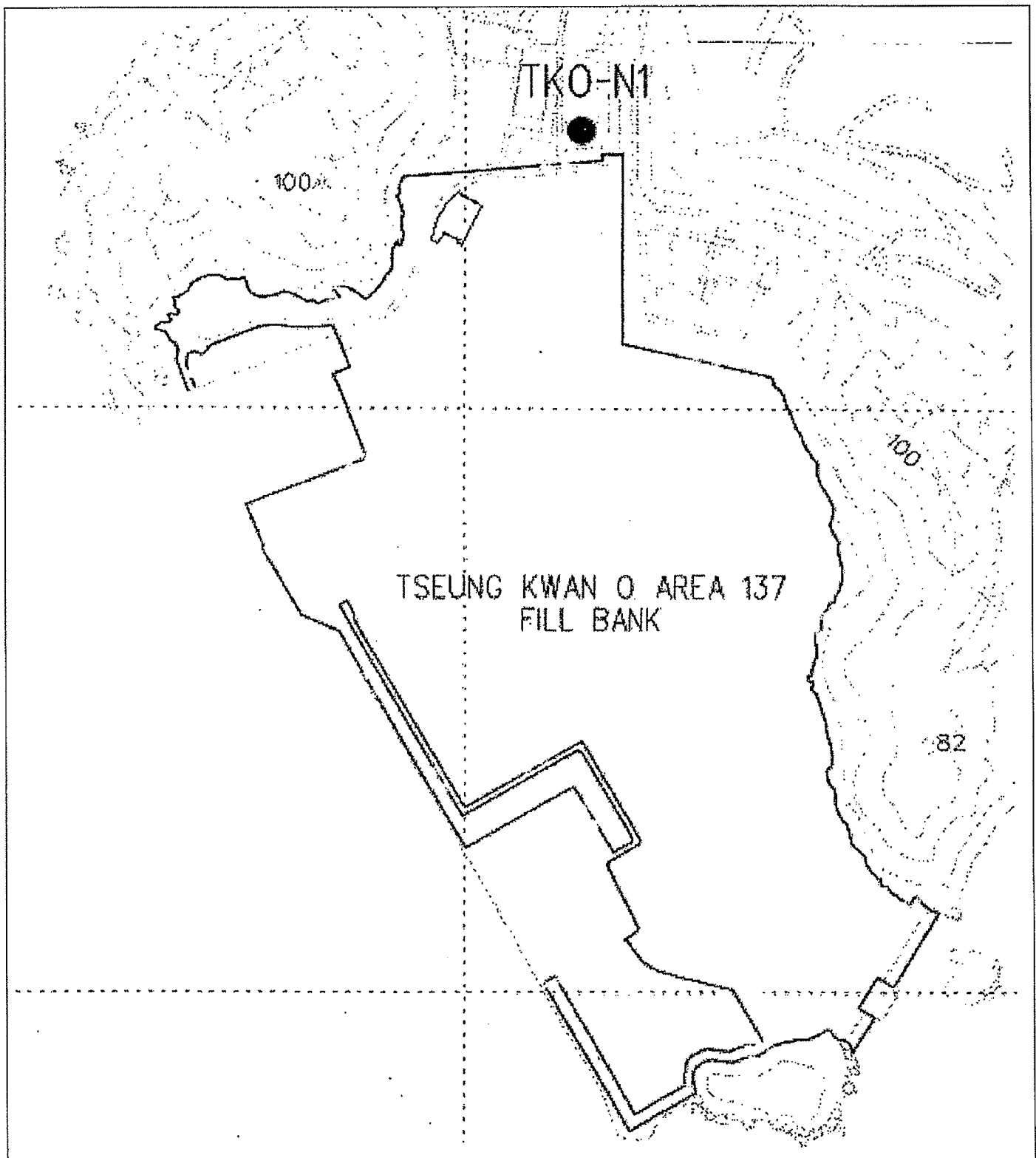


Contract No. CV/2009/02  
 Handling of Surplus Public Fill

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



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



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

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



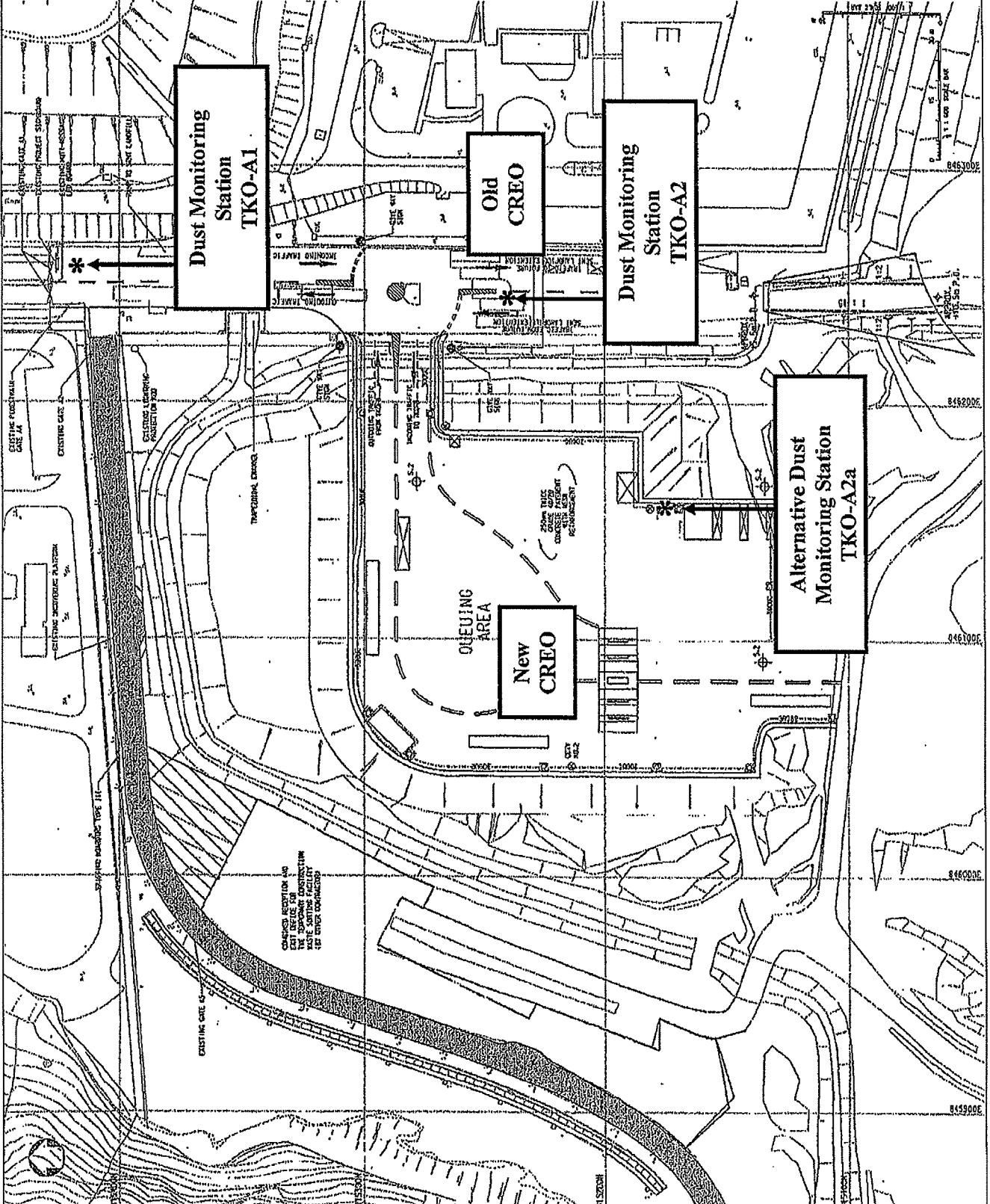
東業德勤測試顧問有限公司  
 ETS-TESTCONSULT LIMITED

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

Title:  
Locations of Air  
Quality  
Monitoring  
Stations -  
Tseung Kwan O  
Area 137 Fill  
Bank

ETS-Testconsult  
Ltd

Figure 3a





## **Appendix II**

**Marine Water Quality Monitoring Report for Contract No. HY/2010/02  
Hong Kong – Zhuhai – Macao Bridge, Hong Kong Boundary Crossing  
Facilities – Reclamation Works**

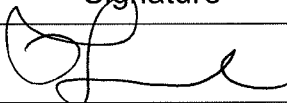



**China Harbour Engineering Company Limited**

Contract No. HY/2010/02

**Hong Kong – Zhuhai – Macao Bridge  
Hong Kong Boundary Crossing  
Facilities –  
Reclamation Works****Impact Water Quality Monitoring Report  
for TKO 137 Fill Bank  
September 2013**

[10/2013]

	Name	Signature
Prepared & Checked:	Isabella Yeung	
Reviewed & Approved:	Y T Tang	

Version:	Rev. 0	Date: 11 October 2013
<b>Disclaimer</b> <p>This report is prepared for China Harbour Engineering Company Limited and is given for its sole benefit in relation to and pursuant to Contract No. HY/2010/02 Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities-Reclamation Works and may not be disclosed to, quoted to or relied upon by any person other than China Harbour Engineering Company Limited without our prior written consent. No person (other than China Harbour Engineering Company Limited) into whose possession a copy of this report comes may rely on this report without our express written consent and China Harbour Engineering Company Limited may not rely on it for any purpose other than as described above.</p>		

AECOM Asia Co. Ltd.  
15/F, Grand Central Plaza, Tower 1, 138 Shatin Rural Committee Road, Shatin, NT, Hong Kong  
Tel: (852) 3922 9000 Fax: (852) 2317 7609 www.aecom.com

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## **EXECUTIVE SUMMARY**

On-site sorting facilities for imported material (public fill) for reclamation works of the “Contract No. HY/2010/02 – Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Work (here below, known as “the Project”) were proposed to establish in Tseung Kwan O (TKO) 137 Fill Bank area (here below known as “the Works Area). Impact monitoring of water quality was conducted at the designated monitoring location. This report presents the impact monitoring results regarding water quality aspects performed in September 2013.

### *Water Quality*

Impact water quality monitoring was conducted at three monitoring stations, C1a, M4a & M5. Monitoring Station C1a serves as the control station; Monitoring Station M4a and M5 are the impact stations. The impact monitoring was carried out three times per week (from 1 to 30 September 2013) during the operation of the mentioned facilities for both mid-ebb and mid-flood tides. Data of temperature, salinity, dissolved oxygen (DO), turbidity (Tby) and suspended solids (SS) were collected and analysed. Details of the monitoring methodology, locations and results are presented in this report.

### **Breaches of Action and Limit Levels for Water Quality**

No exceedance of Action and Limit Level of water quality monitoring results was recorded in the reporting month.

## **1 INTRODUCTION**

### **1.1 Background**

- 1.1.1 Contract No. HY/2010/02 – Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Work (here below, known as “the Project”) mainly comprises reclamation at the northeast of the Hong Kong International Airport of an area of about 130-hectare for the construction of an artificial island for the development of the Hong Kong Boundary Crossing Facilities (HKBCF), and about 19-hectare for the southern landfall of the Tuen Mun - Chek Lap Kok Link (TMCLKL).
- 1.1.2 On-site sorting facilities for imported material (public fill) for reclamation works of the Project were proposed to establish in Tseung Kwan O (TKO) 137 Fill Bank area (here below, known as “the Works Area”). The proposed sorting facilities together with barging points, tipping halls and associated facilities will be installed at the Works Area.
- 1.1.3 The latest Environmental Permit (EP) for Fill Bank at TKO Area 137 was issued on 4 February 2013 (EP-134/2002/K) by the Environmental Protection Department (EPD) to Civil Engineering and Development Department (CEDD), the Permit Holder, regarding the Project. Condition 3.2 of the EP requires the water quality monitoring frequency and parameters at stations C1a, M4a and M5 shall be same as the requirements set out in the EM&A Manual for TKO 137 Fill Bank (here below, known as “EM&A Manual”) and the monitoring results shall be incorporated in the monthly EM&A reports.

### **1.2 Purpose of the Report**

- 1.2.1 The purpose of this impact monitoring report is to assess environmental impact and compliance during transportation and operation of the mentioned facilities for the Project. This report presents the impact monitoring requirements, methodologies and results of water quality measurements in accordance with the EM&A Manual.
- 1.2.2 This impact report presents the monitoring works of water quality monitoring, at two monitoring stations (M4a and M5) and one control station (C1a), conducted in September 2013. A layout plan of the Works Area is provided in Figure 1.1.

### **1.3 Structure of the Report**

- 1.3.1 The structure of the report is as follows:

Section 1: Introduction, background, purpose and the structure of the report.

Section 2: Water quality, which describes the impact water quality monitoring requirements, methodology and action/limit level.

Section 3: Impact water quality monitoring results.

Section 4: Conclusions.

## 2 WATER QUALITY

### 2.1 Monitoring Requirements

2.1.1 Impact marine water quality monitoring at 3 water quality monitoring stations should be established. In accordance with the EM&A Manual, impact water quality monitoring should be conducted 3 days per week during the operation of the facilities in the Works Area. Moreover, as stipulated in the latest EP, water quality monitoring should be conducted since 2 weeks before commencement of operation of the additional barging points. Measurements shall be taken at the 3 designated stations, 2 impact and 1 control stations at mid-flood and mid-ebb tides at three water depths, i.e., 1 m below surface, mid-depth and 1 m from seabed.

### 2.2 Monitoring Equipment

2.2.1 Equipment used in the impact water quality monitoring programme is summarized in Table 2.1. A copy of the calibration certificates for the water quality monitoring equipment are attached in Appendix A.

**Table 2.1 Water Quality Monitoring Equipment**

Parameter	Model and Make
Coordinate of Monitoring stations	Garmin etrex 10
Dissolved Oxygen (Saturation), Temperature, Salinity	YSI Dissolved Oxygen, Salinity & Temperature Meter, YSI Pro2030
Turbidity	HACH Model 2100Q Turbid Meter
Water Depth	Speedtech Instrument SM-5A

### 2.3 Monitoring Parameters, Frequency and Duration

2.3.1 Table 2.2 summarises the monitoring parameters, frequency and duration of impact water quality monitoring. Impact water quality monitoring was carried out at three stations in September 2013. Detailed impact water quality monitoring schedule was provided in Appendix B.

**Table 2.2 Water Quality Monitoring Parameters, Frequency and Duration**

Monitoring Stations	Parameter, unit	Frequency	No. of Depths
<p><i>Control Stations:</i> C1a</p> <p><i>Impact Stations:</i> M4a – M5</p>	<ul style="list-style-type: none"> <li>• Depth, m</li> <li>• Temperature, °C</li> <li>• Salinity, ppt</li> <li>• DO, mg/L</li> <li>• DO Saturation, %</li> <li>• Turbidity, NTU</li> <li>• Suspended Solids (SS), mg/L</li> </ul>	<p>Three times per week during mid-ebb and mid-flood tides (within ± 1.75 hour of the predicted time)</p>	<p>3 (1 m below water surface, mid-depth and 1 m above sea bed, except where the water depth is less than 6 m, in which case the mid-depth station may be omitted. Should the water depth be less than 3 m, only the mid-depth station will be monitored).</p>

### 2.4 Monitoring Locations

2.4.1 The measurements were taken at all designated impact and control stations summarized in Table 2.3. The two impact stations were chosen on the basis of their proximity to the Works Area, which would be under the greatest potential for water quality impacts. In addition, a control station was also set up for ebb-tide references respectively of the surrounding ambient.

**Table 2.3 Location of Water Quality Impact Stations**

Station I.D.	HK 1980 Grid		Status
	Easting	Northing	
C1a	845647	814146	Control Station (Ebb-tide)
M4a	845922	813973	Impact Station (Close to Additional Barging Point, Tipping Halls and Associated Facilities at TKO 137 Fill Bank)
M5	847005	813678	Impact Station (Close to Tai Miu Wan)

## 2.5 Monitoring Methodology

### 2.5.1 Instrumentation

- (a) The in-situ water quality parameters, viz. dissolved oxygen, temperature, salinity and turbidity were measured by multi-parameter meters and turbidity was measured by Turbid Meter.

