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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.43
(JUNE 2013)

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12 July 2013

By E-mail and Fax No.: 2695 3944

ETS-Testconsult Limited
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Attention: Mr. C. L. Lau

Dear Mr. Lau,

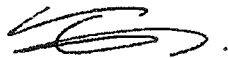
**Re: Contract No. CV/2009/02
Handling of Surplus Public Fill – Tseung Kwan O Area 137 Fill Bank
Monthly EM&A Report No. 43 for June 2013**

Reference is made to your submission of the final draft Monthly EM&A Report for June 2013 for the captioned by E-mail on 11 July 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 Simon Lam or the undersigned should you have any queries.

Yours sincerely,



Tony Cheng
Independent Environmental Checker

c.c. CEDD Attn: Mr. Panda Liu / Mr. Jason Wong
CHCSJV Attn: Mr. Dennis Tang

Fax No.: 2714 0113
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EXECUTIVE SUMMARY

This monthly Environmental Monitoring and Audit (EM&A) report No.43 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 June 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
- Maintenance of haul road within fill bank area
- 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: 15 Occasions at 2 designated locations
- Marine Water Quality Monitoring: 11 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

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	05, 11, 19 and 26 June 2013
IEC site inspection	05 and 19 June 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 June 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 m³ 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
- Maintenance of haul road within fill bank area
- 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 0.6m³/min and 1.7m³/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 recorded.
- 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	02/06/13	122	X	03/06/13	10:30	228	X
					05/06/13	10:00	241	X
					07/06/13	15:40	254	X
		08/06/13	128	X	10/06/13	09:50	215	X
					10/06/13	10:50	229	X
					10/06/13	13:00	237	X
		14/06/13	129	X	14/06/13	08:40	240	X
					17/06/13	09:00	249	X
					19/06/13	09:00	252	X
		20/06/13	137	X	21/06/13	13:00	241	X
					21/06/13	14:00	225	X
					24/06/13	09:55	202	X
		26/06/13	126	X	26/06/13	10:05	180	X
					28/06/13	16:00	214	X
					28/06/13	17:05	225	X
TKO-A2a	New CREO	02/06/13	118	X	03/06/13	10:35	194	X
					05/06/13	10:05	181	X
					07/06/13	16:10	190	X
		08/06/13	114	X	10/06/13	10:00	168	X
					10/06/13	11:00	167	X
					10/06/13	13:00	173	X
		14/06/13	115	X	14/06/13	08:50	175	X
					17/06/13	09:05	184	X
					19/06/13	09:05	188	X
		20/06/13	122	X	21/06/13	13:05	201	X
					21/06/13	14:05	213	X
					24/06/13	10:00	160	X
		26/06/13	114	X	26/06/13	10:00	182	X
					28/06/13	15:55	219	X
					28/06/13	17:00	225	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</i>
<i>Sound Level Calibrator</i>	<i>Rion NC-73</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>L_{eq}, L_{10}, L_{90}</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) *		
		$L_{eq(30min)}$	L_{10}	L_{90}
05/06/13	17:10	70.2	72.4	65.4

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
Temperature	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 19th 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	MLR GPS Navigator, SP24	-----	-----	ET/EW/005/01*
Dissolved Oxygen (Saturation), Temperature, Salinity	YSI Dissolved Oxygen, Salinity & Temperature Meter, YSI Pro2030	02/05/13	01/08/13	ET/EW/008/004*
Turbidity	HACH Model 2100Q Turbid Meter	09/04/13	08/07/13	ET/0505/009
Water Depth	EAGLE Strata 128 Sonar	-----	-----	EW/002/02

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 & 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 & 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 Impact data) or >120% of the upstream control station's turbidity at the same tide on the same day	>4.58 NTU (99%-ile of Impact 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

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

June 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 / 30	24	25	26	27	28	29

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

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 CV/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.
05 June 2013	Operation of TKO Area 137 Fill Bank	CEDPFRSFEM00_130605_TKOFB
19 June 2013		CEDPFRSFEM00_130619_TKOFB

7.1.3 The major findings recorded during the site audit 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
05 June 2013	Dark smoke emission from bulldozer was observed during operation at dry soil deposition area. (Previous item)	The Contractor was reminded to conduct regular maintenance for all plants in order to prevent dark smoke emission	The bulldozer had been repaired and no dark smoke was observed when working at dry soil deposition area.	Closed
	Stagnant water accumulated inside the shovel and chemical waste storage area. (Previous item)	The Contractor was reminded to clean up the stagnant water.	Stagnant water had been removed.	Closed
19 June 2013	No finding was observed during the IEC 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 (05, 11, 19 and 26 June 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
05 June 2013	Standing water was found inside the drip tray in the chemical waste storage area. (Previous item)	The Contractor was reminded to clear the standing water or apply pesticide to avoid mosquito breeding.	Standing water inside the drip tray in the chemical waste storage area was cleared.	Closed
	Silt curtain near tipping hall No.1 were found damaged. (Previous item)	The Contractor was reminded to repair the silt curtain as soon as possible.	---	Follow-up
	Standing water was noted at check point. (Previous item)	The Contractor was reminded to clear the standing water or apply pesticide to avoid mosquito breeding.	Standing water noted at check point was cleared.	Closed
11 June 2013	Silt curtain near tipping hall No.1 were found damaged. (Previous item)	The Contractor was reminded to repair the silt curtain as soon as possible.	---	Follow-up
19 June 2013	Silt curtain near tipping hall No.1 were found damaged. (Previous item)	The Contractor was reminded to repair the silt curtain as soon as possible.	---	Follow-up
26 June 2013	Silt curtain near tipping hall No.1 were found damaged. (Previous item)	The Contractor was reminded to repair the silt curtain 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 ³	---
C&D Waste (general refuse)	0 m ³	---
Chemical Waste	440 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 banded 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. Total 440kg chemical waste disposal was undertaken in the reporting month.

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"> ▪ Site clearance ▪ Construction of a temporary storm water system ▪ Stockpiling of 6 million m³ of public fill ▪ Setting up two barging points for transporting the stockpiled public fill by barges ▪ 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 ▪ Construction of operation of a construction and Demolition Material Sorting Facility (C&DMSF) ▪ Setting up a Construction and Demolition Material Crushing Facility at the TKO Basin ▪ Remove the temporary fill bank



Description	Permit No.	Valid Period		Section
		From	To	
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/13-131	01/04/13	30/06/13	Approval for dumping 3,000,000 tons (approximately equal to 1,666,666 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>June 2013</i>	<i>Cumulative</i>	<i>June 2013</i>	<i>Cumulative</i>	<i>June 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 bowers;
- 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*
- *Maintenance of haul road within fill bank area.*
- *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 used for this cleaning work 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 -



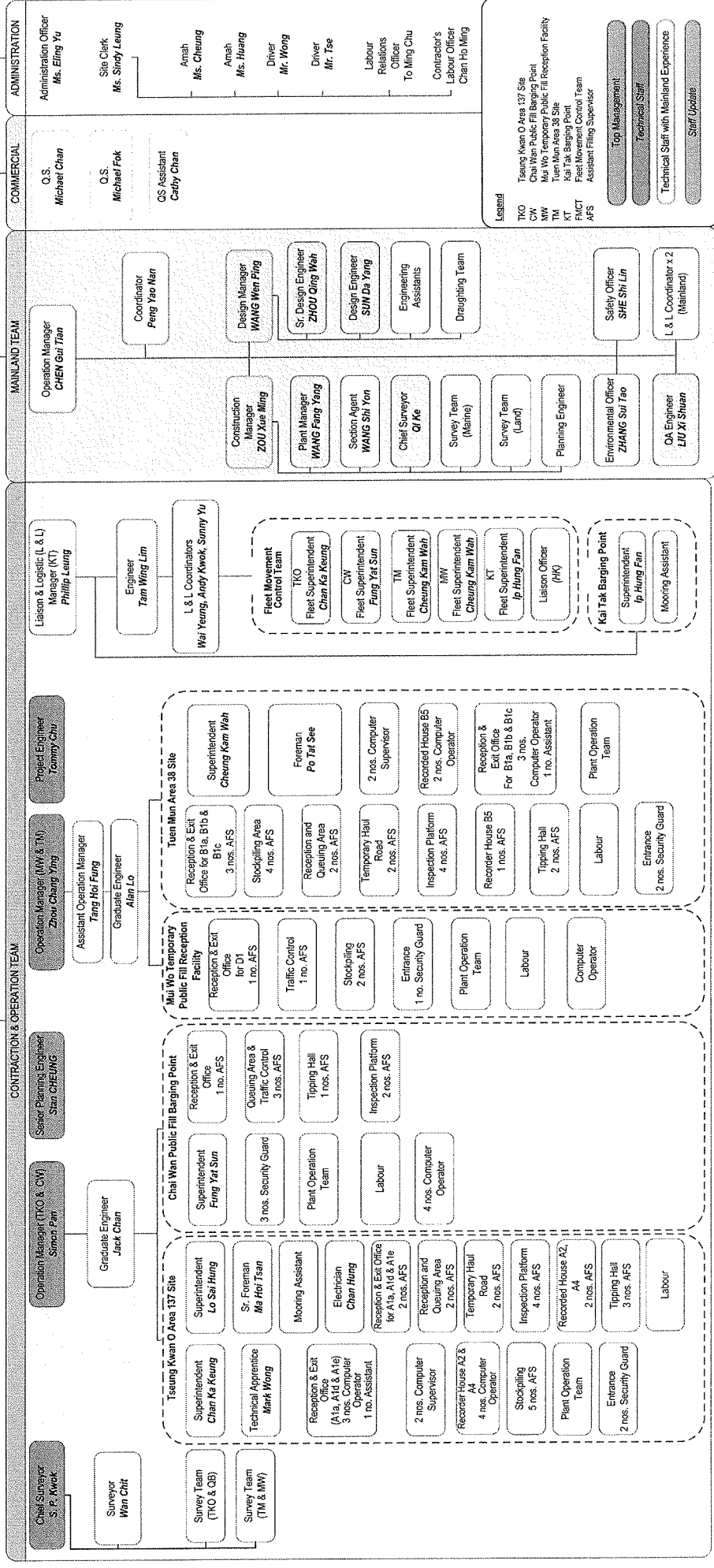
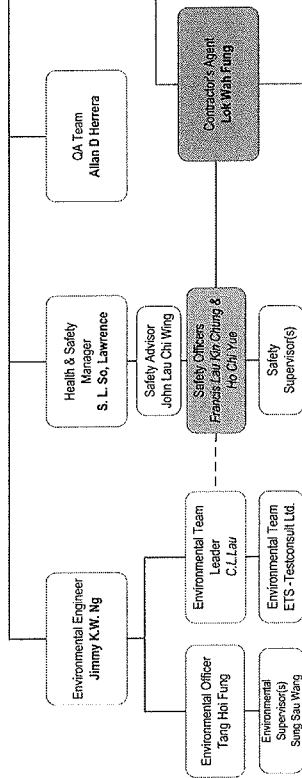
Appendix I

A

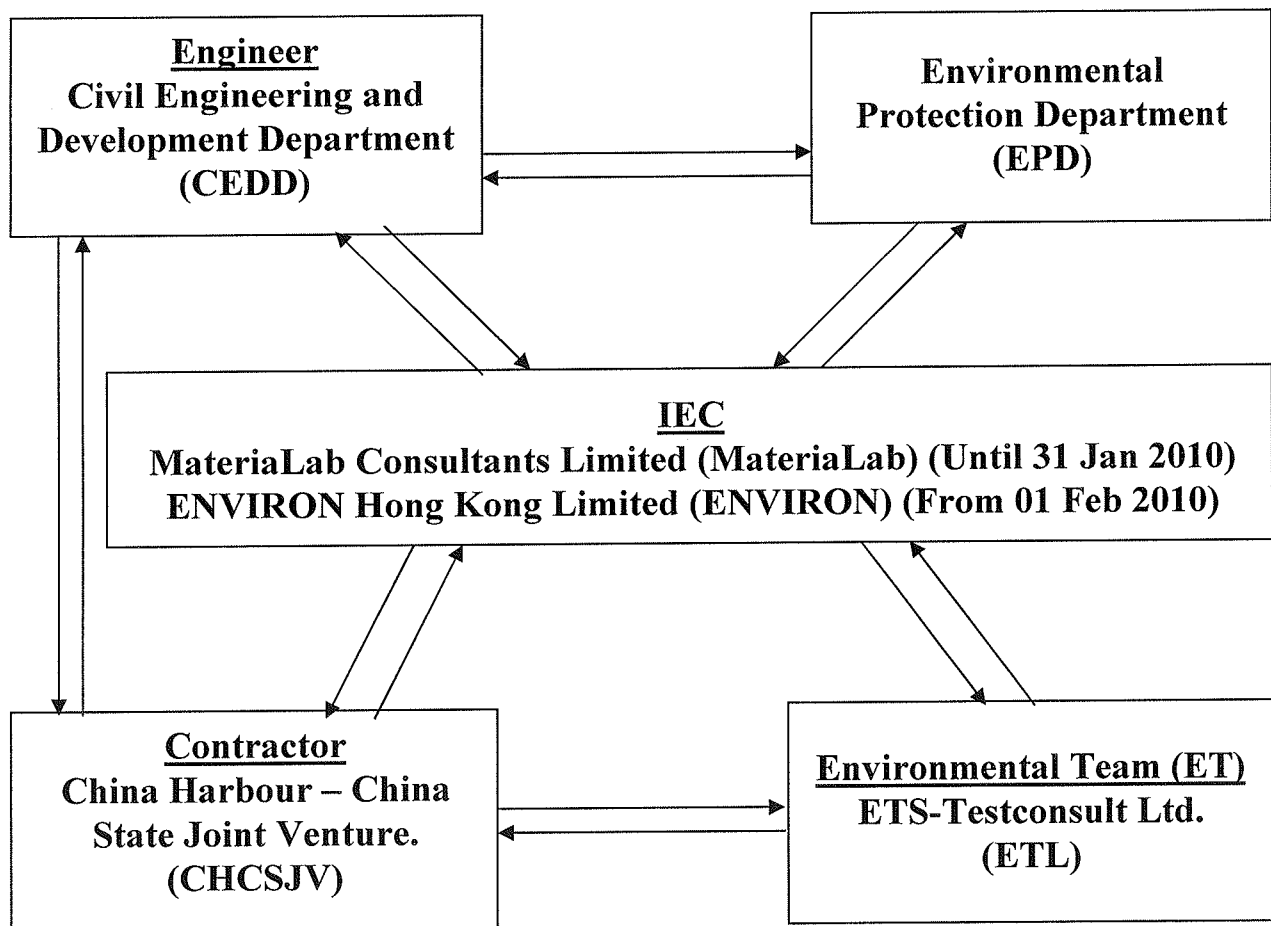
Organization Chart and Lines of Communication

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

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



Lines of Communication

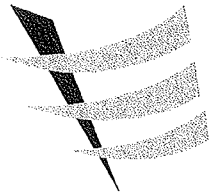




Appendix I

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

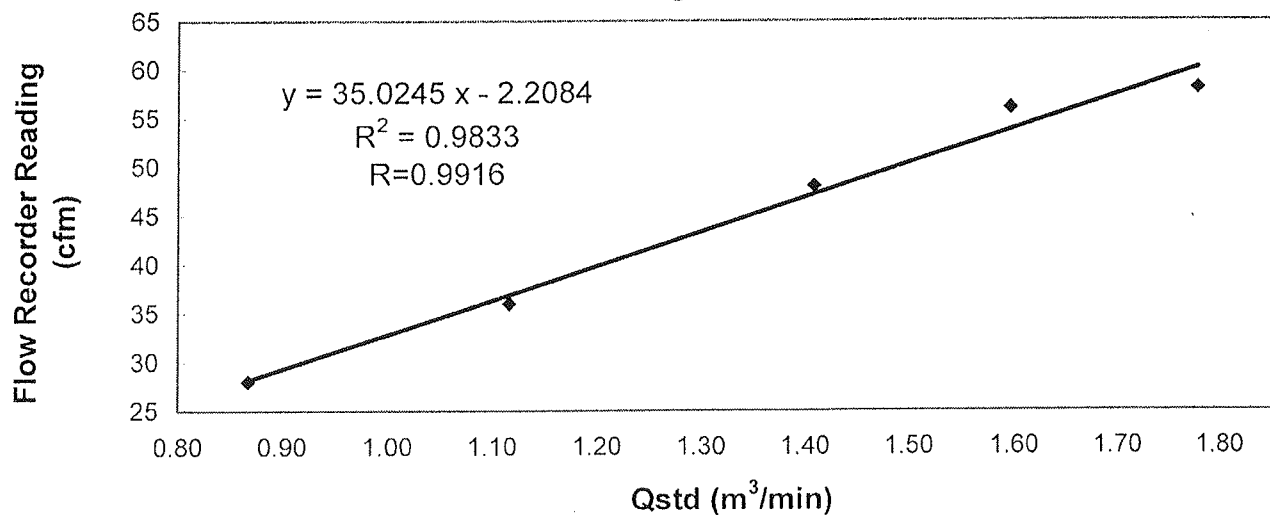
TEST REPORT

Calibration Report
of
High Volume Air Sampler

Manufacturer : Graseby GMW Date of Calibration : 10 May 2013
Serial No. : 10581 (ET / EA / 003 / 22) Calibration Due Date : 09 July 2013
Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual

Results	Flow recorder reading (cfm)	58	56	48	36	28
	Qstd (Actual flow rate, m ³ /min)	1.78	1.60	1.41	1.12	0.87
	Pressure : 753.81 mm Hg	Temp. : 300 K				

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

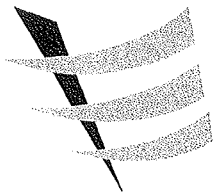


Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration.

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

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Fax : 2695 3944

Web site : www.ets-testconsult.com

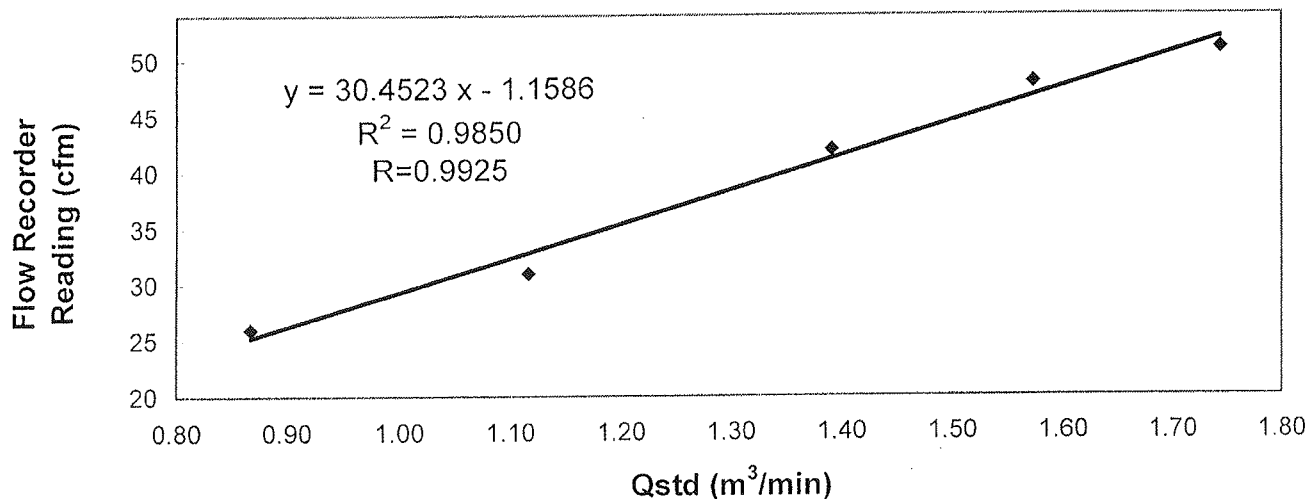
TEST REPORT

**Calibration Report
of
High Volume Air Sampler**

Manufacturer : Graseby GMW Date of Calibration : 10 May 2013
 Serial No. : 1172 (ET / EA / 003 / 11) Calibration Due Date : 09 July 2013
 Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual


Results	Flow recorder reading (cfm)	51	48	42	31	26
	Qstd (Actual flow rate, m ³ /min)	1.74	1.57	1.39	1.12	0.87
Pressure :		753.81	mm Hg	Temp. :		300 K

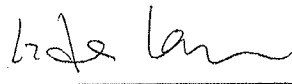
**Sampler 1172 Calibration Curve
Site: Tseung Kwan O A-2**



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 30, 2012 Roots-meter S/N 0438320 Ta (K) - 298
 Operator Tisch Orifice I.D. - 2193 Pa (mm) - 748.03

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.4420	3.2	2.00
2	NA	NA	1.00	1.0190	6.4	4.00
3	NA	NA	1.00	0.9100	7.9	5.00
4	NA	NA	1.00	0.8680	8.8	5.50
5	NA	NA	1.00	0.7170	12.8	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
0.9800	0.6796	1.4030	0.9957	0.6905	0.8926
0.9758	0.9576	1.9842	0.9915	0.9730	1.2623
0.9738	1.0701	2.2184	0.9893	1.0872	1.4113
0.9727	1.1206	2.3267	0.9882	1.1385	1.4802
0.9674	1.3492	2.8061	0.9828	1.3708	1.7852
Qstd slope (m) = 2.09529			Qa slope (m) = 1.31204		
intercept (b) = -0.02194			intercept (b) = -0.01396		
coefficient (r) = 0.99999			coefficient (r) = 0.99999		
y axis = SQRT[H2O(Pa/760) (298/Ta)]			y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

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

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

For subsequent flow rate calculations:

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



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 ³ /min.)		Average (m ³ /min.)	Filter Weight (g)		Conc. (µg/m ³)
		Date	Time	Initial	Final		Initial	Final		Initial	Final	
02/06/13	09:00	03/06/13	09:00	19735.33	19759.33	24.00	1.0909	1.0909	1.0909	2.6741	2.8662	122
08/06/13	09:00	09/06/13	09:00	19762.33	19786.33	24.00	1.0909	1.0909	1.0909	2.7496	2.9504	128
14/06/13	10:00	15/06/13	10:00	19790.33	19814.33	24.00	1.0909	1.0909	1.0909	2.7478	2.9498	129
20/06/13	09:00	21/06/13	09:00	19816.33	19840.33	24.00	1.0909	1.0909	1.0909	2.7501	2.9656	137
26/06/13	13:00	27/06/13	13:00	19844.33	19868.33	24.00	1.0909	1.0909	1.0909	2.7506	2.9493	126

Monitoring Station : TKO-A2a
 Location : new CREO

Date	Start Time	Finish		Elapse Time		Sampling Time (hrs)	Flow Rate (m ³ /min.)		Average (m ³ /min.)	Filter Weight (g)		Conc. (µg/m ³)
		Date	Time	Initial	Final		Initial	Final		Initial	Final	
02/06/13	09:00	03/06/13	09:00	18951.44	18975.44	24.00	1.1874	1.1874	1.1874	2.6789	2.8806	118
08/06/13	09:00	09/06/13	09:00	18978.44	19002.44	24.00	1.1874	1.1874	1.1874	2.7321	2.9270	114
14/06/13	10:00	15/06/13	10:00	19006.44	19030.44	24.00	1.1874	1.1874	1.1874	2.7330	2.9289	115
20/06/13	09:00	21/06/13	09:00	19032.44	19056.44	24.00	1.1874	1.1874	1.1874	2.7494	2.9578	122
26/06/13	13:00	27/06/13	13:00	19060.44	19084.44	24.00	1.1874	1.1874	1.1874	2.7521	2.9465	114

Summary of 1-hr TSP Monitoring Results

Monitoring Station : TKO-A1
Location : Site Egress

Date	Time		Elapse Time		Sampling Time (hrs)	Flow Rate (m ³ /min.)		Average (m ³ /min.)	Filter Weight (g)		Conc. (µg/m ³)
	Start	Finish	Initial	Final		Initial	Final		Initial	Final	
03/06/13	10:30	11:30	19759.33	19760.33	1.00	1.0909	1.0909	1.0909	2.7621	2.7770	228
05/06/13	10:00	11:00	19760.33	19761.33	1.00	1.0909	1.0909	1.0909	2.7640	2.7798	241
07/06/13	15:40	16:40	19761.33	19762.33	1.00	1.0909	1.0909	1.0909	2.7327	2.7493	254
10/06/13	09:50	10:50	19786.33	19787.33	1.00	1.0909	1.0909	1.0909	2.7629	2.7770	215
10/06/13	10:50	11:50	19787.33	19788.33	1.00	1.0909	1.0909	1.0909	2.7292	2.7442	229
10/06/13	13:00	14:00	19788.33	19789.33	1.00	1.0909	1.0909	1.0909	2.7227	2.7382	237
14/06/13	08:40	09:40	19789.33	19790.33	1.00	1.0909	1.0909	1.0909	2.7286	2.7443	240
17/06/13	09:00	10:00	19814.33	19815.33	1.00	1.0909	1.0909	1.0909	2.7313	2.7476	249
19/06/13	09:00	10:00	19815.33	19816.33	1.00	1.0909	1.0909	1.0909	2.7309	2.7474	252
21/06/13	13:00	14:00	19840.33	19841.33	1.00	1.0909	1.0909	1.0909	2.7294	2.7452	241
21/06/13	14:00	15:00	19841.33	19842.33	1.00	1.0909	1.0909	1.0909	2.7304	2.7451	225
24/06/13	09:55	10:55	19842.33	19843.33	1.00	1.0909	1.0909	1.0909	2.7517	2.7649	202
26/06/13	10:05	11:05	19843.33	19844.33	1.00	1.0909	1.0909	1.0909	2.7530	2.7648	180
28/06/13	16:00	17:00	19868.33	19869.33	1.00	1.0909	1.0909	1.0909	2.7511	2.7651	214
28/06/13	17:05	18:05	19869.33	19870.33	1.00	1.0909	1.0909	1.0909	2.7485	2.7632	225

Monitoring Station : TKO-A2a
Location : New CREO

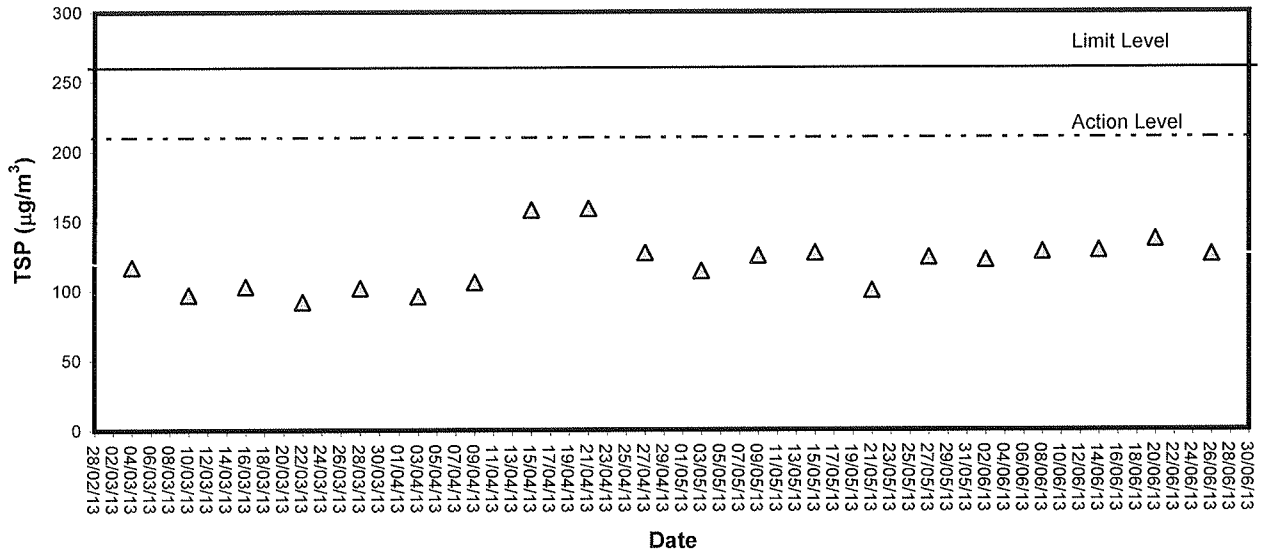
Date	Time		Elapse Time		Sampling Time (hrs)	Flow Rate (m ³ /min.)		Average (m ³ /min.)	Filter Weight (g)		Conc. (µg/m ³)
	Start	Finish	Initial	Final		Initial	Final		Initial	Final	
03/06/13	10:35	11:35	18975.44	18976.44	1.00	1.1874	1.1874	1.1874	2.7743	2.7881	194
05/06/13	10:05	11:05	18976.44	18977.44	1.00	1.1874	1.1874	1.1874	2.7721	2.7850	181
07/06/13	16:10	17:10	18977.44	18978.44	1.00	1.1874	1.1874	1.1874	2.7606	2.7741	190
10/06/13	10:00	11:00	19002.44	19003.44	1.00	1.1874	1.1874	1.1874	2.7341	2.7461	168
10/06/13	11:00	12:00	19003.44	19004.44	1.00	1.1874	1.1874	1.1874	2.7406	2.7525	167
10/06/13	13:00	14:00	19004.44	19005.44	1.00	1.1874	1.1874	1.1874	2.7406	2.7529	173
14/06/13	08:50	09:50	19005.44	19006.44	1.00	1.1874	1.1874	1.1874	2.7419	2.7544	175
17/06/13	09:05	10:05	19030.44	19031.44	1.00	1.1874	1.1874	1.1874	2.7425	2.7556	184
19/06/13	09:05	10:05	19031.44	19032.44	1.00	1.1874	1.1874	1.1874	2.7401	2.7535	188
21/06/13	13:05	14:05	19056.44	19057.44	1.00	1.1874	1.1874	1.1874	2.7397	2.7540	201
21/06/13	14:05	15:05	19057.44	19058.44	1.00	1.1874	1.1874	1.1874	2.7409	2.7561	213
24/06/13	10:00	11:00	19058.44	19059.44	1.00	1.1874	1.1874	1.1874	2.7606	2.7720	160
26/06/13	10:00	11:00	19059.44	19060.44	1.00	1.1874	1.1874	1.1874	2.7521	2.7651	182
28/06/13	15:55	16:55	19084.44	19085.44	1.00	1.1874	1.1874	1.1874	2.7519	2.7675	219
28/06/13	17:00	18:00	19085.44	19086.44	1.00	1.1874	1.1874	1.1874	2.7493	2.7653	225