### 2.5.2 Operating/Analytical Procedures

- (a) A hand-held digital Global Positioning Systems (GPS) were used to ensure that the correct location was selected prior to sample collection.
- (b) Portable, battery-operated echo sounders were used for the determination of water depth at each designated monitoring station.
- (c) All in-situ measurements were taken at 3 water depths, 1 m below water surface, mid-depth and 1 m above sea bed, except where the water depth was less than 6 m, in which case the mid-depth station was omitted. Should the water depth be less than 3 m, only the mid-depth station was monitored.
- (d) At each measurement/sampling depth, two consecutive in-situ monitoring (DO concentration and saturation, temperature, turbidity, salinity) and water sample for SS were collected. For turbidity measurement, the sample was collected by using sampler and then transferred to the cell. The reading of turbidity of the sample was directly recorded from the Turbidimeter (HACH 2100Q) after inserting the cell to the Turbidimeter. For DO concentration and saturation, temperature and salinity, duplicate measurements were performed by dropping the calibrated probes of the corresponding monitoring equipments to the designated depths of the water column and taking readings after stabilized. Where the difference in the value between the first and second readings of DO or turbidity parameters was more than 25% of the value of the first reading, the reading was discarded and further readings were taken.
- (e) Duplicate samples from each independent sampling event were collected for SS measurement. Water samples were collected using the water samplers and the samples were stored in high-density polythene bottles. Water samples collected were well-mixed in the water sampler prior to pre-rinsing and transferring to sample bottles. Sample bottles were pre-rinsed with the same water samples. The sample bottles were then be packed in cool-boxes (cooled at 4°C without being frozen), and delivered to Environmental Laboratory, ETS-Testconsult Ltd. (HOKLAS Registration No. 022) for the analysis of suspended solids concentrations. The laboratory determination work would be started within 24 hours after collection of the water samples. Environmental Laboratory, ETS-Testconsult Ltd., is a HOKLAS accredited laboratory and has comprehensive quality assurance and quality control programmes. For QA/QC procedures, one duplicate samples of every batch of 20 samples was analyzed and attached in Appendix D.

### 2.5.3 Maintenance and Calibration

- (a) Before each round of monitoring, the dissolved oxygen probe of YSI Pro2030 was calibrated by the wet bulb method.
- (b) The monitoring instruments were checked, calibrated and certified by a laboratory accredited under HOKLAS before use and subsequently re-calibrated at 3-monthly intervals throughout all stages of the water quality monitoring.

**2.6 Action and Limit Levels**

2.6.1 The Action and Limit Levels (AL levels) have been set in accordance with the derivation criteria specified in the EM&A Manual. This is shown in Table 2.4.

**Table 2.4 Action and Limit Levels for Water Quality**

Parameters	Action	Limit
DO in mg/L (Surface & Middle, Bottom)	Surface & Middle 5.5 mg/L  Bottom 5.2 mg/L	Surface & Middle 4.0 mg/L  Bottom 2.0 mg/L
SS in mg/L (depth-averaged)	4.9 mg/L or 120% of upstream control station's SS at the same tide of the same day	5.2 mg/L or 130% of upstream control station's SS at the same tide of the same day and specific sensitive receiver water quality requirements (e.g. required suspended solids level at FCZ)
Turbidity in NTU (depth-averaged)	3.9 NTU or 120% of upstream control station's turbidity at the same tide of the same day	4.2 NTU or 130% of upstream control station's turbidity at the same tide of the same day

- Notes:
- "depth-averaged" is calculated by taking the arithmetic means of reading of all three depths.
  - For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
  - For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
  - All the figures given in the table are used for reference only and the EPD may amend the figures whenever it is considered as necessary.



### 3 MONITORING RESULTS

3.1.1 The impact water quality monitoring results for C1a, M4a and M5 are summarized in Tables 2.5 and 2.6. Detail water quality monitoring results are presented in Appendix C.

**Table 2.5 Summary of Marine Water Monitoring Results for Mid-ebb Tide**

Monitoring Station	Temperature (°C)	Salinity (ppt)	DO (SM) (mg/L)	DO (Bottom) (mg/L)	DO Saturation (%)	Turbidity (NTU)	SS (mg/L)
C1a	27.2 (25.3 - 28)	26.5 (23 - 28.9)	6.0 (5.5 - 6.6)	5.7 (5.2 - 6.2)	85.4 (77.3 - 96.9)	2.9 (2 - 4)	4.0 (3 - 5.2)
M4a	27.2 (25.3 - 28.1)	26.5 (22.9 - 28.9)	6.0 (5.6 - 6.6)	5.7 (5.2 - 6.3)	85.4 (76.3 - 98.3)	2.9 (2.2 - 3.9)	3.9 (3 - 5)
M5	27.2 (25.2 - 28.1)	26.5 (22.9 - 28.8)	6.0 (5.5 - 7)	5.9 (5.3 - 6.6)	86.4 (78 - 103)	2.9 (2.2 - 3.8)	3.9 (3 - 5.2)

**Table 2.6 Summary of Marine Water Monitoring Results for Mid-flood Tide**

Monitoring Station	Temperature (°C)	Salinity (ppt)	DO (SM) (mg/L)	DO (Bottom) (mg/L)	DO Saturation (%)	Turbidity (NTU)	SS (mg/L)
C1a	27.2 (25.2 - 28.3)	26.4 (22.9 - 28.9)	6.1 (5.6 - 6.5)	5.8 (5.4 - 6.1)	86.3 (77.3 - 95.9)	2.8 (2 - 3.7)	3.8 (3 - 4.8)
M4a	27.2 (25.2 - 28.4)	26.4 (23 - 28.9)	6.1 (5.6 - 6.5)	5.8 (5.4 - 6.3)	86.3 (77.2 - 96.9)	2.7 (2.2 - 3.6)	3.8 (3 - 4.8)
M5	27.2 (25.2 - 28.4)	26.4 (22.9 - 28.9)	6.1 (5.6 - 6.9)	5.9 (5.5 - 6.6)	86.8 (78.8 - 101.8)	2.7 (2.1 - 3.3)	3.8 (3 - 4.6)

3.1.2 The weather conditions during the monitoring period were generally fine and cloudy with a few rainy days. Sea conditions for the majority of monitoring days were generally calm and small wave with great wave days on 23 and 30 September 2013. No major water pollution source, which might affect the result observed during the impact monitoring period.

3.1.3 Since the water depths at all the monitoring stations were generally higher than 6m, sampling was conducted at three water depths at each station.

3.1.4 The summary of impact water quality exceedance is shown in Table 2.7.

**Table 2.7 Summary of Marine Water Monitoring Exceedance**

Monitoring Station	Exceedance Level	DO (SM)		DO(Bottom)		Turbidity		SS		Total	
		Flood	Ebb	Flood	Ebb	Flood	Ebb	Flood	Ebb	Flood	Ebb
M4a	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
M5	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0

Note: S: Surface; and  
 M: Mid-depth.

3.1.5 No exceedance of Action and Limit Level of water quality monitoring results was recorded in the reporting month.

## **4 CONCLUSIONS**

- 4.1.1 This impact monitoring report presents impact monitoring results for water quality at designated locations C1a, M4a and M5 in accordance with the EM&A Manual. Monitoring Station C1a serves as the control station; Monitoring Station M4a and M5 are the impact stations.
- 4.1.2 All laboratory results satisfied the QA/QC requirements and all monitoring equipment is properly calibrated and with valid calibration certificates.
- 4.1.3 No exceedance of Action and Limit Level of water quality monitoring results was recorded in the reporting month.

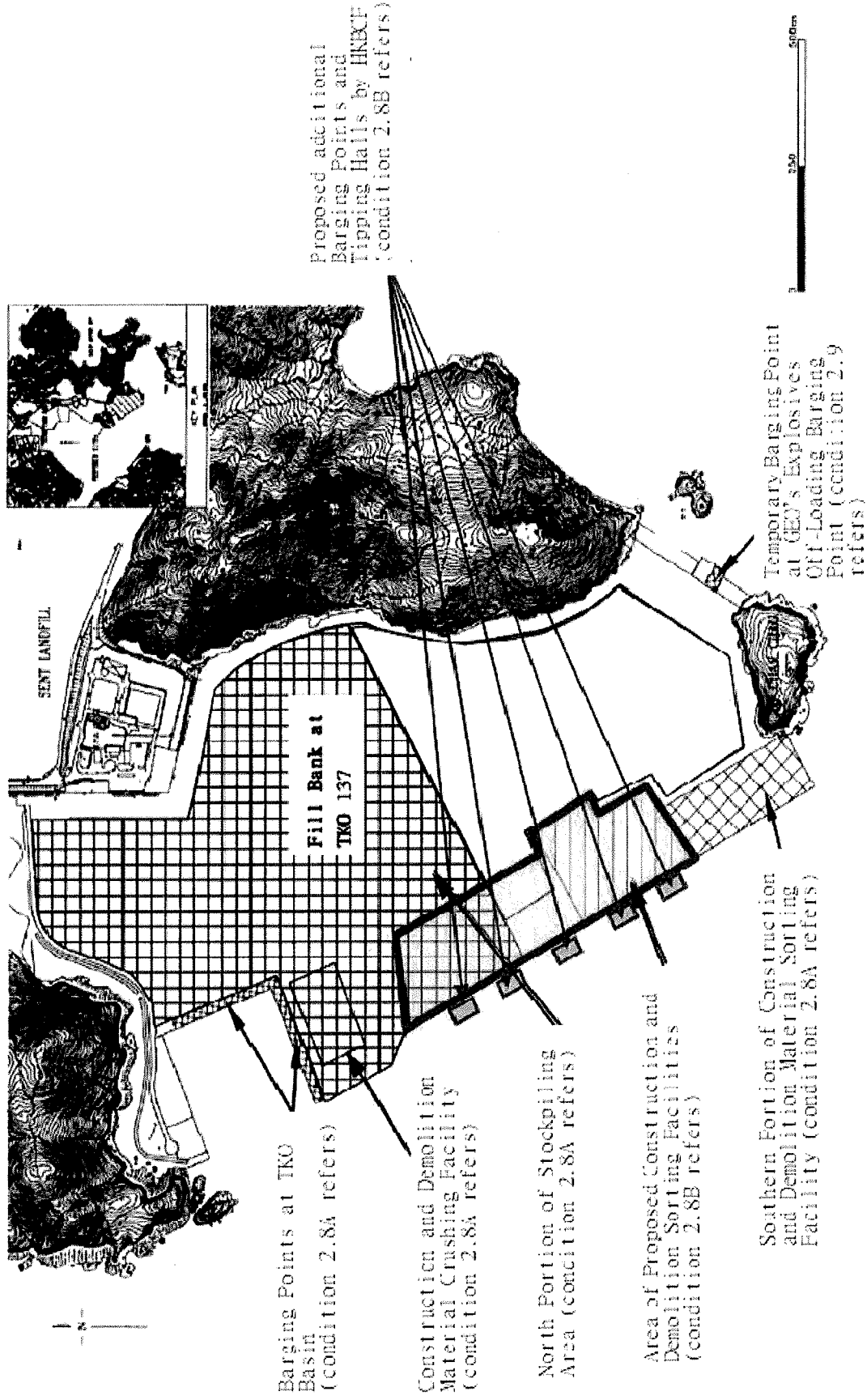
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## FIGURES

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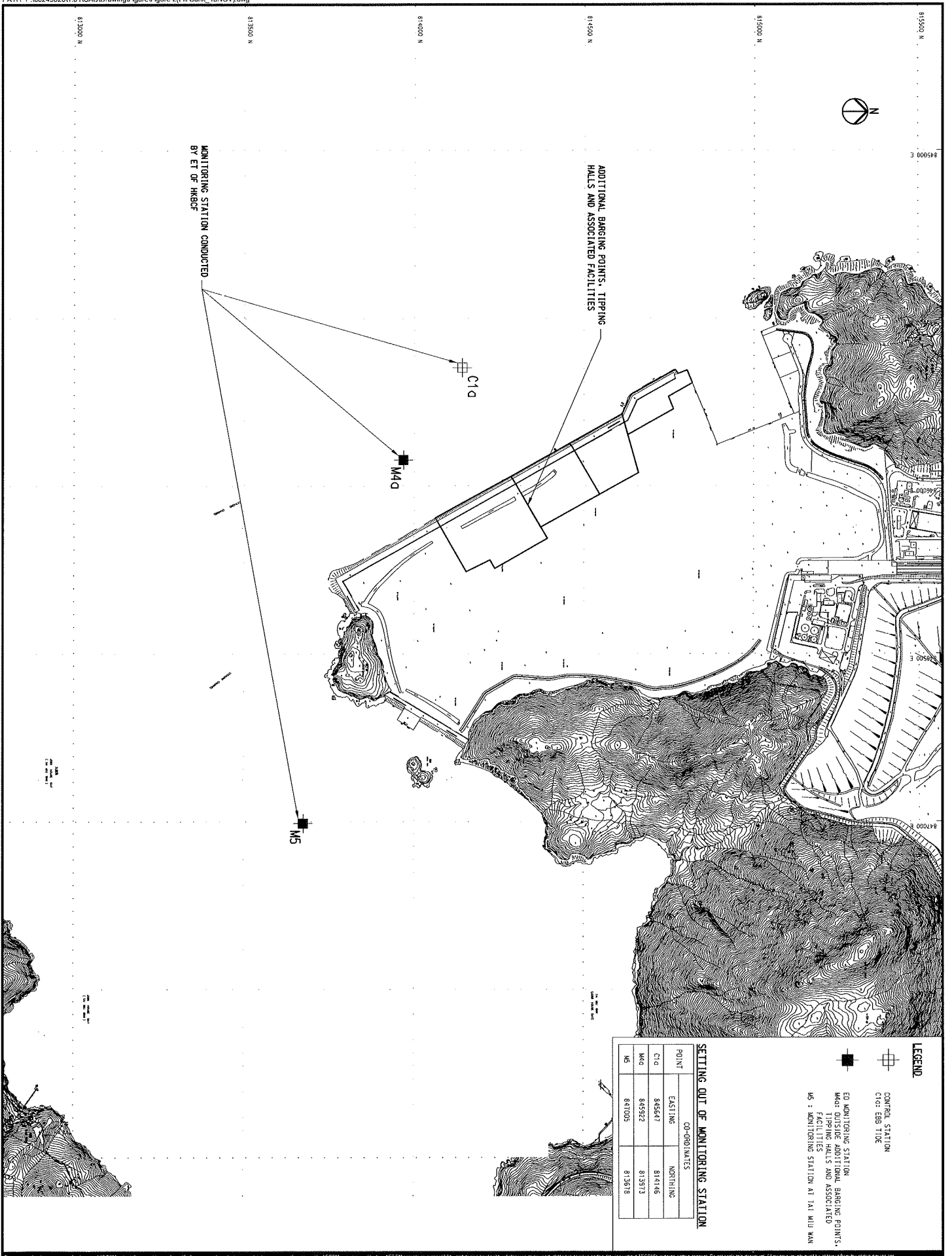
(Plan Originated from Figure 2 of Environmental Permit No.: EP-134/2002(K))

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**HONG KONG - ZHUHAI - MACAO BRIDGE  
HONG KONG BOUNDARY CROSSING FACILITIES  
RECLAMATION WORKS**