Appendix I

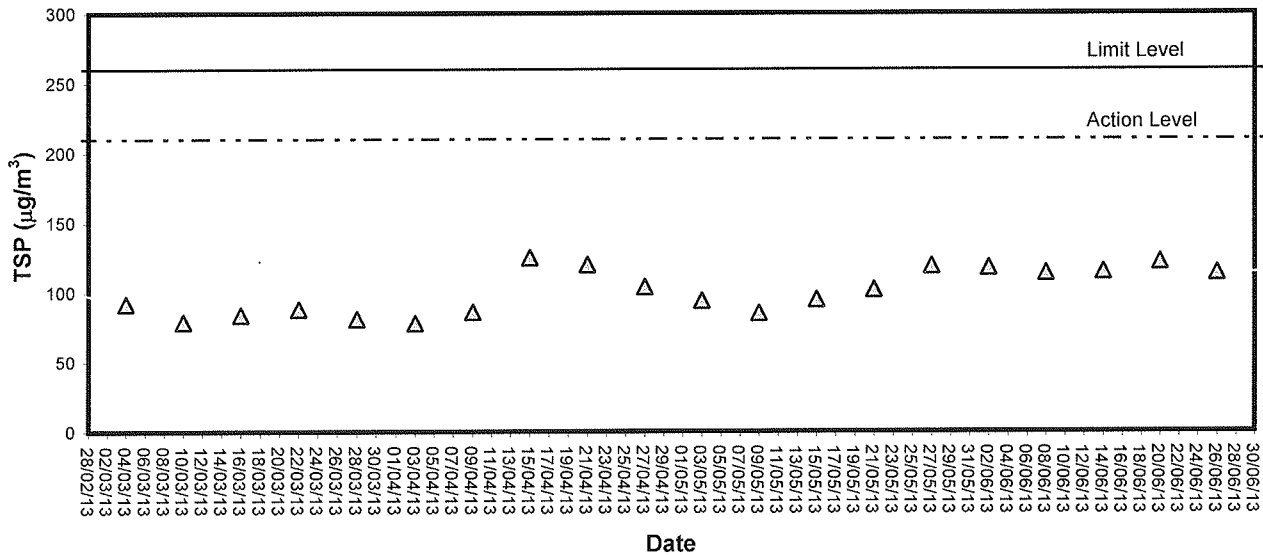
B3

Graphical Plots of Impact Air Quality Monitoring Data

24-hour TSP level at TKO-A1

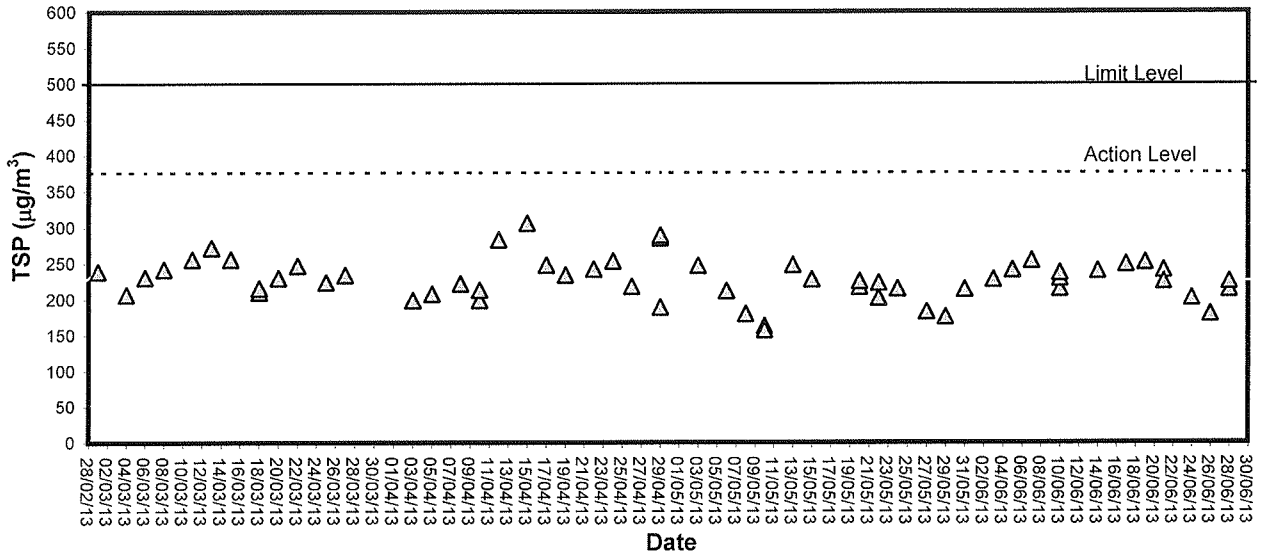


24-hour TSP level at TKO-A2a

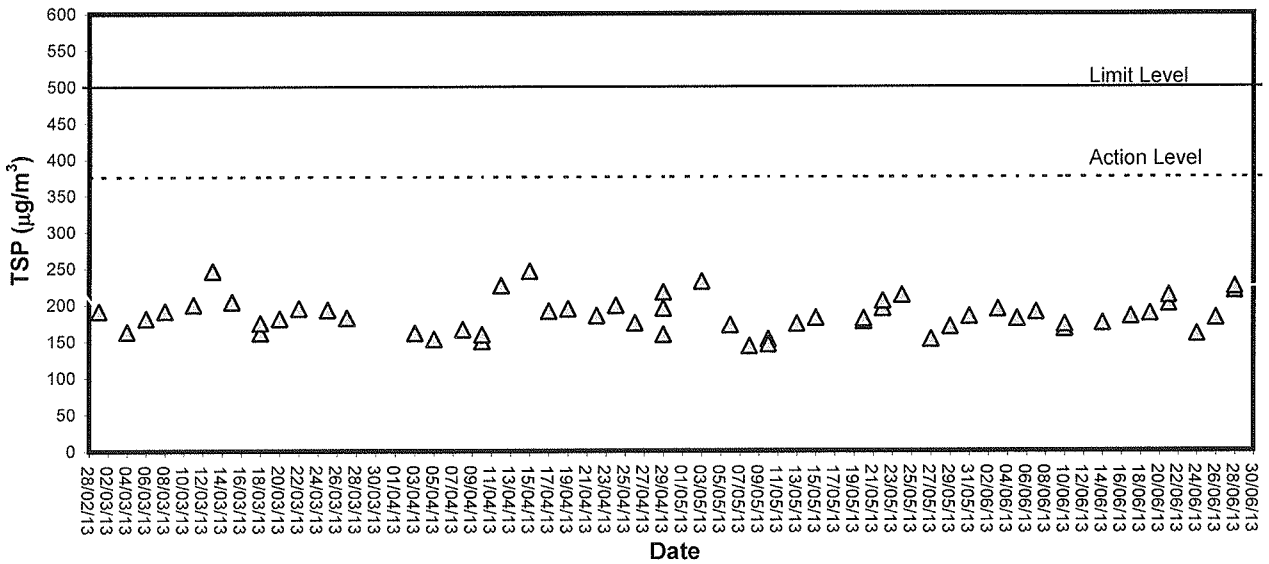




1-hour TSP level at TKO-A1



1-hour TSP level at TKO-A2a





Appendix I

C1

Calibration Certificates for Impact Noise Monitoring Equipment



Calibration Certificate

Certificate No. **27389**

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. : Q22892

Date of receipt : 31-Oct-12

Item Tested

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

Manufacturer : Rion

Model : NL-31

Serial No. : 00593620

Test Conditions

Date of Test : 16-Nov-12

Supply Voltage : --

Ambient Temperature : (23 ± 3)°C

Relative Humidity : (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure : Z01.

Test Results

All results were within the IEC 651 Type1 and IEC 804 Type1 specifications after adjustment.

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	C101623	SCL-HKSAR
S024	Sound Level Calibrator	15136	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 : 

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



Calibration Certificate

Certificate No. 27389

Page 2 of 3 Pages

Results :

1. SPL Accuracy

UUT Setting			Applied Value (dB)	UUT Reading (dB)
Level Range (dB)	Weight	Response		
20 – 100	L _A	Fast	94.0	94.0
		Slow		94.0
	L _C	Fast		94.0
		L _p		Fast
30 – 120	L _A	Fast	94.0	93.9
		Slow		93.9
	L _C	Fast		94.0
		L _p		Fast
30 – 120	L _A	Fast	114.0	113.9
		Slow		113.9
	L _C	Fast		114.0
		L _p		Fast

IEC 651 Type 1 Spec. : ± 0.7 dB

Uncertainty : ± 0.1 dB

2. Level Stability : 0.0 dB

IEC 651 Type 1 Spec. : ± 0.3 dB

Uncertainty : ± 0.01 dB

3. Linearity

3.1 Level Linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec. (Primary Indicator Range)
130	114.0	113.9	0.0	± 0.7 dB
130	104.0	103.9	0.0	
120	94.0	93.9 (Ref.)	--	
110	84.0	84.0	+ 0.1	
100	74.0	74.0	+ 0.1	
90	64.0	64.0	+ 0.1	
80	54.0	54.0	+ 0.1	
		54.1	+ 0.2	

Uncertainty : ± 0.1 dB



Calibration Certificate

Certificate No. 27389

Page 3 of 3 Pages

3.2 Differential level linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec.
120	84.0	84.0	+ 0.1	± 0.4 dB
	94.0	93.9 (Ref.)	--	
	95.0	94.9	- 0.0	± 0.2 dB

Uncertainty : ± 0.1 dB

4. Frequency Weighting - A weighting

Frequency	Attenuation (dB)	IEC 651 Type 1 Spec.
31.5 Hz	- 39.7	- 39.4 dB, ± 1.5 dB
63 Hz	- 26.3	- 26.2 dB, ± 1.5 dB
125 Hz	- 16.3	- 16.1 dB, ± 1 dB
250 Hz	- 8.8	- 8.6 dB, ± 1 dB
500 Hz	- 3.3	- 3.2 dB, ± 1 dB
1 kHz	0.0 (Ref.)	0 dB, ± 1 dB
2 kHz	+ 1.2	+ 1.2 dB, ± 1 dB
4 kHz	+ 1.1	+ 1.0 dB, ± 1 dB
8 kHz	- 1.2	- 1.1 dB, + 1.5 dB ~ - 3 dB
16 kHz	- 6.7	- 6.6 dB, + 3 dB ~ ∞

Uncertainty : ± 0.1 dB

5. Time Averaging

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

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 : 1007 hPa
 4. The UUT's internal calibration was performed before the calibration.

----- END -----



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:

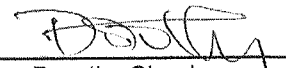
<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Traceable to</u>
S014	Spectrum Analyzer	13535	NIM-PRC & SCL-HKSAR
S024	Sound Level Calibrator	15136	NIM-PRC & SCL-HKSAR
S041	Universal Counter	15610	SCL-HKSAR
S206	Sound Level Meter	16338	SCL-HKSAR
S031	6½ dgt. Multimeter	20032	NIM-PRC

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



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	± 1 dB

Uncertainty : ± 0.2 dB

2. Frequency Accuracy

UUT Nominal Value	Measured Value	Mfr's Spec.
1 kHz	0.987 kHz	± 2 %

Uncertainty : ± 0.1 %

3. Level Stability : 0.0 dB

Uncertainty : ± 0.01 dB

4. Total Harmonic Distortion : < 1.5 %

Mfr's Spec. : < 3 %

Uncertainty : ± 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 _{eq} (30min)	L ₁₀	L ₉₀		
05/06/13	17:10	70.2	72.4	65.4	0.5	Drizzle

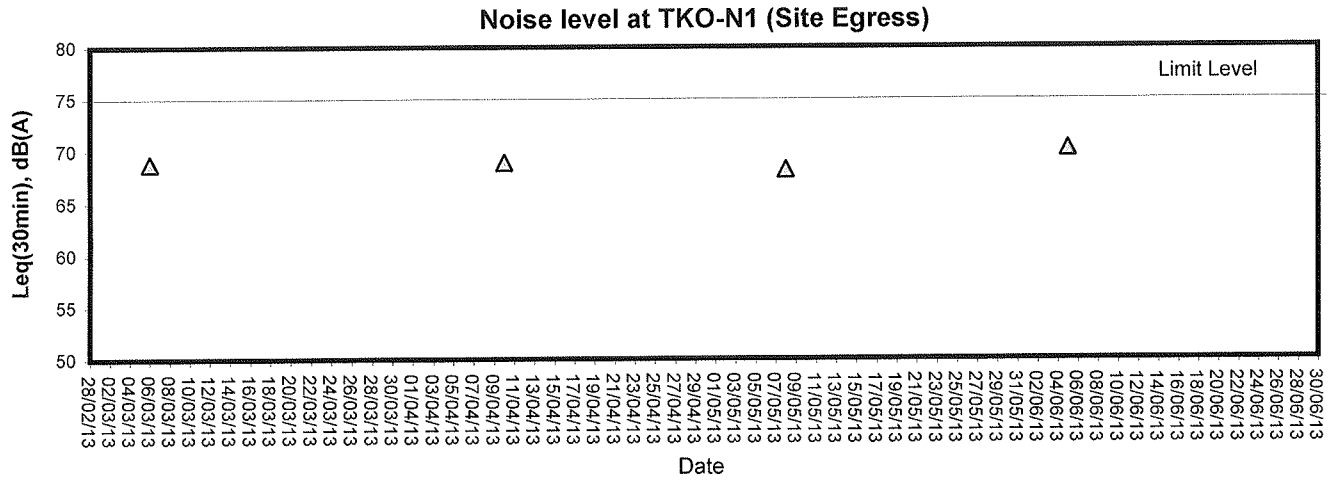
Appendix I

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 Turbidity Meter

Equipment Ref. No. : ET/0505/009 Manufacturer : HACH
Model No. : 2100Q Serial No. : 11060 C 010010
Date of Calibration : 09/04/2013 Due Date : 08/07/2013

Gelex Vial Std	Theoretical Value (NTU)	Measured Value (NTU)	Difference %
0-10 NTU	5.7	5.56	2.49
10-100 NTU	54.9	53.4	2.77
100-1000 NTU	562	552	1.80

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 :



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>02/05/2013</u>	Calibration Due Date : <u>01/08/2013</u>

Temperature Verification

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

Temperature (°C)				
Reference Thermometer reading	Measured	20.1	Corrected	19.7
DO Meter reading	Measured	19.7	Difference	0.0

Standardization of sodium thiosulphate (Na₂S₂O₃) solution

Reagent No. of Na ₂ S ₂ O ₃ titrant	CPE/012/4.5/001/6	Reagent No. of 0.025N K ₂ Cr ₂ O ₇	CPE/012/4.4/001/18
	Trial 1	Trial 2	
Initial Vol. of Na ₂ S ₂ O ₃ (ml)	0.10	0.15	
Final Vol. of Na ₂ S ₂ O ₃ (ml)	10.35	10.55	
Vol. of Na ₂ S ₂ O ₃ used (ml)	10.25	10.40	
Normality of Na ₂ S ₂ O ₃ solution (N)	0.02439	0.02404	
Average Normality (N) of Na ₂ S ₂ O ₃ solution (N)	0.02422		
Acceptance criteria, Deviation	Less than ± 0.001N		

Calculation: Normality of Na₂S₂O₃, N = $\frac{V \times N}{V}$ ml Na₂S₂O₃ used
 $\frac{0.25 \times 0.025}{10.25} = 0.002439$

Linearity Checking

Determination of dissolved oxygen content by Winkler Titration *

Purging Time (min)	2		5		10	
	1	2	1	2	1	2
Initial Vol. of Na ₂ S ₂ O ₃ (ml)	0.00	11.10	22.10	0.00	8.10	13.10
Final Vol. of Na ₂ S ₂ O ₃ (ml)	11.10	22.10	30.30	8.10	13.10	18.00
Vol. (V) of Na ₂ S ₂ O ₃ used (ml)	11.10	11.00	8.20	8.10	5.00	4.90
Dissolved Oxygen (DO), mg/L	7.22	7.15	5.33	5.27	3.25	3.19
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	7.22	7.15	7.19	0.28
5	5.36	5.22	5.29	5.33	5.27	5.30	0.19
10	3.16	3.25	3.21	3.25	3.19	3.22	0.31
Linear regression coefficient				0.9999			



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/012/4.7/002/03	Reagent No. of NaCl (30ppt)	CPE/012/4.8/002/03
-----------------------------	--------------------	-----------------------------	--------------------

Determination of dissolved oxygen content by Winkler Titration **

Salinity (ppt)	10		30	
	1	2	1	2
Trial				
Initial Vol. of Na ₂ S ₂ O ₃ (ml)	0.00	12.10	24.10	35.20
Final Vol. of Na ₂ S ₂ O ₃ (ml)	12.10	24.10	35.20	46.00
Vol. (V) of Na ₂ S ₂ O ₃ used (ml)	12.10	12.00	11.10	10.80
Dissolved Oxygen (DO), mg/L	7.87	7.80	7.22	7.02
Acceptance criteria, Deviation	Less than + 0.3mg/L		Less than + 0.3mg/L	

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

Salinity (ppt)	DO meter reading, mg/L			Winkler Titration result**, mg/L			Difference (%) of DO Content
	1	2	Average	1	2	Average	
10	7.86	7.91	7.89	7.87	7.80	7.84	0.64
30	7.29	7.24	7.27	7.22	7.02	7.12	2.08

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 Salinity Meter

Equipment Ref. No. : ET/EW/008/004 Manufacturer : YSI
Model No. : Pro 2030 Serial No. : 10F 101978
Date of Calibration : 02/05/2013 Due Date : 01/08/2013

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

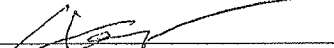
S/001/4

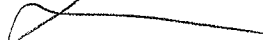
Salinity Standard (ppt)	Measured Salinity (ppt)	Difference %
30.0	30.6	1.98

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 : 

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)		
			Surface	Bottom		Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
03/06/13	1330-1346	32/Fine	Surface	1.0	25.8	25.2	25.3	8.50	8.46	120.0	119.5	1.92	1.93	3.2	3.3	3.4			
			Middle	10.3	25.6	25.3	25.3	8.30	8.34	118.9	118.0	1.94	2.14	3.4	3.5				
			Bottom	19.6	25.4	25.8	25.8	8.17	8.18	118.3	115.5	2.16	2.35	3.6	3.3				
05/06/13	1530-1547	29/Cloudy	Surface	1.0	25.8	25.2	25.2	8.68	8.64	122.6	122.0	1.80	1.83	3.2	3.1	3.3			
			Middle	10.4	26.7	25.3	25.3	8.65	8.63	121.9	121.7	2.04	2.07	3.2	3.3				
			Bottom	19.8	25.5	25.8	25.8	8.61	8.07	121.5	113.8	2.09	2.47	3.4	3.6				
07/06/13	1730-1747	29/Fine	Surface	1.0	25.9	25.2	25.2	8.10	8.51	114.2	120.2	2.44	1.90	3.2	3.3	3.4			
			Middle	10.4	25.8	25.6	25.6	8.10	8.50	113.4	120.0	2.50	2.14	3.4	3.1				
			Bottom	19.8	26.5	25.9	25.9	7.97	7.94	112.3	111.9	2.51	2.54	3.6	3.7				
10/06/13	1830-1845	30/Cloudy	Surface	1.0	24.7	26.4	26.5	7.91	5.73	79.9	79.6	3.84	3.80	5.2	5.2	5.0			
			Middle	10.7	24.3	26.8	26.9	5.71	5.39	79.3	74.8	3.75	3.58	5.2	4.7				
			Bottom	20.4	24.3	27.0	27.1	5.40	5.26	75.0	73.0	3.60	4.02	4.6	5.1				
14/06/13	0730-0745	24/Cloudy	Surface	1.0	24.9	26.3	26.3	5.37	5.90	72.6	78.9	3.99	3.60	5.0	4.8	4.9			
			Middle	10.7	24.8	26.4	26.4	5.57	5.59	78.8	74.7	3.59	3.75	4.8	4.9				
			Bottom	20.4	24.3	27.0	27.0	5.60	5.36	74.9	74.4	3.71	3.95	5.0	5.1				
17/06/13	1100-1115	30/Cloudy	Surface	1.0	25.4	26.4	26.4	5.34	5.91	74.1	82.6	3.92	3.46	5.2	4.5	4.8			
			Middle	11.1	25.1	26.7	26.7	5.38	5.72	82.8	80.0	3.44	3.65	4.4	4.9				
			Bottom	21.2	24.8	26.9	27.0	5.92	5.57	82.4	77.8	3.67	4.06	4.8	5.1				
19/06/13	1400-1415	30/Fine	Surface	1.0	25.5	26.6	26.6	5.59	5.89	78.1	82.6	4.09	3.44	5.2	4.8	4.7			
			Middle	10.9	25.2	26.8	26.8	5.54	5.60	82.7	78.5	3.92	3.64	4.8	4.5				
			Bottom	20.8	25.0	26.9	26.9	5.88	5.73	82.4	80.3	3.47	4.01	4.6	4.9				
21/06/13	1600-1618	29/Cloudy	Surface	1.0	25.7	26.7	26.8	5.61	5.77	78.6	80.8	4.02	3.56	5.2	4.8	4.9			
			Middle	10.8	25.4	27.0	27.0	5.75	5.58	80.4	78.2	3.63	3.77	4.8	4.7				
			Bottom	20.6	25.2	27.1	27.1	5.67	5.43	80.1	76.0	4.00	4.18	4.6	5.1				

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)				
			Surface	Bottom		Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
24/06/13	1830-1845	28/Drizzle	Surface	1.0	27.1	24.3	24.3	5.81	5.81	84.2	3.54	4.8	3.52	4.6	4.8	3.50	3.50	3.32	4.3	4.3	
					26.9	24.2	24.2	5.80	5.80	84.0	3.50	4.4									
					26.9	24.4	24.4	5.63	5.63	81.6	3.40	4.2									
			Middle	10.2	26.9	24.4	24.4	5.67	5.67	82.2	3.38	4.4	3.38	4.4	3.39	4.3	4.4	3.38	4.4	4.3	4.3
					26.2	24.7	24.7	5.45	5.45	78.4	3.02	4.0	3.02	4.0	3.05	4.1	3.02	4.0	4.1	4.1	4.1
					26.2	24.8	24.8	5.49	5.49	78.9	3.08	4.2	3.08	4.2	3.05	4.1	4.2	3.08	4.2	4.1	4.1
26/06/13	0723-0738	28/Drizzle	Surface	1.0	26.9	24.5	24.5	5.98	5.98	86.5	3.35	4.4	3.35	4.5	4.4	3.35	3.35	3.02	4.2	4.2	
					26.7	24.4	24.4	5.96	5.96	86.3	3.34	4.6									
					26.7	24.5	24.5	5.55	5.55	80.4	2.81	3.8									2.81
			Middle	10.2	26.7	24.6	24.6	5.53	5.53	80.1	2.84	4.2	2.84	4.2	2.83	4.0	4.2	2.84	4.2	4.0	4.0
					25.9	24.8	24.8	5.64	5.64	81.1	2.93	4.0	2.93	4.0	2.89	4.0	4.0	2.93	4.0	4.0	4.0
					25.9	24.9	24.9	5.67	5.67	81.6	2.85	4.0	2.85	2.85	2.89	4.0	4.0	2.85	4.0	4.0	4.0
28/06/13	0830-0845	29/Cloudy	Surface	1.0	27.2	26.2	26.2	6.17	6.17	89.2	2.98	4.0	2.95	4.0	4.0	2.98	2.92	2.85	3.9	3.9	
					27.0	26.1	26.1	6.13	6.13	88.6	2.92	4.0									
					27.0	26.4	26.4	6.09	6.09	87.8	3.09	4.2									3.09
			Middle	10.5	27.0	26.4	26.4	6.01	6.01	86.7	3.08	4.0	3.08	4.0	2.85	4.1	4.0	3.08	4.0	4.0	4.0
					26.8	26.6	26.6	5.93	5.93	85.6	2.51	3.6	2.51	2.52	3.7	2.51	3.6	2.51	3.6	3.7	3.7
					26.8	26.6	26.6	5.91	5.91	85.3	2.53	3.8	2.53	2.52	3.7	2.53	3.8	2.52	3.7	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	Bottom		Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
03/06/13	1500-1516	32/Fine	Surface	1.0	25.2	25.2	8.31	8.30	117.3	117.2	1.74	1.76	2.8	2.9	1.80	3.1	3.0	3.1	3.0	3.3	3.1
					25.3	8.52	120.3	1.56	3.0												
			Middle	4.6	25.4	8.55	120.7	1.55	3.2												
					25.4	8.23	116.5	2.08	3.4												
			Bottom	8.2	25.4	8.20	116.0	2.10	3.2												
					25.2	8.51	120.3	1.59	2.8												
05/06/13	1702-1721	29/Cloudy	Surface	1.0	25.3	25.3	8.56	8.54	121.0	120.7	1.67	1.63	2.4	2.6	1.93	2.9	2.8	2.9	2.8	3.3	2.9
					25.4	8.60	121.2	1.89	3.0												
			Middle	4.4	25.4	8.63	121.6	1.95	3.0												
					25.4	8.21	115.8	2.22	3.2												
			Bottom	7.8	25.5	8.27	116.6	2.28	3.4												
					25.3	8.38	118.4	1.67	2.8												
07/06/13	1903-1920	29/Fine	Surface	1.0	25.3	25.3	8.43	8.41	119.0	118.7	1.74	1.71	3.0	2.9	2.01	3.1	3.0	3.1	3.0	3.5	3.2
					25.4	8.50	119.2	2.02	3.2												
			Middle	4.4	25.4	8.45	119.9	2.02	3.4												
					25.6	8.08	113.8	2.29	3.6												
			Bottom	7.8	25.5	8.14	114.7	2.35	4.2												
					26.3	5.86	81.6	3.38	4.6												
10/06/13	1955-2015	30/Cloudy	Surface	1.0	26.4	26.4	5.83	5.74	81.2	79.8	3.42	3.51	4.6	4.4	3.39	4.7	4.8	4.7	4.6	4.1	4.4
					26.8	5.72	79.6	3.46	4.6												
			Middle	4.4	27.0	5.54	77.1	3.24	4.0												
					26.9	5.51	77.7	3.28	4.2												
			Bottom	7.8	26.4	5.79	77.5	3.39	4.4												
					26.3	5.76	77.0	3.33	4.2												
14/06/13	0910-0925	24/cloudy	Surface	1.0	26.4	26.4	5.93	5.95	79.3	79.6	3.50	3.52	4.6	4.7	3.46	4.5	4.8	4.5	4.6	4.5	4.5
					26.5	5.97	79.9	3.54	4.8												
			Middle	4.4	27.0	5.24	72.7	3.51	4.6												
					27.0	5.28	73.3	3.49	4.4												
			Bottom	7.8	26.4	6.06	84.7	3.02	4.0												
					26.5	6.03	84.3	3.09	4.2												
17/06/13	1230-1245	30/Cloudy	Surface	1.0	26.7	26.5	5.92	5.94	82.8	83.0	2.98	2.97	3.8	3.9	2.99	3.9	4.0	3.9	4.0	3.8	3.8
					26.8	5.95	83.2	2.95	4.0												
			Middle	4.7	27.0	5.87	82.1	2.94	3.8												
					26.9	5.84	81.7	2.98	3.8												
			Bottom	8.4	26.6	6.01	83.9	3.03	4.0												
					26.7	6.02	84.4	3.07	4.2												
19/06/13	1541-1600	30/Fine	Surface	1.0	26.8	26.8	5.94	5.96	83.2	83.5	3.14	3.15	4.0	4.1	3.11	4.1	4.0	4.1	4.0	4.1	4.1
					26.7	5.98	83.8	3.16	4.4												
			Middle	4.3	27.0	5.77	80.8	3.10	4.2												
					26.9	5.73	80.2	3.14	4.0												
			Bottom	7.6	26.8	5.92	83.0	3.14	4.2												
					26.9	5.89	82.6	3.21	4.0												
21/06/13	1733-1750	29/Cloudy	Surface	1.0	27.0	26.9	5.78	5.80	81.0	81.2	3.09	3.08	4.0	4.1	3.11	4.1	4.2	4.1	4.0	3.9	4.0
					27.1	5.81	81.4	3.05	4.2												
			Middle	4.4	27.1	5.72	80.2	3.06	4.0												
					27.1	5.70	79.8	3.11	4.0												
			Bottom	7.8	27.1	5.72	80.2	3.06	4.0												
					27.1	5.70	79.8	3.11	4.0												

Mid-Flood Tide



東業德勤測試顧問有限公司
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)		
			Surface	Bottom		Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
24/06/13	2015-2030	28/Drizzle	Surface	1.0	27.2	24.3	24.3	5.88	5.86	85.2	84.9	3.40	3.42	4.6	4.4	3.35	4.1	4.3	
			Middle	4.4	26.8	24.5	5.94	5.95	86.1	86.3	3.14	3.15	4.2	4.1					
			Bottom	7.8	26.8	24.6	5.96	5.46	78.8	79.1	3.47	3.49	4.2	4.4					
26/06/13	0851-0900	28/Drizzle	Surface	1.0	27.0	24.3	24.4	5.84	5.85	84.4	84.6	2.95	2.97	4.2	4.1	2.66	4.1	3.8	
			Middle	4.4	26.6	24.6	5.71	5.70	82.6	82.4	2.89	2.90	4.0	4.1					
			Bottom	7.8	26.5	24.7	5.69	5.58	82.2	80.8	2.91	2.10	4.2	3.3					
28/06/13	1015-1030	29/Cloudy	Surface	1.0	27.2	26.1	26.1	6.02	6.03	86.9	87.1	2.13	3.05	4.2	4.3	3.25	4.1	4.4	
			Middle	4.5	27.1	26.2	6.04	6.12	87.2	88.3	3.06	3.25	4.4	4.1					
			Bottom	8.0	27.0	26.3	6.11	6.07	88.4	87.4	3.26	3.44	4.0	4.7					

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	Bottom		Value	Average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
03/06/13	0805-0821	29/Fine	Surface	1.0	25.7	25.1	25.1	8.64	8.65	122.0	122.2	1.78	1.81	2.8	2.8	3.2			
			Middle	10.1	25.6	25.4	8.61	8.59	121.7	121.3	1.84	2.06	2.8	3.3					
			Bottom	19.2	25.3	25.8	8.06	8.03	120.8	113.2	2.03	2.47	3.4	3.5					
05/06/13	0930-0947	28/Cloudy	Surface	1.0	25.7	25.1	8.59	8.55	121.3	120.8	1.85	1.88	3.0	2.9	3.2				
			Middle	10.2	25.7	25.4	8.56	8.54	121.0	120.6	1.91	2.12	2.8	3.3					
			Bottom	19.4	25.4	25.9	8.01	7.98	120.1	112.5	2.09	2.52	3.4	3.5					
07/06/13	1100-1117	28/Fine	Surface	1.0	25.8	25.1	8.42	8.46	120.1	119.5	1.92	1.95	3.2	3.2	3.4				
			Middle	10.1	25.7	25.5	8.47	8.45	119.5	119.2	1.98	2.19	3.2	3.3					
			Bottom	19.2	25.4	25.8	7.92	7.89	118.9	111.2	2.16	2.59	3.4	3.7					
10/06/13	1230-1245	32/Cloudy	Surface	1.0	24.8	26.3	5.63	5.65	78.8	78.5	3.89	3.85	4.8	4.7	4.8				
			Middle	10.5	24.3	26.8	5.32	5.31	73.9	73.7	3.80	3.63	4.6	4.7					
			Bottom	20.0	24.2	27.0	5.29	5.18	73.5	71.9	3.65	4.07	4.6	5.1					
14/06/13	1400-1416	25/Cloudy	Surface	1.0	24.9	26.4	5.83	5.84	78.0	78.1	3.67	3.68	4.8	4.7	5.0				
			Middle	10.4	24.9	26.5	5.51	5.53	73.7	73.9	3.69	3.84	4.6	5.1					
			Bottom	19.8	24.4	27.1	5.54	5.30	74.1	73.6	3.87	4.01	4.6	5.1					
17/06/13	1700-1716	28/Cloudy	Surface	1.0	25.3	26.4	5.80	5.82	81.6	81.4	3.51	3.53	4.6	4.7	4.8				
			Middle	10.9	25.0	26.6	5.65	5.63	79.1	78.8	3.54	3.72	4.8	4.7					
			Bottom	20.8	24.8	26.9	5.61	5.48	78.5	76.5	3.74	4.13	4.6	5.1					
19/06/13	0800-0816	27/Cloudy	Surface	1.0	25.4	26.5	5.78	5.77	81.0	80.8	3.57	3.59	4.6	4.7	4.9				
			Middle	10.7	25.1	26.7	5.75	5.58	80.6	78.3	3.60	3.78	4.8	4.8					
			Bottom	20.4	24.9	26.9	5.56	5.43	78.5	75.9	3.80	4.19	5.0	5.3					
21/06/13	0930-0948	28/Cloudy	Surface	1.0	25.6	26.7	5.69	5.68	76.2	79.6	4.22	3.66	4.6	4.7	4.8				
			Middle	10.6	25.3	26.9	5.51	5.49	77.3	77.0	3.64	3.85	4.8	4.5					
			Bottom	20.2	25.1	27.0	5.47	5.34	76.6	74.7	3.87	4.26	4.4	5.3					

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		Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
24/06/13	1200-1216	25/Drizzle	Surface	1.0	27.0	24.4	24.4	5.93	5.92	85.9	85.8	3.41	3.40	4.2	4.3	3.08	3.9	4.0	4.1
						24.3		5.91		85.6		3.39		4.4					
			24.4	24.5	5.50	5.49	79.7	79.6	2.87	2.89	3.8	3.9							
			24.5		5.48		79.4		2.90		4.0								
			Bottom	19.0	26.0	24.8	24.8	5.59	5.60	80.4	80.5	2.99	2.95	3.8	3.9				
						24.8		5.60		80.6		2.91		4.0					
26/06/13	1330-1348	28/Cloudy	Surface	1.0	26.9	24.5	24.5	5.84	5.84	84.4	84.4	3.42	3.43	4.4	4.4	3.13	3.9	4.1	4.1
						24.4		5.83		84.3		3.44		4.4					
			24.5	24.6	5.41	5.41	78.3	78.3	2.95	2.95	3.8	3.9							
			24.6		5.40		78.2		2.94		4.0								
			Bottom	18.7	25.9	24.8	24.9	5.54	5.55	79.8	79.9	3.01	3.02	4.2	4.1				
						24.9		5.55		79.9		3.02		4.0					
28/06/13	1500-1517	29/Cloudy	Surface	1.0	27.2	26.1	26.1	6.09	6.08	87.9	87.8	3.02	3.03	3.0	3.0	2.92	3.2	2.9	2.9
						26.1		6.07		87.6		3.04		3.0					
			26.2	26.3	6.01	6.02	86.7	86.9	3.16	3.17	3.2	3.2							
			26.3		6.03		87.0		3.17		3.2								
			Bottom	19.6	27.0	26.4	26.5	5.64	5.64	81.2	81.2	2.57	2.58	2.6	2.6				
						26.6		5.63		81.1		2.58		2.6					

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	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
03/06/13	0940-0957	29/Fine	Surface	25.8	25.1	25.2	8.47	8.50	8.54	120.0	120.2	1.59	1.63	2.8	2.8	3.2		
			Middle	25.8	25.2	8.56	8.58	120.8	121.0	1.88	1.91	3.2	3.2					
			Bottom	25.7	25.4	8.17	8.20	115.6	116.0	2.21	2.24	3.4	3.5					
05/06/13	1103-1120	28/Cloudy	Surface	25.8	25.1	25.2	8.42	8.45	8.49	119.2	119.4	1.65	1.69	3.0	2.9	3.1		
			Middle	25.7	25.2	8.51	8.53	120.1	120.3	1.94	1.97	2.8	3.0					
			Bottom	25.6	25.5	8.18	8.15	114.8	115.3	2.27	2.30	3.4	3.5					
07/06/13	1231-1250	28/Fine	Surface	25.8	25.1	25.2	8.33	8.36	8.39	117.8	118.1	1.72	1.76	3.0	3.3	3.3		
			Middle	25.8	25.3	8.40	8.43	118.5	118.9	2.01	2.04	3.6	3.2					
			Bottom	25.6	25.5	8.03	8.06	113.1	113.6	2.34	2.37	3.2	3.2					
10/06/13	1355-1415	32/Cloudy	Surface	25.1	26.3	26.3	5.78	5.77	5.71	80.5	80.3	3.43	3.45	4.6	4.5	4.5		
			Middle	24.2	26.9	26.9	5.67	5.66	78.9	78.7	3.60	3.56	4.4	4.8				
			Bottom	24.0	27.1	27.1	5.46	5.45	76.0	76.2	3.29	3.31	4.2	4.1				
14/06/13	1542-1600	25/Cloudy	Surface	25.1	26.3	26.3	5.73	5.72	5.80	76.7	76.5	3.46	3.43	4.4	4.6	4.7		
			Middle	25.0	26.3	26.3	5.70	5.89	78.5	78.8	3.57	3.59	4.8	4.8				
			Bottom	24.3	26.4	26.4	5.91	5.20	79.1	72.2	3.61	3.56	4.8	4.7				
17/06/13	1842-1900	28/Cloudy	Surface	25.4	26.4	26.4	5.97	5.96	5.90	83.5	83.3	3.10	3.14	4.2	4.3	4.4		
			Middle	24.8	26.7	26.8	5.83	5.85	81.6	81.8	3.05	3.04	4.4	4.4				
			Bottom	24.7	26.8	27.0	5.86	5.77	82.0	80.6	3.02	3.04	4.4	4.5				
19/06/13	0942-1000	27/Cloudy	Surface	25.5	26.5	26.6	5.92	5.91	5.85	82.8	82.7	3.16	3.20	4.0	4.2	4.1		
			Middle	24.9	26.8	26.9	5.89	5.80	81.0	81.2	3.23	3.10	4.4	4.1				
			Bottom	24.8	26.9	27.0	5.81	5.72	81.3	80.0	3.08	3.10	4.2	4.0				
21/06/13	1103-1120	28/Cloudy	Surface	25.7	26.7	26.8	5.83	5.82	5.76	81.7	81.5	3.22	3.26	4.4	4.4	4.2		
			Middle	25.1	26.9	26.9	5.69	5.71	79.7	79.9	3.17	3.16	4.0	4.1				
			Bottom	25.1	27.1	27.1	5.72	5.63	80.1	78.8	3.14	3.19	4.2	4.0				

Mid-Ebb Tide

Monitoring Station : TKO-M4

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)	Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)			Turbidity (NTU)			Suspended Solids (mg/L)		
					Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average	
24/06/13	1343-1400	25/Drizzle	Surface	1.0	24.2	24.3	5.79	5.80	5.73	83.8	84.0	3.01	3.03	4.0	4.2	3.9		
					24.3		5.81			3.04		4.4						
			Middle	4.2	24.5	24.5	5.66	5.65	81.8	2.94	2.95	4.0	4.1					
					24.5		5.64			2.96		4.2						
			Bottom	7.4	24.6	24.7	5.54	5.53	80.1	2.12	2.15	3.2	3.4					
					24.7		5.52			2.18		3.6						
26/06/13	1513-1530	28/Cloudy	Surface	1.0	24.4	24.4	5.71	5.72	5.69	82.6	82.8	3.04	3.05	3.8	4.0	3.7		
					24.3		5.73			3.06		4.2						
			Middle	4.2	24.6	24.6	5.64	5.66	81.9	2.94	2.95	4.0	3.9					
					24.5		5.67			2.96		3.8						
			Bottom	7.3	24.7	24.8	5.51	5.52	79.8	2.18	2.19	3.4	3.3					
					24.8		5.52			2.19		3.2						
28/06/13	1640-1700	29/Cloudy	Surface	1.0	26.0	26.1	6.00	5.99	6.01	86.6	86.4	3.17	3.16	4.2	4.1	4.4		
					26.1		5.97			3.15		4.0						
			Middle	4.2	26.3	26.3	6.01	6.03	87.0	3.39	3.38	4.4	4.3					
					26.3		6.05			3.37		4.2						
			Bottom	7.4	26.4	26.4	5.93	5.94	85.5	3.59	3.58	4.6	4.7					
					26.4		5.94			3.57		4.8						



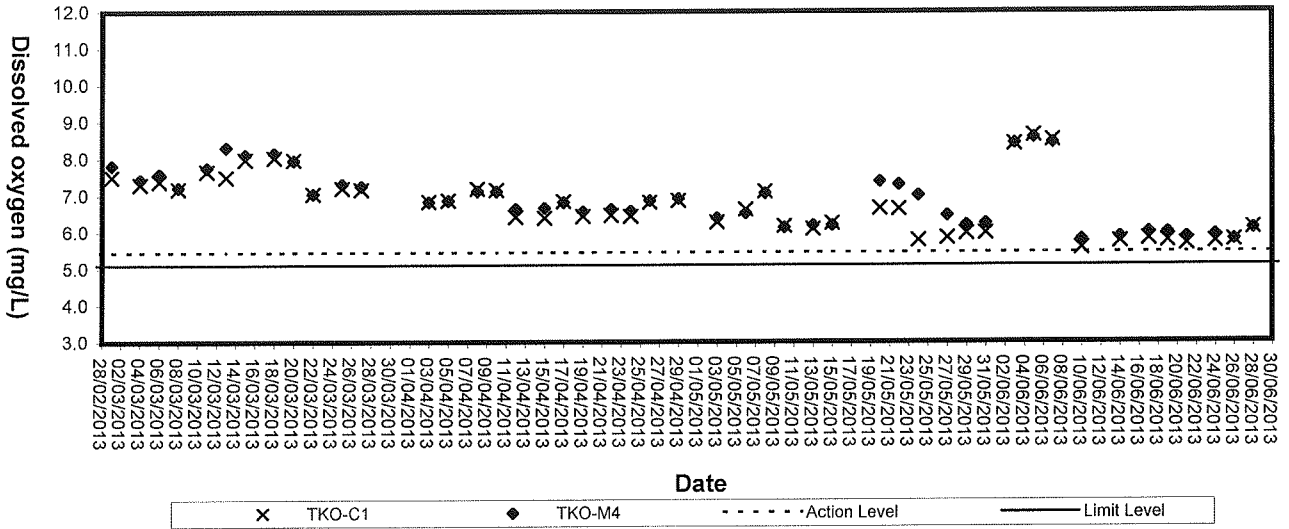
Appendix I

D3

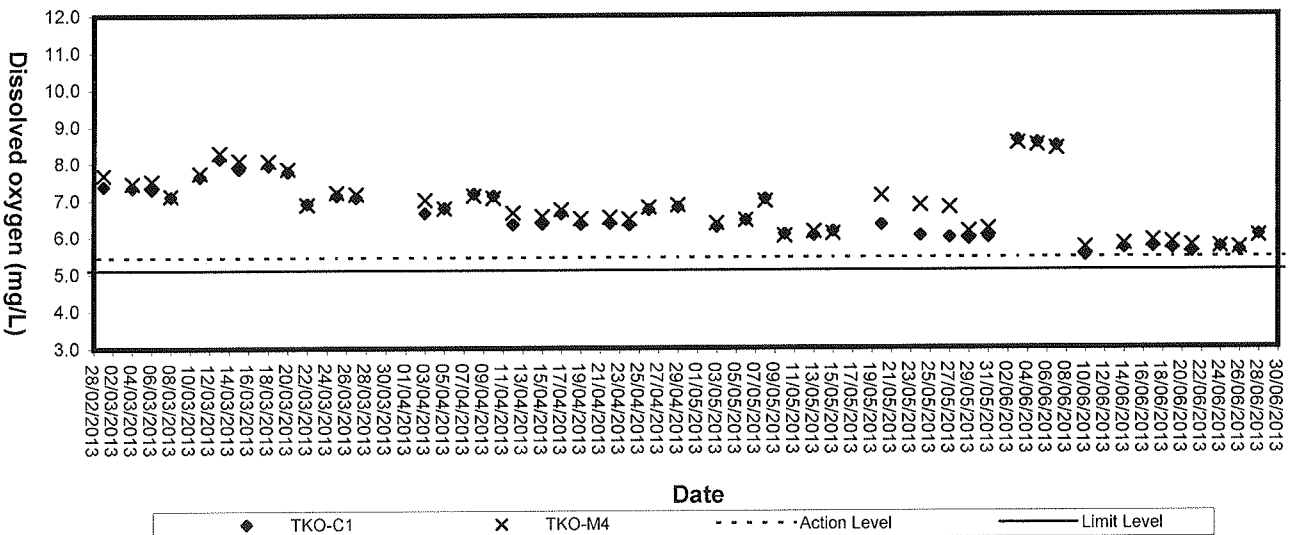
Graphical Plots of Impact Marine Water Quality Monitoring Data



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

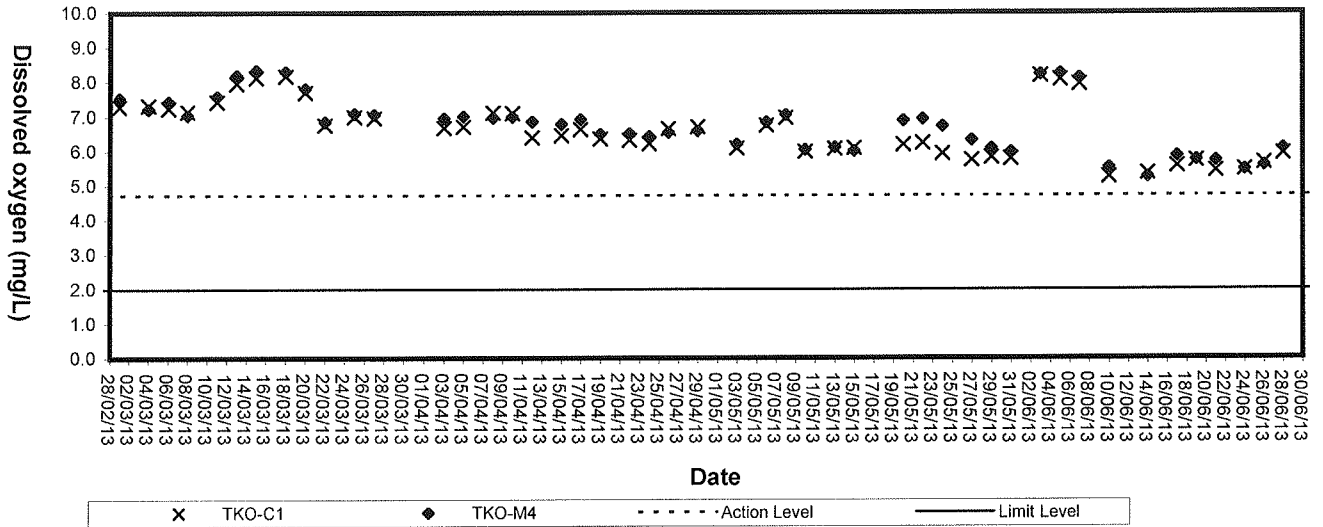


Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide

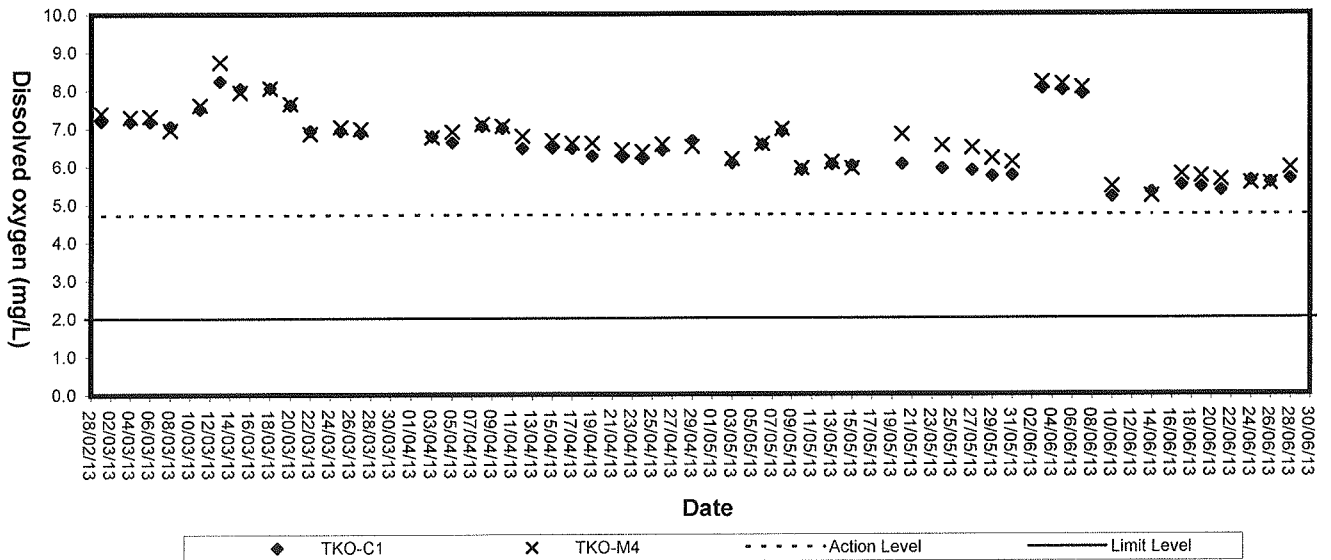




Dissolved Oxygen (Bottom) at Mid-Flood Tide

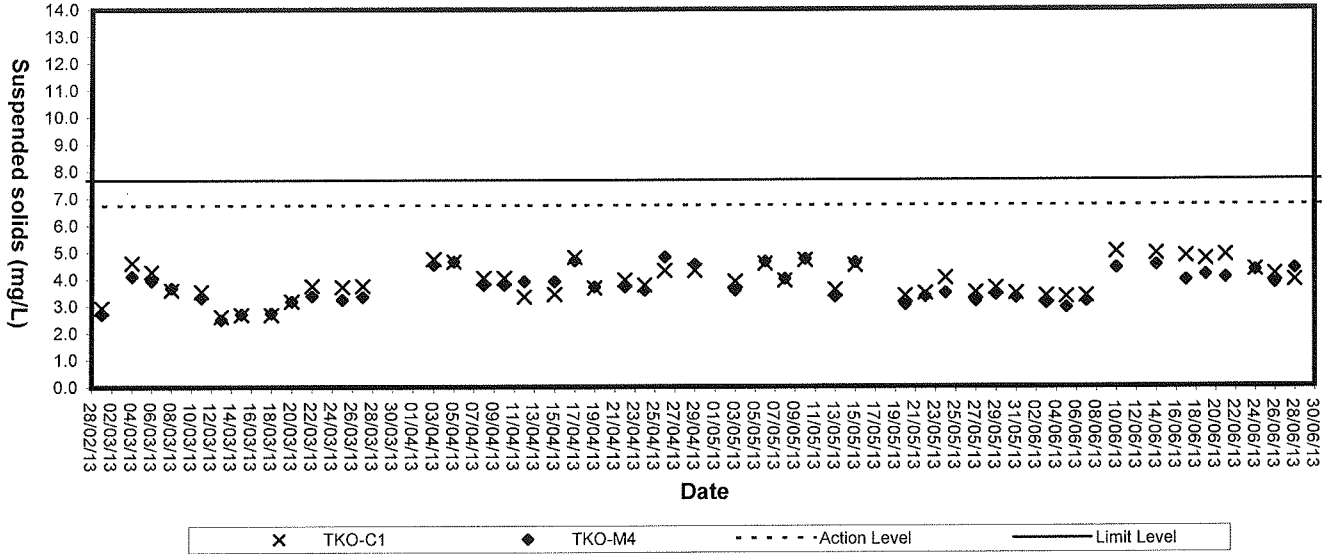


Dissolved Oxygen (Bottom) at Mid-Ebb Tide

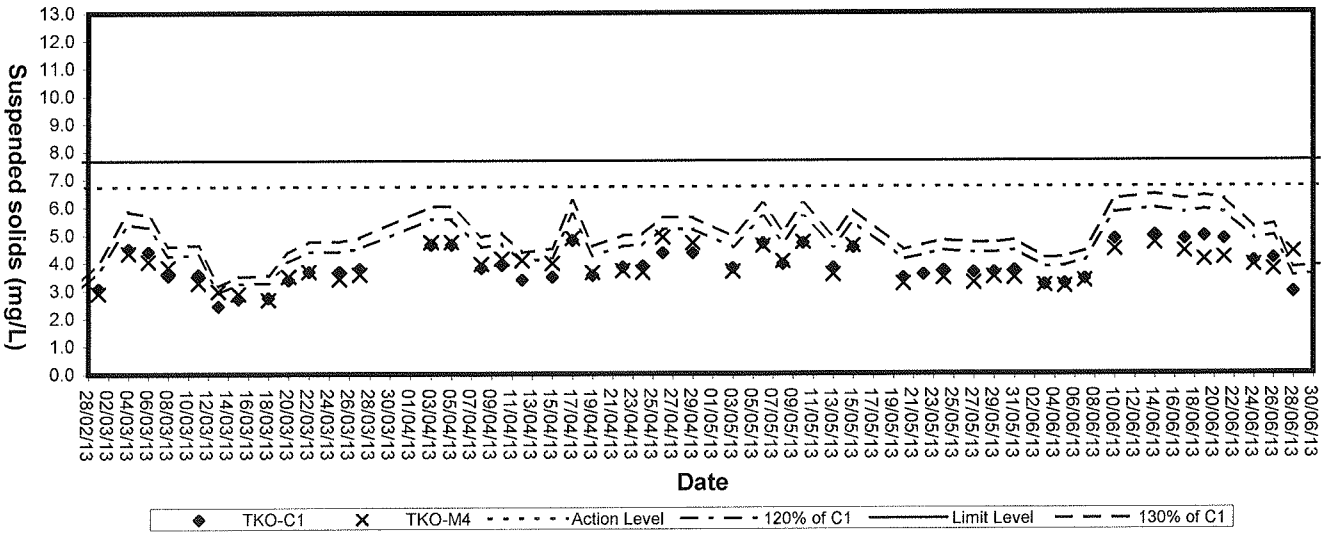




Suspended solids (Depth-average) at Mid-Flood Tide

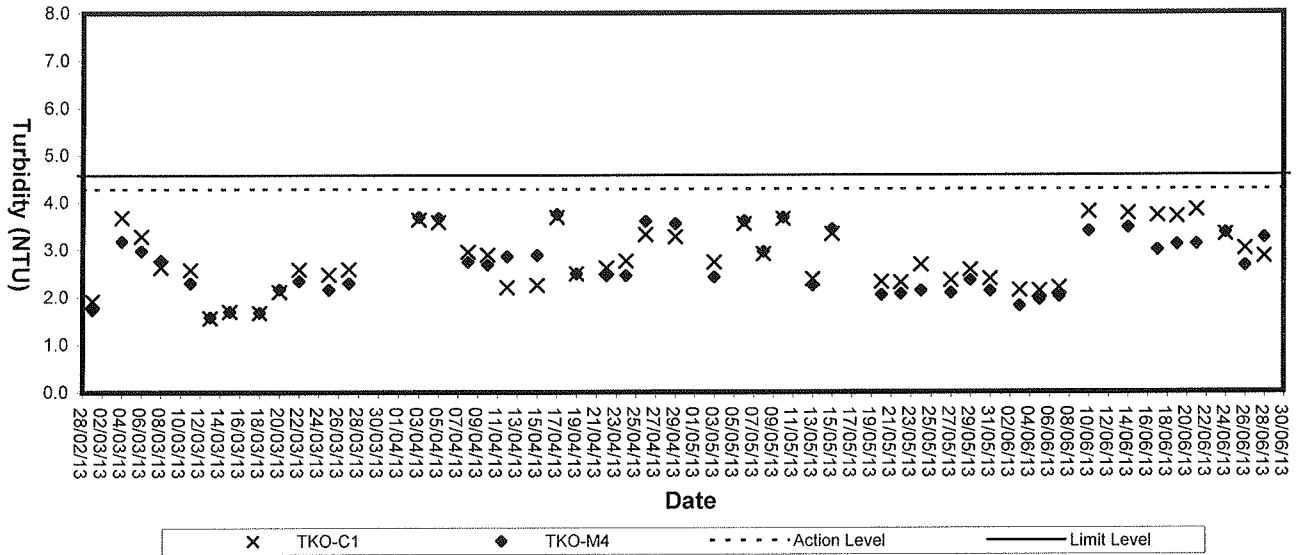


Suspended Solids (Depth-average) at Mid-Ebb Tide

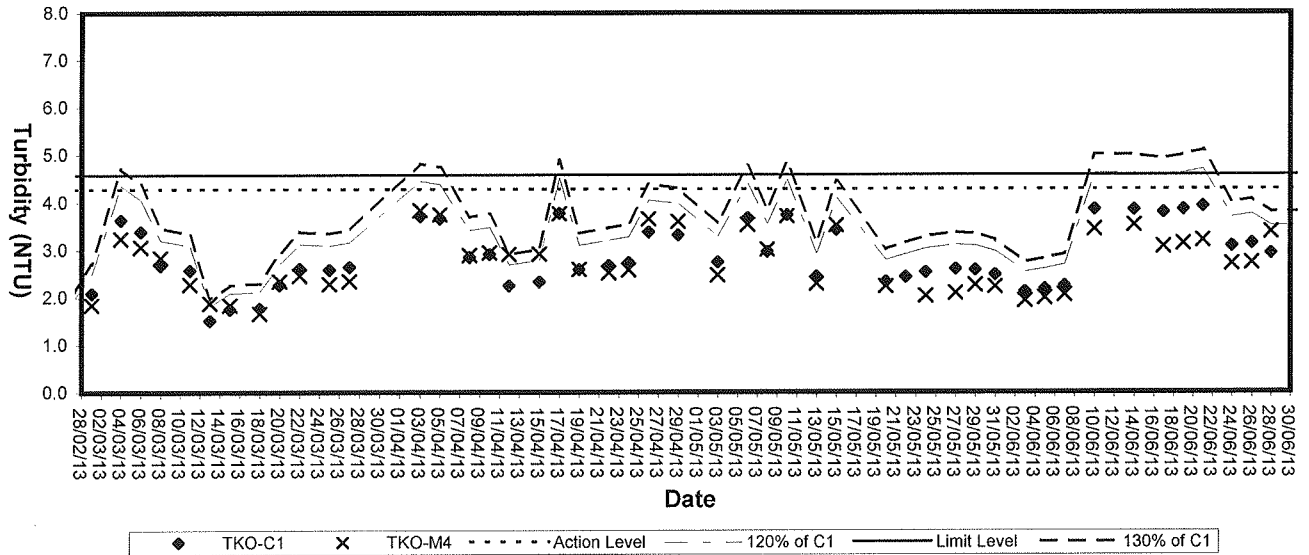




Turbidity (Depth-average) at Mid-Flood Tide



Turbidity (Depth-average) at Mid-Ebb Tide





Appendix I

E

Weather Condition

Extract of Meteorological Observations for Tseung Kwan O Automatic Weather Station, June 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. (%)
Jun 1	*****	34.1	29.8	26.4	24.3	91	73	55
Jun 2	*****	33.9	30.1	26.7	24.6	91	73	56
Jun 3	*****	34.1	29.7	26.9	25.1	92	77	60
Jun 4	*****	30.7	27.2	24.2	25.1	98	89	67
Jun 5	*****	29.2	26.1	24.3	24.8	99	93	71
Jun 6	*****	30.8	26.9	24.4	25.1	100	90	71
Jun 7	*****	33.1	29.0	25.4	25.1	98	81	59
Jun 8	*****	33.6	29.5	26.8	25.2	95	78	60
Jun 9	*****	32.6	28.6	26.5	26.4	99	89	69
Jun 10	*****	32.1	28.3	26.4	26.2	97	89	70
Jun 11	*****	27.0	23.8	21.8	23.0	98	96	90
Jun 12	*****	26.5	23.7	21.9	21.1	97	86	70
Jun 13	*****	27.3	24.1	22.5	22.2	97	89	75
Jun 14	*****	25.5	24.8	23.7	23.6	97	93	84
Jun 15	*****	26.6	25.8	24.8	25.1	98	96	91
Jun 16	*****	27.8	27.1#	26.1	26.0#	97	94#	91
Jun 17	*****	29.4	27.5	26.6	26.2	97	93	82
Jun 18	*****	32.6	28.6	26.4	26.0	98	86	66
Jun 19	*****	33.1	29.0	25.8	25.6	98	83	57
Jun 20	*****	34.4	29.5	26.0	25.3	95	79	56
Jun 21	*****	33.2	29.2	26.7	25.6	96	82	62
Jun 22	*****	28.8	27.4	25.3	25.4	95	89	81
Jun 23	*****	30.9	27.2	25.1	25.4	99	90	76
Jun 24	*****	29.1	26.7	25.0	25.4	98	93	80
Jun 25	*****	29.9	28.7	27.3	25.6	90	84	78
Jun 26	*****	31.7	29.2	28.1	25.3	88	80	66
Jun 27	*****	33.1	29.6	28.0	25.2	89	78	63
Jun 28	*****	31.4	29.2	27.7	25.3	88	80	69
Jun 29	*****	32.9	29.7	28.0	25.8	89	80	65
Jun 30	*****	33.4	29.5	26.4	25.1	95	78	54
Mean	*****	31.0	27.9#	25.7	25.0#	95	85#	70
Maximum	*****	34.4	30.1#	28.1	26.4#	100	96#	91
Minimum	*****	25.5	23.7#	21.8	21.1#	88	73#	54