**Site Layout Plan for TKO 137 Fill Bank**





**APPENDIX A  
CALIBRATION RECORDS**



### Internal Calibration Report of Dissolved Oxygen Meter

Equipment Ref. No. : <u>ET/EW/008/005</u>	Manufacturer : <u>YSI</u>
Model No. : <u>Pro 2030</u>	Serial No. : <u>12A 100353</u>
Date of Calibration : <u>31/07/2013</u>	Calibration Due Date : <u>30/10/2013</u>

**Temperature Verification**

Ref. No. of Reference Thermometer : ET/0521/008

Ref. No. of Water Bath : ---

		Temperature (°C)		
Reference Thermometer reading	Measured	20.2	Corrected	19.8
DO Meter reading	Measured	19.8	Difference	0.0

**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/012/4.5/001/7	Reagent No. of 0.025N K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	CPE/012/4.4/001/20
		Trial 1	Trial 2
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		0.10	0.00
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		10.55	10.40
Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)		10.45	10.40
Normality of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02392	0.02404
Average Normality (N) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02398	
Acceptance criteria, Deviation		Less than <u>± 0.001N</u>	

Calculation: Normality of Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>, N = 0.25 / 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
Trial						
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	0.00	11.70	23.20	0.00	7.90	12.90
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	11.70	23.20	31.20	7.90	12.90	18.00
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	11.70	11.50	8.00	7.90	5.00	5.10
Dissolved Oxygen (DO), mg/L	7.53	7.40	5.15	5.09	3.22	3.28
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	7.44	7.65	7.65	7.53	7.40	7.47	2.38
5	5.30	5.22	5.26	5.15	5.09	5.12	2.70
10	3.20	3.11	3.16	3.22	3.28	3.25	2.81
Linear regression coefficient				0.9982			





## Internal Calibration Report of Dissolved Oxygen Meter

### Zero Point Checking

DO meter reading, mg/L	0.00
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### Salinity Checking

Reagent No. of NaCl (10ppt)	CPE/012/4.7/002/07	Reagent No. of NaCl (30ppt)	CPE/012/4.8/002/07
-----------------------------	--------------------	-----------------------------	--------------------

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

Salinity (ppt)	10		30	
	1	2	1	2
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	0.00	12.00	24.30	35.30
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	12.00	24.30	35.30	46.40
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	12.00	12.30	11.00	11.10
Dissolved Oxygen (DO), mg/L	7.73	7.92	7.08	7.15
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	7.82	7.73	7.78	7.73	7.92	7.83	0.64
30	7.15	7.09	7.12	7.08	7.15	7.12	0.00

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

<sup>#</sup> Delete as appropriate

Calibrated by :

Approved by :



## Performance Check of Salinity Meter

Equipment Ref. No. : ET/EW/008/005      Manufacturer : YSI  
Model No. : Pro 2030      Serial No. : 12A 100353  
Date of Calibration : 31/07/2013      Due Date : 30/10/2013

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

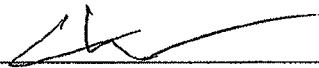
S/001/4

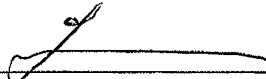
Salinity Standard (ppt)	Measured Salinity (ppt)	Difference %
30.0	31.2	3.92

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 : 



## Performance Check of Turbidity Meter

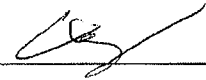
Equipment Ref. No. : ET/0505/009                      Manufacturer : HACH  
Model No. : 2100Q                                      Serial No. : 11060 C 010010  
Date of Calibration : 09/07/2013                      Due Date : 08/10/2013

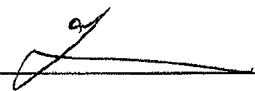
Gelex Vial Std	Theoretical Value (NTU)	Measured Value (NTU)	Difference %
0-10 NTU	5.56	5.72	-2.84
10-100 NTU	53.4	54.2	-1.49
100-1000 NTU	552	561	-1.62

Acceptance Criteria

Difference : <5 %

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

Checked by : 

Approved by : 

**APPENDIX B  
IMPACT MONITORING SCHEDULES**

**Contract No. HY/2010/02 - Hong Kong-Zhuhai-Macao Bridge  
Hong Kong Boundary Crossing Facilities – Reclamation Works  
Impact Water Quality Monitoring Schedule for September 2013 (TKO 137 Fill Bank)**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
01-Sep	02-Sep	03-Sep	04-Sep	05-Sep	06-Sep	07-Sep
	Impact Water Quality Monitoring Mid-ebb: 10:30 Mid-flood: 17:33		Impact Water Quality Monitoring Mid-ebb: 11:41 Mid-flood: 18:15		Impact Water Quality Monitoring Mid-ebb: 12:50 Mid-flood: 19:04	
08-Sep	09-Sep	10-Sep	11-Sep	12-Sep	13-Sep	14-Sep
	Impact Water Quality Monitoring Mid-flood: 08:35 Mid-ebb: 14:40		Impact Water Quality Monitoring Mid-flood: 10:28 Mid-ebb: 16:12		Impact Water Quality Monitoring Mid-flood: 13:25 Mid-ebb: 18:31	
15-Sep	16-Sep	17-Sep	18-Sep	19-Sep	20-Sep	21-Sep
	Impact Water Quality Monitoring Mid-ebb: 09:36 Mid-flood: 16:42		Impact Water Quality Monitoring Mid-ebb: 11:15 Mid-flood: 17:53			
22-Sep	23-Sep	24-Sep	25-Sep	26-Sep	27-Sep	28-Sep
	Impact Water Quality Monitoring# Mid-flood: 08:39 Mid-ebb: 14:28		Impact Water Quality Monitoring Mid-flood: 10:17 Mid-ebb: 15:35		Impact Water Quality Monitoring Mid-ebb: 05:47* Mid-flood: 18:16	
29-Sep	30-Sep					
	Impact Water Quality Monitoring Mid-ebb: 08:59 Mid-flood: 16:23					

(\* ) Proposed WQM on 27 September 2013 will be carried out between 08:00 to 09:41 because the site works start from 08:00. The proposed WQM period is within the flood tide (01:52 to 09:41 on 27 September 2013).

(#) WQM of mid-flood tide on 23 September 2013 was cancelled due to bad weather (Typhoon Signal No.8).

**APPENDIX C  
IMPACT WATER QUALITY MONITORING  
RESULTS AND THEIR GRAPHICAL  
PRESENTATION**

**Mid-Ebb Tide**

Monitoring Station : C1a

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)	Water Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)	
							Value	Ave.	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average
02/09/13	0952-1009	27/Cloudy	Small Wave	19.8	Surface	27.7	25.9	25.9	6.0	6.0	87.8	88.0	2.4	2.4	3.4	3.5
					Middle	27.6	25.8	26.0	6.0	6.0	88.1	88.7	2.4	2.9	3.6	4.2
					Bottom	27.5	26.0	26.2	6.0	5.7	88.6	83.7	3.0	3.2	4.0	4.3
04/09/13	1125-1143	26/Drizzle	Small Wave	19.8	Surface	27.2	26.2	26.2	5.7	6.0	83.4	82.7	3.2	2.4	3.4	3.5
					Middle	27.3	26.2	23.1	6.0	5.9	83.9	83.5	3.3	2.9	3.6	4.1
					Bottom	25.6	23.0	23.2	6.0	5.7	82.8	78.8	2.4	3.2	4.0	4.3
06/09/13	1225-1243	26/Cloudy	Small Wave	19.4	Surface	25.7	23.1	23.4	5.9	5.9	83.6	81.5	2.4	2.4	3.4	3.3
					Middle	25.5	23.2	23.5	6.0	5.6	83.4	82.3	3.0	3.0	3.6	3.7
					Bottom	25.3	23.4	23.5	6.0	5.7	82.0	78.1	3.0	3.2	3.8	4.1
09/09/13	1355-1413	30/Fine	Small Wave	17.4	Surface	25.4	23.5	27.2	5.6	6.5	77.9	96.9	3.3	2.1	4.0	3.1
					Middle	27.5	27.2	27.2	6.6	6.3	96.8	91.7	2.2	2.3	3.2	3.4
					Bottom	27.6	27.1	27.4	6.2	6.1	91.6	90.5	2.2	2.4	3.6	3.7
11/09/13	1526-1543	28/Fine	Small Wave	17.2	Surface	27.2	27.1	27.1	6.1	6.2	90.3	94.1	2.4	2.1	3.4	3.5
					Middle	27.1	27.1	27.2	6.4	6.4	90.6	89.0	2.1	2.2	3.6	3.3
					Bottom	27.3	27.2	27.3	6.4	6.1	94.2	87.5	2.1	2.4	3.6	3.7
13/09/13	1720-1735	28/Fine	Small Wave	18.8	Surface	27.2	26.3	26.3	6.1	6.0	88.8	84.3	2.2	2.1	3.2	3.2
					Middle	27.3	26.4	26.6	6.1	6.0	89.2	87.7	2.3	3.1	4.4	4.4
					Bottom	27.1	27.2	26.2	6.0	6.1	87.9	85.7	2.4	3.3	4.4	4.5
16/09/13	0900-0916	27/Fine	Small Wave	19.8	Surface	27.5	26.5	26.5	6.1	6.1	85.5	89.2	2.6	2.7	3.6	3.8
					Middle	27.1	26.2	26.6	6.1	6.0	85.8	86.7	3.3	3.2	4.0	4.3
					Bottom	27.5	26.7	26.7	5.8	5.9	86.9	85.4	3.2	3.7	4.4	4.6
18/09/13	1100-1116	28/Fine	Small Wave	19.2	Surface	27.4	26.7	26.5	6.0	6.0	85.1	87.9	3.7	2.7	4.4	3.8
					Middle	27.5	26.5	26.6	5.9	5.9	85.6	85.3	3.7	3.3	4.4	4.4
					Bottom	27.4	26.7	26.7	5.8	5.8	87.7	84.0	3.7	3.7	4.4	4.7

**Mid-Ebb Tide**

**Monitoring Station : C1a**

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)	Water Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Turbidity (NTU)		Suspended Solids (mg/L)	
							Value	Ave.	Value	Average	Depth-average	Value	Average	Value	Average
23/09/13	1355-1415	29/Fine	Great Wave	18.7	Surface	27.9	27.7	27.7	5.5	82.5	3.6	4.4	3.6	4.5	
						27.9	27.7	27.7	5.5	82.2	3.6	4.6			
						27.8	27.9	27.9	5.5	81.9	3.7	4.8			
					Middle	27.9	27.9	27.9	5.5	81.6	3.7	4.8	3.8	4.8	
						27.8	28.0	28.1	5.2	77.4	4.0	5.0			
						27.8	28.1	28.1	5.2	77.3	4.0	5.1			
25/09/13	1459-1515	30/Cloudy	Small Wave	19.4	Surface	27.7	26.7	26.7	6.2	87.5	2.4	3.4	2.4	3.5	
						27.6	26.7	26.7	6.2	87.1	2.4	3.6			
						27.6	26.6	26.7	6.0	84.8	2.6	3.6			
					Middle	27.5	26.7	26.7	6.1	84.9	2.6	3.8	2.7	3.7	
						27.6	26.8	26.9	5.9	82.4	3.0	4.0			
						27.6	26.9	26.9	5.9	82.3	3.0	4.1			
27/09/13	0822-0837	26/Fine	Calm	18.4	Surface	27.9	27.7	27.8	5.8	84.8	3.0	4.0	3.0	4.2	
						27.9	27.8	27.8	5.8	85.2	3.1	4.4			
						27.8	27.9	28.0	5.7	83.9	3.2	4.4			
					Middle	27.8	28.0	28.0	5.7	83.5	3.3	4.6	3.3	4.5	
						27.7	28.2	28.3	5.5	81.7	3.6	4.6			
						27.6	28.3	28.3	5.5	82.0	3.5	4.8			
30/09/13	0855-0910	29/Cloudy	Great Wave	19.4	Surface	28.0	28.6	28.6	6.1	89.6	3.0	3.8	2.9	3.9	
						28.0	28.6	28.6	6.1	89.0	2.9	4.0			
						28.0	28.8	28.8	5.8	84.2	3.3	4.4			
					Middle	28.0	28.7	28.8	5.7	83.7	3.3	4.4	3.2	4.4	
						27.9	28.9	28.9	5.6	82.5	3.5	4.6			
						27.9	28.9	28.9	5.6	82.0	3.5	4.8			



**Mid-Flood Tide**

Monitoring Station : C1a

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)		Water Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
					Surface	Bottom		Value	Ave.	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
02/09/13	1652-1709	28/Cloudy	Small Wave	20.2	Surface	1.0	27.6	25.8	6.0	25.8	88.8	89.0	2.3	2.3	3.6	3.4	3.7	
					Middle	10.1	27.6	25.7	6.1	26.0	89.2	89.7	2.3	2.9	3.2	3.6		
					Bottom	19.2	27.4	25.9	6.1	26.0	89.6	89.7	2.9	2.9	3.8	3.7		
04/09/13	1725-1743	26/Drizzle	Small Wave	20.0	Surface	1.0	27.1	26.1	5.7	26.2	84.5	84.8	3.1	3.2	4.2	4.1	3.8	
					Middle	10.0	27.2	26.2	5.8	23.0	85.0	83.8	3.2	2.3	4.0	3.4		
					Bottom	19.0	25.7	22.9	6.0	23.2	83.7	83.8	2.3	2.3	3.6	3.4		
06/09/13	1725-1743	26/Cloudy	Small Wave	20.2	Surface	1.0	25.5	23.2	6.1	23.2	84.5	84.7	2.8	2.8	3.8	3.9	3.7	
					Middle	10.1	25.5	23.2	6.1	23.4	84.8	84.7	2.8	2.8	4.0	4.0		
					Bottom	19.2	25.3	23.3	5.7	23.4	79.6	79.8	3.1	3.1	4.2	4.2		
09/09/13	0821-0836	28/Fine	Small Wave	18.8	Surface	1.0	25.2	23.4	5.8	23.4	80.0	82.3	3.1	2.4	3.2	3.1	3.3	
					Middle	9.4	25.8	23.2	5.9	23.3	82.5	82.3	2.3	2.4	3.0	3.0		
					Bottom	17.8	25.7	23.3	6.0	23.5	82.1	83.1	2.4	2.9	3.2	3.8		
11/09/13	0955-1013	28/Fine	Small Wave	17.8	Surface	1.0	25.6	23.4	6.0	23.5	83.3	90.4	2.9	2.2	3.6	3.5	3.3	
					Middle	8.9	25.6	23.4	6.0	27.3	82.9	90.4	2.9	2.2	3.4	3.3		
					Bottom	18.2	25.4	23.5	5.7	27.4	78.8	89.6	3.2	2.5	3.2	3.6		
13/09/13	1250-1305	29/Fine	Small Wave	19.2	Surface	1.0	25.3	23.5	5.7	23.5	89.9	85.5	2.1	2.1	3.6	3.4	3.8	
					Middle	9.6	27.2	27.2	6.1	26.5	89.2	85.2	2.5	3.0	4.0	4.0		
					Bottom	18.2	27.1	27.1	6.1	26.5	84.1	85.3	2.5	2.9	3.8	3.8		
16/09/13	1600-1615	29/Fine	Small Wave	19.2	Surface	1.0	27.2	26.7	6.0	26.7	84.4	84.3	3.1	3.2	4.2	4.2	4.1	
					Middle	9.6	27.2	26.7	6.0	26.5	84.4	84.3	3.1	3.2	4.2	4.2		
					Bottom	18.2	27.7	26.5	6.2	26.5	85.4	85.7	2.2	2.2	3.6	3.7		
18/09/13	1700-1716	28/Fine	Small Wave	19.6	Surface	1.0	27.6	26.5	6.2	26.5	90.1	90.5	2.5	2.5	3.6	3.7	4.2	
					Middle	9.8	27.6	26.5	6.2	26.7	89.8	88.5	2.6	2.6	3.8	3.8		
					Bottom	18.6	27.5	26.6	6.1	26.7	86.8	86.0	3.0	3.0	4.0	4.0		