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

Date	Total Rainfall (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
Jun 1	0.0	230	7.2
Jun 2	0.0	200	7.3
Jun 3	0.0	180	5.1
Jun 4	18.0	030	5.0
Jun 5	0.5	020	4.7
Jun 6	6.5	110	3.9
Jun 7	0.0	190	5.8
Jun 8	14.0	200	8.3
Jun 9	45.0	230	6.6
Jun 10	4.0	240	4.8
Jun 11	104.5	070	5.6
Jun 12	0.5	060	6.3
Jun 13	2.5	060	6.8
Jun 14	30.0	040	10.0
Jun 15	78.0	150	6.1
Jun 16	10.5	140#	7.3#
Jun 17	14.5	130	6.6
Jun 18	0.5	110	5.4
Jun 19	0.0	190	4.0
Jun 20	0.0	200	5.3
Jun 21	2.0	030	9.9
Jun 22	24.5	140	8.4
Jun 23	13.0	200	6.0
Jun 24	65.0	200	5.3
Jun 25	1.5	200#	9.3#
Jun 26	0.0	190	8.4
Jun 27	0.0	190	7.5
Jun 28	1.0	190	7.5
Jun 29	0.0	200	6.6
Jun 30	0.0	110	5.4
Mean	-----	200#	6.5#
Total	436.0	---	-----
Maximum	104.5	---	10.0#
Minimum	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 detected



Appendix I

F

Event-Action Plans

EVENT/ACTION PLAN FOR AIR QUALITY EXCEEDANCE

ACTION

IC(E)

ER

ET Leader

Contractor

ACTION LEVEL

<p>1. Exceedance for one sample</p>	<p>1. Identify source, investigate the causes of exceedance and propose remedial measures Inform ER, IC(E) and Contractor Repeat measurement to confirm finding Increase monitoring frequency to daily</p>	<p>1. Check monitoring data submitted by the ET Check contractor's working method</p>	<p>1. Notify Contractor</p>	<p>1. Rectify any unacceptable practise Amend working methods if appropriate</p>
<p>2. Exceedance for two or more consecutive samples</p>	<p>1. Identify source, investigate the causes of exceedance and propose remedial measures Inform IC(E) and Contractor Repeat measurements to confirm finding Increase monitoring frequency to daily Discuss with IC(E) and Contractor on remedial actions If exceedance continues, arrange meeting with IC(E) and ER. If exceedance stops, cease additional monitoring</p>	<p>1. Check monitoring data submitted by the ET Leader Check the Contractor's working method Discuss with ET and Contractor on possible remedial measures Advise the ER on the effectiveness of the proposed remedial measures Supervise implementation of remedial measures</p>	<p>1. Confirm receipt of notification of failure in writing Notify the Contractor Ensure remedial measures properly implemented</p>	<p>1. Submit proposals for remedial actions to IC(E) within 3 working days of notification Implement the agreed proposals Amend proposal if appropriate</p>

LIMIT LEVEL

<p>1. Exceedance for one sample</p>	<p>1. Identify source, investigate the causes of exceedance and propose remedial measures Inform ER, Contractor and EPD Repeat measurement to confirm finding Increase monitoring frequency to daily Assess the effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results</p>	<p>1. Check monitoring data submitted by the ET Leader Check Contractor's working method Discuss with ET and Contractor on possible remedial measures Advise the ER on the effectiveness of the proposed remedial measures Supervise implementation of remedial measures</p>	<p>1. Confirm receipt of notification of failure in writing Notify the Contractor Ensure remedial measures properly implemented</p>	<p>1. Take immediate action to avoid further exceedance Submit proposals for remedial actions to IC(E) within 3 working days of notification Implement the agreed proposals Amend proposal if appropriate.</p>
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EVENT/ACTION PLAN FOR AIR QUALITY EXCEEDANCE

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

EVENT/ACTION PLAN FOR NOISE EXCEEDANCE

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

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"> 1. Identify source(s) of impact; 2. Repeat in-situ measurement to confirm findings; 3. Notify Contractor in writing within 24 hours of identification of the exceedance 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Carry out investigation 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 7. Discuss mitigation measures with Contractor if exceedance is due to the construction works within 4 working days 8. Repeat measurement on next day of exceedance if exceedance is due to the construction works 	<ol style="list-style-type: none"> 1. Notify the ER and IEC in writing within 24 hours of identification of exceedance 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Submit investigation report to IEC and ER within 3 working days of the identification of an exceedance 5. Consider changes of working method if exceedance is due to the construction works 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 7. Implement the agreed mitigation measures within reasonable time scale 	<ol style="list-style-type: none"> 1. Notify EPD and other relevant governmental agencies in writing within 24 hours of the identification of the exceedance 2. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 3. Require contractor to propose remedial measures for the analysed problem if related to the construction works 4. Ensure remedial measures are properly implemented 5. Assess the effectiveness of the mitigation measure
			<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET 2. Confirm ET assessment if exceedance is due / not due to the works 3. Discuss with ET, ER and Contractor on the mitigation measures 4. Review contractor's mitigation measures whenever necessary to ensure their effectiveness and advise the ER accordingly 5. Supervise the implementation of mitigation measures

EVENT AND ACTION PLAN FOR WATER QUALITY

Event	ACTION			IEC
	ET Leader	Contractor	ER	
<p>Action level being exceeded by more than one consecutive sampling days</p>	<ol style="list-style-type: none"> 1. Identify source(s) of impact; 2. Repeat in-situ measurement to confirm findings 3. Notify Contractor in writing within 24 hours of identification 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Carry out investigation 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 7. Discuss mitigation measures with IEC and Contractor within 4 working of identification of an exceedance 8. Ensure mitigation measures are implemented; 9. Prepare to increase the monitoring frequency to daily; 10. Repeat measurement on next day of exceedance. 	<ol style="list-style-type: none"> 1. Notify IEC and ER in writing within 24 hours of identification of exceedance 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Submit the results of the investigation to IEC and ER within 3 working days of the identification of an exceedance 6. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 4 working days of identification of an exceedance 7. Implement the agreed mitigation measures within reasonable time scale 	<ol style="list-style-type: none"> 1. Notify EPD and other relevant governmental agencies in writing within 24 hours of the identification of the exceedance 2. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 3. Require contractor to propose remedial measures for the analysed problem if related to the construction works 4. Ensure remedial measures are properly implemented 5. Assess the effectiveness of the mitigation measure 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET 2. Confirm ET assessment if exceedance is due / not due to the works 3. Discuss with ET, ER and Contractor on the mitigation measures. 4. Review contractor's mitigation measures whenever necessary to ensure their effectiveness and advise the ER accordingly 5. Assess the effectiveness of the implemented mitigation measures.

EVENT AND ACTION PLAN FOR WATER QUALITY EXCEEDANCE

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

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



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: 5 June 2013

Time: 11:00

Location: TKO Area 137

Checklist No. CEDPFRSFEM00_130605_TKOFB

Inspected by

CEDD: CKWOO

IEC: JASON CHAI

ET: KW MAK

Contractor: SW SUNG

PART A: GENERAL INFORMATION

Weather: Sunny Fine Cloudy Rainy

Temperature: °C

Humidity: High Moderate Low

Wind: Strong Breeze Light Calm

PART B: SITE AUDIT

		Not Obs.	Yes	No	Follow up	N/A	Photo/Remarks
Section 1: Water Quality							
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 checked="" type="checkbox"/>	<input 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 type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input checked="" 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"/>	
Section 2: Air Quality							
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 type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input checked="" 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 impemeable sheet or sprayed with water or protected by other method approved by CEDD?	<input checked="" type="checkbox"/>	<input 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"/>	
Section 3: Noise						
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"/>	
Section 4: Waste/Chemical Management						
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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.05	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.06	<input type="checkbox"/>	<input checked="" 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"/>	
Section 5: Landscape & Visual						
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 15.05.13 (Ref No. CEDPFRSFEM00_130515_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; p2</u>
Is the situation in item <u>Fu②</u> improved / rectified?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>closed; p4</u>
Is the situation in item <u>Fu③</u> improved / rectified?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>closed; pb</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"/>	

Remarks:

Follow-up

- Fu①, the bulldozer had been repaired & no dark smoke was observed during operation. (closed)
- Fu② + Fu③, stagnant water had been removed. (closed)

Observation:

- NO adverse environmental observation is recorded.

Signature:
CEDD's Representative

[Signature]
Name: C. K. Woo

Date: 5-6-2013

Signature:
IEC Auditor

Jason
Name: K C LAM

Date: 5 Jun 2013

Signature:
ET Auditor

[Signature]
Name: Mad Kei Wai

Date: 5/6/13

Signature:
Contractor's Representative

[Signature]
Name: Siu Sum Y

Date: 5 Jun 2013

Contract No.: CV/2009/02

Inspection Date: 5 June 2013

(1) Follow-up the previous inspection

Checklist No.: CEDPFRSFEM00_130515_TKOFB

Before



Photo 1

Dry Soil Deposition Area

Dark smoke emission from Bulldozer is observed during operation at dry soil deposition area.

After

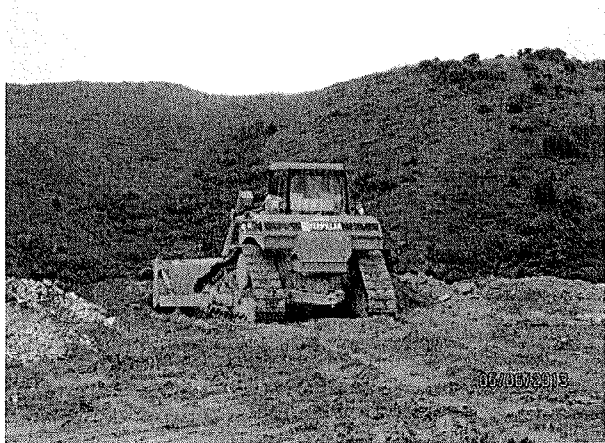


Photo 2

Dry Soil Deposition Area

The bulldozer had been repaired and no dark smoke was observed when working at dry soil deposition area. **(Closed)**

Before



Photo 3

Workshop

Stagnant water accumulated inside the shovel shall be cleaned up.

After



Photo 4

Workshop

Stagnant water had been removed. **(Closed)**

Before



Photo 5

Workshop

Stagnant water accumulated inside the chemical waste storage area shall be cleaned up.

After



Photo 6

Workshop

Stagnant water had been removed. (Closed)

(2) Observation during site inspection

Checklist No.: CEDPFRSFEM00_130605_TKOFB

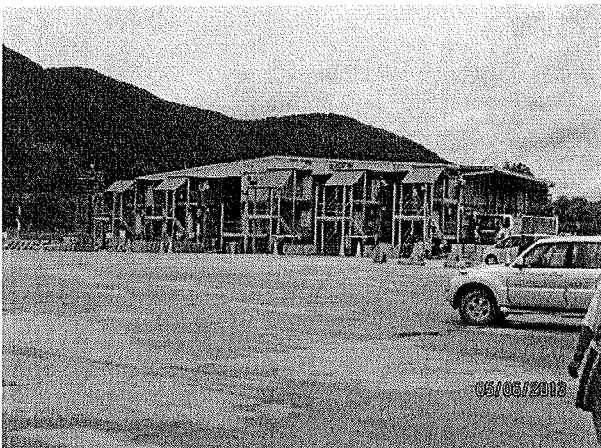
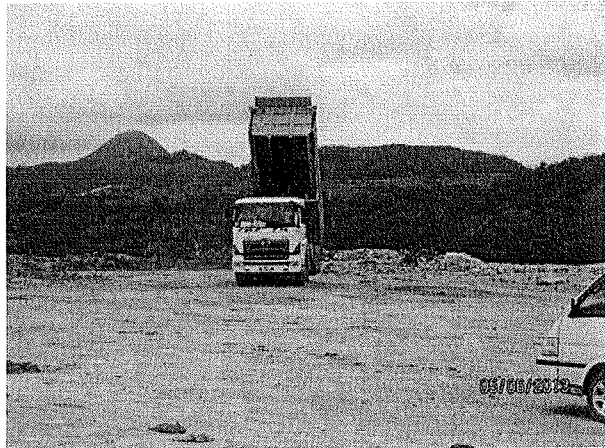


Photo 7 and 8

No adverse environmental observation is recorded.



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

Inspection

Date: 19 June 2013

Time: 14:30

Location: TKO Area 137

Checklist No. CEDPFRSFEM00_130619_TKOFB

Inspected by CKWOO

CEDD: JASON LAM

IEC: KW MAK

ET: SW SUNG

Contractor: SW SUNG

PART A: GENERAL INFORMATION

Weather: Sunny Fine Cloudy Rainy

Temperature: 30 °C

Humidity: High Moderate Low

Wind: Strong Breeze Light Calm

PART B: SITE AUDIT

	Not Obs.	Yes	No	Follow up	N/A	Photo/ Remarks
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Section 1: Water Quality

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 checked="" type="checkbox"/>	<input 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 type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input checked="" 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"/>	
Section 2: Air Quality							
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 type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input checked="" 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 checked="" type="checkbox"/>	<input 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"/>	
Section 3: Noise						
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"/>	
Section 4: Waste/Chemical Management						
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 type="checkbox"/>	<input checked="" 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 checked="" type="checkbox"/>	<input 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"/>	
Section 5: Landscape & Visual						
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"/>	
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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"/>	
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Section 7: Follow-up for the Previous Environmental Inspection on date 05.06.13 (Ref No. CEDPFRSFEM00_130605_TKOFB)

Is the situation in item _____ improved / rectified?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>No Follow up</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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-------------------------------------	--------------------------	--------------------------	--------------------------	--------------------------

Remarks:

During inspection:
 - No adverse environmental observation is recorded

Signature:
CEDD's Representative

Name: C. K. Chan

Date: 18-6-2013

Signature:
IEC Auditor

Name: KC LAM

Date: 19.06.13

Signature:
ET Auditor

Name: Mak Jee Wai

Date: 19/6/13

Signature:
Contractor's Representative

Name: S. W. Sun

Date: 19/6/13

Contract No.: CV/2009/02

Inspection Date: 19 June 2013

Observation during site inspection

Checklist No.: CEDPFRSFEM00_130619_TKOFB



Photo 1

No significant air quality impact is observed at dry soil deposition area.



Photo 2

Spraying water on the haul road, to maintain road surface wet.



Photo 3

Tarpaulin sheet is placed underneath the repairing plant, to avoid oil leakage on the ground.

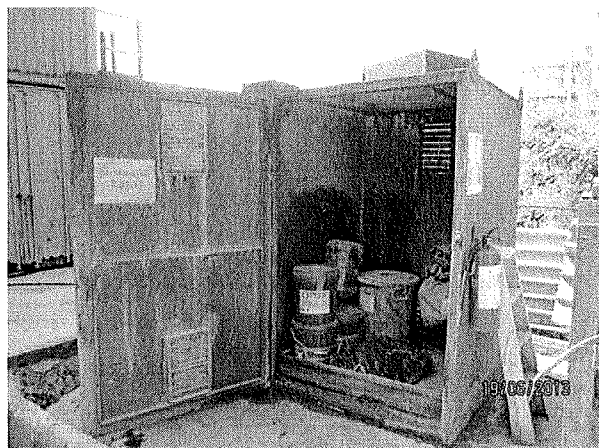


Photo 4

Good housekeeping at chemical waste storage area.



Appendix I


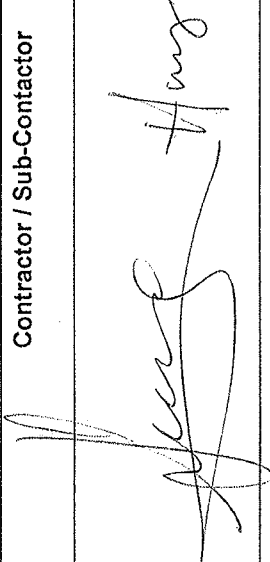

I

Weekly ET's Site Inspection Record



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

Inspection Date : 5/6/13
 Time : 11:15
 Weather : Sunny / Fine / Cloudy / Overcast / Drizzle / Rain / Storm / Hazy
 Wind : Calm / Light / Breeze / Strong
 Temperature : 32°C
 Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:			
Name:	C. K. Woo	S. W. Sze Li Kam Tung	Mak Sei Wai
Title	ALOW/P3	CEO S.S.	E.T

Implementation Stages*		Remark
Fugitive Dust Emission		
✓		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.
Noise Impact		
✓		The approved method of working, equipment and sound-reducing measures (e.g. use of silenced type of equipment, etc.) shall be adapted.
✓		Only well maintained plant should be operated on-site and plant should be serviced regularly during the construction works.
✓		Powered mechanical equipment (PME) should be covered or shielded by appropriate acoustic materials.
✓		Air compressors and hand held breakers should have noise labels.
✓		Machines and plants that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.
✓		Noisy equipment and mobile plant shall always be site away from NSRs.


Environmental Checklist		Implementation		Remark
		Stages*	Stages*	
		Yes	No	N/A
Water Quality				
▪	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 shotcrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.	✓		
▪	Existing and newly constructed Catchpits, sand and silt removal facilities and intercepting channels shall be maintained, and the deposited silt and grit shall be removed weekly and on a need basis especially at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.	✓		
▪	A wheel washing bay shall be provided at the site exit and wash-water shall have sand and silt settled out or removed before being discharged into storm drains.	✓		
▪	The section of construction road between wheel washing bay and the public road shall be paved with concrete, bituminous materials or 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.	✓		Item 2
▪	A waste collection vessel shall be deployed to remove floating debris.	✓		

Environmental Checklist	Implementation Stages*			Remark
	Yes	No	N/A	
Landscape and Visual				
▪ 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.	✓			
Other Environmental Factors				
▪ 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.	✓			


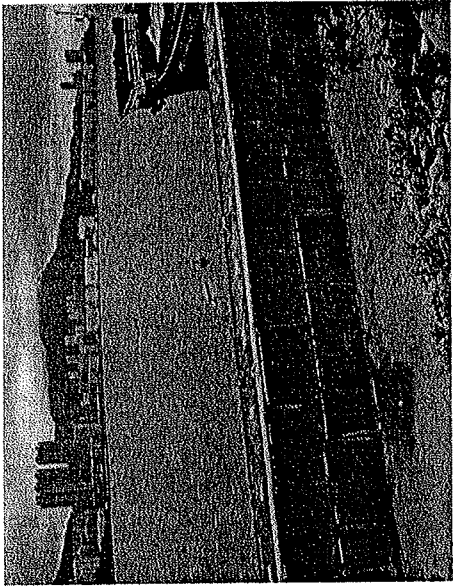
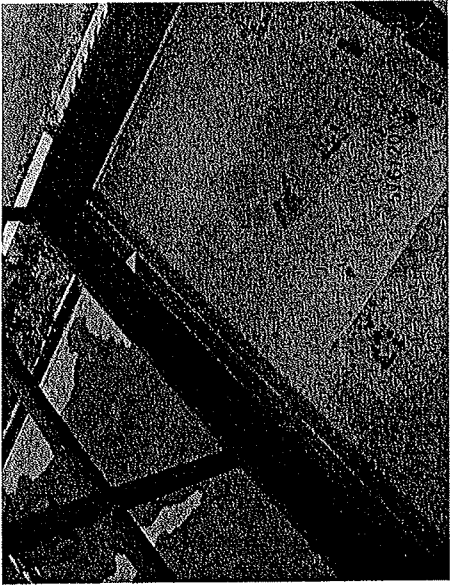
Summary of the Weekly Site Inspection:

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 3 on 15/05/13, item 3 on 22/05/13 and item 1 on 29/05/13, standing water inside the drip tray in the chemical waste storage area was cleared.	---	130605_001	No	---
2	Follow-up action to item 4 on 22/05/13 and item 2 on 29/05/13, silt curtain near tipping hall No. 1 were still found damaged.	To repair the silt curtain as soon as possible.	130605_002	Yes	11/06/13
3	Follow-up action to item 3 on 29/05/13, standing water noted at check point was cleared.	---	130605_003	No	---

Remark

Name	Title	Signature	Date
Linda Law	Senior Environmental Officer		05 June 2013

Photos

 <p>Photo 130605_001 (Chemical waste storage area) (Improved)</p>	 <p>Photo 130605_002 (Silt curtain near the tipping hall No. 1)</p>	 <p>Photo 130605_003 (Check point) (Improved)</p>




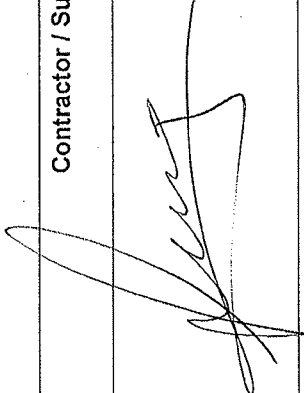

CEDD Contract No.: CV/2009/02
Handling of Surplus Public Fill - Tseung Kwun O Fill Bank

Inspection Date : 11/16/13
 Time : 10:50
 Weather : Sunny / Fine / Cloudy / Overcast / Drizzle / Rain / Storm / Hazy

Wind : Calm / Light / Breeze / Strong

Temperature : 30°C

Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:			
Name:	C.K. Wong	W. Lam	Mok Hei Man
Title	AW/PS	S.S.	E.T

Environmental Checklist		Implementation Stages*		Remark
		Yes	No / N/A	
Fugitive Dust Emission				
▪	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.	✓		
Noise Impact				
▪	The approved method of working, equipment and sound-reducing measures (e.g. use of silenced type of equipment, etc.) shall be adapted.	✓		
▪	Only well maintained plant should be operated on-site and plant should be serviced regularly during the construction works.	✓		
▪	Powered mechanical equipment (PME) should be covered or shielded by appropriate acoustic materials.	✓		
▪	Air compressors and hand held breakers should have noise labels.	✓		
▪	Machines and plants that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.	✓		
▪	Noisy equipment and mobile plant shall always be site away from NSRs.	✓		


Environmental Checklist		Implementation Stages*		Remark
		Yes	No / N/A	
Water Quality				
▪	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 treated by compaction, followed by hydroseeding, vegetation 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 tight size such that adequate clearance is maintained between the vessels and the seabed at all states of the tide to ensure the undue turbidity is not generated by turbulence from vessel movement or propeller wash.	✓		
▪	All vessels used for transportation of fill material shall have tight fitting seals to their bottom openings to prevent leakage of material during transport.	✓		
▪	Adequate environmental control measures shall be provided / 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.	✓		Item 1
▪	A waste collection vessel shall be deployed to remove floating debris.	✓		

Environmental Checklist		Implementation Stages*			Remark
		Yes	No	N/A	
Landscape and Visual					
▪	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.	√			
Other Environmental Factors					
▪	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 4 on 22/05/13, item 2 on 29/05/13 and item 2 on 05/06/11, silt curtain near tipping hall No.1 were still found damaged.	To repair the silt curtain as soon as possible.	130611_001	Yes	19/06/13

Remark

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

Checked by

Photos

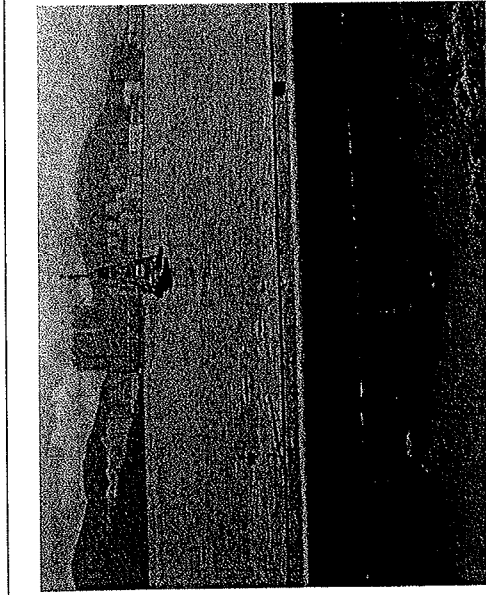

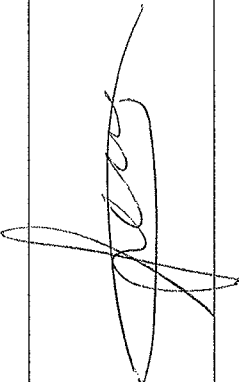



Photo 130611_001 (Silt curtain near the tipping hall No.1)



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

Inspection Date : 19/6/13
 Time : 14:40
 Weather : Sunny / Fine / Cloudy / Overcast / Drizzle / Rain / Storm / Hazy
 Wind : Calm / Light / Breeze / Strong
 Temperature : 32°C
 Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:			
Name:	C.K. Joo	Sun Suk	Mark Teri Wan
Title	AO/EP3	AS60	E.T

Environmental Checklist		Implementation Stages*		Remark
		Yes	No / N/A	
Fugitive Dust Emission				
▪	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 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.	✓		
Noise Impact				
▪	The approved method of working, equipment and sound-reducing measures (e.g. use of silenced type of equipment, etc.) shall be adapted.	✓		
▪	Only well maintained plant should be operated on-site and plant should be serviced regularly during the construction works.	✓		
▪	Powered mechanical equipment (PME) should be covered or shielded by appropriate acoustic materials.	✓		
▪	Air compressors and hand held breakers should have noise labels.	✓		
▪	Machines and plants that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.	✓		
▪	Noisy equipment and mobile plant shall always be site away from NSRs.	✓		

Environmental Checklist		Implementation Stages*		Remark
		Yes	No / N/A	
Water Quality				
▪	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 shotcrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.	✓		
▪	Existing and newly constructed Catchpits, sand and silt removal facilities and intercepting channels shall be maintained, and the deposited silt and grit shall be removed weekly and on a need basis especially at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.	✓		
▪	A wheel washing bay shall be provided at the site exit and wash-water shall have sand and silt settled out or removed before being discharged into storm drains.	✓		
▪	The section of construction road between wheel washing bay and the public road shall be paved with concrete, bituminous materials or hardcore to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.	✓		
▪	Sewage from toilets shall be discharged in to a foul sewer, or chemical toilets shall be provided. The chemical toilets (if use) shall be provided by a licensed contractor, who will be responsible for disposal and maintenance of these facilities.	✓		
▪	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 hails 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.	✓		Item 1
▪	A waste collection vessel shall be deployed to remove floating debris.	✓		

		Implementation Stages*			Remark
		Yes	No	N/A	
Environmental Checklist					
Landscape and Visual					
▪	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.	√			
Other Environmental Factors					
▪	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.	√			

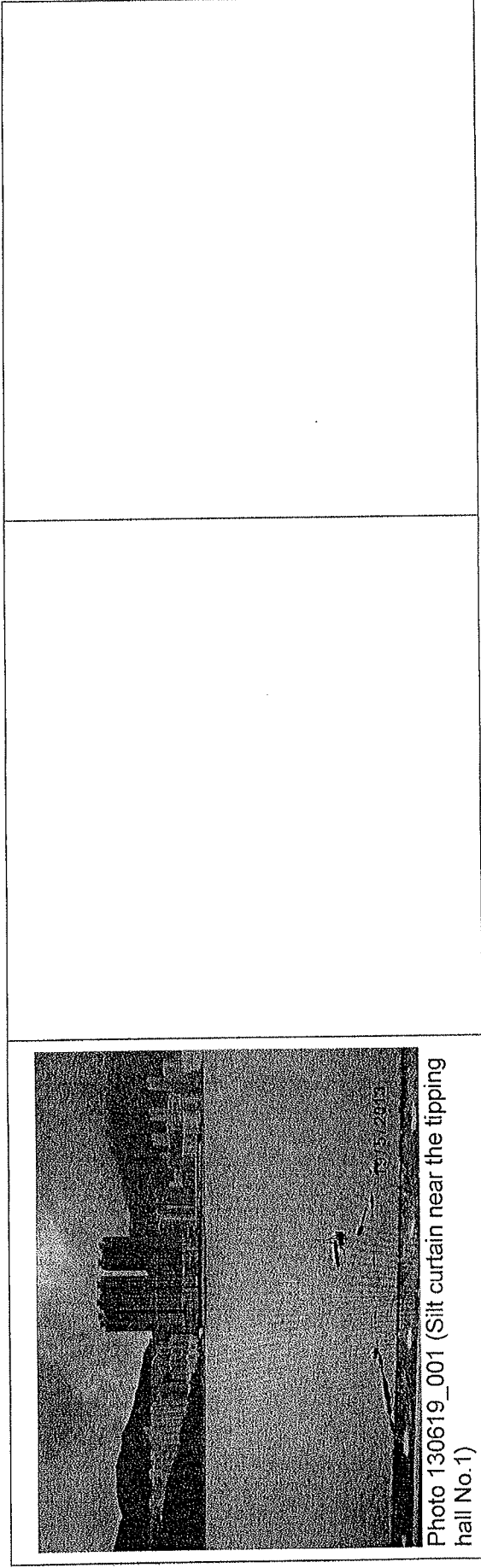
Summary of the Weekly Site Inspection:

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 4 on 22/05/13, item 2 on 29/05/13, item 2 on 05/06/13 and item 1 on 11/06/13, silt curtain near tipping hall No.1 were still found damaged.	To repair the silt curtain as soon as possible.	130619_001	Yes	26/06/13

Remark

Name	Title	Signature	Date
Linda Law	Senior Environmental Officer	<i>Linda Law</i>	19 June 2013


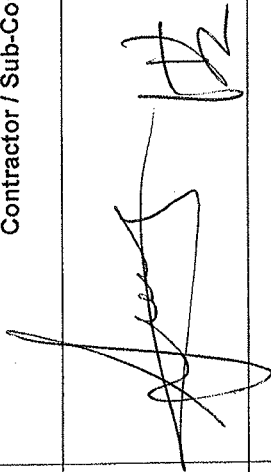

Photos





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

Inspection Date : 26 - JUN - 2013
 Time : 10:20
 Weather : Sunny / Fine / Cloudy / Overcast / Drizzle / Rain / Storm / Hazy
 Wind : Calm / Light / Breeze / Strong
 Temperature : 20°C
 Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:			
Name:	M. K. Kong	S. V. Sung	K. M. Lam
Title	AE/PS	AO	E.T

Environmental Checklist		Implementation Stages*		Remark
		Yes	No / N/A	
Fugitive Dust Emission				
▪	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 clearing 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 property 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.	✓		
Noise Impact				
▪	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.	✓		


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

	Implementation Stages*		Remark
	Yes	No / N/A	
Water Quality			
▪ 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 treated by compaction, followed by hydroseeding, vegetation 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 shotcrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.	✓		
▪ Existing and newly constructed Catchpits, sand and silt removal facilities and intercepting channels shall be maintained, and the deposited silt and grit shall be removed weekly and on a need basis especially at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.	✓		
▪ A wheel washing bay shall be provided at the site exit and wash-water shall have sand and silt settled out or removed before being discharged into storm drains.	✓		
▪ The section of construction road between wheel washing bay and the public road shall be paved with concrete, bituminous materials or 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.	✓		Item 1
▪ A waste collection vessel shall be deployed to remove floating debris.	✓		

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 4 on 22/05/13, item 2 on 29/05/13 and item 2 on 05/06/11, item 1 on 11/6/13 and item 1 on 19/06/13, silt curtain near tipping hall No. 1 were still found damaged.	To repair the silt curtain as soon as possible.	130626_001	Yes	03/07/13

Remark

Name	Title	Signature	Date
Linda Law	Senior Environmental Officer		26 June 2013

Photos

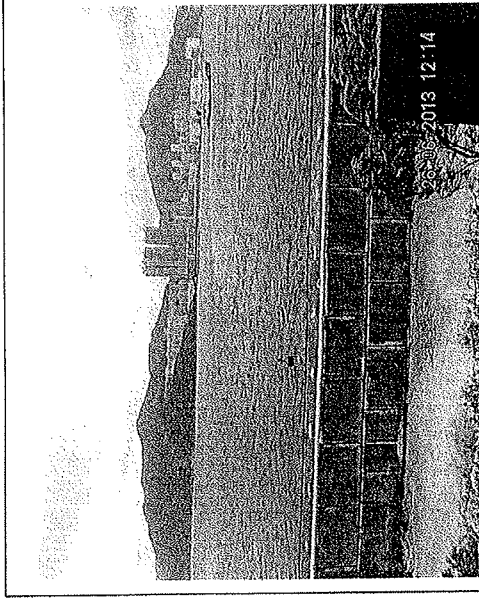


Photo 130626_001 (Silt curtain near the tipping hall No.1)

Appendix I

J

Implementation Schedule of Mitigation Measures



Environmental Mitigation Implementation Schedule

	Location	Implementation Status				
		Implemented	Partially implemented	Not implemented	Not Applicable	
Environmental Protection Measures						
Air Quality						
<ul style="list-style-type: none"> ▪ 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 rout 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. ▪ 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. ▪ 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. ▪ All plant and equipment should be well maintained e.g. without black smoke emission. 						
Noise Impact						
<ul style="list-style-type: none"> ▪ 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 site 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. 						



	Location	Implementation Status		
		Implemented	Partially implemented	Not implemented
Water Quality				
Drainage system should be adequate and well maintained to prevent flooding and overflow, especially after rain storms.	All areas	✓		
Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding.	All areas	✓		
The existing / realigned intercepting channels and the sand / silt removal facilities shall be used and maintained regularly.	All areas	✓		
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.	Along the seafront		✓	
A buffer distance of at least 20m shall be maintained between the boundary of the C&DMSF and the seafront.	C&DMSF			✓
The stormwater intercepting system shall be effective to collect of runoff and remove suspended solids before discharge.	All areas	✓		
The material shall be properly covered to prevent washed away especially before rainstorm.	All areas	✓		
The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD.	Temporary Slopes	✓		
A wheel washing bay shall be provided at the site exit and wash-water shall have sand and silt settled out or removed before being discharged into storm drains.	Wheel Washing facility	✓		
Obtain Discharge License	Site Office	✓		
Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer.	Barge Handling Area (BHA)	✓		
The work activities shall not cause any visible foam, oil, grease, scum, litter or other objectionable matters to be present on the water in the vicinity of the barging facilities.	Barge Handling Area (BHA)	✓		
A waste collection vessel shall be deployed to remove floating debris.	Barge Handling Area (BHA)	✓		
Landscape and Visual				
Construction of lighting to avoid spillage and glare	All areas	✓		
Hydro-seeding	Completed slopes	✓		
Hoarding erection	Site boundary	✓		
Damage to surrounding area avoided	All areas	✓		
Other Environmental Factors				
C&D waste sorted from mixed C&D material shall be transfer to SENT landfill for disposal.	All areas	✓		
Plan and stock construction materials carefully to minimise generation of waste.	All areas	✓		
Any unused materials or those with remaining functional capacity should be recycled.	All areas	✓		
All generators, fuel and oil storage are within bunded areas.	All areas	✓		
Oil leakage from machinery, vehicle and plant is prevented.	All areas	✓		
Bund chemical storage area to 110% capacity.	All areas	✓		
Prevent disposal of hazardous materials to air, soil and water body.	All areas	✓		
Provide rubbish skips at all work areas	All areas	✓		
Good site practices should be adopted to clean the rubbish and litter on a regular basis so as to prevent the rubbish and litter from dropping into the nearby environment.	All areas	✓		



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)

July 2013

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2 <u>24 hr TSP</u>	3 <u>1-hr TSP x 2</u> <u>Weekly SI</u> <u>WQM</u> Mid-ebb (08:45 -10:45) Mid-flood (15:00 -17:00)	4	5 <u>1-hr TSP</u> <u>WQM</u> Mid-ebb (10:00 -12:00) Mid-flood (16:30 -18:30)	6
7	8 <u>1-hr & 24 hr TSP</u> <u>WQM</u> Mid-ebb (11:30 -13:30) Mid-flood (18:00 -20:00)	9	10 <u>1-hr TSP</u> <u>Weekly SI</u> <u>NM</u> <u>WQM</u> Mid-ebb (13:00 -15:00) Mid-flood (19:00 -21:00)	11	12 <u>1-hr TSP</u> <u>WQM</u> Mid-flood (08:00-10:00) Mid-ebb (13:30-15:30)	13
14 <u>24 hr TSP</u>	15 <u>1-hr TSP</u> <u>Weekly SI</u> <u>WQM</u> Mid-flood (09:00-11:00) Mid-ebb (15:30-17:30)	16	17 <u>1-hr TSP</u> <u>Weekly SI</u> <u>WQM</u> Mid-flood (12:30-14:30) Mid-ebb (17:30-19:30)	18	19 <u>1-hr TSP</u> <u>WQM</u> Mid-ebb (08:30 -10:30) Mid-flood (15:00 -17:00)	20 <u>24 hr TSP</u>
21	22 <u>1-hr TSP x 2</u> <u>WQM</u> Mid-ebb (11:00 -13:00) Mid-flood (17:30 -19:30)	23	24 <u>1-hr TSP</u> <u>Weekly SI</u> <u>WQM</u> Mid-ebb (12:30 -14:30) Mid-flood (18:30 - 20:30)	25	26 <u>1-hr & 24 hr TSP</u> <u>WQM</u> Mid-flood (08:00-10:00) Mid-ebb (14:00-16:00)	27
28	29 <u>1-hr TSP</u> <u>WQM</u> Mid-flood (10:00-12:00) Mid-ebb (15:30-17:30)	30	31 <u>1-hr TSP</u> <u>Weekly SI</u> <u>WQM</u> Mid-flood (13:30-15:30) Mid-ebb (17:30-19:30)			



Appendix I

M

Complaint Log

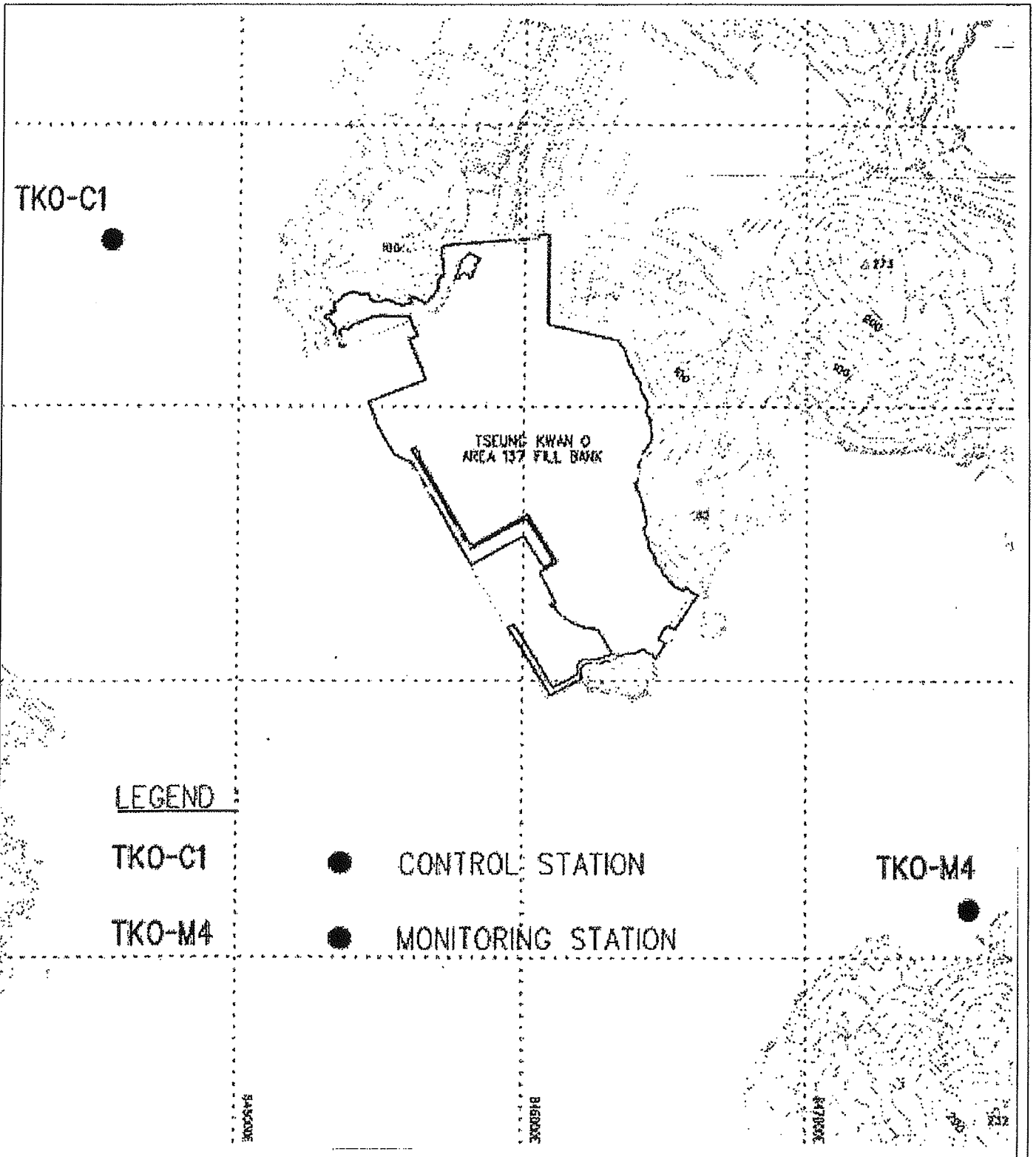
Complaint Logs

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

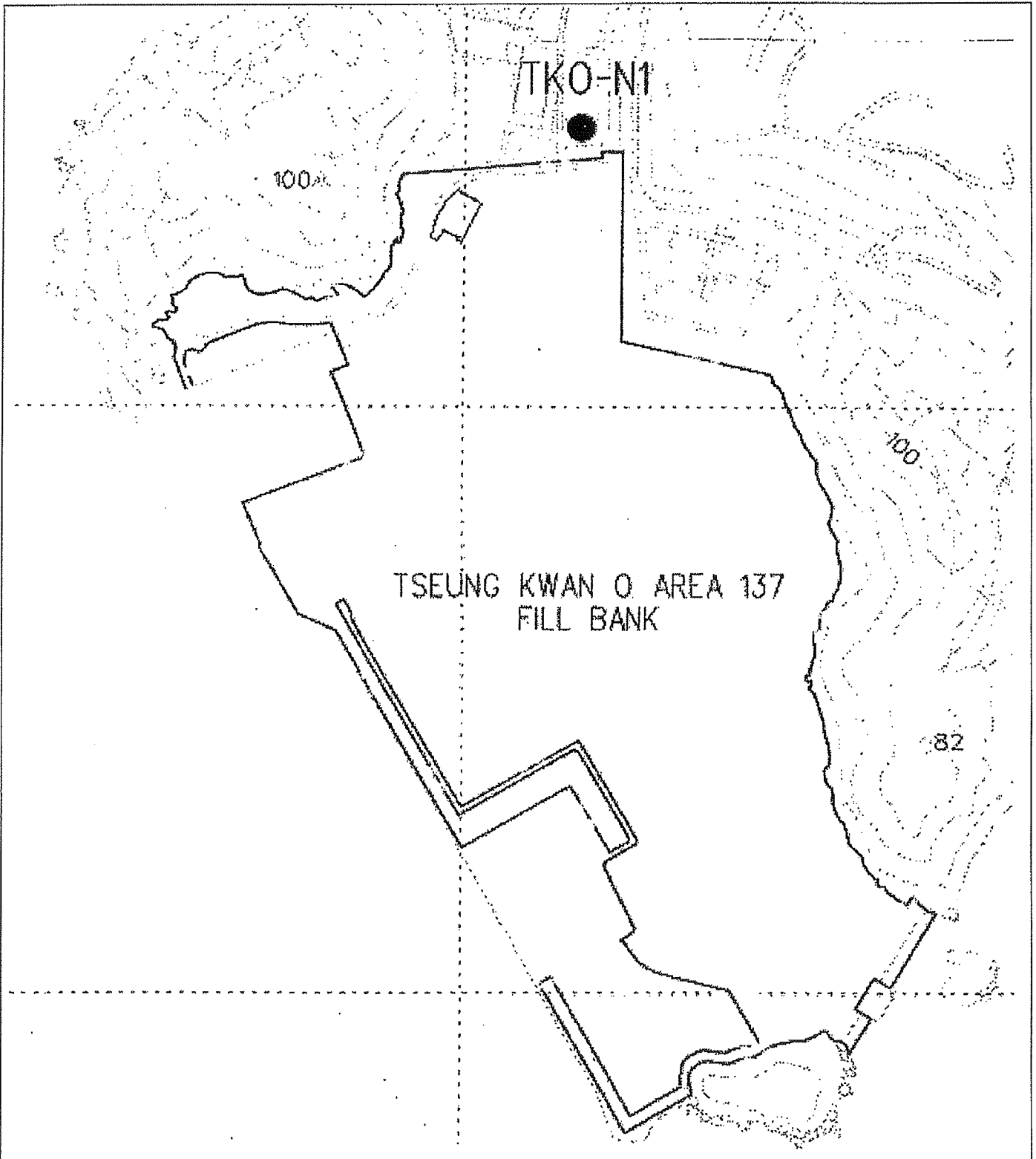
Figures



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





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

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



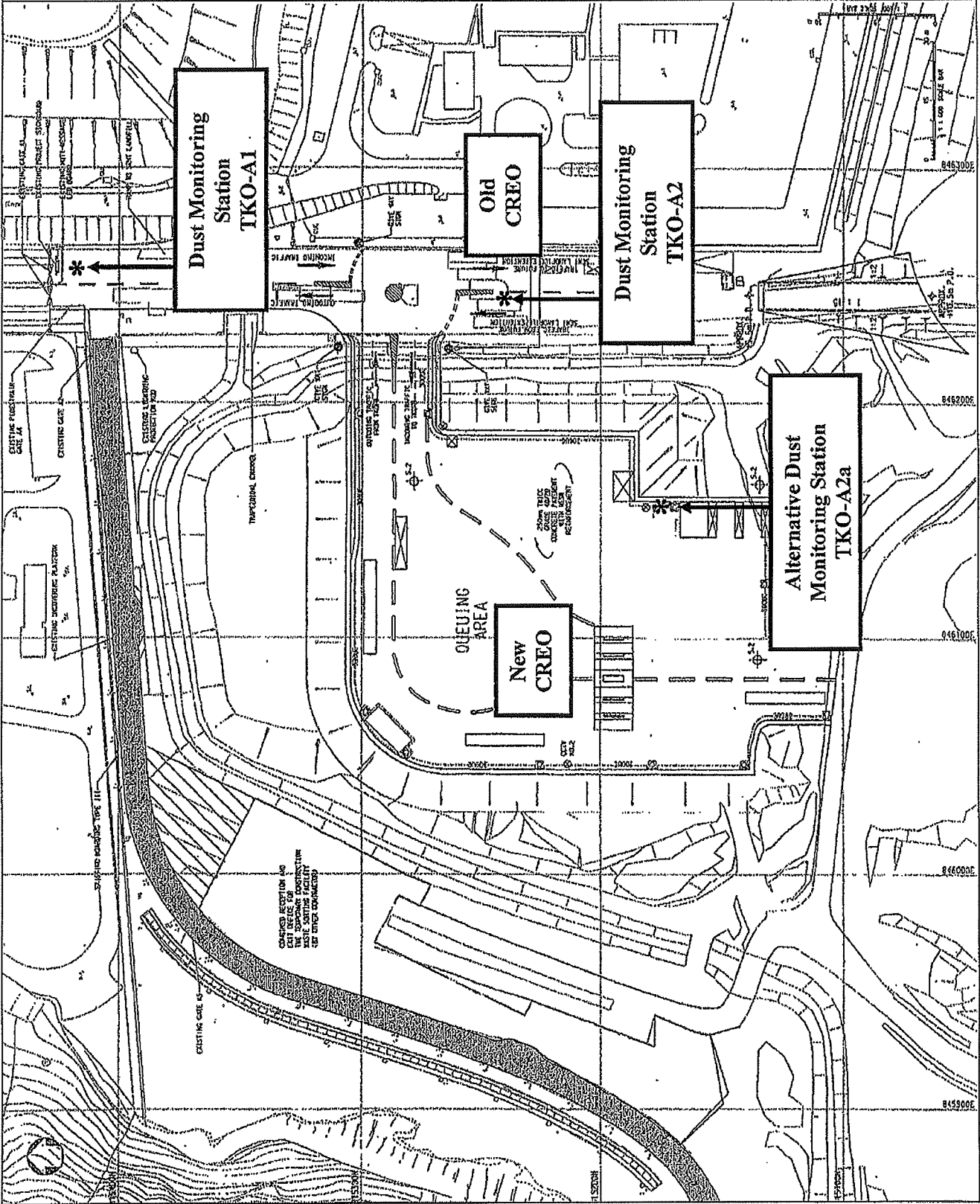
東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

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

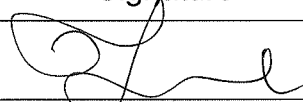

**Marine Water Quality Monitoring Report for Contract No. HY/2010/02
Hong Kong – Zhuhai – Macao Bridge, Hong Kong Boundary Crossing
Facilities – Reclamation Works**

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
June 2013**

[07/2013]

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

Version: Rev. 0 Date: 12 July 2013

Disclaimer

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Figure 2.1	Impact Water Quality Monitoring Stations at TKO 137 Fill Bank

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Appendix C	Impact Water Quality Monitoring Results and their Graphical Presentation
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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 June 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 June 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 June 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 June 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
Control Stations: C1a Impact Stations: M4a – M5	<ul style="list-style-type: none"> • Depth, m • Temperature, °C • Salinity, ppt • DO, mg/L • DO Saturation, % • Turbidity, NTU • Suspended Solids (SS), mg/L 	Three times per week during mid-ebb and mid-flood tides (within ± 1.75 hour of the predicted time)	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).

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:
1. "depth-averaged" is calculated by taking the arithmetic means of reading of all three depths.
 2. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
 3. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
 4. 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	25.7 (24.3 - 27.2)	25.9 (24.2 - 27.1)	6.4 (5.4 - 8.4)	6.3 (5.3 - 7.9)	89.6 (74.2 - 118.8)	3.3 (1.9 - 4.3)	4.4 (2.8 - 5.4)
M4a	25.7 (24.3 - 27.2)	25.9 (24.3 - 27.1)	6.4 (5.4 - 8.3)	6.1 (5.2 - 7.9)	89.0 (72.4 - 117.6)	3.1 (1.8 - 4)	4.1 (2.8 - 5.2)
M5	25.7 (24.3 - 27.2)	26.0 (24.3 - 27.2)	6.6 (5.6 - 8.4)	6.1 (5.2 - 8.1)	91.0 (73.7 - 119.1)	2.9 (1.7 - 3.6)	3.9 (2.8 - 4.8)

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	25.7 (24.3 - 27.3)	25.9 (24.3 - 27.1)	6.4 (5.5 - 8.5)	6.3 (5.4 - 8)	90.4 (75 - 119.5)	3.2 (1.6 - 4.2)	4.2 (2.6 - 5.2)
M4a	25.7 (24.5 - 27.3)	25.9 (24.3 - 27.2)	6.5 (5.5 - 8.4)	6.1 (5.2 - 7.9)	90.0 (73.2 - 118.1)	3.0 (1.6 - 3.9)	4.0 (2.8 - 5.2)
M5	25.7 (24.2 - 27.2)	26.0 (24.3 - 27.1)	6.6 (5.7 - 8.5)	6.2 (5.3 - 8.2)	91.7 (74.5 - 120)	2.8 (1.5 - 3.7)	3.9 (2.6 - 4.8)

3.1.2 The weather conditions during the monitoring period were generally fine and cloudy with a few drizzle days. Sea conditions for the majority of monitoring days were generally calm and small wave. 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 6 m, 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

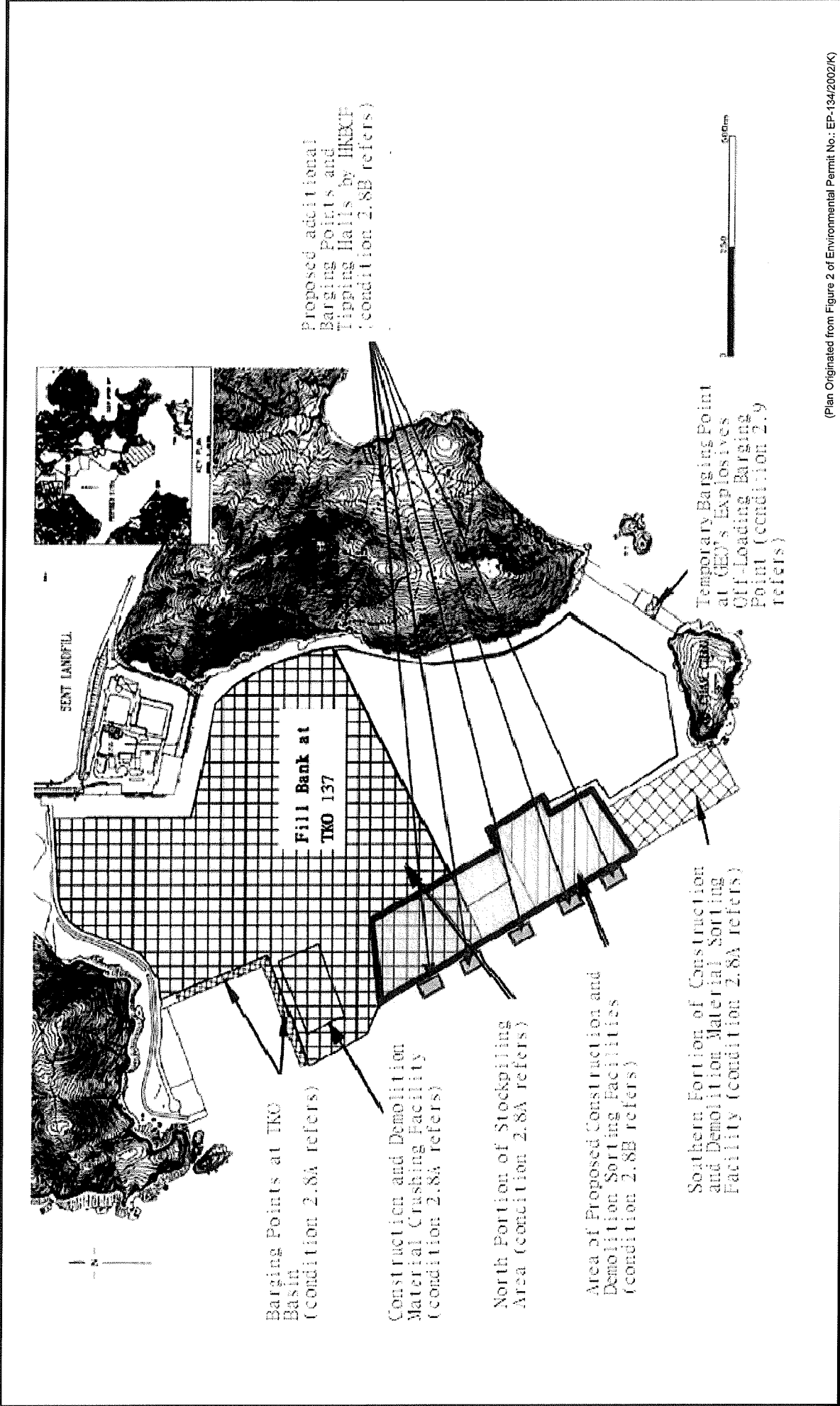
Note: S: Surface; and
 M: Mid-depth.

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.

FIGURES



(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**

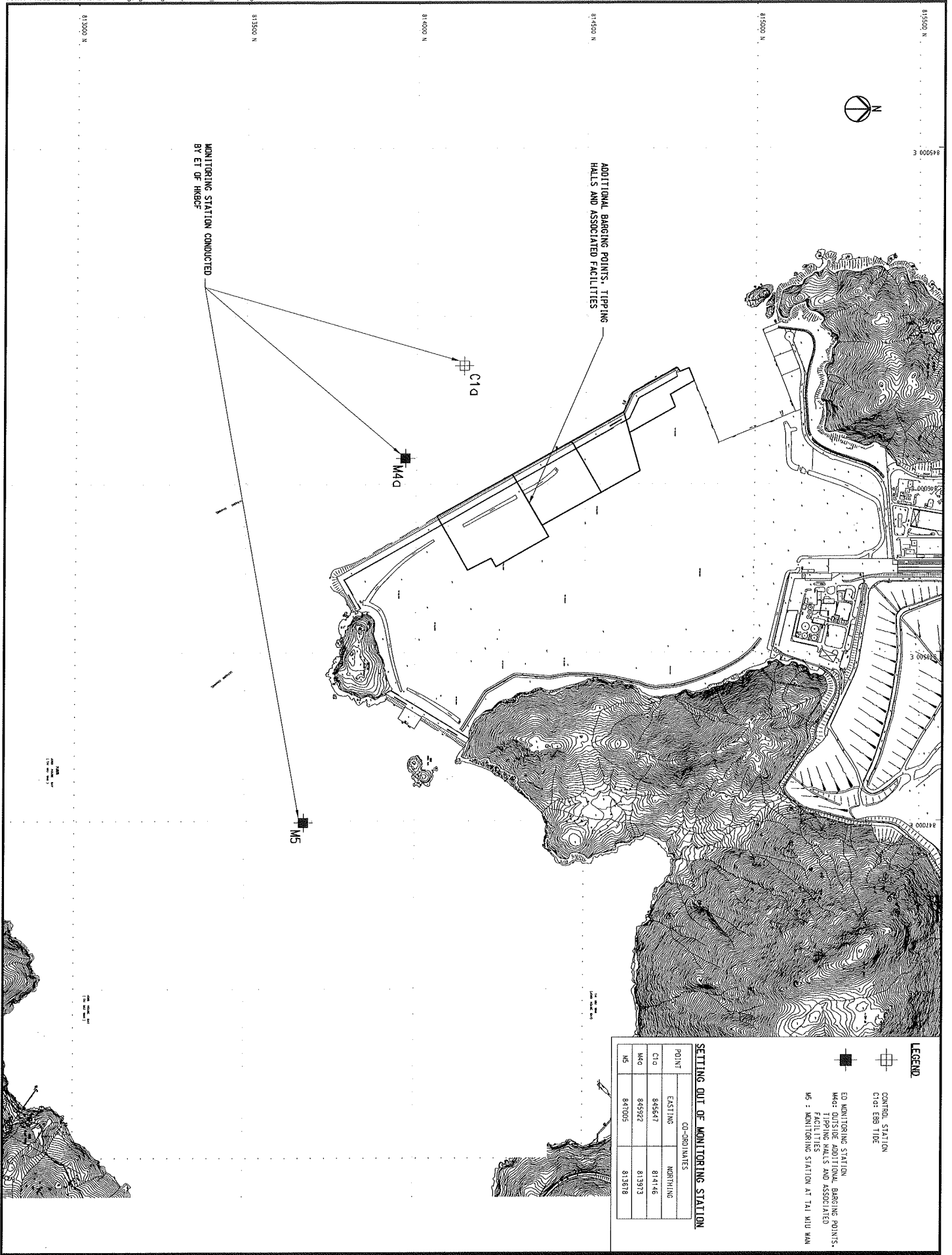
Site Layout Plan for TKO 137 Fill Bank

Project No.: 60249820

Date: MAY 2012



Figure 1.1



**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>02/05/2013</u>	Calibration Due Date : <u>01/08/2013</u>

Temperature Verification

Ref. No. of Reference Thermometer : E1/0521/008

Ref. No. of Water Bath : ---

		Temperature (°C)		
Reference Thermometer reading	Measured	20.1	Corrected	19.7
DO Meter reading	Measured	19.6	Difference	0.1

Standardization of sodium thiosulphate (Na₂S₂O₃) solution

Reagent No. of Na ₂ S ₂ O ₃ titrant	CPE/012/4.5/001/6	Reagent No. of 0.025N K ₂ Cr ₂ O ₇	CPE/012/4.4/001/18
		Trial 1	Trial 2
Initial Vol. of Na ₂ S ₂ O ₃ (ml)		0.10	0.15
Final Vol. of Na ₂ S ₂ O ₃ (ml)		10.35	10.55
Vol. of Na ₂ S ₂ O ₃ used (ml)		10.25	10.40
Normality of Na ₂ S ₂ O ₃ solution (N)		0.02439	0.02404
Average Normality (N) of Na ₂ S ₂ O ₃ solution (N)		0.02422	
Acceptance criteria, Deviation		Less than ± 0.001N	

Calculation: Normality of Na₂S₂O₃, N = $\frac{1}{10.25} \times \text{ml Na}_2\text{S}_2\text{O}_3 \text{ used}$
 $\frac{0.25}{10.25} = 0.02439$