**Mid-Flood Tide**

Monitoring Station : C1a

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)	Water Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)		
							Value	Ave.	Value	Average	Value	Average	Value	Depth-average	Value
25/09/13	0930-0945	29/Cloudy	Small Wave	19.8	Surface	27.7	26.7	6.2	87.1	2.4	3.6	2.4	3.7	2.6	3.6
						27.6	26.7	6.2	86.5	2.5	3.8				
					Middle	27.5	26.9	6.0	84.1	2.4	3.4	2.4	3.3		
						27.5	26.9	6.0	83.8	2.4	3.2				
					Bottom	27.4	27.0	5.9	82.3	3.0	4.0	3.0	3.9		
						27.5	27.1	5.9	82.7	3.0	3.8				
27/09/13	1652-1709	28/Fine	Small Wave	19.2	Surface	28.0	27.8	5.7	84.0	2.8	3.6	2.8	3.7	3.2	4.1
						28.0	27.9	5.7	84.4	2.8	3.8				
					Middle	27.9	28.1	5.6	82.4	3.2	4.2	3.2	4.1		
						27.9	28.1	5.6	82.9	3.2	4.0				
					Bottom	27.8	28.4	5.4	80.1	3.5	4.4	3.5	4.5		
						27.8	28.4	5.5	77.3	3.5	4.6				
30/09/13	1528-1543	29/Drizzle	Great Wave	19.8	Surface	28.3	28.5	6.2	90.0	3.2	4.4	3.2	4.3	3.4	4.6
						28.3	28.4	6.2	90.6	3.2	4.2				
					Middle	28.2	28.8	5.9	85.9	3.5	4.6	3.5	4.7		
						28.2	28.7	5.8	85.4	3.4	4.8				
					Bottom	28.1	28.9	5.7	83.7	3.6	4.8	3.6	4.7		
						28.1	28.9	5.7	83.1	3.6	4.6				

**Mid-Ebb Tide**

**Monitoring Station : M4a**

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)		Water Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Turbidity (NTU)		Suspended Solids (mg/L)	
					Surface	Bottom		Value	Ave.	Value	Average	Depth-average	Value	Average	Value	Depth-average
02/09/13	1014-1035	27/Cloudy	Small Wave	16.0	Surface	1.0	27.7	25.8	5.8	25.8	85.2	2.2	3.4	2.7	3.4	3.6
							27.6	25.7	5.7	25.7	84.3	2.3	3.2			
							27.5	25.8	5.8	25.9	85.5	2.7	3.8			
							27.6	25.9	5.8	25.8	85.8	2.7	3.6			
							27.3	26.0	5.6	26.1	82.3	3.0	3.8			
							27.3	26.1	5.6	26.1	82.2	3.0	4.0			
04/09/13	1149-1207	26/Drizzle	Small Wave	16.2	Surface	1.0	25.7	22.9	5.7	23.0	79.5	2.3	3.4	2.7	3.4	3.5
							25.6	23.0	5.8	23.0	80.3	2.3	3.6			
							25.4	23.2	5.8	23.3	80.5	2.7	3.8			
							25.5	23.3	5.8	23.3	80.8	2.7	3.6			
							25.3	23.4	5.6	23.4	77.5	3.0	4.0			
							25.4	23.3	5.6	23.3	77.2	3.0	3.8			
06/09/13	1249-1307	26/Cloudy	Small Wave	15.8	Surface	1.0	25.8	23.2	5.7	23.3	79.1	2.3	3.0	2.7	3.0	3.2
							25.7	23.3	5.6	23.3	78.3	2.4	3.4			
							25.6	23.4	5.7	23.4	79.3	2.7	3.6			
							25.5	23.4	5.7	23.4	79.7	2.8	3.4			
							25.3	23.5	5.5	23.5	76.8	3.1	4.0			
							25.4	23.4	5.5	23.4	76.3	3.1	3.8			
09/09/13	1421-1439	30/Fine	Small Wave	17.7	Surface	1.0	27.6	27.2	6.6	27.2	98.0	2.3	3.2	2.4	3.2	3.5
							27.6	27.1	6.6	27.1	98.3	2.4	3.4			
							27.4	27.2	6.5	27.2	96.0	2.5	3.8			
							27.3	27.2	6.5	27.2	95.7	2.4	3.4			
							27.2	27.1	6.3	27.1	92.9	2.4	3.6			
							27.1	27.0	6.3	27.0	92.6	2.4	3.4			
11/09/13	1551-1609	28/Fine	Small Wave	18.0	Surface	1.0	27.4	27.2	6.4	27.2	95.2	2.3	3.6	2.4	3.6	3.7
							27.5	27.1	6.5	27.1	95.6	2.3	3.8			
							27.4	27.2	6.4	27.2	93.2	2.4	3.6			
							27.3	27.3	6.3	27.3	93.0	2.4	3.4			
							27.2	27.3	6.1	27.3	90.3	2.4	3.6			
							27.1	27.2	6.1	27.2	90.0	2.4	3.8			
13/09/13	1740-1755	28/Fine	Small Wave	18.0	Surface	1.0	27.4	26.5	6.3	26.5	88.1	2.8	3.6	3.0	3.6	4.0
							27.3	26.4	6.3	26.4	88.3	2.8	3.8			
							27.3	26.4	6.1	26.4	85.9	3.0	4.0			
							27.3	26.4	6.2	26.4	86.5	3.0	4.2			
							27.2	26.0	5.8	26.1	81.8	3.2	4.4			
							27.2	26.1	5.9	26.1	82.3	3.3	4.2			
16/09/13	0921-0939	27/Fine	Small Wave	16.6	Surface	1.0	27.6	26.6	6.2	26.6	89.9	2.9	3.6	3.1	3.6	3.7
							27.5	26.5	6.2	26.5	90.3	2.9	3.8			
							27.7	26.7	6.0	26.7	87.2	3.3	4.2			
							27.6	26.7	6.0	26.7	87.5	3.3	4.4			
							27.5	26.8	5.9	26.8	86.3	3.2	4.0			
							27.5	26.8	5.9	26.8	86.1	3.2	4.2			
18/09/13	1121-1139	28/Fine	Small Wave	15.8	Surface	1.0	27.4	26.4	6.1	26.5	88.5	3.0	3.8	3.2	3.8	4.2
							27.5	26.5	5.9	26.5	88.7	3.0	4.0			
							27.3	26.5	5.9	26.5	85.6	3.3	4.2			
							27.2	26.5	5.9	26.5	86.1	3.4	4.4			
							27.2	26.6	5.8	26.6	85.0	3.3	4.4			
							27.2	26.7	5.8	26.7	84.5	3.3	4.2			

**Mid-Ebb Tide**

**Monitoring Station : M4a**

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)		Water Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
					Surface	Bottom		Value	Ave.	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
23/09/13	1420-1440	29/Fine	Great Wave	18.1	Surface	1.0	27.9	27.7	5.7	27.7	84.7	84.6	3.4	4.2	3.6	4.2	4.3	4.6
							28.0	27.6	5.7	27.6	84.5	84.6	3.4	4.4				
							27.8	27.8	5.6	27.9	83.7	83.6	3.6	4.6				
					Middle	9.1	27.8	27.9	5.6	27.9	83.4	83.6	3.7	4.8				
							27.8	28.0	5.2	28.0	78.0	77.9	3.8	5.0				
							27.7	28.0	5.2	28.0	77.7	77.9	3.9	4.8				
25/09/13	1518-1530	30/Cloudy	Small Wave	16.0	Surface	1.0	27.7	26.7	6.2	26.7	86.9	86.4	2.2	3.2	2.5	3.2	3.3	3.6
							27.7	26.7	6.1	26.9	85.8	86.4	2.2	3.4				
							27.6	26.8	5.9	26.9	83.3	83.6	2.3	3.4				
					Middle	8.0	27.6	26.9	6.0	26.9	83.8	83.6	2.3	3.6				
							27.5	26.9	5.7	26.9	80.0	79.9	3.0	4.0				
							27.5	26.9	5.7	26.9	79.8	79.9	3.0	3.8				
27/09/13	0841-0855	26/Calm	Small Wave	18.4	Surface	1.0	27.9	27.7	5.8	27.7	85.5	85.2	2.9	3.6	3.2	3.6	3.7	4.2
							28.0	27.7	5.8	27.9	84.9	85.2	2.9	3.8				
							27.8	27.9	5.6	27.9	83.2	83.0	3.2	4.2				
					Middle	9.2	27.8	27.9	5.6	27.9	82.7	83.0	3.3	4.4				
							27.7	28.2	5.4	28.2	80.0	80.2	3.4	4.4				
							27.7	28.2	5.4	28.2	80.4	80.2	3.5	4.6				
30/09/13	0915-0930	29/Cloudy	Great Wave	16.2	Surface	1.0	28.1	28.7	6.2	28.7	90.8	91.1	2.7	3.6	3.1	3.6	4.0	4.1
							28.1	28.6	6.2	28.8	91.4	91.1	2.8	3.8				
							28.0	28.8	5.8	28.8	85.0	84.9	3.1	4.0				
					Middle	8.1	28.0	28.7	5.8	28.8	84.7	84.9	3.1	4.0				
							27.8	28.9	5.8	28.9	84.2	84.0	3.3	4.6				
							27.8	28.9	5.7	28.9	83.7	84.0	3.3	4.4				

## Mid-Flood Tide

Monitoring Station : M4a

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)		Water Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
					Surface	Bottom		Value	Ave.	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
02/09/13	1714-1735	28/Cloudy	Small Wave	16.4	Surface	1.0	27.6	25.7	25.7	5.9	86.3	2.2	3.2	2.2	3.1	3.0	3.6	3.0
							27.7	25.6	5.8	85.4	2.2	3.0						
					Middle	8.2	27.4	25.7	25.8	5.9	86.6	2.6	3.6	2.6	3.7	3.8		
							27.5	25.8	5.9	86.9	2.6	3.8						
					Bottom	15.4	27.2	26.0	26.0	5.7	83.4	2.9	4.0	2.9	4.1	4.2		
							27.1	26.0	5.6	83.1	3.0	4.2						
04/09/13	1749-1807	26/Drizzle	Small Wave	16.4	Surface	1.0	25.6	23.0	23.0	5.8	81.2	2.2	3.2	2.2	3.1	3.0	3.6	3.0
							25.6	23.0	5.9	81.5	2.2	3.0						
					Middle	8.2	25.4	23.3	23.3	5.9	82.2	2.5	3.6	2.6	3.7	3.8		
							25.5	23.2	5.9	82.4	2.6	3.8						
					Bottom	15.4	25.2	23.4	23.4	5.7	78.5	2.9	3.8	2.9	3.9	4.0		
							25.2	23.3	5.7	78.8	2.9	4.0						
06/09/13	1749-1807	26/Cloudy	Small Wave	16.6	Surface	1.0	25.7	23.3	23.3	5.8	79.9	2.2	3.2	2.2	3.1	3.0	3.6	3.0
							25.7	23.2	5.7	79.4	2.3	3.0						
					Middle	8.3	25.6	23.3	23.4	5.8	80.1	2.7	3.6	2.7	3.7	3.8		
							25.5	23.4	5.8	80.6	2.7	3.8						
					Bottom	15.6	25.3	23.6	23.6	5.6	77.8	3.0	4.0	3.0	4.0	4.0		
							25.3	23.5	5.6	77.2	3.0	4.0						
09/09/13	0840-0855	28/Fine	Small Wave	18.2	Surface	1.0	27.5	27.2	27.3	6.5	96.4	2.2	3.2	2.2	3.3	3.4	3.3	3.4
							27.6	27.3	6.4	96.3	2.2	3.4						
					Middle	9.1	27.4	27.3	27.3	6.4	93.8	2.3	3.2	2.3	3.4	3.6		
							27.4	27.3	6.4	93.5	2.3	3.6						
					Bottom	17.2	27.1	27.0	27.1	6.3	92.3	2.3	3.4	2.3	3.3	3.4		
							27.1	27.1	6.3	92.0	2.3	3.2						
11/09/13	1021-1039	28/Fine	Small Wave	18.4	Surface	1.0	27.5	27.1	27.2	6.5	96.6	2.3	3.2	2.3	3.3	3.4	3.5	3.6
							27.5	27.2	6.5	96.9	2.3	3.4						
					Middle	9.2	27.3	27.3	27.3	6.4	94.6	2.4	3.6	2.4	3.7	3.8		
							27.4	27.3	6.4	94.4	2.4	3.8						
					Bottom	17.4	27.3	27.2	27.2	6.2	91.6	2.3	3.6	2.3	3.6	3.6		
							27.2	27.1	6.2	91.2	2.3	3.6						
13/09/13	1310-1325	29/Fine	Small Wave	18.4	Surface	1.0	27.4	26.3	26.4	6.4	89.0	2.9	3.6	2.9	3.5	3.4	3.8	3.8
							27.3	26.4	6.4	89.5	2.9	3.4						
					Middle	9.2	27.3	26.4	26.4	6.0	84.6	2.5	3.6	2.5	3.7	3.8		
							27.2	26.4	6.1	84.8	2.5	3.8						
					Bottom	17.4	27.2	26.6	26.7	6.0	83.3	3.0	4.0	3.0	4.1	4.2		
							27.2	26.7	6.0	83.6	3.0	4.2						
16/09/13	1622-1640	29/Fine	Small Wave	16.2	Surface	1.0	27.6	26.5	26.6	6.3	91.0	2.5	3.6	2.5	3.7	3.8	4.0	4.0
							27.6	26.6	6.3	91.4	2.4	3.8						
					Middle	8.1	27.5	26.7	26.7	6.1	89.4	3.0	4.2	3.0	4.1	4.0		
							27.6	26.7	6.2	89.8	3.0	4.0						
					Bottom	15.2	27.4	26.9	27.0	5.9	85.9	3.4	4.4	3.4	4.3	4.2		
							27.4	26.0	6.0	87.1	3.4	4.2						
18/09/13	1721-1741	28/Fine	Small Wave	16.4	Surface	1.0	27.5	26.4	26.5	6.1	89.3	2.9	3.8	2.9	3.7	3.6	4.0	4.0
							27.4	26.5	6.2	89.8	2.9	3.6						
					Middle	8.2	27.4	26.6	26.6	6.0	86.6	3.2	4.2	3.2	4.3	4.4		
							27.3	26.6	6.0	86.9	3.3	4.4						
					Bottom	15.4	27.2	26.7	26.8	5.9	85.6	3.2	4.2	3.2	4.1	4.0		
							27.1	26.8	5.9	85.2	3.2	4.0						

**Mid-Flood Tide**

**Monitoring Station : M4a**

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)		Water Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)	
					Surface	Bottom		Value	Ave.	Value	Average	Value	Average	Value	Depth-average
25/09/13	0950-1005	29/Cloudy	Small Wave	16.4	Surface	1.0	27.7	26.7	6.1	26.7	86.2	2.3	3.4	3.5	
							27.6	26.7	6.2	26.7	86.5	2.4	3.6		
					Middle	8.2	27.5	26.8	5.9	26.9	83.4	2.4	2.5	3.7	
							27.5	26.9	6.0	26.9	83.7	2.4	3.8		
					Bottom	15.4	27.5	27.0	5.9	27.0	83.3	2.6	2.6	3.9	
							27.4	27.0	6.0	27.0	83.8	2.6	3.8		
27/09/13	1713-1730	28/Fine	Small Wave	19.4	Surface	1.0	28.1	27.9	5.8	27.9	85.3	2.6	3.6	3.7	
							28.0	27.9	5.8	27.9	85.7	2.7	3.8		
					Middle	9.7	28.0	28.1	5.6	28.2	83.4	3.0	3.0	4.1	
							27.9	28.2	5.6	28.2	82.9	3.1	4.2		
					Bottom	18.4	27.8	28.4	5.4	28.5	79.4	3.4	3.4	4.5	
							27.8	28.5	5.4	28.5	79.9	3.4	4.6		
30/09/13	1548-1604	29/Drizzle	Great Wave	16.8	Surface	1.0	28.4	28.5	6.1	28.5	89.0	3.3	4.4	4.3	
							28.3	28.4	6.0	28.4	88.4	3.3	4.2		
					Middle	8.4	28.1	28.8	6.0	28.8	87.5	3.4	3.4	4.5	
							28.1	28.7	5.9	28.7	87.1	3.4	4.4		
					Bottom	15.8	28.0	28.9	5.8	28.9	84.6	3.5	3.5	4.7	
							28.1	28.8	5.8	28.8	84.9	3.6	4.8		

**Mid-Ebb Tide**

**Monitoring Station : M5**

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)	Water Temp (°C)		Salinity (ppt)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Ave.	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average		
02/09/13	1042-1059	27/Cloudy	Small Wave	14.8	Surface	27.6	25.7	25.7	5.8	85.9	2.5	2.5	3.6	2.8	3.6	3.9		
					Middle	27.6	25.9	25.9	5.7	83.3	2.9	2.8	3.8					
					Bottom	27.6	25.9	25.9	5.7	83.6	2.8	2.8	4.0					
04/09/13	1215-1233	26/Drizzle	Small Wave	14.6	Surface	27.3	26.0	26.0	5.8	85.2	2.9	2.9	4.0	2.8	4.0	4.0		
					Middle	27.2	26.0	26.0	5.8	85.5	2.9	2.9	4.4					
					Bottom	25.6	23.0	23.0	5.8	81.0	2.5	2.6	3.6					
06/09/13	1315-1333	26/Cloudy	Small Wave	14.2	Surface	25.5	23.2	23.2	5.6	78.2	2.9	2.9	4.0	2.8	4.0	3.8		
					Middle	25.4	23.2	23.2	5.7	78.7	2.8	2.8	4.2					
					Bottom	25.3	23.2	23.2	5.7	80.0	3.0	2.9	4.2					
09/09/13	1445-1503	30/Fine	Small Wave	16.7	Surface	25.3	23.4	23.4	5.8	80.0	2.9	2.9	4.4	2.8	4.4	4.2		
					Middle	25.2	23.4	23.4	5.8	80.2	2.9	2.9	4.4					
					Bottom	25.6	23.2	23.2	5.7	79.8	2.6	2.6	3.6					
11/09/13	1615-1633	28/Fine	Small Wave	16.8	Surface	25.7	23.2	23.2	5.8	80.0	2.7	2.6	3.4	2.3	3.4	3.2		
					Middle	25.5	23.4	23.4	5.6	78.0	3.0	2.9	3.6					
					Bottom	25.5	23.3	23.3	5.7	78.4	2.9	2.9	3.8					
13/09/13	1815-1830	28/Fine	Small Wave	16.4	Surface	25.4	23.4	23.4	5.7	79.3	3.0	3.0	4.0	2.3	4.0	3.3		
					Middle	25.3	23.5	23.5	5.7	79.6	3.0	3.0	4.4					
					Bottom	27.1	27.1	27.1	6.6	97.3	2.3	2.4	3.2					
16/09/13	0947-1002	27/Fine	Small Wave	14.8	Surface	27.1	27.2	27.2	6.6	97.6	2.4	2.4	3.6	3.1	3.6	4.3		
					Middle	27.7	27.2	27.2	7.0	103.0	2.2	2.2	3.2					
					Bottom	27.4	27.3	27.4	6.8	99.2	2.3	2.3	3.0					
18/09/13	1147-1202	28/Fine	Small Wave	14.4	Surface	27.4	26.3	26.3	6.1	84.7	3.0	3.1	4.0	3.1	4.0	4.1		
					Middle	27.3	26.4	26.4	6.1	84.9	3.1	3.1	3.8					
					Bottom	27.2	26.2	26.2	6.1	85.5	3.3	3.3	4.4					
18/09/13	1147-1202	28/Fine	Small Wave	14.4	Surface	27.1	26.3	26.3	6.1	85.8	3.4	3.3	4.4	3.1	4.4	4.1		
					Middle	27.7	26.5	26.5	6.1	88.2	3.1	3.2	4.2					
					Bottom	27.5	26.9	26.9	5.8	83.7	3.0	3.0	4.0					
18/09/13	1147-1202	28/Fine	Small Wave	14.4	Surface	27.5	26.9	26.9	5.8	83.9	3.1	3.1	4.4	3.1	4.4	4.3		
					Middle	27.6	26.6	26.6	6.0	86.3	3.1	3.1	4.4					
					Bottom	27.6	26.7	26.7	6.0	87.5	3.2	3.2	4.2					
18/09/13	1147-1202	28/Fine	Small Wave	14.4	Surface	27.5	26.9	26.9	5.8	83.7	3.0	3.0	4.0	3.1	4.0	4.3		
					Middle	27.5	26.6	26.6	6.0	86.3	3.1	3.1	4.4					
					Bottom	27.4	26.6	26.6	5.9	86.4	3.2	3.2	4.2					
18/09/13	1147-1202	28/Fine	Small Wave	14.4	Surface	27.4	26.7	26.7	5.9	85.8	3.1	3.1	4.0	3.1	4.0	4.1		
					Middle	27.4	26.7	26.7	5.9	85.8	3.2	3.2	4.0					
					Bottom	27.3	26.7	26.8	5.7	82.4	3.1	3.1	4.0					
18/09/13	1147-1202	28/Fine	Small Wave	14.4	Surface	27.2	26.8	26.8	5.7	82.6	3.1	3.1	4.0	3.1	4.0	4.0		
					Middle	27.2	26.8	26.8	5.7	82.6	3.1	3.1	4.0					
					Bottom	27.2	26.8	26.8	5.7	82.6	3.1	3.1	4.0					

**Mid-Ebb Tide**

**Monitoring Station : M5**

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)		Water Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Turbidity (NTU)		Suspended Solids (mg/L)				
					Surface	Middle		Value	Ave.	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average		
23/09/13	1445-1505	29/Fine	Great Wave	16.5	Surface	1.0	27.9	27.6	27.7	5.7	85.0	3.5	4.4	3.5	4.5	3.6	4.7		
							27.9	27.7	5.7	84.7	3.5	4.6							
					Middle	8.3	27.8	27.9	27.9	5.5	82.5	3.7	4.8	5.5	82.4			3.7	4.8
							27.9	27.8	5.5	82.2	3.7	4.8							
					Bottom	15.5	27.7	28.1	28.1	5.3	78.4	3.8	4.6	5.3	78.6			3.8	4.6
							27.8	28.0	5.3	78.7	3.8	5.2							
Surface	1.0	27.7	26.6	26.6	6.0	84.4	2.4	3.6	6.0	84.6	2.4	3.2	3.4						
		27.6	26.6	6.0	84.7	2.4	3.2												
Middle	7.0	27.6	26.9	26.9	5.7	80.2	2.5	3.4	5.7	80.6	2.5	3.6	3.5						
		27.6	26.9	5.7	81.0	2.6	3.6												
Bottom	13.0	27.5	27.0	27.0	5.9	83.3	2.9	3.8	5.9	83.2	2.9	4.0	3.9						
		27.6	27.0	5.9	83.0	2.9	4.0												
27/09/13	0902-0917	26/Fine	Small Wave	11.8	Surface	1.0	27.8	27.8	27.9	5.8	86.3	2.8	3.8	2.8	3.9	3.0	4.0		
							27.8	27.9	5.8	85.7	2.8	4.0							
					Middle	5.9	27.8	27.8	27.9	5.7	84.9	2.9	3.8	5.7	84.6			2.9	4.0
							27.8	27.9	5.7	84.3	2.9	4.0							
					Bottom	10.8	27.7	28.0	28.1	5.6	82.6	3.3	4.2	5.6	82.4			3.3	4.4
							27.8	28.1	5.6	82.1	3.4	4.4							
Surface	1.0	28.1	28.7	28.7	6.3	92.8	2.4	3.6	6.3	92.5	2.4	3.7							
		28.0	28.6	6.3	92.2	2.4	3.8												
Middle	7.5	28.0	28.8	28.8	5.9	86.3	3.0	4.0	5.9	86.1	3.0	3.9							
		28.0	28.8	5.9	85.9	3.0	3.8												
Bottom	14.0	27.9	28.8	28.8	5.8	85.0	3.1	4.2	5.8	85.3	3.1	4.1							
		27.8	28.7	5.8	85.6	3.1	4.0												



## Mid-Flood Tide

Monitoring Station : M5

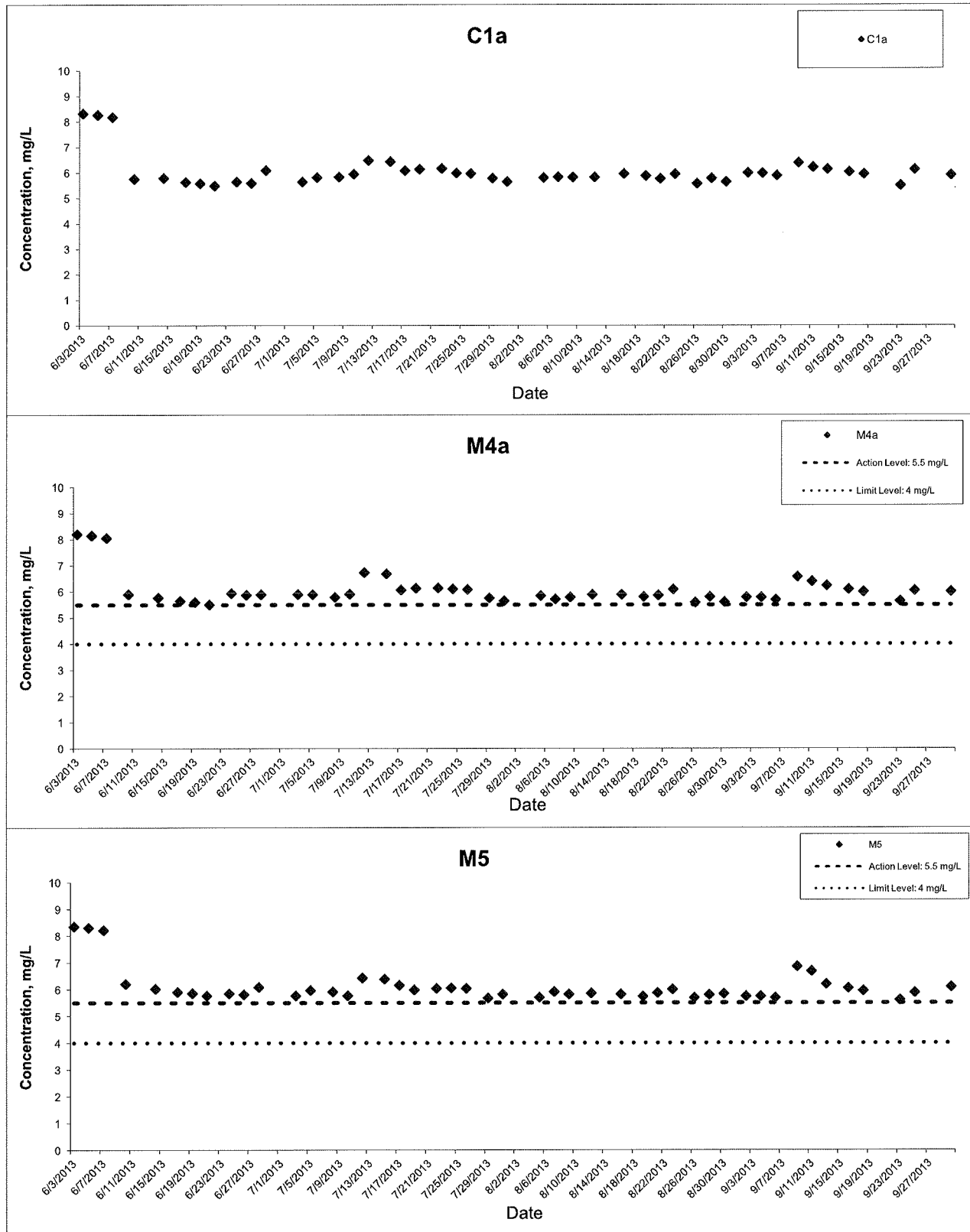
Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)		Water Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
					Surface	Bottom		Value	Ave.	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
02/09/13	1742-1759	28/Cloudy	Small Wave	15.2	Surface	1.0	27.5	25.6	25.7	5.9	87.0	2.4	2.5	3.6	3.7			
					Middle	7.6	27.5	25.7	5.9	87.4	2.5	2.8	3.8					
					Bottom	14.2	27.4	25.8	5.7	84.4	2.8	2.7	4.0					
							27.4	25.7	5.8	84.7	2.7		3.8					
							27.2	25.9	5.9	86.3	2.9	2.9	4.2					
							27.1	26.0	5.9	86.6	2.9	2.9	4.0					
04/09/13	1815-1833	26/Drizzle	Small Wave	14.8	Surface	1.0	25.6	23.0	23.0	6.0	82.6	2.4	2.4	3.6	3.5			
					Middle	7.4	25.5	23.2	5.7	82.9	2.4	2.8	3.4					
					Bottom	13.8	25.4	23.3	5.7	79.4	2.8	2.8	3.8					
							25.3	23.3	5.9	79.7	2.8	2.8	3.6					
							25.2	23.4	5.9	81.3	2.8	2.8	4.0					
							25.7	23.2	5.8	81.7	2.8	2.8	3.8					
06/09/13	1815-1833	26/Cloudy	Small Wave	15.0	Surface	1.0	25.6	23.3	23.3	5.8	80.4	2.5	2.5	3.2	3.3			
					Middle	7.5	25.4	23.4	5.7	80.9	2.6	2.8	3.4					
					Bottom	14.0	25.5	23.4	5.7	78.8	2.8	2.8	3.6					
							25.3	23.4	5.8	79.3	2.8	2.8	3.8					
							25.2	23.5	5.8	80.2	2.9	2.9	3.6					
							27.6	27.3	6.8	80.5	2.9	2.9	3.8					
09/09/13	0915-0930	28/Fine	Small Wave	17.6	Surface	1.0	27.6	27.3	27.3	6.8	100.7	2.2	2.2	3.0	3.1			
					Middle	8.8	27.5	27.4	6.5	101.0	2.1	2.2	3.2					
					Bottom	16.6	27.5	27.3	6.5	95.9	2.2	2.2	3.4					
							27.2	27.3	6.5	95.4	2.2	2.2	3.2					
							27.2	27.3	6.4	95.3	2.1	2.1	3.0					
							27.6	27.2	6.9	94.1	2.2	2.2	3.2					
11/09/13	1045-1103	28/Fine	Small Wave	17.2	Surface	1.0	27.6	27.2	27.3	6.9	101.8	2.1	2.1	3.2	3.1			
					Middle	8.6	27.5	27.3	6.9	101.5	2.2	2.2	3.0					
					Bottom	16.2	27.4	27.3	6.7	97.8	2.2	2.2	3.2					
							27.3	27.4	6.7	98.2	2.2	2.2	3.4					
							27.3	27.2	6.5	95.9	2.3	2.3	3.4					
							27.2	27.3	6.6	96.2	2.3	2.3	3.6					
13/09/13	1335-1350	28/Fine	Small Wave	17.0	Surface	1.0	27.3	26.4	26.4	6.3	87.8	3.1	3.1	4.0	4.1			
					Middle	8.5	27.2	26.3	6.3	88.2	3.1	3.1	4.2					
					Bottom	16.0	27.2	26.4	6.1	85.7	3.1	3.1	4.2					
							27.2	26.4	6.2	86.1	3.1	3.1	4.4					
							27.2	26.6	6.1	85.2	3.3	3.3	4.4					
							27.1	26.7	6.1	85.4	3.3	3.3	4.6					
16/09/13	1648-1703	29/Fine	Small Wave	14.0	Surface	1.0	27.7	26.6	26.6	6.0	88.4	3.0	3.0	3.6	3.7			
					Middle	7.0	27.6	26.7	5.8	87.5	3.0	3.0	3.8					
					Bottom	13.0	27.5	26.9	5.9	84.9	3.1	2.9	4.0					
							27.4	26.9	5.8	85.5	3.0	2.9	4.2					
							27.4	26.7	5.7	83.3	3.1	3.1	4.2					
							27.4	26.9	5.8	84.2	3.2	3.1	4.4					
18/09/13	1747-1803	28/Fine	Small Wave	14.8	Surface	1.0	27.4	26.4	26.5	6.0	87.6	3.0	3.0	4.2	4.1			
					Middle	7.4	27.4	26.7	6.0	88.0	3.0	3.0	4.0					
					Bottom	13.8	27.3	26.8	5.9	87.2	3.1	3.1	4.2					
							27.2	26.8	5.7	86.4	3.1	3.1	4.0					
							27.2	26.8	5.7	83.0	3.0	3.0	3.6					
							27.2	26.8	5.7	83.5	3.0	3.0	3.8					