Lineality Checking

Determination of dissolved oxygen content by Winkler Titration *

Purging Time (min)	2		5		10	
	1	2	1	2	1	2
Trial						
Initial Vol. of Na ₂ S ₂ O ₃ (ml)	0.00	11.60	23.00	0.00	7.80	12.80
Final Vol. of Na ₂ S ₂ O ₃ (ml)	11.60	23.00	30.90	7.80	12.80	17.80
Vol. (V) of Na ₂ S ₂ O ₃ used (ml)	11.60	11.40	7.90	7.80	5.00	5.00
Dissolved Oxygen (DO), mg/L	7.54	7.41	5.14	5.07	3.25	3.25
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	7.55	7.54	7.41	7.48	0.93
5	5.30	5.22	5.26	5.14	5.07	5.11	2.89
10	3.12	3.18	3.15	3.25	3.25	3.25	3.13
Linear regression coefficient				0.9978			



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/012/4.7/002/03	Reagent No. of NaCl (30ppt)	CPE/012/4.8/002/03
-----------------------------	--------------------	-----------------------------	--------------------

Determination of dissolved oxygen content by Winkler Titration **

Salinity (ppt)	10		30	
	1	2	1	2
Initial Vol. of Na ₂ S ₂ O ₃ (ml)	0.00	11.90	24.10	35.00
Final Vol. of Na ₂ S ₂ O ₃ (ml)	11.90	24.10	35.00	46.00
Vol. (V) of Na ₂ S ₂ O ₃ used (ml)	11.90	12.20	10.90	11.00
Dissolved Oxygen (DO), mg/L	7.74	7.93	7.09	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	7.74	7.93	7.84	0.77
30	7.09	7.16	7.13	7.09	7.15	7.12	0.14

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 Salinity Meter

Equipment Ref. No. : ET/EW/008/005 Manufacturer : YSI

Model No. : Pro 2030 Serial No. : 12A 100353

Date of Calibration : 02/05/2013 Due Date : 01/08/2013

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

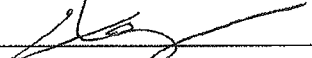
S/001/4

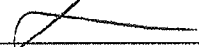
Salinity Standard (ppt)	Measured Salinity (ppt)	Difference %
30.0	30.9	2.96

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 : 09/04/2013 Due Date : 08/07/2013


Gelex Vial Std	Theoretical Value (NTU)	Measured Value (NTU)	Difference %
0-10 NTU	5.7	5.56	2.49
10-100 NTU	54.9	53.4	2.77
100-1000 NTU	562	552	1.80

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 June 2013 (TKO 137 Fill Bank)**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						01-Jun
02-Jun	03-Jun	04-Jun	05-Jun	06-Jun	07-Jun	08-Jun
	Impact Water Quality Monitoring Mid-ebb: 08:49 Mid-flood: 14:46		Impact Water Quality Monitoring Mid-ebb: 10:27 Mid-flood: 16:53		Impact Water Quality Monitoring Mid-ebb: 11:41 Mid-flood: 18:27	
09-Jun	10-Jun	11-Jun	12-Jun	13-Jun	14-Jun	15-Jun
	Impact Water Quality Monitoring Mid-flood: 13:23 Mid-ebb: 20:19				Impact Water Quality Monitoring Mid-flood: 08:02 Mid-ebb: 15:08	
16-Jun	17-Jun	18-Jun	19-Jun	20-Jun	21-Jun	22-Jun
	Impact Water Quality Monitoring Mid-flood: 12:02 Mid-ebb: 18:25		Impact Water Quality Monitoring Mid-ebb: 08:38 Mid-flood: 15:05		Impact Water Quality Monitoring Mid-ebb: 10:19 Mid-flood: 17:20	
23-Jun	24-Jun	25-Jun	26-Jun	27-Jun	28-Jun	29-Jun
	Impact Water Quality Monitoring Mid-ebb: 12:48 Mid-flood: 19:53		Impact Water Quality Monitoring Mid-flood: 07:35 Mid-ebb: 14:27		Impact Water Quality Monitoring Mid-flood: 09:20 Mid-ebb: 16:00	
30-Jun						

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

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	Value
24/06/13	1938-1956	28/Drizzle	Small Wave	13.0	Surface	27.1	24.4	24.4	6.0	86.8	3.7	4.8	3.7	4.8	3.6	4.7
						27.2	24.4	5.9	85.6	3.7	4.6					
					Middle	26.9	24.5	5.7	81.9	3.7	4.4	3.7	4.6			
						26.9	24.5	5.7	82.3	3.7	4.8					
					Bottom	26.8	24.8	5.5	79.7	3.4	4.2	3.4	4.3			
						26.8	24.8	5.6	80.9	3.4	4.4					
26/06/13	0831-0846	28/Drizzle	Small Wave	12.8	Surface	27.1	24.4	24.4	6.0	85.2	3.0	4.0	3.0	4.1	3.3	4.1
						27.1	24.3	6.0	86.6	3.1	4.2					
					Middle	26.7	24.6	5.8	84.3	3.2	4.2	3.2	4.1			
						26.8	24.7	5.8	83.7	3.2	4.0					
					Bottom	26.6	24.8	5.3	76.8	3.5	4.6	3.5	4.7			
						26.6	24.9	5.4	77.6	3.6	4.8					
28/06/13	0949-1008	29/Cloudy	Small Wave	14.0	Surface	27.1	26.4	26.4	6.2	89.6	2.4	3.6	2.4	3.4	2.7	3.7
						27.0	26.4	6.2	90.2	2.3	3.2					
					Middle	27.0	26.3	6.2	89.3	2.8	3.6	2.8	3.7			
						27.0	26.4	6.2	89.0	2.8	3.8					
					Bottom	26.9	26.6	5.9	84.5	3.1	4.0	3.0	3.9			
						26.9	26.7	5.8	84.2	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)		Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)		
							Value	Ave.	Value	Average	Depth-average	Value	Average	Value	Average	Value	Average
03/06/13	1433-1448	32/Fine	Small Wave	13.2	Surface	25.8	25.3	25.3	8.3	117.8	118.2	1.5	2.8	2.7	1.9	2.8	3.0
						25.9	25.3	8.3	118.6	1.6	2.6						
						25.6	25.5	8.2	115.4	1.8	2.8						
						25.6	25.5	8.1	114.8	1.9	3.2						
						25.5	25.7	7.9	112.1	2.2	3.2						
						25.4	25.8	8.0	112.9	2.2	3.4						
05/06/13	1633-1648	29/Cloudy	Calm	14.0	Surface	25.9	25.3	25.4	8.4	119.3	119.7	1.7	2.8	2.9	2.0	2.8	3.1
						25.9	25.4	8.5	120.0	1.8	3.0						
						25.7	25.5	8.4	117.8	2.0	3.0						
						25.6	25.6	8.3	116.9	2.0	3.2						
						25.4	25.7	8.1	114.2	2.3	3.4						
						25.3	25.8	8.2	114.8	2.4	3.2						
07/06/13	1834-1849	29/Fine	Calm	13.8	Surface	25.8	25.3	25.4	8.3	117.3	117.7	1.8	2.6	2.8	2.1	2.6	3.0
						25.8	25.4	8.4	118.0	1.8	3.0						
						25.6	25.5	8.2	116.0	2.0	2.8						
						25.7	25.5	8.2	115.3	2.1	2.8						
						25.4	25.8	8.0	112.3	2.4	3.2						
						25.3	25.9	8.0	112.6	2.4	3.4						
10/06/13	1930-1940	30/Cloudy	Small Wave	15.2	Surface	25.8	26.5	26.5	6.8	95.9	95.7	2.4	3.4	3.5	2.7	3.4	3.7
						25.7	26.6	5.7	81.4	2.6	3.6						
						24.5	26.7	5.8	82.0	2.6	3.4						
						24.3	27.0	5.3	75.2	3.2	4.2						
						24.2	27.1	5.3	74.5	3.2	4.0						
						25.8	26.4	6.3	88.7	2.6	3.6						
14/06/13	0840-0855	24/Cloudy	Small Wave	15.0	Surface	25.9	26.4	26.4	6.2	87.5	88.1	2.6	3.8	3.7	2.7	3.8	4.0
						24.7	26.6	5.9	83.0	2.4	3.8						
						24.8	26.6	5.9	82.6	2.5	3.6						
						24.4	26.9	5.4	74.5	3.1	4.0						
						24.4	26.9	5.4	74.9	3.0	4.0						
						25.5	26.5	6.1	85.6	3.3	4.0						
17/06/13	1210-1225	30/Cloudy	Small Wave	15.2	Middle	25.0	26.9	27.0	5.9	82.1	82.3	3.1	4.2	4.3	3.2	4.2	4.3
						24.9	27.0	5.9	82.4	3.2	4.4						
						24.8	27.0	5.6	78.9	3.3	4.4						
						24.7	27.0	5.7	79.4	3.3	4.4						
						25.6	26.3	5.9	81.8	3.4	4.4						
						25.6	26.4	5.8	81.5	3.5	4.2						
19/06/13	1513-1528	30/Fine	Small Wave	16.8	Middle	25.0	26.6	26.7	5.8	80.6	80.8	3.6	4.6	4.7	3.6	4.6	4.6
						24.9	26.7	5.8	81.0	3.5	4.8						
						24.9	26.9	5.6	78.1	3.5	4.8						
						24.8	26.9	5.5	77.3	3.7	4.6						
						25.7	26.5	5.9	83.3	3.4	4.2						
						25.8	26.6	5.9	82.7	3.5	4.4						
21/06/13	1708-1726	29/Cloudy	Small Wave	16.6	Middle	25.2	26.8	26.8	5.7	79.7	79.9	3.3	4.2	4.3	3.4	4.2	4.4
						25.1	26.8	5.7	80.1	3.4	4.4						
						25.0	26.9	5.5	76.3	3.5	4.6						
						25.0	27.0	5.5	77.1	3.6	4.4						
						25.7	26.5	5.9	83.3	3.4	4.2						
						25.8	26.6	5.9	82.7	3.5	4.4						

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	Depth-average	Value	Average	Depth-average
24/06/13	1315-1331	25/Drizzle	Small Wave	12.4	Surface	1.0	27.2	24.3	6.0	24.3	86.0	3.1	4.2	3.1	4.3	4.4		
							27.2	24.3	5.9	24.3	85.9	3.1	4.4					
							26.8	24.5	5.8	24.5	83.6	3.3	4.4					
					Middle	6.2	26.9	24.5	5.7	24.5	83.0	3.3	4.0	3.3	4.2			
							26.7	24.7	5.3	24.7	76.1	3.6	4.6					
							26.8	24.7	5.3	24.7	76.8	3.6	4.8					
26/06/13	1446-1504	28/Cloudy	Small Wave	12.3	Surface	1.0	27.2	24.4	5.9	24.4	84.9	3.2	4.0	3.2	4.1	4.4		
							27.1	24.4	5.9	24.4	85.1	3.2	4.0					
							26.8	24.6	5.7	24.6	82.0	3.3	4.4					
					Middle	6.2	26.7	24.5	5.8	24.5	82.3	3.3	4.2	3.3	4.3			
							26.6	24.8	5.3	24.8	76.7	3.6	4.6					
							26.6	24.7	5.3	24.7	76.6	3.6	4.8					
28/06/13	1608-1630	29/Cloudy	Small Wave	13.2	Surface	1.0	27.2	26.1	6.1	26.1	88.5	2.6	3.8	2.7	3.7	4.0		
							27.1	26.1	6.1	26.1	88.3	2.7	3.6					
							26.9	26.4	6.0	26.4	87.1	2.8	3.8					
					Middle	6.6	27.0	26.3	6.1	26.3	87.4	2.9	4.0	2.9	3.9			
							27.0	26.5	5.7	26.5	82.5	3.2	4.2					
							27.0	26.6	5.8	26.6	82.8	3.2	4.4					

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	Ave.	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
03/06/13	0916-0930	29/Fine	Calm	13.8	Surface	25.8	25.2	8.4	25.2	118.6	118.9	1.7	3.0	2.9	3.1			
						25.7	25.2	8.4	25.2	119.1	1.7	2.8	2.8					
						25.7	25.4	8.3	25.4	117.3	2.0	2.8	2.9					
						25.7	25.3	8.3	25.3	116.5	2.0	3.0	3.0					
						25.6	25.6	8.1	25.7	114.0	2.3	3.4	3.5					
						25.5	25.7	8.1	25.7	114.6	2.3	3.6	3.6					
05/06/13	1034-1049	28/Cloudy	Calm	13.6	Surface	25.8	25.2	8.4	25.3	117.9	118.2	1.7	3.0	3.0	3.3			
						25.8	25.3	8.4	25.3	118.5	1.8	3.2	3.2					
						25.8	25.4	8.3	25.5	116.7	2.0	3.2	3.3					
						25.7	25.5	8.2	25.5	115.7	2.1	3.4	3.4					
						25.6	25.7	8.0	25.8	112.9	2.4	3.6	3.6					
						25.5	25.8	8.1	25.8	113.7	2.4	3.6	3.6					
07/06/13	1212-1226	28/Fine	Calm	13.4	Surface	25.8	25.3	8.3	25.4	116.6	116.9	1.8	3.0	3.1	3.2			
						25.7	25.4	8.3	25.4	117.1	1.9	3.2	3.2					
						25.6	25.4	8.2	25.5	115.3	2.1	3.0	3.1					
						25.6	25.5	8.1	25.5	114.6	2.1	3.2	3.2					
						25.5	25.7	7.9	25.8	111.6	2.4	3.4	3.5					
						25.4	25.8	7.9	25.8	111.9	2.5	3.6	3.6					
10/06/13	1330-1340	32/Cloudy	Small Wave	14.8	Surface	25.9	26.5	6.7	26.5	95.2	95.0	2.5	3.7	3.7	3.9			
						25.8	26.4	6.7	26.5	94.8	2.5	3.8	3.8					
						24.6	26.6	5.7	26.7	80.7	2.7	3.8	3.7					
						24.6	26.7	5.7	26.7	81.3	2.6	3.6	3.7					
						24.4	26.9	5.3	27.0	74.5	3.2	4.2	4.3					
						24.3	27.0	5.2	27.0	73.8	3.3	4.4	4.4					
14/06/13	1512-1527	25/Cloudy	Small Wave	14.6	Surface	25.7	26.3	6.2	26.4	87.8	87.3	2.7	3.8	3.7	3.8			
						25.8	26.4	6.2	26.4	86.7	2.7	3.6	3.6					
						24.7	26.7	5.9	26.7	82.2	2.5	3.6	3.7					
						24.8	26.6	5.8	26.8	81.7	2.5	3.8	3.8					
						24.5	26.8	5.3	26.8	73.7	3.1	4.2	4.1					
						24.4	26.8	5.3	26.8	74.1	3.1	4.0	4.1					
17/06/13	1812-1827	28/Cloudy	Small Wave	16.8	Surface	25.5	26.4	6.0	26.4	84.4	84.1	3.3	4.2	4.3	4.4			
						25.4	26.4	6.0	26.4	83.7	3.4	4.4	4.4					
						24.9	27.0	5.8	27.0	80.8	3.2	4.0	4.2					
						25.0	26.9	5.8	27.0	81.2	3.2	4.4	4.4					
						24.7	27.1	5.6	27.1	77.6	3.4	4.6	4.7					
						24.8	27.0	5.6	27.1	78.2	3.4	4.8	4.8					
19/06/13	0912-0927	27/Cloudy	Small Wave	16.4	Surface	25.5	26.5	6.0	26.5	83.8	83.5	3.4	4.3	4.3	4.3			
						25.6	26.5	5.9	26.5	83.1	3.5	4.2	4.2					
						25.0	27.0	5.7	27.1	80.1	3.3	4.0	4.1					
						25.1	27.1	5.8	27.1	80.6	3.3	4.2	4.2					
						24.9	27.2	5.5	27.2	76.8	3.5	4.4	4.6					
						24.8	27.1	5.6	27.1	77.5	3.5	4.8	4.8					
21/06/13	1038-1056	28/Cloudy	Small Wave	16.2	Surface	25.7	26.4	5.9	26.5	82.6	82.3	3.5	4.2	4.3	4.5			
						25.7	26.5	5.9	26.5	82.0	3.4	4.4	4.4					
						25.1	26.7	5.6	26.8	79.0	3.4	4.2	4.4					
						25.0	26.8	5.7	26.8	79.4	3.4	4.6	4.6					
						25.0	27.0	5.4	27.0	75.6	3.5	4.6	4.7					
						24.9	27.0	5.5	27.0	76.4	3.6	4.8	4.8					

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
24/06/13	1912-1927	28/Drizzle	Small Wave	18.8	Surface	1.0	27.2	24.4	5.8	24.4	84.5	3.7	4.8	3.7	4.4	4.6		
							27.3	24.3	5.9	24.7	85.0	3.7	4.4					
					Middle	9.4	26.8	24.7	6.0	24.7	86.4	3.4	3.5	3.4	3.5	4.4		
							26.8	24.6	6.0	24.7	86.8	3.4	4.6					
					Bottom	17.8	26.7	24.7	5.4	24.7	77.6	3.5	4.8	3.5	4.7			
							26.7	24.7	5.4	24.7	78.2	3.5	4.6					
26/06/13	0807-0822	28/Drizzle	Small Wave	18.6	Surface	1.0	27.0	24.4	5.9	24.4	85.9	2.9	3.8	2.9	4.0			
							27.1	24.4	6.0	24.6	86.1	2.9	4.2					
					Middle	9.3	26.6	24.5	5.9	24.6	86.0	3.1	3.1	3.1	4.1			
							26.7	24.6	6.0	24.8	86.8	3.1	4.0					
					Bottom	17.6	26.7	24.8	5.4	24.8	78.0	3.9	5.0	3.9	4.9			
							26.6	24.8	5.4	24.8	77.8	3.9	4.8					
28/06/13	0915-0931	29/Cloudy	Small Wave	18.8	Surface	1.0	27.2	26.4	6.0	26.4	86.1	3.1	4.2	3.1	4.3			
							27.0	26.3	5.9	26.3	85.8	3.2	4.4					
					Middle	9.4	27.0	26.3	6.1	26.3	87.5	2.8	2.9	2.8	3.7			
							27.0	26.3	6.1	26.5	88.1	2.9	3.6					
					Bottom	17.8	26.8	26.5	6.0	26.5	86.4	2.5	3.4	2.5	3.5			
							26.9	26.5	6.0	26.5	86.1	2.5	3.6					

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)		Dissolved Oxygen		Turbidity (NTU)		Suspended Solids (mg/L)	
							Value	Ave.	Value	Average	Value	Average	Value	Average	Value	Average
03/06/13	1412-1427	32/Fine	Small Wave	18.6	Surface	25.9	25.2	25.3	8.1	8.1	114.4	114.7	1.6	1.7	2.8	2.9
					Middle	25.9	25.3	8.1	8.1	114.9		1.7		3.0		
					Bottom	25.5	25.6	8.0	8.0	112.7	112.6	2.1	2.1	3.2	3.1	
						25.6	25.5	7.9	7.9	112.5		2.1		3.0		
						25.3	25.8	7.7	7.7	109.5	109.2	2.3	2.3	3.4	3.2	
						25.3	25.8	7.7	7.7	108.9		2.3		3.0		
05/06/13	1613-1627	29/Cloudy	Calm	18.4	Surface	25.9	25.2	25.3	8.4	8.3	118.1	117.9	1.9	1.8	2.8	2.9
					Middle	25.8	25.3	8.3	8.3	117.6		1.8		3.0		
					Bottom	25.5	25.6	8.1	8.1	114.5	114.7	2.2	2.3	3.2	3.3	
						25.6	25.5	8.1	8.1	114.8		2.3		3.4		
						25.3	25.7	7.9	7.9	111.3	111.7	2.6	2.6	3.8	3.7	
						25.2	25.8	7.9	7.9	112.0		2.6		3.6		
07/06/13	1813-1827	29/Fine	Calm	18.4	Surface	25.9	25.2	25.2	8.2	8.2	116.3	116.0	1.9	1.9	2.8	2.8
					Middle	25.8	25.2	8.2	8.2	115.6		1.9		2.8		
					Bottom	25.5	25.4	8.0	8.0	112.6	112.8	2.3	2.4	3.4	3.5	
						25.6	25.5	8.0	8.0	113.0		2.4		3.6		
						25.4	25.9	7.8	7.8	109.3	109.7	2.7	2.7	3.8	3.7	
						25.4	26.0	7.8	7.8	110.0		2.7		3.6		
10/06/13	1910-1925	30/Cloudy	Small Wave	19.6	Surface	25.2	26.0	26.1	6.0	6.0	83.8	83.7	2.9	2.9	3.8	3.9
					Middle	25.3	26.1	6.0	6.0	83.5		2.9		4.0		
					Bottom	24.8	26.4	5.9	5.9	83.0	83.2	2.7	2.7	3.6	3.7	
						24.9	26.5	6.0	6.0	83.4		2.8		3.8		
						24.6	26.8	5.7	5.7	79.2	78.8	3.0	3.1	4.0	4.1	
						24.5	26.8	5.6	5.6	78.4		3.1		4.2		
14/06/13	0814-0830	24/Cloudy	Small Wave	19.4	Surface	25.4	25.9	25.9	5.9	5.9	83.1	83.0	2.8	2.8	3.8	3.9
					Middle	25.4	25.8	5.9	5.9	82.8		2.9		4.0		
					Bottom	24.9	26.3	5.7	5.7	79.8	80.1	3.0	3.0	4.0	4.1	
						24.9	26.4	5.7	5.7	80.3		3.0		4.2		
						24.5	26.8	5.7	5.7	79.6	79.1	3.1	3.2	4.4	4.3	
						24.6	26.8	5.6	5.6	78.5		3.2		4.2		
17/06/13	1145-1200	30/Cloudy	Small Wave	18.8	Surface	25.5	26.4	26.4	5.8	5.8	81.5	81.3	3.4	3.5	4.2	4.4
					Middle	25.5	26.3	5.8	5.8	81.0		3.5		4.6		
					Bottom	24.9	26.9	5.7	5.7	79.2	79.0	3.7	3.7	4.8	4.9	
						25.0	27.0	5.6	5.6	78.8		3.6		5.0		
						24.8	27.0	5.4	5.4	75.9	75.7	3.7	3.7	4.6	4.7	
						24.8	26.9	5.4	5.4	75.4		3.7		4.8		
19/06/13	1447-1503	30/Fine	Small Wave	18.4	Surface	25.6	26.4	26.4	6.0	6.0	82.9	83.2	3.6	3.6	4.8	4.6
					Middle	25.6	26.4	6.0	6.0	83.5		3.6		4.4		
					Bottom	25.1	26.7	5.6	5.6	78.5	78.8	3.3	3.4	4.2	4.4	
						25.1	26.7	5.7	5.7	79.1		3.4		4.6		
						24.9	26.9	5.4	5.4	76.0	76.3	3.9	3.9	5.2	5.1	
						24.9	27.0	5.5	5.5	76.6		3.9		5.0		
21/06/13	1646-1703	29/Cloudy	Small Wave	18.4	Surface	25.8	26.6	26.6	5.7	5.6	79.4	79.1	3.6	3.6	4.4	4.6
					Middle	25.8	26.6	5.6	5.6	78.8		3.6		4.8		
					Bottom	25.3	26.8	5.5	5.5	77.1	77.0	3.8	3.8	4.8	4.7	
						25.2	26.9	5.5	5.5	76.8		3.8		4.6		
						25.1	27.1	5.3	5.3	73.6	73.4	3.9	3.8	4.8	4.9	
						25.0	27.2	5.2	5.2	73.2		3.8		5.0		

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	Middle		Bottom	Value	Ave.	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average
24/06/13	1245-1300	25/Drizzle	Small Wave	18.4	Surface	1.0	27.1	24.3	5.9	24.3	85.2	2.9	3.6	3.0	3.7	3.4	4.0	4.2
							27.2	24.3	5.9	24.3	85.3	3.0	3.8					
							26.7	24.4	6.0	24.5	86.8	3.2	4.2					
					Middle	9.2	26.8	24.5	6.0	24.5	86.4	3.2	4.0	3.2	4.1	3.4	4.0	
							26.8	24.7	5.3	24.8	76.8	4.0	4.8					
							26.8	24.8	5.3	24.8	76.5	3.9	5.0					
26/06/13	1422-1439	28/Cloudy	Small Wave	17.9	Surface	1.0	27.1	24.3	5.9	24.4	85.2	3.0	3.8	3.0	3.9	3.4	4.2	4.4
							27.1	24.4	5.9	24.4	85.4	3.0	4.0					
							26.7	24.5	5.8	24.5	83.4	3.2	4.2					
					Middle	9.0	26.7	24.5	5.8	24.5	83.3	3.2	4.4	3.2	4.3	3.4	4.4	
							26.5	24.7	5.2	24.7	75.9	3.9	4.8					
							26.6	24.7	5.2	24.7	75.7	3.9	5.2					
28/06/13	1546-1603	29/Cloudy	Small Wave	18.1	Surface	1.0	27.1	26.0	5.8	26.1	84.3	3.4	4.2	3.4	4.3	3.0	3.8	4.0
							27.2	26.1	5.8	26.1	83.8	3.4	4.4					
							27.0	26.3	6.0	26.3	85.7	3.0	4.0					
					Middle	9.0	27.0	26.3	6.0	26.3	85.9	3.0	3.8	3.0	3.9	3.0	3.8	
							26.9	26.5	5.8	26.5	84.1	2.7	3.6					
							27.0	26.5	5.9	26.5	84.4	2.7	3.8					

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)			Dissolved Oxygen			Turbidity (NTU)			Suspended Solids (mg/L)								
					Surface	Bottom		Value	Ave.	Value	Average	Depth-average	Value	Average	Value	Average	Value	Depth-average	Value	Average	Value	Depth-average					
03/06/13	0852-0907	29/Fine	Calm	18.4	Surface	1.0	25.8	25.2	8.3	8.3	117.6	117.3	1.9	1.8	3.0	2.9											
							25.8	25.2	8.3	8.3	117.0	117.3	1.8	1.8	2.8	2.9											
					Middle	9.2	25.5	25.5	8.1	8.1	114.1	114.3	2.2	2.3	3.2	3.3	2.2										
							25.5	25.6	8.1	8.1	114.5	114.3	2.3	2.3	3.4	3.3											
					Bottom	17.4	25.3	25.9	7.9	7.9	111.2	111.6	2.6	2.6	3.6	3.7	7.9										
							25.3	25.9	7.9	7.9	111.9	111.6	2.6	2.6	3.8	3.7											
05/06/13	1013-1027	28/Cloudy	Calm	18.2	Surface	1.0	25.8	25.2	8.3	8.3	116.9	116.6	1.9	1.9	2.8	2.8											
							25.7	25.1	8.2	8.2	116.2	116.6	1.9	1.9	2.8	2.8											
					Middle	9.1	25.5	25.6	8.0	8.0	113.2	113.3	2.3	2.3	3.2	3.3	2.3										
							25.4	25.5	8.1	8.1	113.4	113.3	2.4	2.4	3.4	3.3											
					Bottom	17.2	25.4	25.8	7.8	7.8	110.0	110.4	2.7	2.7	3.8	3.7	7.8										
							25.3	25.8	7.9	7.9	110.7	110.4	2.7	2.7	3.6	3.7											
07/06/13	1148-1203	28/Fine	Calm	17.8	Surface	1.0	25.8	25.2	8.2	8.2	115.6	115.3	2.0	2.0	2.8	2.9											
							25.8	25.2	8.1	8.1	115.0	115.3	1.9	1.9	3.0	3.0											
					Middle	8.9	25.6	25.5	7.9	7.9	112.0	112.2	2.4	2.4	3.4	3.5	2.4										
							25.5	25.4	8.0	8.0	112.3	112.2	2.5	2.5	3.6	3.5											
					Bottom	16.8	24.3	25.8	7.7	7.7	108.6	109.0	2.8	2.8	3.8	3.7	7.7										
							25.3	25.9	7.8	7.8	109.3	109.0	2.7	2.7	3.6	3.7											
10/06/13	1310-1325	32/Cloudy	Small Wave	19.2	Surface	1.0	25.3	26.0	5.9	5.9	82.8	82.7	2.9	2.9	3.8	3.9											
							25.3	26.0	5.9	5.9	82.5	82.7	3.0	3.0	4.0	4.0											
					Middle	9.6	24.9	26.4	5.9	5.9	82.0	82.2	2.7	2.8	3.8	3.9	2.9										
							25.0	26.4	5.9	5.9	82.4	82.2	2.8	2.8	4.0	4.0											
					Bottom	18.0	24.5	26.7	5.6	5.6	78.2	77.8	3.1	3.1	4.0	4.1	3.1										
							24.5	26.8	5.5	5.5	77.4	77.8	3.2	3.2	4.2	4.1											
14/06/13	1446-1502	25/Cloudy	Small Wave	19.0	Surface	1.0	25.4	25.9	5.9	5.9	82.3	82.2	2.9	2.9	3.8	3.9											
							25.3	26.0	5.9	5.9	82.0	82.2	2.9	2.9	4.0	4.0											
					Middle	9.5	24.9	26.3	5.6	5.7	79.0	79.3	3.1	3.1	4.0	4.1	3.1										
							24.8	26.3	5.7	5.7	79.5	79.3	3.1	3.1	4.2	4.1											
					Bottom	18.0	24.6	26.8	5.6	5.6	78.8	78.2	3.2	3.2	4.0	4.3	3.2										
							24.6	26.9	5.6	5.6	77.6	78.2	3.3	3.3	4.2	4.3											
17/06/13	1746-1802	28/Cloudy	Small Wave	18.4	Surface	1.0	25.4	26.3	5.7	5.7	80.2	80.0	3.5	3.5	4.4	4.3											
							25.4	26.4	5.7	5.7	79.7	80.0	3.6	3.6	4.2	4.3											
					Middle	9.2	24.8	26.8	5.6	5.6	78.0	77.8	3.8	3.7	4.6	4.7	3.7										
							24.9	26.9	5.6	5.6	77.5	77.8	3.7	3.7	4.8	4.7											
					Bottom	17.4	24.9	27.0	5.3	5.3	74.6	74.4	3.8	3.7	4.8	4.7	3.7										
							24.8	27.0	5.3	5.3	74.2	74.4	3.7	3.7	4.6	4.7											
19/06/13	0846-0902	27/Cloudy	Small Wave	18.2	Surface	1.0	25.5	26.4	5.7	5.7	79.5	79.3	3.6	3.6	4.4	4.5											
							25.5	26.5	5.7	5.7	79.0	79.3	3.6	3.6	4.6	4.5											
					Middle	9.1	24.9	26.9	5.5	5.5	77.3	77.2	3.8	3.8	5.0	4.9	3.7										
							25.0	27.0	5.5	5.5	77.0	77.2	3.8	3.8	4.8	4.9											
					Bottom	17.2	24.9	27.1	5.3	5.3	74.0	73.8	3.8	3.9	5.0	4.9	3.9										
							24.9	27.1	5.3	5.3	73.5	73.8	3.9	3.9	4.8	4.9											
21/06/13	1016-1033	28/Cloudy	Small Wave	18.0	Surface	1.0	25.7	26.5	5.6	5.6	78.5	78.3	3.6	3.7	4.6	4.7											
							25.7	26.5	5.6	5.6	78.0	78.3	3.7	3.7	4.8	4.7											
					Middle	9.0	25.2	26.8	5.4	5.4	76.2	76.1	3.9	3.9	5.0	4.9	3.8										
							25.2	26.8	5.4	5.4	75.9	76.1	3.8	3.9	4.8	4.9											
					Bottom	17.0	25.0	27.0	5.2	5.2	72.8	72.6	3.9	3.9	4.8	4.9	3.9										
							25.0	27.1	5.2	5.2	72.4	72.6	3.9	3.9	4.8	4.9											