**Mid-Flood Tide**

**Monitoring Station : M5**

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)	Water Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Turbidity (NTU)		Suspended Solids (mg/L)								
							Value	Ave.	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average			
25/09/13	1015-1030	29/Cloudy	Small Wave	14.8	Surface	27.6	26.8	6.1	85.2	2.2	3.2	2.2	3.3	2.4	3.4	3.4						
						27.6	26.7	6.1	85.5	2.1	3.4											
					Middle	27.6	26.9	5.8	82.0	2.5	3.6	2.5	81.7				2.5	3.6				
						27.6	26.9	5.8	81.4	2.5	3.4	2.5	81.7				2.5	3.4				
					Bottom	27.4	27.1	5.9	83.0	2.4	3.6	2.4	83.3				2.4	3.6	2.4	3.5	3.4	3.5
						27.5	27.0	6.0	83.6	2.5	3.4	2.5	83.3				2.5	3.4	2.5	3.5		
27/09/13	1738-1754	28/Fine	Small Wave	12.2	Surface	28.1	28.0	5.7	84.5	2.6	3.8	2.6	3.7	2.8	4.0	3.9						
						28.0	28.0	5.6	83.4	2.8	3.8						2.8	83.6	2.8	3.8		
					Middle	28.0	28.1	5.7	83.8	2.8	4.0	2.8	83.6				2.8	4.0	2.8	3.9	3.9	
						28.0	28.1	5.7	83.8	2.8	4.0	2.8	83.6				2.8	4.0	2.8	3.9		
					Bottom	27.9	28.2	5.5	81.5	3.1	4.2	3.1	81.3				3.1	4.2	3.1	4.1	4.0	4.1
						27.9	28.3	5.5	81.1	3.2	4.0	3.2	81.3				3.2	4.0	3.2	4.0		
30/09/13	1620-1635	29/Drizzle	Great Wave	15.6	Surface	28.4	28.6	6.2	90.6	3.0	4.0	3.0	3.9	3.1	4.2	4.0						
						28.4	28.5	6.2	90.0	3.1	3.8						3.1	90.3	3.1	3.8		
					Middle	28.2	28.9	5.9	86.5	3.0	4.0	3.0	86.2				3.0	4.0	3.0	3.9	4.0	
						28.1	28.8	5.9	85.8	2.9	4.0	2.9	86.2				2.9	4.0	2.9	3.9		
					Bottom	28.1	28.9	5.8	84.7	3.2	4.2	3.2	84.5				3.2	4.2	3.2	4.3	4.4	4.3
						28.1	28.9	5.8	84.3	3.2	4.4	3.2	84.5				3.2	4.4	3.2	4.3		

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



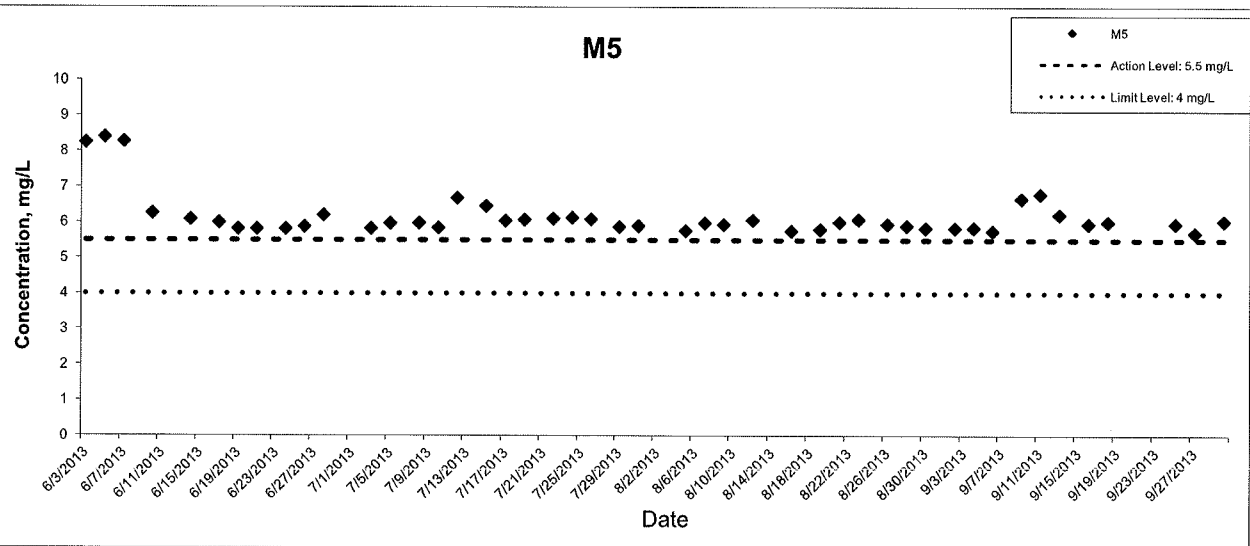
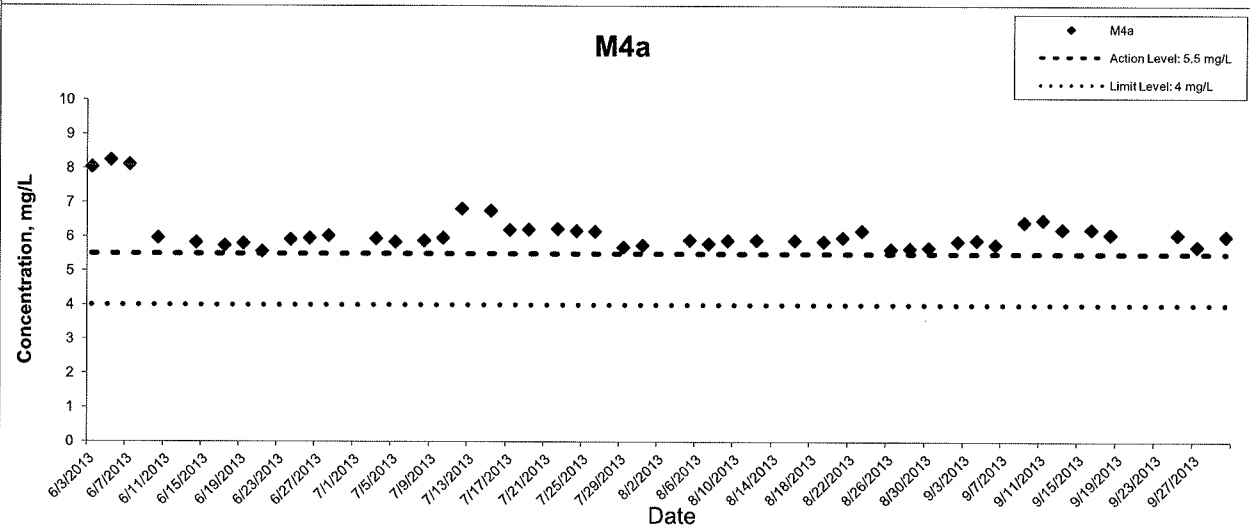
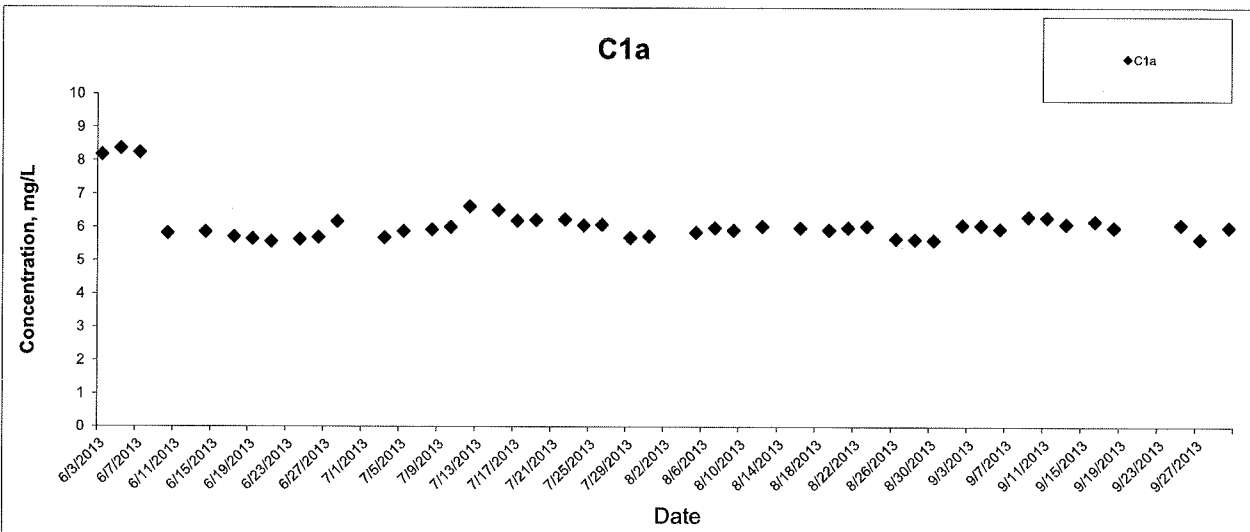
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HONG KONG BOUNDARY CROSSING FACILITIES  
- RECLAMATION WORKS**

**Graphical Presentation of Impact Water Quality  
Monitoring Results**



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



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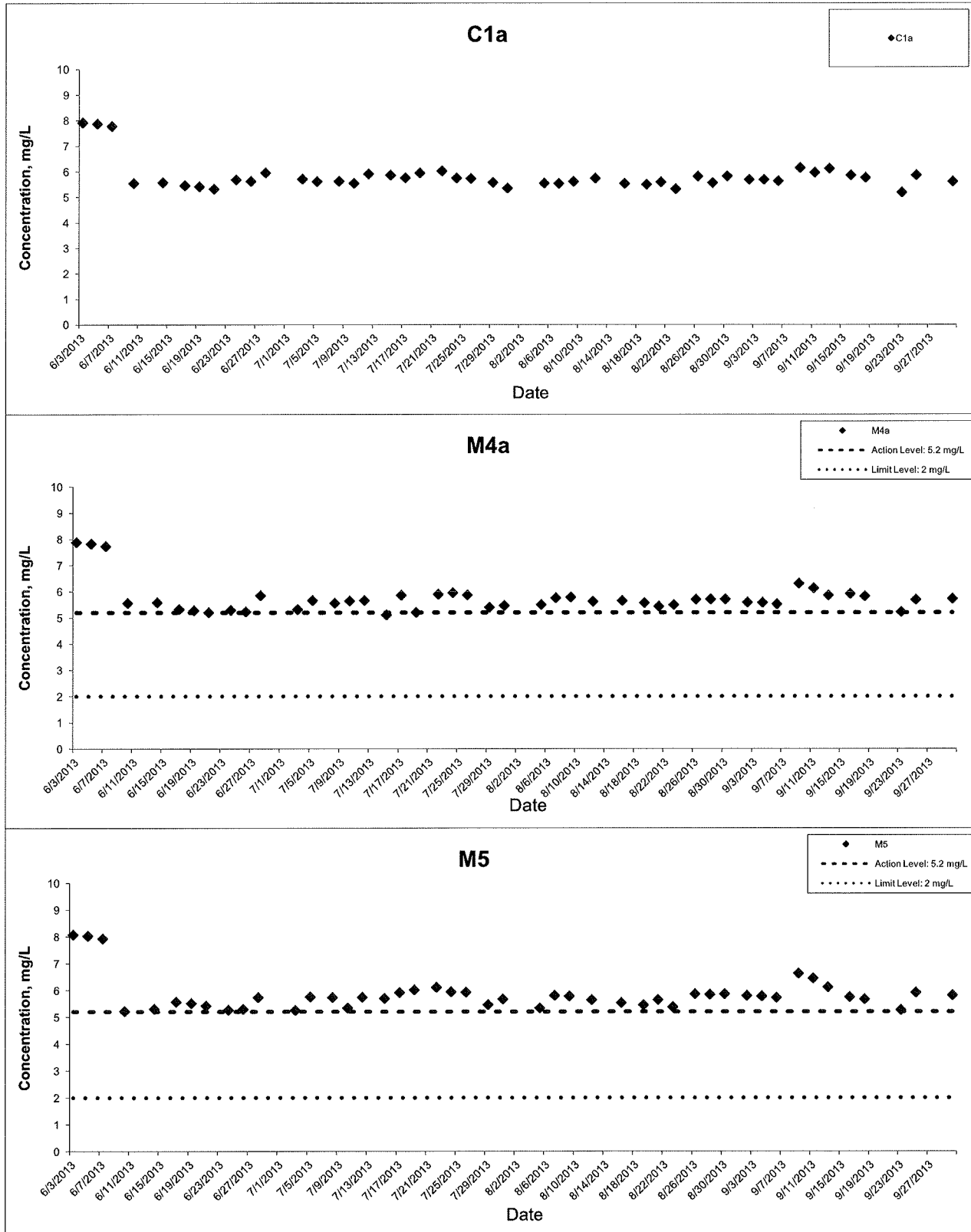


Project No.: 60249820

Date: October 2013

Appendix C

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



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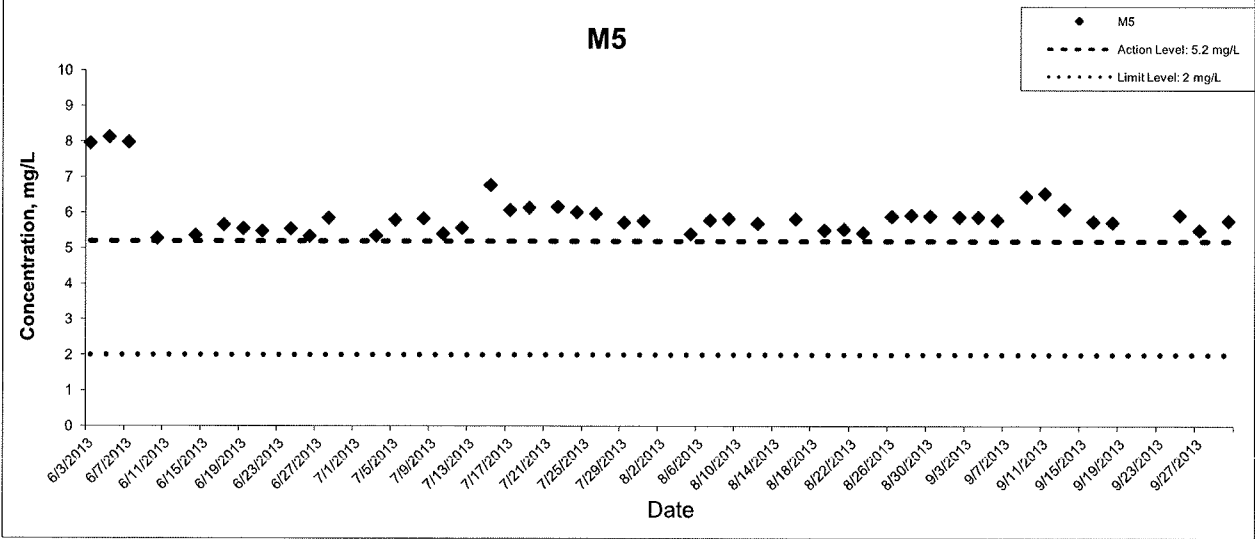
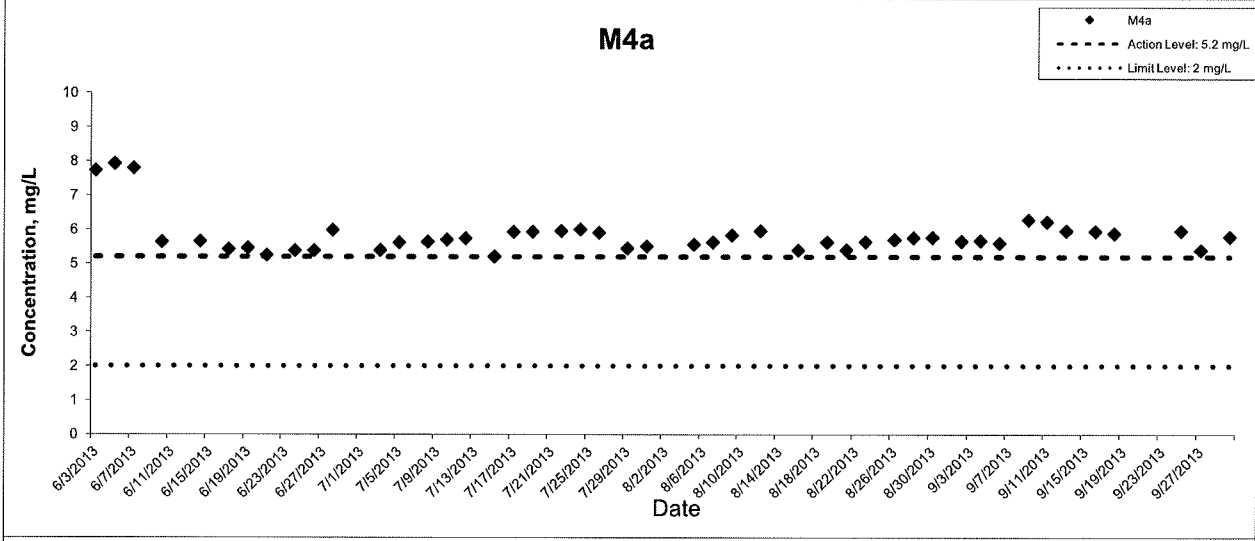
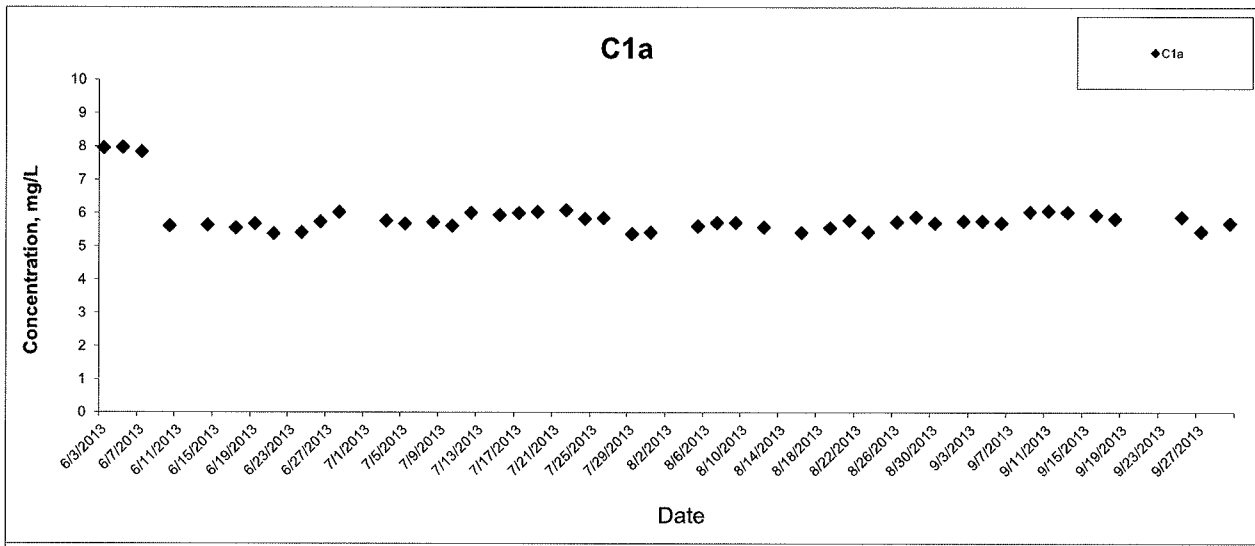


Project No.: 60249820

Date: October 2013

Appendix C

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



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- RECLAMATION WORKS

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Monitoring Results

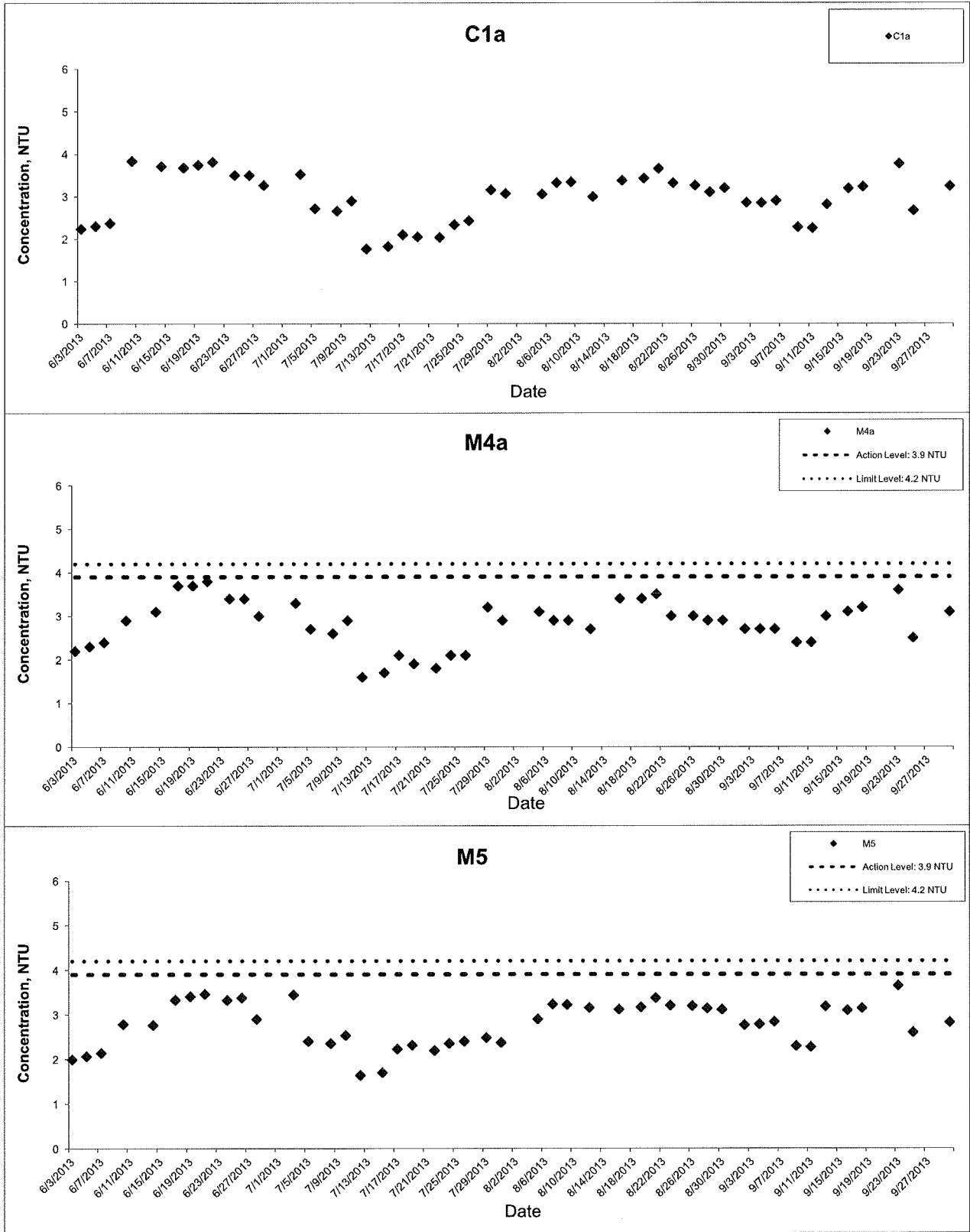


Project No.: 60249820

Date: October 2013

Appendix C

### Turbidity at Mid-Ebb Tide



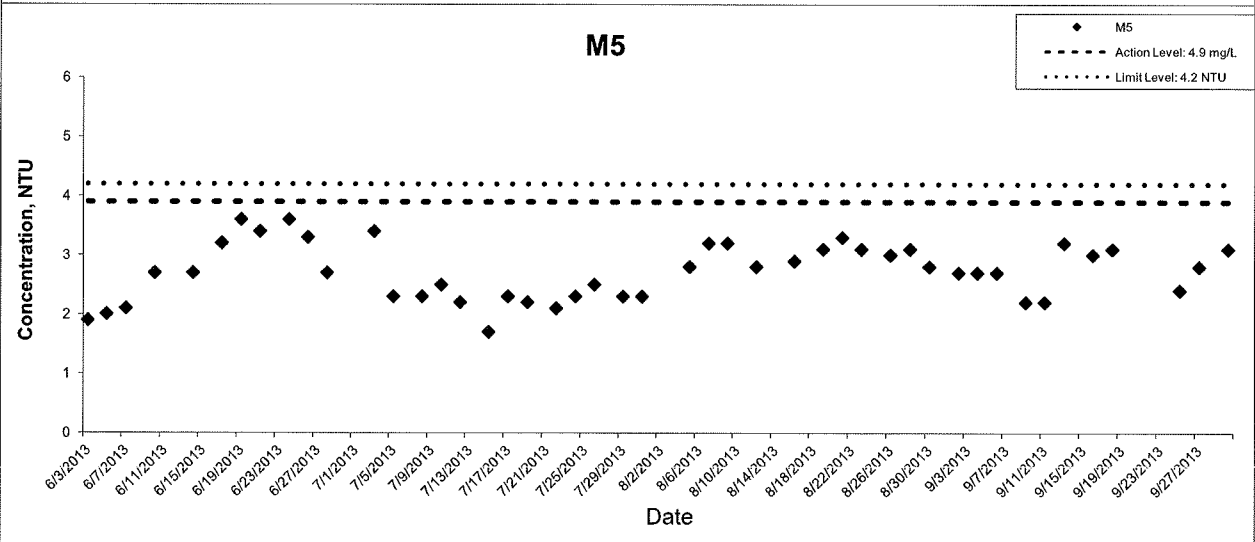
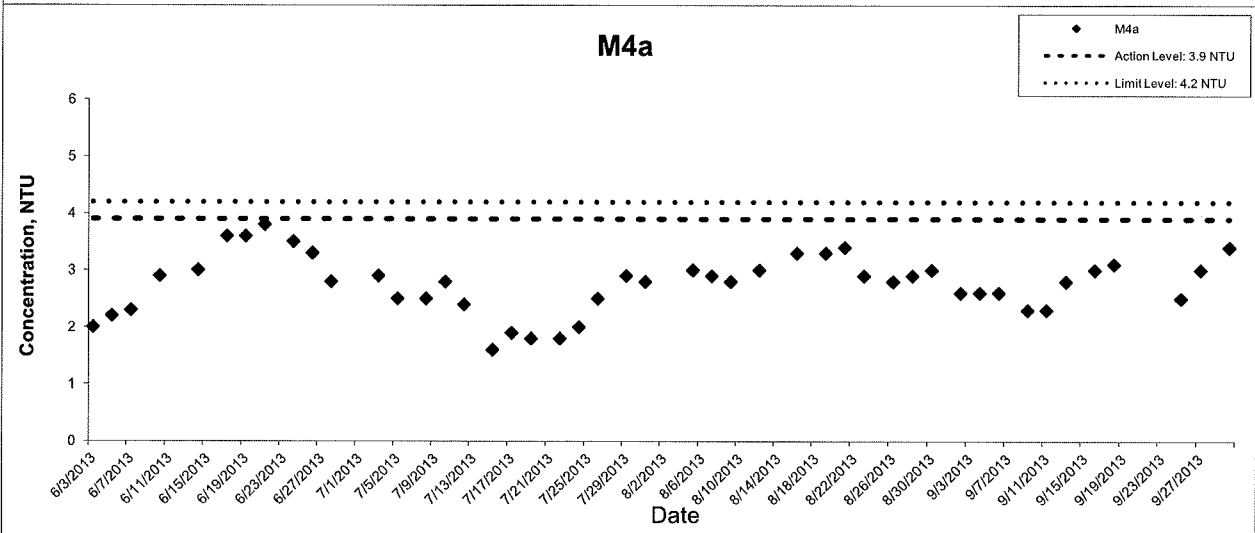
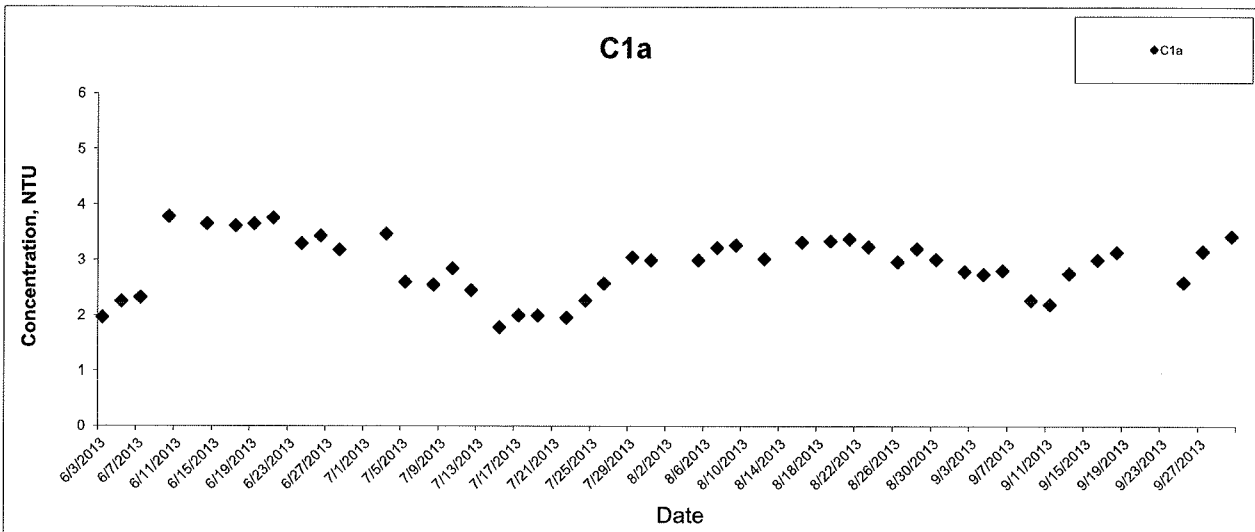
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### Turbidity at Mid-Flood Tide