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	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average	
24/06/13	1850-1905	28/Drizzle	Small Wave	19.0	Surface	27.3	24.3	24.3	5.7	83.1	3.0	4.4	3.0	4.4	3.3	3.0	4.2	4.3
						27.3	24.3	5.7	82.6	3.0	4.0							
					Middle	26.8	24.5	24.5	5.6	81.0	3.9	4.8	3.9	4.7				
						26.9	24.4	24.4	5.5	79.8	4.0	4.6						
					Bottom	26.8	24.8	24.8	5.4	78.3	2.9	3.8	2.9	3.9				
						26.7	24.7	24.7	5.4	78.6	3.0	4.0						
26/06/13	0746-0801	28/Drizzle	Small Wave	18.8	Surface	27.1	24.3	24.4	5.8	83.5	2.2	3.2	2.2	3.3	3.4	2.2	3.3	4.4
						27.2	24.4	24.4	5.8	84.2	2.3	3.4						
					Middle	26.7	24.5	24.5	5.6	79.3	4.2	5.2	4.2	5.1				
						26.8	24.5	24.5	5.6	81.5	4.2	5.0						
					Bottom	26.6	24.7	24.8	5.7	82.8	3.9	4.8	3.8	4.9				
						26.5	24.8	24.8	5.8	83.3	3.8	5.0						
28/06/13	0851-0907	29/Cloudy	Small Wave	19.0	Surface	27.1	26.3	26.4	6.1	87.7	3.0	4.0	3.0	4.0	3.2	3.0	4.4	4.2
						27.2	26.4	26.4	6.1	88.1	3.0	4.0						
					Middle	27.1	26.2	26.2	6.3	90.9	3.4	4.6	3.4	4.4				
						27.0	26.1	26.1	6.3	90.2	3.4	4.2						
					Bottom	26.9	26.6	26.6	6.0	86.9	3.1	4.0	3.1	4.1				
						26.9	26.6	26.6	6.0	86.7	3.1	4.2						

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)		Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)	
							Value	Ave.	Value	Average	Depth-average	Value	Average	Value	Depth-average	Value
03/06/13	1350-1405	32/Fine	Small Wave	18.8	Surface	25.8	25.2	25.3	8.1	114.7	115.0	1.6	2.8	2.0	2.7	3.0
						25.8	25.3	8.2	115.2	1.6	2.6					
						25.6	25.4	8.2	115.8	1.9	3.0					
						25.7	25.5	8.2	116.3	1.9	2.8					
						25.3	25.9	8.0	112.5	2.4	3.4					
						25.4	26.0	7.9	111.9	2.4	3.5					
05/06/13	1550-1606	29/Cloudy	Calm	18.8	Surface	25.7	25.3	25.3	8.4	119.1	119.3	1.9	2.8	2.3	2.7	3.2
						25.8	25.2	8.5	119.5	2.0	2.6					
						25.6	25.4	8.3	117.3	2.2	3.2					
						25.6	25.5	8.3	116.5	2.3	3.4					
						25.3	25.9	8.0	112.5	2.5	3.6					
						25.4	25.9	8.0	112.1	2.6	3.8					
07/06/13	1751-1807	29/Fine	Calm	18.6	Surface	25.8	25.2	25.3	8.3	117.1	117.2	2.0	3.2	2.3	3.0	3.3
						25.9	25.3	8.3	117.2	2.1	2.8					
						25.6	25.5	8.2	115.4	2.3	3.2					
						25.6	25.6	8.1	114.9	2.3	3.4					
						25.5	25.8	7.9	110.7	2.6	3.6					
						25.4	25.9	7.8	110.0	2.7	3.8					
10/06/13	1850-1905	30/Cloudy	Small Wave	18.4	Surface	25.3	26.0	26.1	5.9	81.8	82.2	3.9	5.2	3.8	5.0	4.8
						25.2	26.1	5.9	82.5	3.9	4.8					
						24.6	26.5	5.7	80.4	4.0	5.0					
						24.7	26.5	5.8	80.9	4.0	4.8					
						24.3	26.7	5.6	78.6	3.4	4.4					
						24.3	26.8	5.6	78.3	3.5	4.6					
14/06/13	0753-0809	24/Cloudy	Small Wave	18.6	Surface	25.4	26.0	26.1	5.9	88.3	85.4	3.6	4.8	3.7	4.8	4.7
						25.3	26.1	5.9	82.5	3.5	4.8					
						24.9	26.4	5.9	81.9	3.9	4.8					
						25.0	26.3	5.8	81.3	3.9	5.0					
						24.6	26.7	5.6	78.6	3.5	4.6					
						24.7	26.7	5.7	79.2	3.5	4.4					
17/06/13	1125-1140	30/Cloudy	Small Wave	18.4	Surface	25.4	26.5	26.5	5.8	81.0	80.7	3.5	4.4	3.6	4.3	4.5
						25.5	26.4	5.8	80.4	3.5	4.2					
						24.9	26.8	5.7	79.4	3.4	4.6					
						24.8	26.9	5.7	79.0	3.4	4.2					
						24.8	27.0	5.6	77.8	4.0	4.8					
						24.7	27.0	5.5	77.3	3.9	5.0					
19/06/13	1425-1441	30/Fine	Small Wave	18.0	Surface	25.6	26.3	26.4	5.8	81.3	81.6	3.5	4.8	3.7	4.5	4.7
						25.5	26.4	5.9	81.8	3.5	4.2					
						25.0	26.7	5.5	76.5	3.6	4.8					
						24.9	26.8	5.5	76.8	3.6	4.6					
						24.8	27.0	5.7	79.2	3.8	4.8					
						24.9	27.0	5.7	79.6	3.9	5.2					
21/06/13	1623-1641	29/Cloudy	Small Wave	18.2	Surface	25.8	26.5	26.6	5.6	78.8	79.2	3.7	4.8	3.8	4.7	4.8
						25.7	26.6	5.7	79.5	3.6	4.6					
						25.2	26.9	5.5	77.2	3.6	4.4					
						25.1	27.0	5.5	76.8	3.5	4.6					
						25.0	27.0	5.4	75.6	4.1	5.0					
						25.1	27.1	5.4	75.0	4.1	5.2					

Mid-Ebb Tide

Monitoring Station : C1a

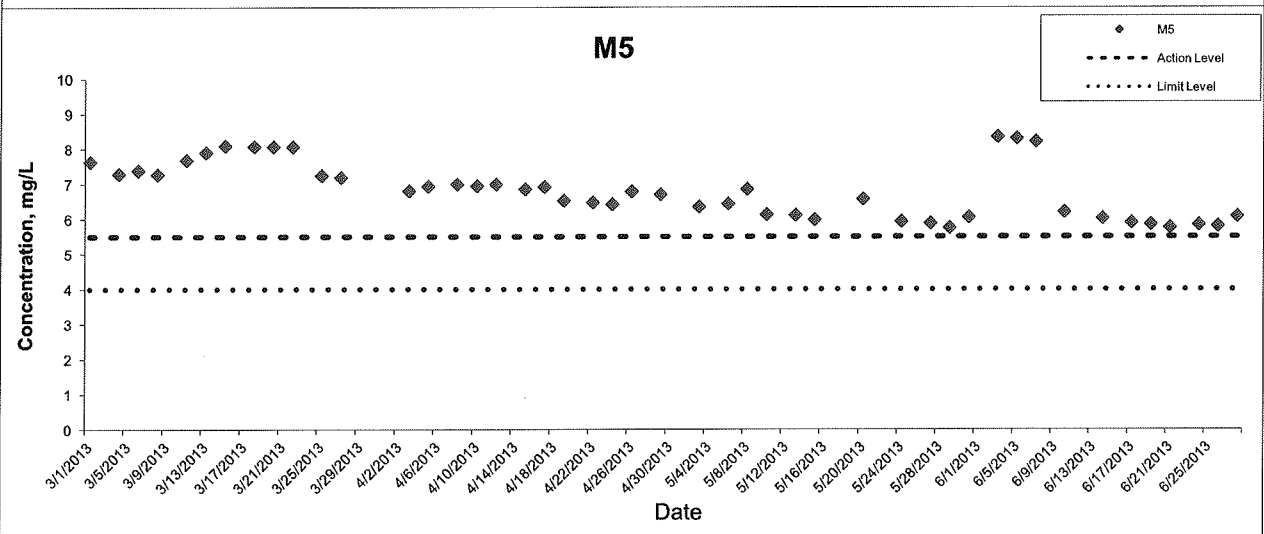
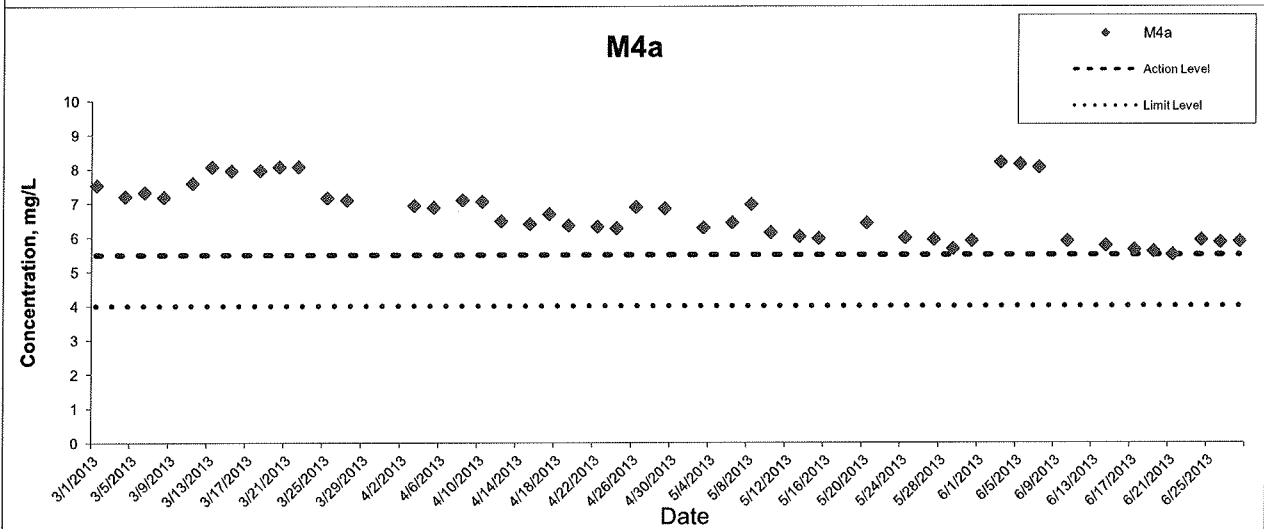
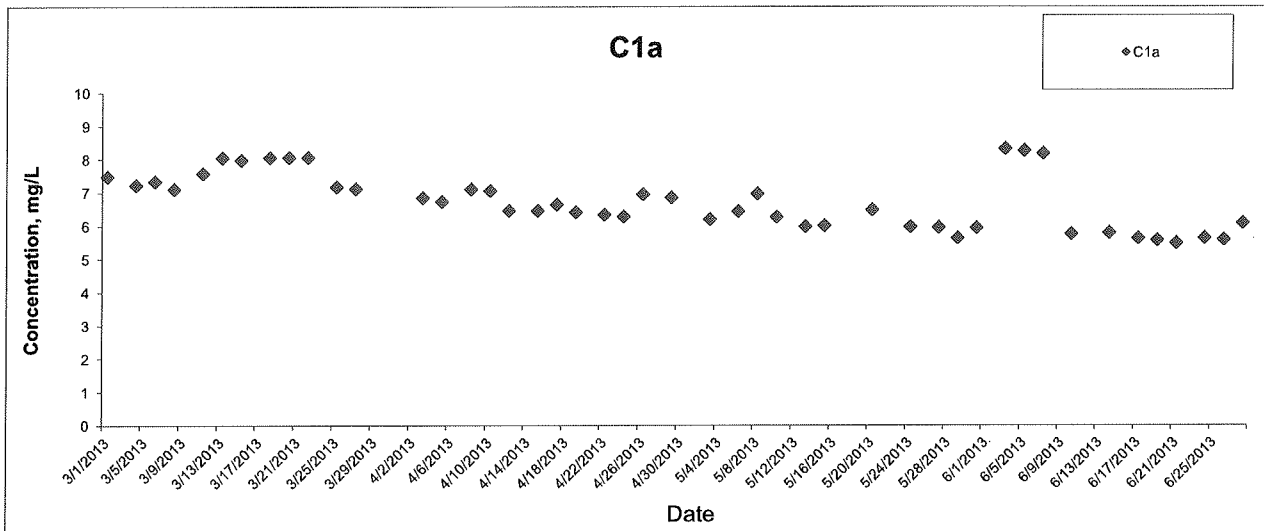
Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)		Water Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
					Surface	Middle		Value	Ave.	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
24/06/13	1225-1240	25/Drizzle	Small Wave	18.6	Surface	1.0	27.2	24.2	5.7	24.3	82.9	2.3	3.4	2.3	3.5	3.4	3.5	4.5
							27.2	24.3	5.8	83.6	2.3	3.6						
							26.8	24.4	5.5	78.7	4.3	5.2						
					Middle	9.3	26.8	24.4	5.6	24.4	80.9	4.3	5.2	3.9	3.9	4.8	4.9	
							26.8	24.4	5.7	82.2	3.9	5.0						
							26.7	24.6	5.7	82.6	3.9	5.0						
26/06/13	1356-1414	28/Cloudy	Small Wave	18.2	Surface	1.0	27.2	24.4	5.7	24.4	82.6	2.3	4.2	2.3	3.5	4.2	4.3	4.8
							27.1	24.3	5.7	82.8	2.3	4.4						
							26.8	24.5	5.5	78.0	4.3	5.2						
					Middle	9.1	26.7	24.6	5.5	24.6	78.2	4.3	5.4	3.9	3.9	4.8	4.9	
							26.6	24.7	5.6	81.4	3.9	5.0						
							26.5	24.8	5.6	81.5	3.9	5.0						
28/06/13	1523-1539	29/Cloudy	Small Wave	18.3	Surface	1.0	27.2	26.2	6.0	26.2	86.7	3.1	4.0	3.1	3.3	4.0	4.2	4.4
							27.2	26.1	6.0	86.9	3.1	4.4						
							27.1	26.2	6.2	89.0	3.5	4.8						
					Middle	9.2	27.0	26.3	6.2	26.3	89.1	3.6	4.8	3.2	3.2	4.8	4.1	
							27.0	26.5	6.0	86.0	3.2	4.2						
							27.0	26.6	5.9	85.5	3.2	4.0						

Mid-Ebb Tide

Monitoring Station : C1a

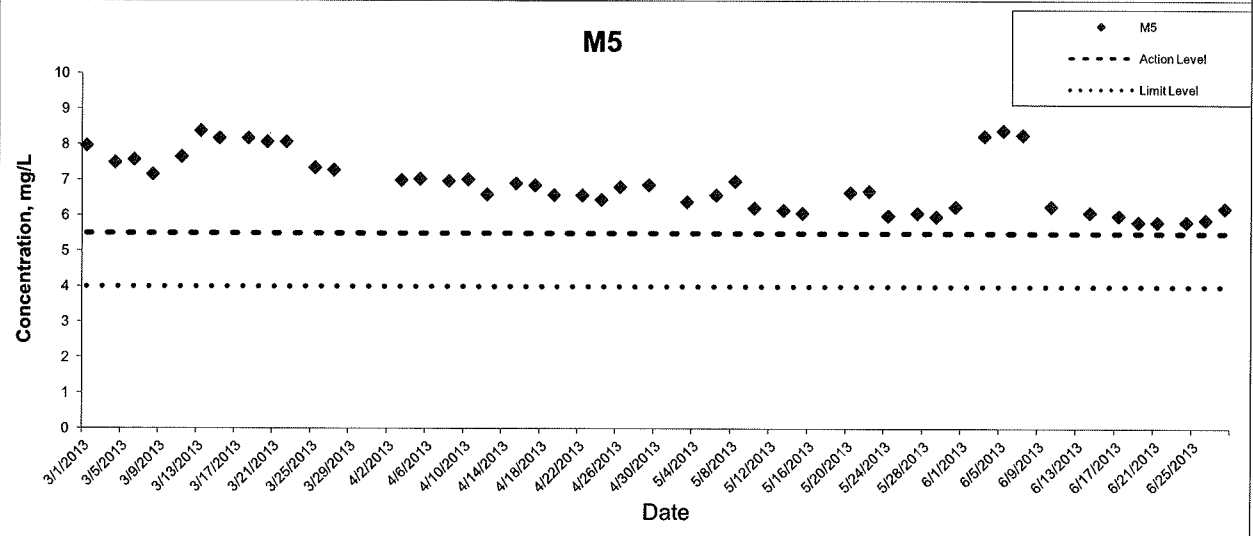
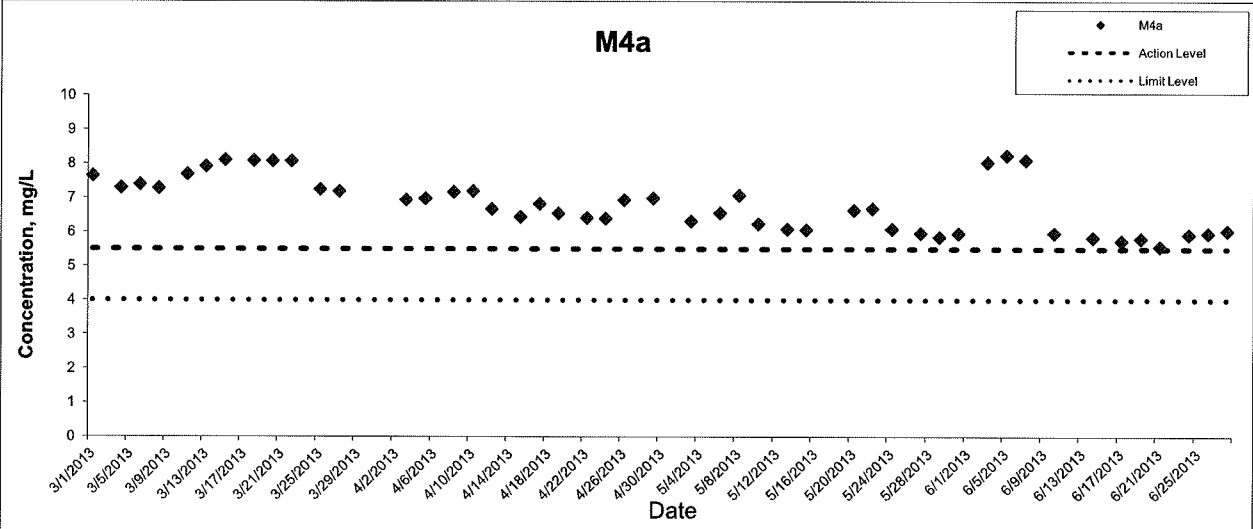
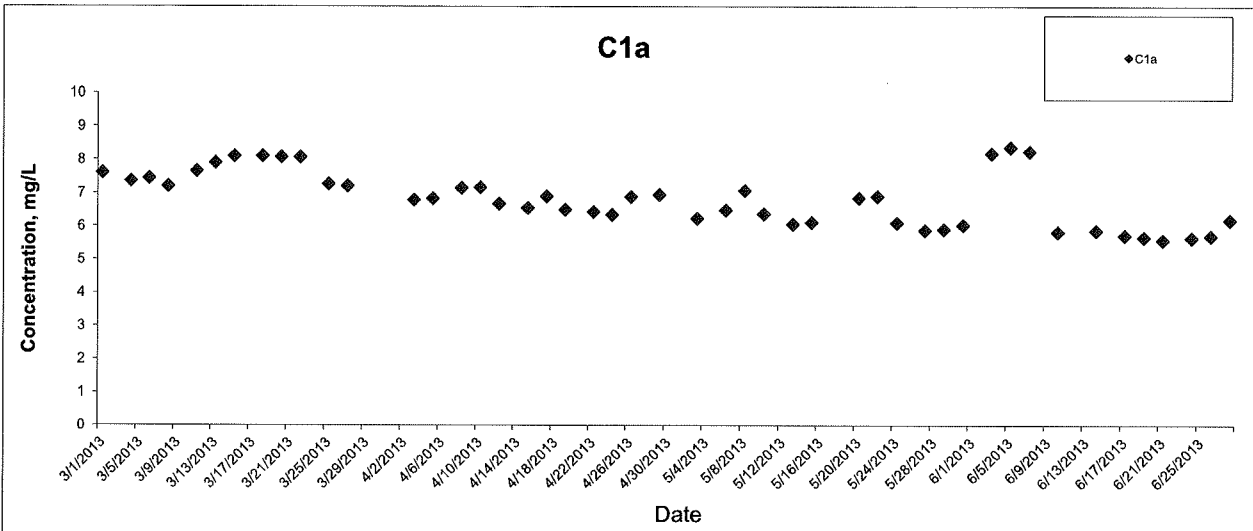
Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)	Water Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)		Dissolved Oxygen		Turbidity (NTU)		Suspended Solids (mg/L)		Depth-average
							Value	Ave.	Value	Average	Value	Average	Value	Average	Value	Average	
03/06/13	0830-0845	29/Fine	Calm	18.6	Surface	25.7	25.1	25.2	8.4	118.3	118.6	1.9	3.0	2.2	3.0	3.5	
					Middle	25.8	25.2	8.4	118.8	116.4	2.0	3.2					
					Bottom	25.5	25.5	8.3	116.7	116.1	2.2	3.6					
05/06/13	0951-1007	28/Cloudy	Calm	18.4	Surface	25.6	25.5	25.5	8.2	116.1	115.7	2.2	3.2	2.3	3.2	3.3	
					Middle	25.5	25.4	8.2	115.2	115.2	2.3	3.4					
					Bottom	25.3	25.9	7.9	111.1	110.9	2.6	3.8					
07/06/13	1126-1141	28/Fine	Calm	18.2	Surface	25.7	25.1	25.2	8.2	116.4	116.7	2.0	3.0	2.4	3.0	3.5	
					Middle	25.8	25.2	8.3	117.0	114.4	2.1	3.2					
					Bottom	25.5	25.5	8.1	114.8	114.4	2.3	3.6					
10/06/13	1250-1305	32/Cloudy	Small Wave	18.0	Surface	25.4	25.9	25.9	7.8	110.0	109.7	2.7	3.8	3.8	3.8	4.9	
					Middle	25.4	26.5	5.7	80.0	79.8	4.0	5.2					
					Bottom	24.4	26.8	5.6	77.8	77.6	3.5	4.6					
14/06/13	1424-1440	25/Cloudy	Small Wave	18.2	Surface	24.3	26.8	26.8	5.5	77.4	84.2	3.7	4.8	3.7	4.8	4.8	
					Middle	25.3	26.0	5.8	81.0	81.1	4.0	5.2					
					Bottom	25.4	26.1	5.8	81.6	80.3	4.0	4.8					
17/06/13	1724-1740	28/Cloudy	Small Wave	18.0	Surface	24.8	26.7	26.8	5.6	78.2	78.0	3.5	4.4	3.7	4.4	4.7	
					Middle	24.7	26.9	5.5	76.6	77.9	3.5	4.6					
					Bottom	24.6	27.0	5.4	76.1	76.4	4.0	5.0					
19/06/13	0824-0840	27/Cloudy	Small Wave	17.8	Surface	25.4	26.4	26.5	5.6	79.0	78.8	3.7	4.8	3.7	4.8	4.8	
					Middle	25.5	26.5	5.6	78.5	77.2	3.6	4.4					
					Bottom	24.9	26.8	5.5	77.4	75.8	3.5	4.8					
21/06/13	0953-1011	28/Cloudy	Small Wave	17.6	Surface	24.8	27.0	27.1	5.4	76.0	75.8	4.1	5.0	3.8	5.0	4.8	
					Middle	24.7	27.1	5.4	75.5	74.2	4.0	5.2					
					Bottom	25.7	26.4	5.6	78.0	74.8	3.7	4.8					

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



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



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

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

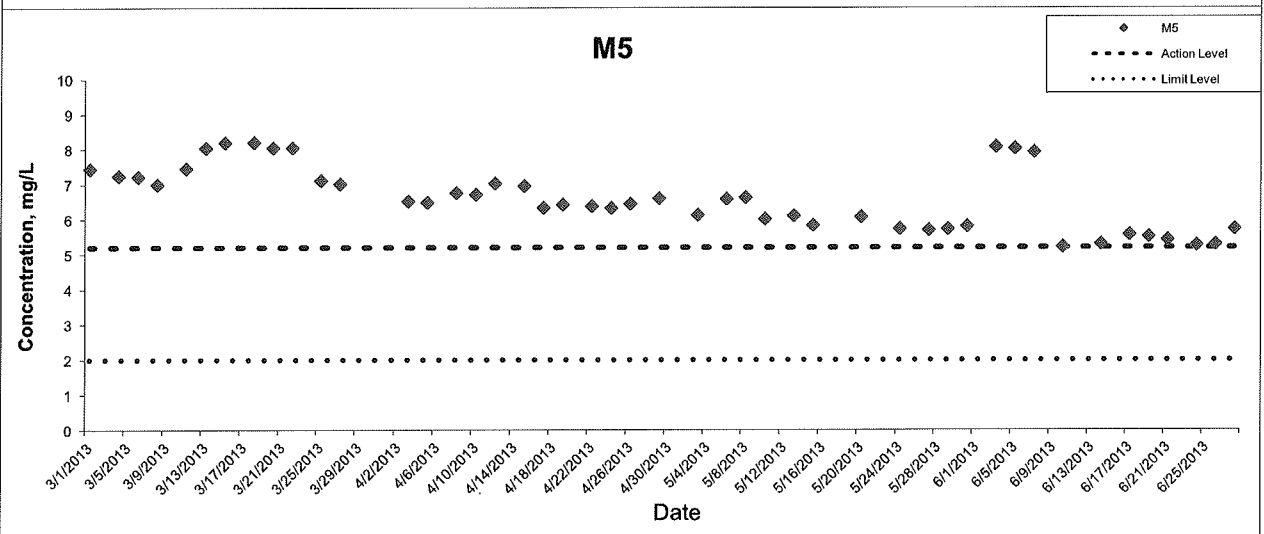
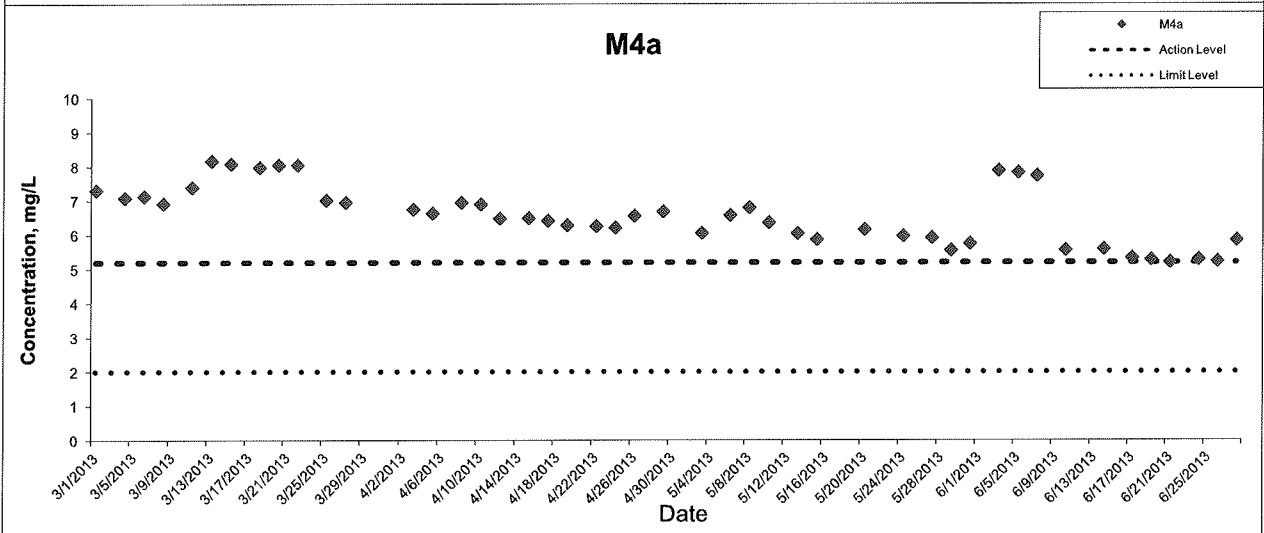
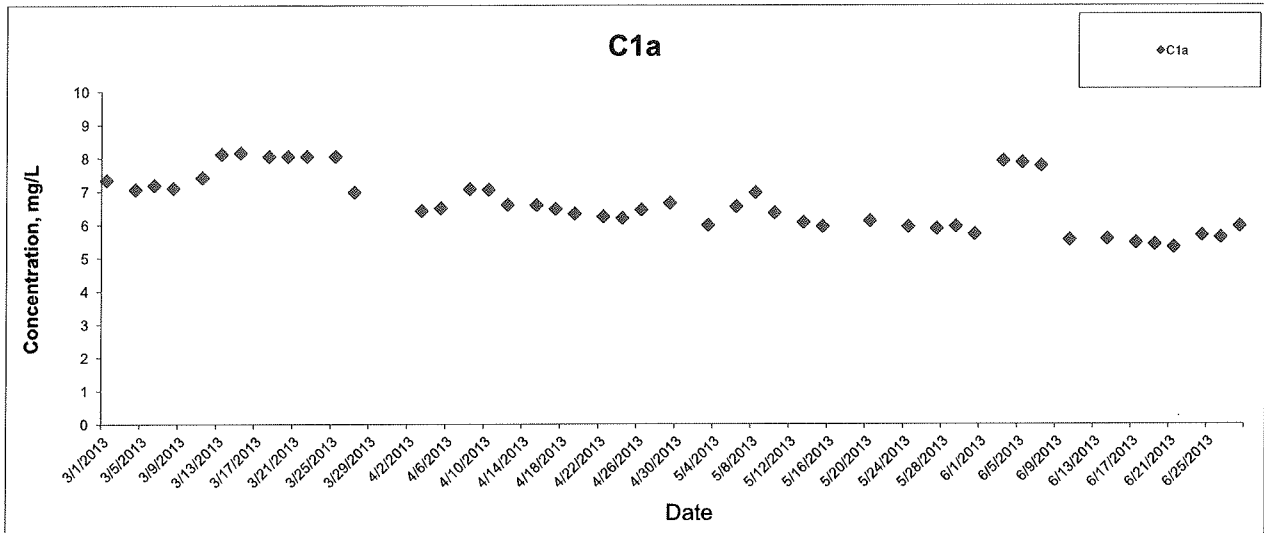


Project No.: 60249820

Date: July 2013

Appendix C

Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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

Graphical Presentation of Impact Water Quality
 Monitoring Results

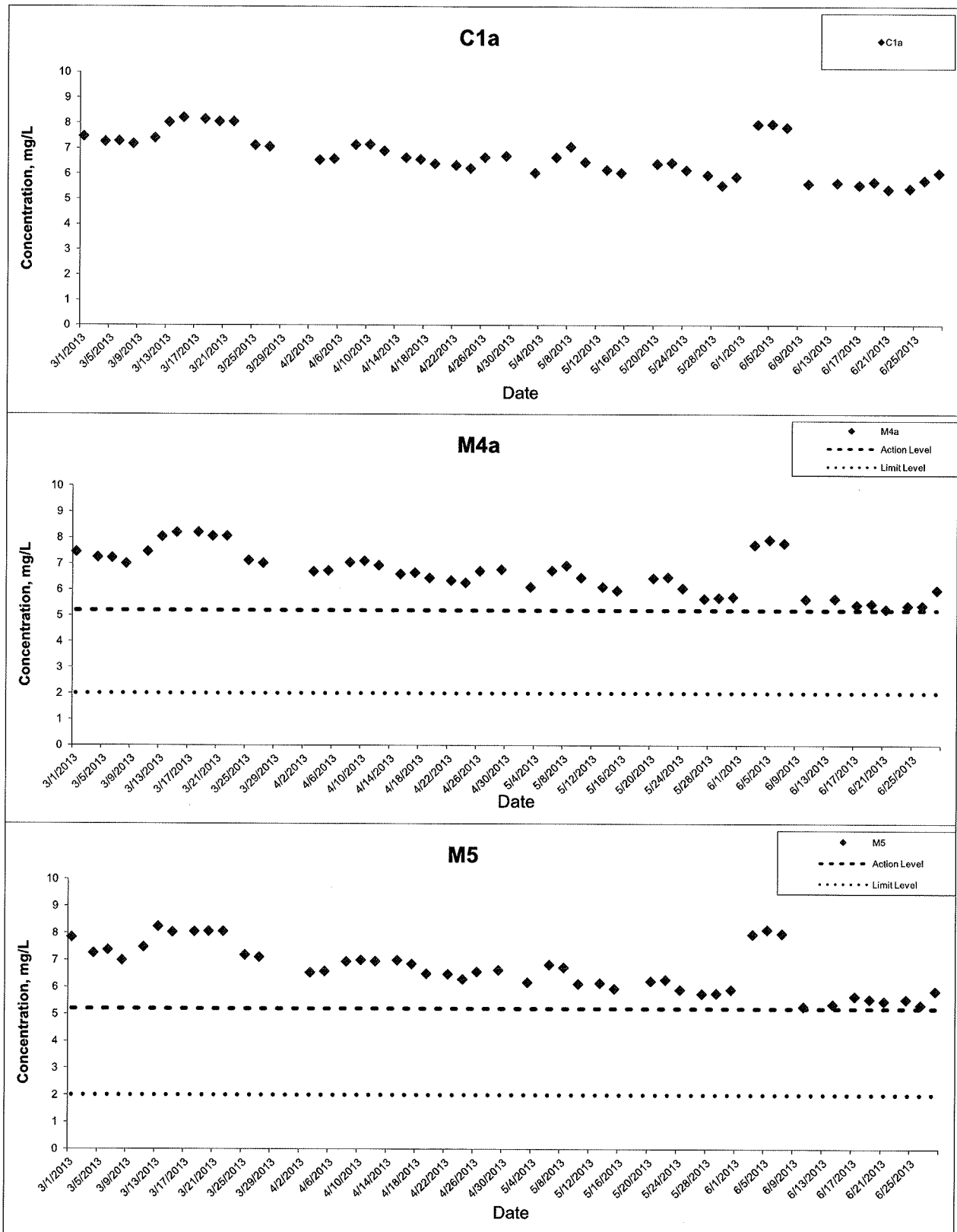


Project No.: 60249820

Date: July 2013

Appendix C

Dissolved Oxygen (Bottom) at Mid-Flood Tide



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HONG KONG - ZHUHAI - MACAO BRIDGE

HONG KONG BOUNDARY CROSSING FACILITIES

- RECLAMATION WORKS

Graphical Presentation of Impact Water Quality
Monitoring Results

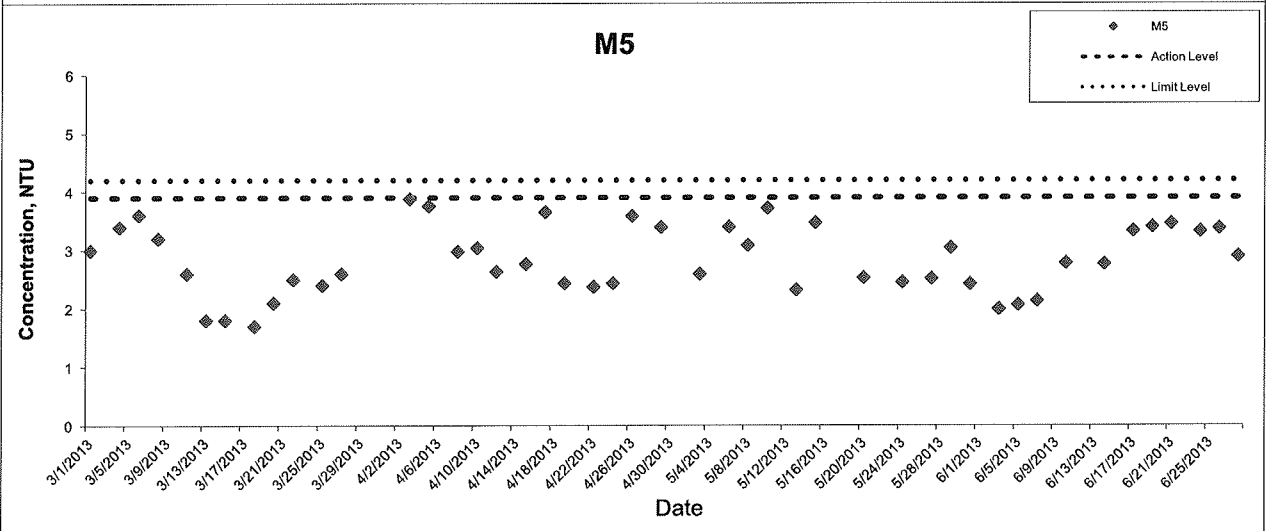
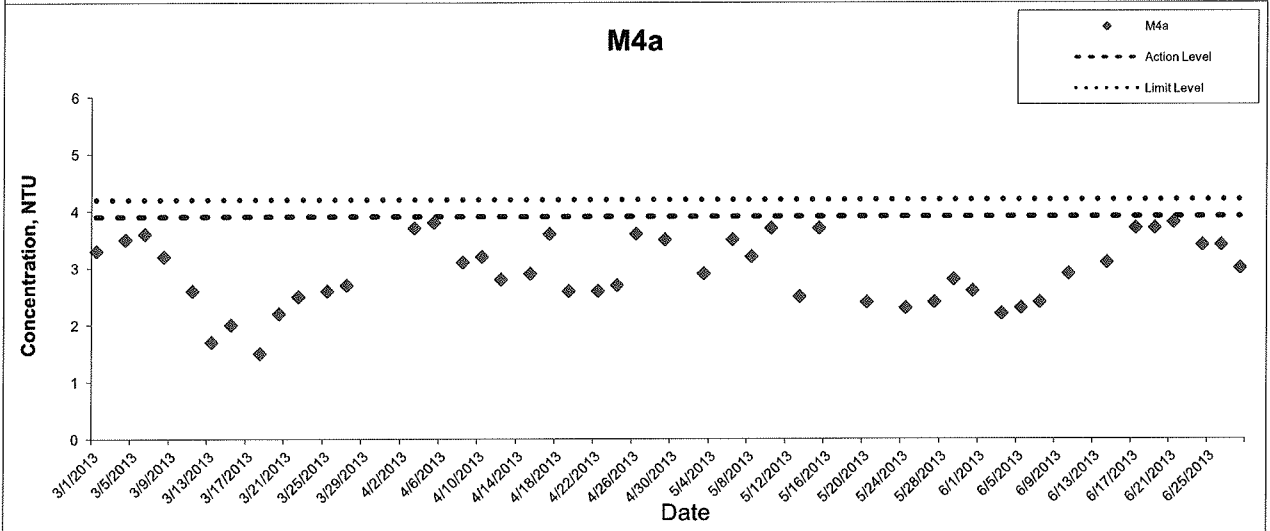
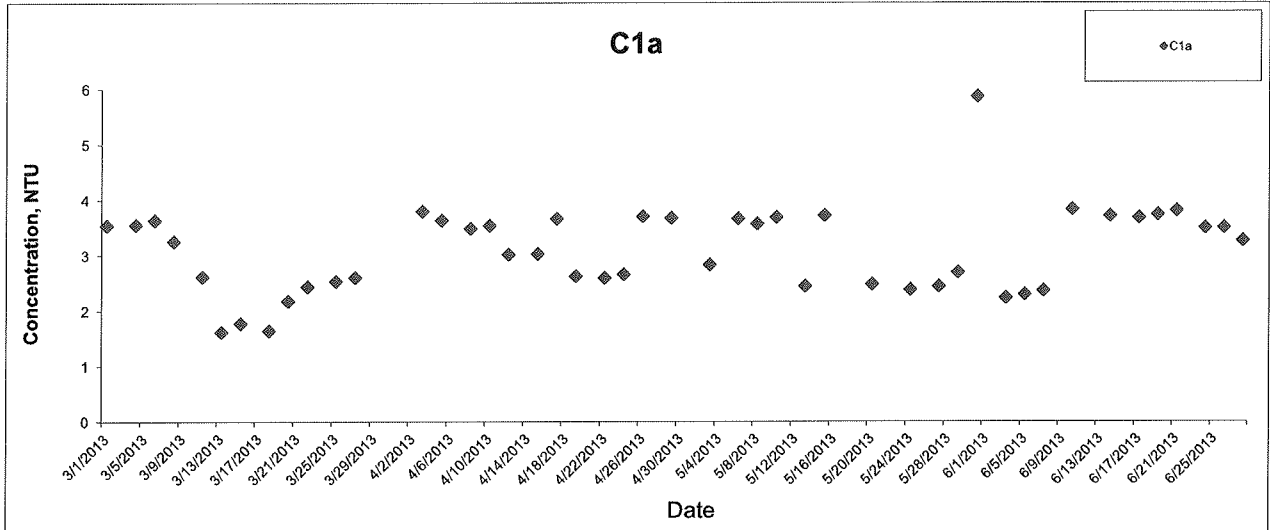


Project No.: 60249820

Date: July 2013

Appendix C

Turbidity at Mid-Ebb Tide



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

Graphical Presentation of Impact Water Quality Monitoring Results

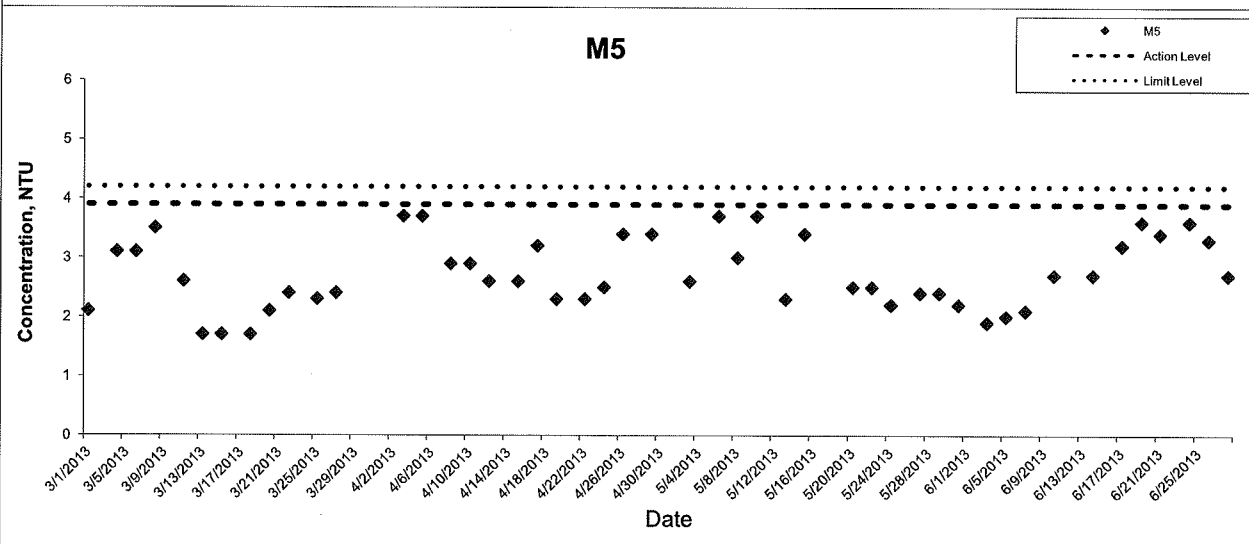
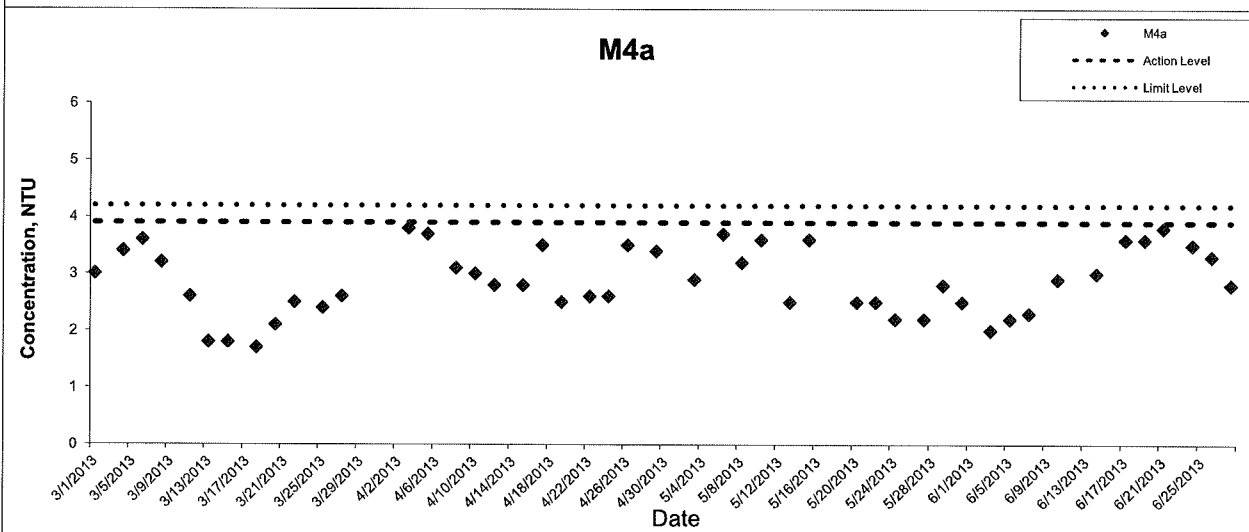
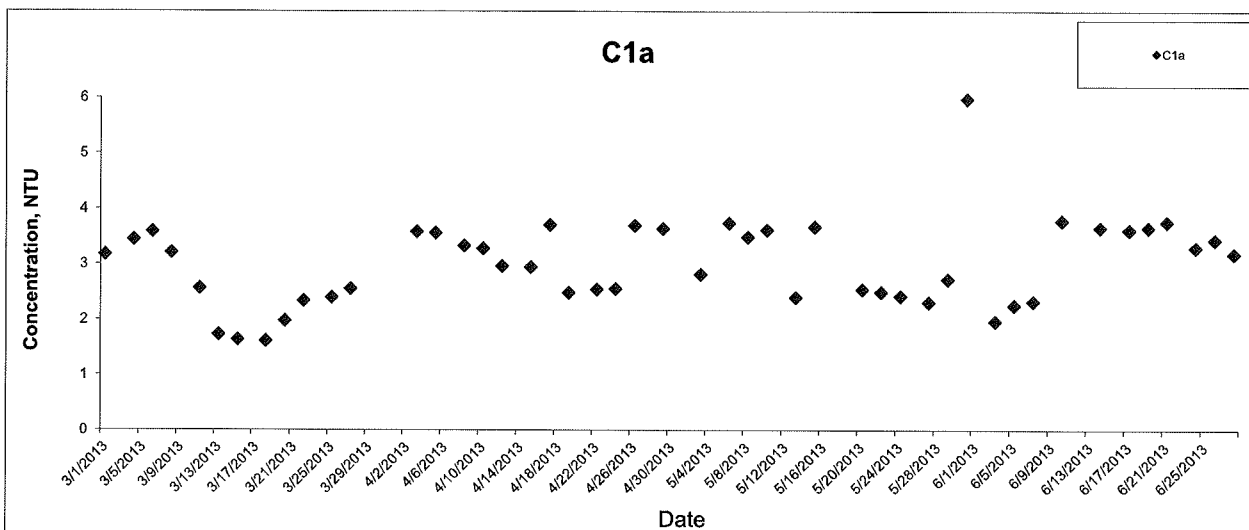


Project No.: 60249820

Date: July 2013

Appendix C

Turbidity at Mid-Flood Tide



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- RECLAMATION WORKS

Graphical Presentation of Impact Water Quality
Monitoring Results

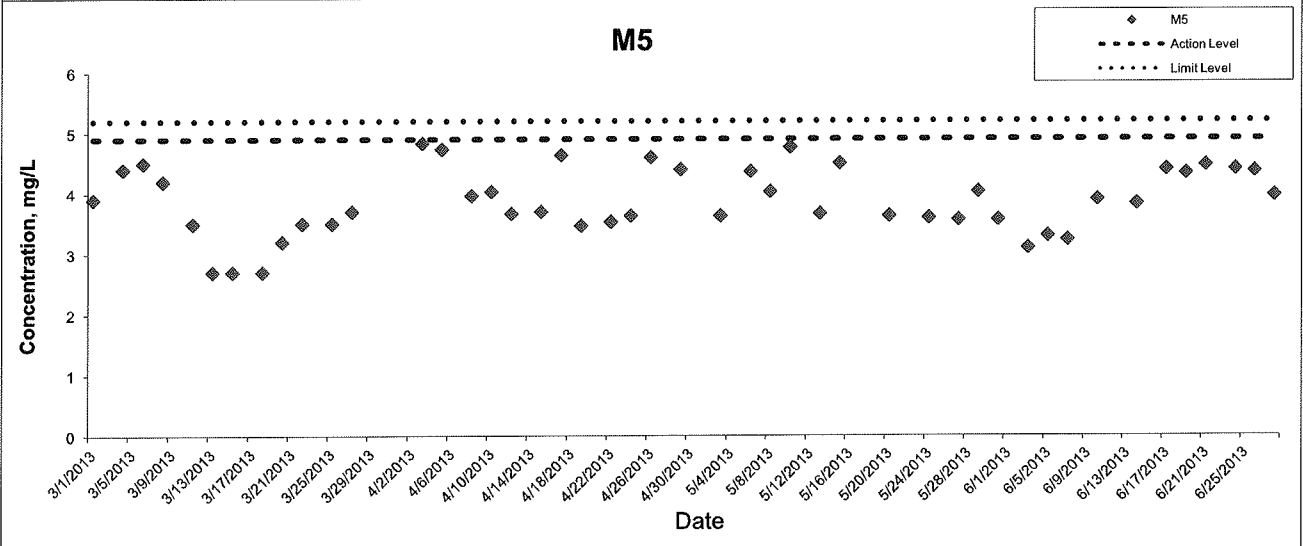
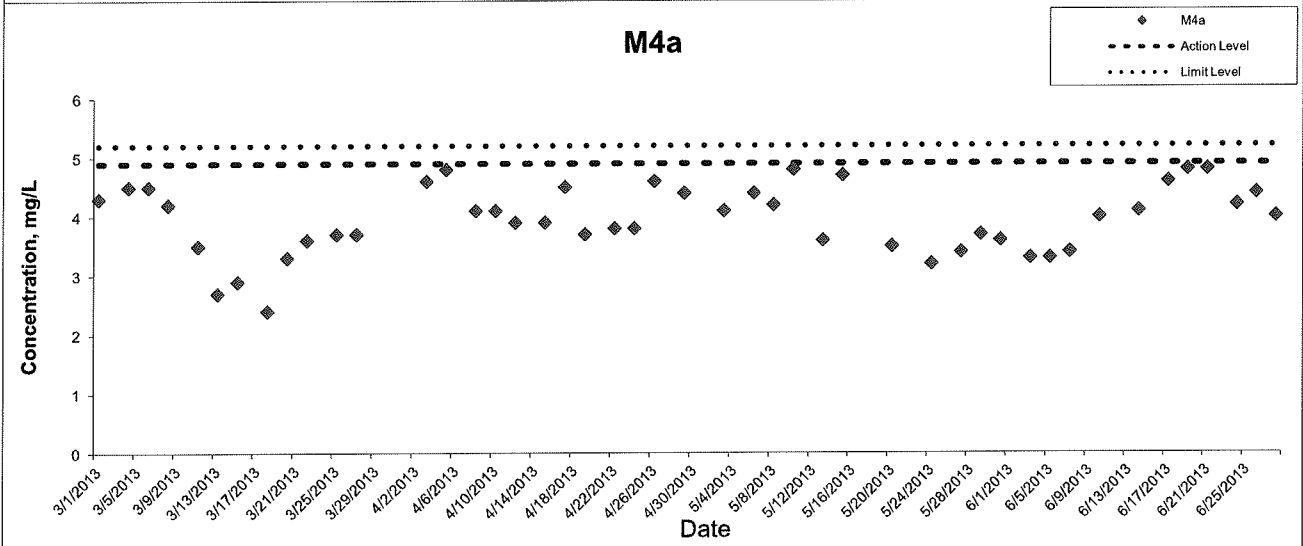
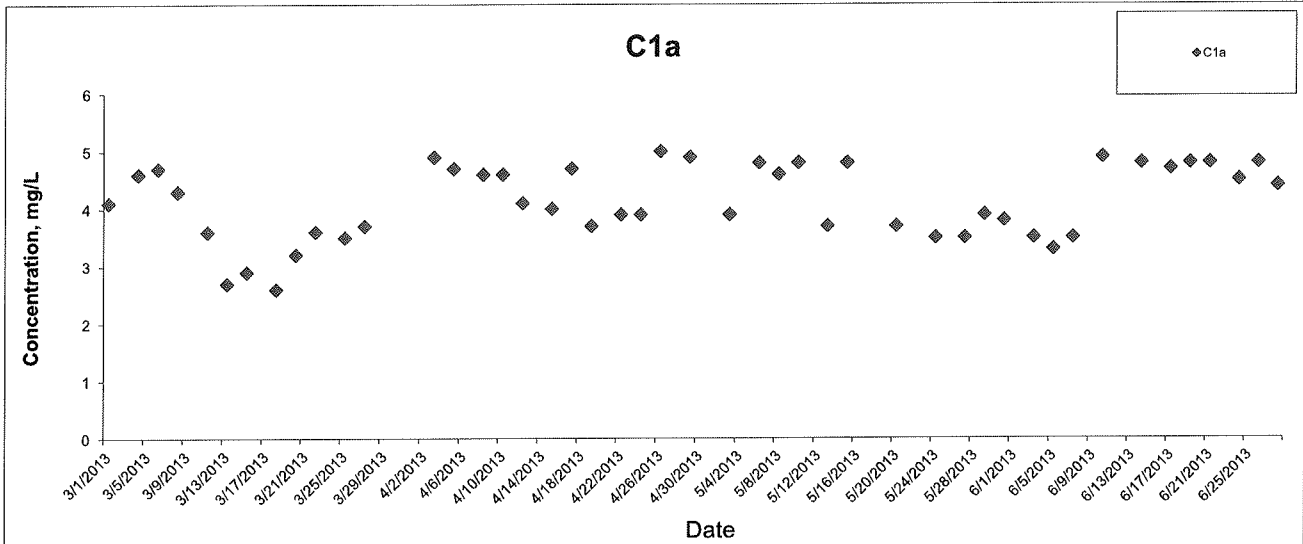


Project No.: 60249820

Date: July 2013

Appendix C

Suspended Solids at Mid-Ebb Tide



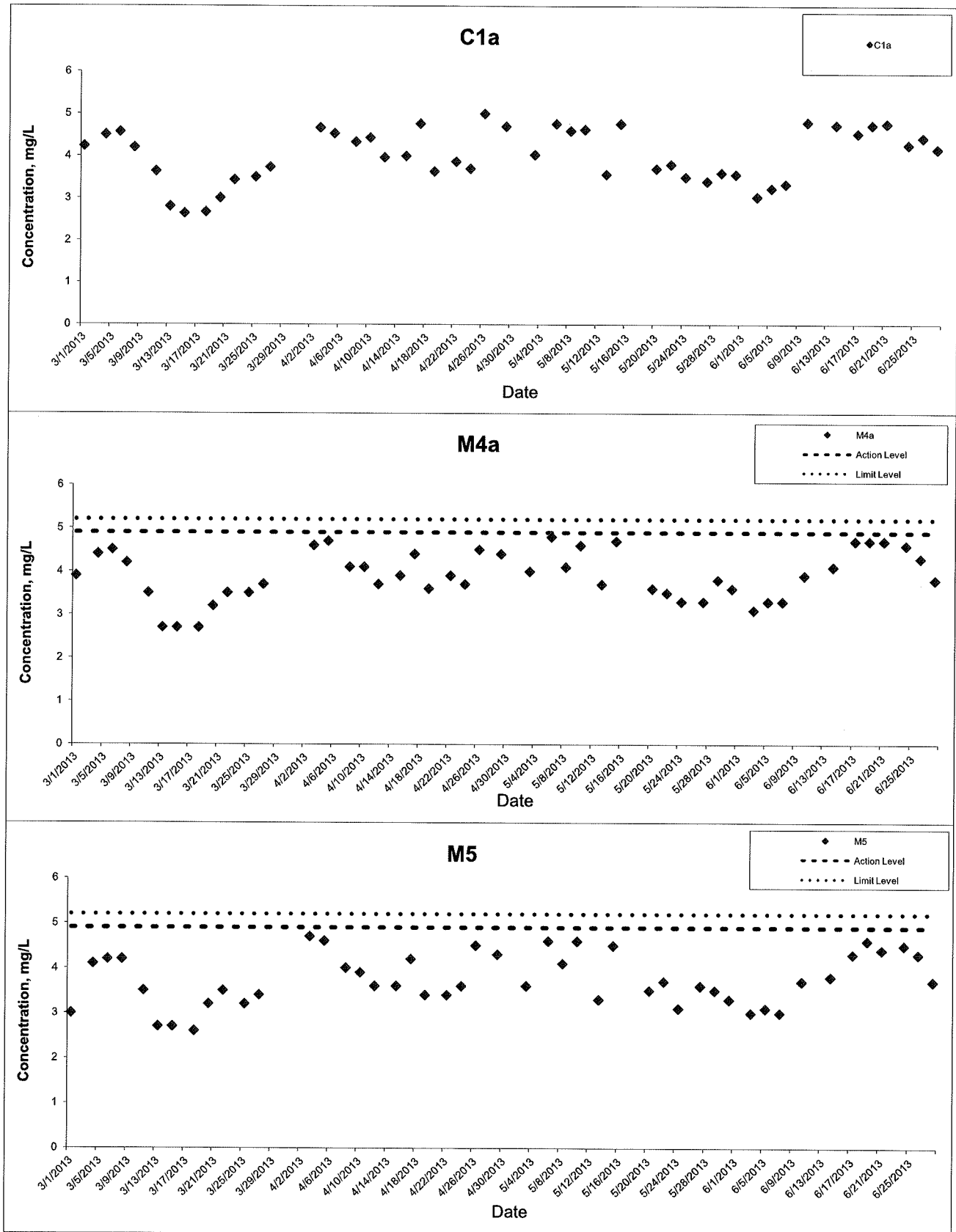
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**HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS**

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



Suspended Solids at Mid-Flood Tide



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 HONG KONG BOUNDARY CROSSING FACILITIES
 - RECLAMATION WORKS

Graphical Presentation of Impact Water Quality
 Monitoring Results



**APPENDIX D
QA/QC REPORT**

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 @
03/06/2013	103.5	FC1a-S1	0.00	EC1a-S2	102.1
	104.5	EC1a-M1	10.53**	EWM5-B2	94.2

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.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
05/06/2013	97.5	FC1a-S1	13.33**	EC1a-S2	104.2
	104.4	EC1a-M1	0.0	EWM5-B2	94.0

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 @
07/06/2013	94.4	FC1a-S1	0.00	EC1a-S2	100.0
	107.9	EC1a-M1	10.53**	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 @
10/06/2013	108.0	FC1a-S1	0.0	EC1a-S2	108.0
	107.9	EC1a-M1	0.0	EWM5-B2	96.2

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.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
14/06/2013	93.6	FC1a-S1	8.0	EC1a-S2	103.8
	96.1	EC1a-M1	0.0	EWM5-B2	102.0

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 @
17/06/2013	104.1	FC1a-S1	8.7	EC1a-S2	108.5
	102.2	EC1a-M1	0.0	EWM5-B2	107.8

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 @
19/06/2013	102.0	FC1a-S1	8.0	EC1a-S2	104.0
	93.5	EC1a-M1	0.0	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 @
21/06/2013	101.4	FC1a-S1	0.0	EC1a-S2	105.9
	103.7	EC1a-M1	8.7	EWM5-B2	102.0

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 @
24/06/2013	100.0	FC1a-S1	8.7	EC1a-S2	103.9
	99.4	EC1a-M1	0.0	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 @
26/06/2013	93.5	FC1a-S1	0.0	EC1a-S2	91.8
	97.1	EC1a-M1	7.4	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 @
28/06/2013	97.9	FC1a-S1	0.0	EC1a-S2	94.2
	103.7	EC1a-M1	8.0	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.