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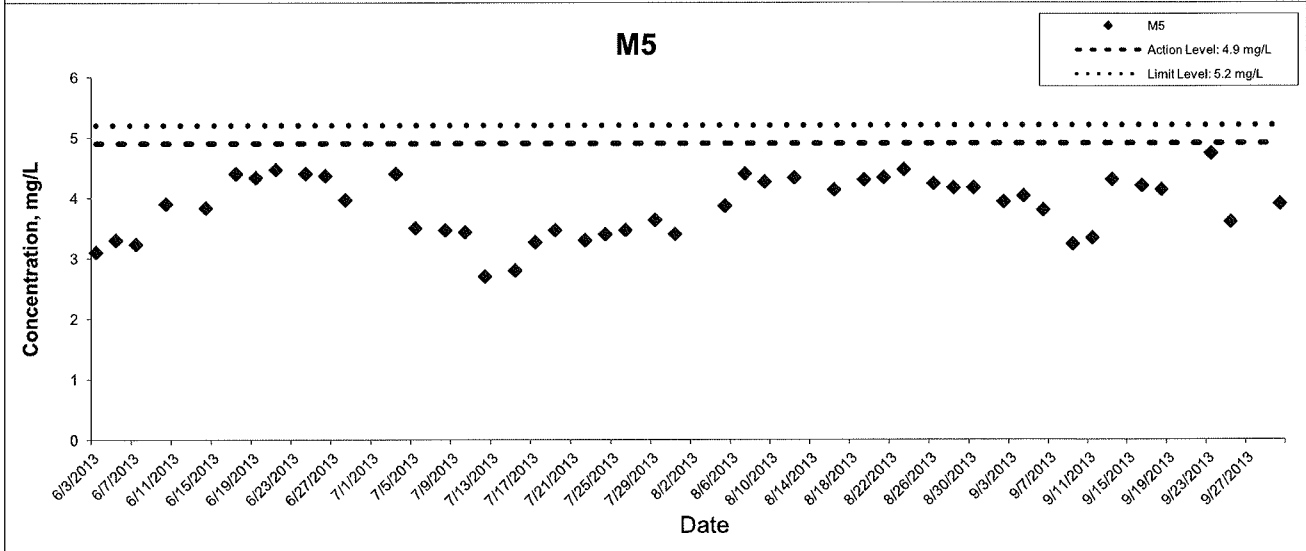
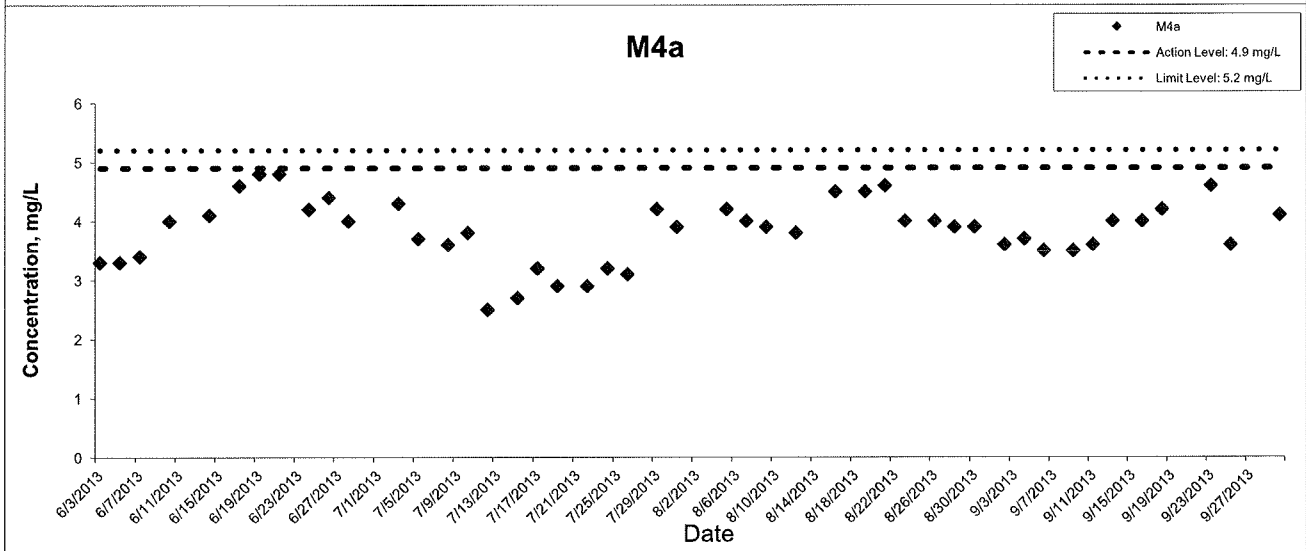
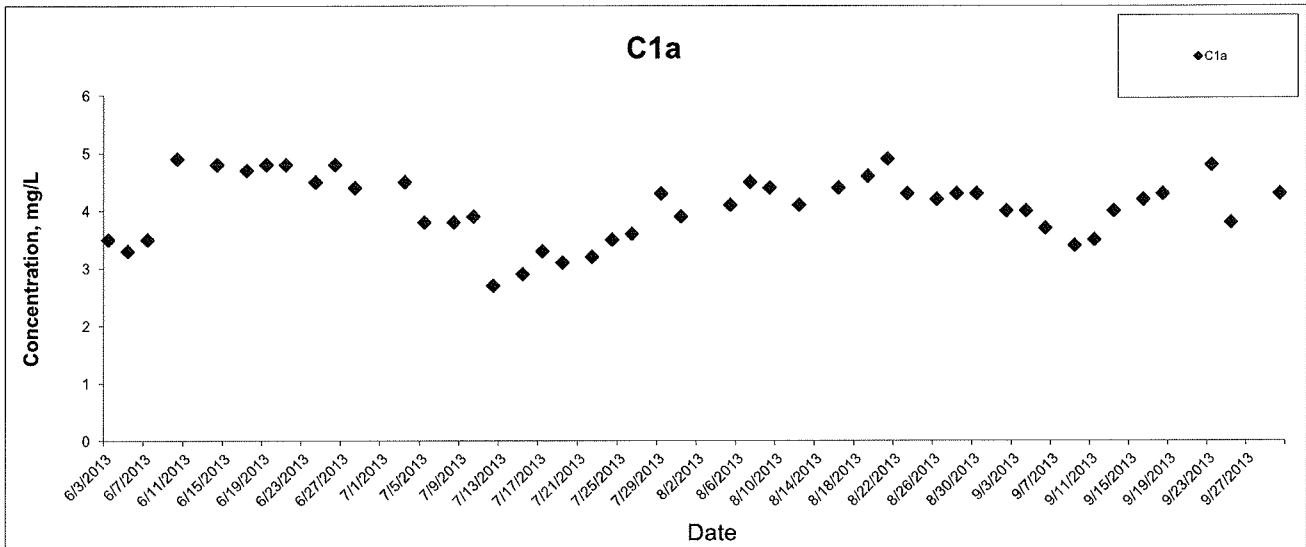
Project No.: 60249820

Date: October 2013

Appendix C



### Suspended Solids at Mid-Ebb Tide



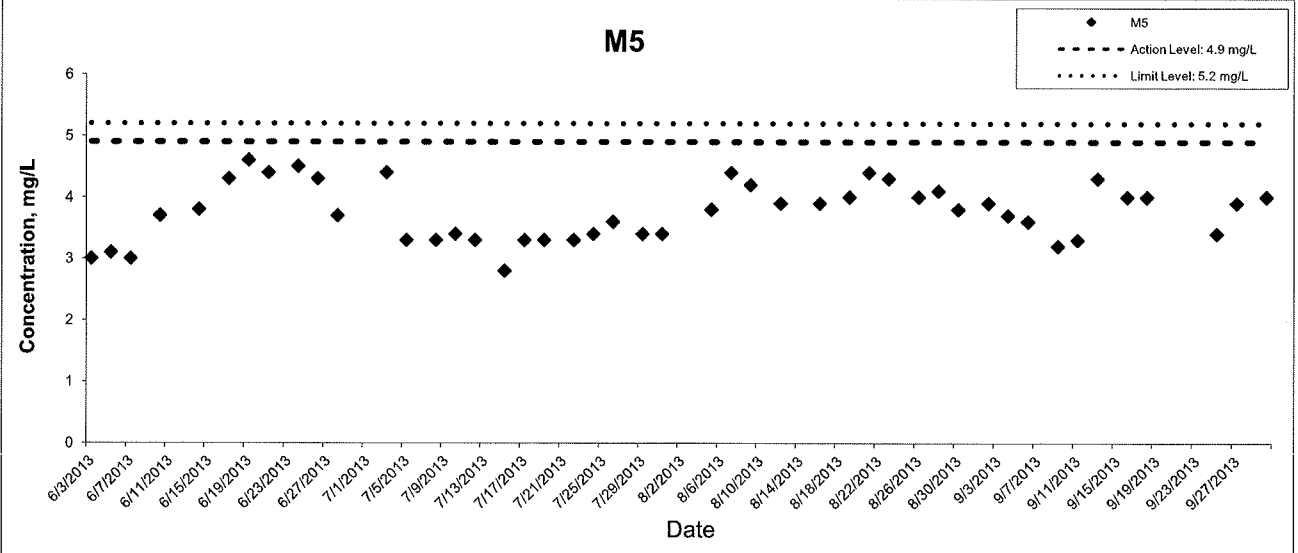
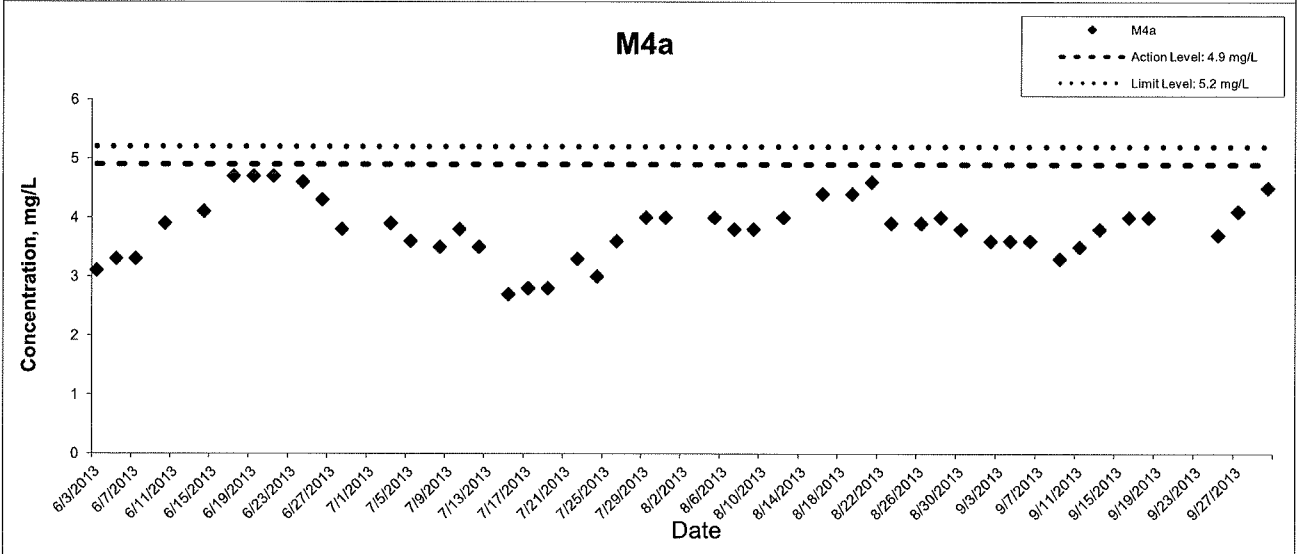
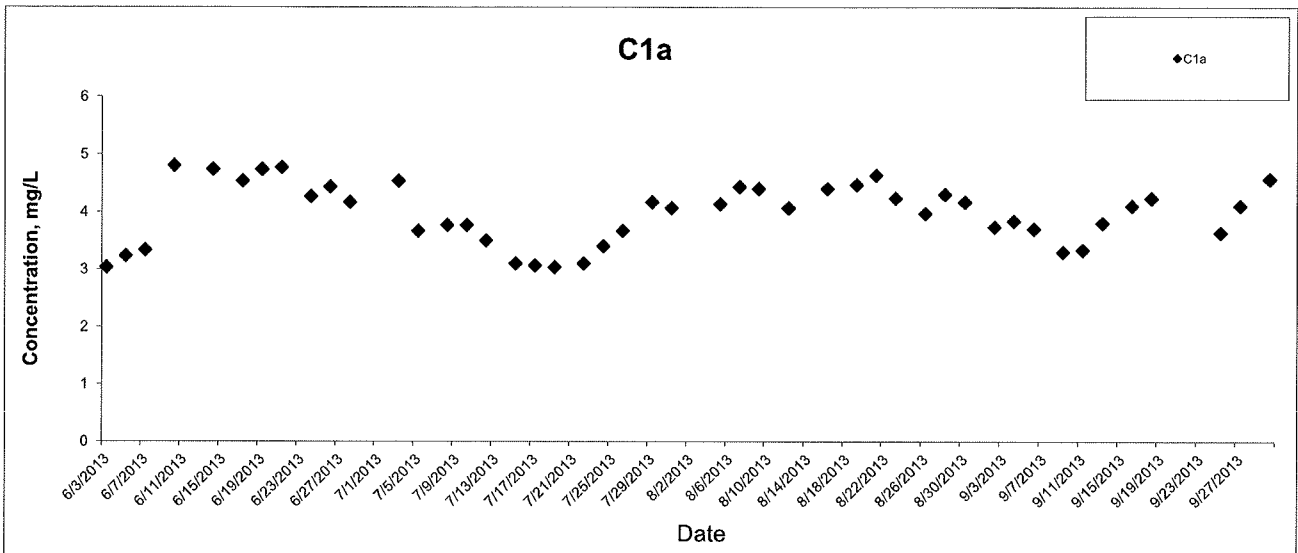
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### Suspended Solids at Mid-Flood Tide



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**APPENDIX D  
QA/QC REPORT**

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**APPENDIX G**

**Delivery Receipts of Concrete & Reinforcement**

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

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
02/09/2013	102.5	FC1a-S1	0.00	EC1a-S2	98.0
	104.9	EC1a-M1	8.70	EWM5-B2	107.7

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
04/09/2013	93.1	FC1a-S1	10.53**	EC1a-S2	102.1
	99.4	EC1a-M1	0.00	EWM5-B2	98.0

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
06/09/2013	104.3	FC1a-S1	0.00	EC1a-S2	107.7
	97.6	EC1a-M1	10.53**	EWM5-B2	100.0

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
09/09/2013	100.6	FC1a-S1	11.76**	EC1a-S2	95.9
	104.0	EC1a-M1	0.00	EWM5-B2	102.1

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
11/09/2013	107.6	FC1a-S1	0.00	EC1a-S2	95.9
	103.3	EC1a-M1	11.76**	EWM5-B2	91.7

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
13/09/2013	93.5	FC1a-S1	0.00	EC1a-S2	94.0
	93.7	EC1a-M1	8.70	EWM5-B2	100.0

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
16/09/2013	105.0	FC1a-S1	0.00	EC1a-S2	98.1
	96.5	EC1a-M1	8.70	EWM5-B2	92.3

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
18/09/2013	105.5	FC1a-S1	10.53**	EC1a-S2	92.3
	101.7	EC1a-M1	0.00	EWM5-B2	102.1

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
23/09/2013	92.5	EC1a-S1	8.70	EWM5-B2	91.8

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
25/09/2013	96.5	FC1a-S1	0.00	EC1a-S2	100.0
	97.7	EC1a-M1	10.53**	EWM5-B2	93.8

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
27/09/2013	99.4	FC1a-S1	0.00	EC1a-S2	106.3
	96.6	EC1a-M1	0.00	EWM5-B2	102.1

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
30/09/2013	99.0	FC1a-S1	8.70	EC1a-S2	95.9
	92.1	EC1a-M1	0.00	EWM5-B2	104.2

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.