

ATAL-Degrémont-China State Joint Venture

Contract No. DC/2008/03
Design, Build and Operate Pillar
Point Sewage Treatment Works:
Tenth Monthly EM&A Report

September 2011

Environmental Resources Management

21/F Lincoln House
979 King's Road
Taikoo Place
Island East, Hong Kong
Telephone: (852) 2271 3000
Facsimile: (852) 2723 5660
E-mail: post.hk@erm.com
<http://www.erm.com>

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Reference 0119806

For and on behalf of ERM-Hong Kong, Limited	
Approved by:	Frank Wan
Signed:	
Position:	Partner
Certified by:	 (Environmental Team Leader – Roger Leung)
Certified by:	 (Registered Landscape Architect (R078) - Christina Ip)
Date:	14 September 2011



AECOM +852 3105 8686 tel
8/F Grand Central Plaza, Tower 2 +852 2317 7609 fax
138 Shatin Rural Committee Road
Shatin, Hong Kong
www.aecom.com

Your Ref:
Our Ref: 60017423/C/jwym/11091202

By Hand & By Fax (2833 9162)

Drainage Services Department
Sewage Services Branch
Harbour Area Treatment Scheme Division
5/F., Western Magistracy,
2A Pok Fu Lam Road,
Hong Kong.

Attn: Mr. Eddie S.K. LEUNG (T:2159 3413)

12 September 2011

Dear Sir,

**Contract No. CV/2008/03
Design, Build and Operate
Pillar Point Sewage Treatment Works**

Monthly EM&A Report for August 2011

Reference is made to Environmental Team (ET)'s revised draft of the Monthly EM&A Report for August 2011 provided by email dated 12 September 2011. We have no further comment.

We hereby verify the said Monthly EM&A Report as having complied with the requirement as set out in the EM&A Manual in accordance with the condition 3.6 of Environmental Permit No. EP-321/2008.

Should you have any queries, please feel free to contact the undersigned at 3922 9393.

For and on behalf of
AECOM Asia Co. Ltd.

Y T Tang
Independent Environmental Checker

c.c. AECOM – Mr. Tim Lee
ERM – Ms. Winnie Ko
ATAL–Degremont–China State JV – Mr. C.Y. Fong

(Fax No. 2317 7609)
(Fax No. 2723 5660)
(Fax No. 2811 3321)

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EXECUTIVE SUMMARY

The construction works of *DC/2008/03 of Design, Build and Operate Pillar Point Sewage Treatment Works (the Project)* commenced on 13 November 2010. This is the 10th monthly Environmental Monitoring and Audit (EM&A) report presenting the EM&A works carried out during the period from 1 to 31 August 2011 in accordance with the EM&A Manual.

Summary of Construction Works undertaken during the Reporting Month

Works undertaken in the reporting month include:

- Concrete structuring for Bay 2 base slab, cone shape central pit and outer wall construction;
- Constructing sump pipe base slab for Bay 3, 4 and 5;
- Constructing pipe trench between Bay 1 and Zone 2;
- Constructing piling platform at east side of corridor of Zone 1 to 5;
- Constructing base slab and wall at PTW;
- Replacing of soft formation by rock fill;
- Blinding concrete; and
- Constructing base slab at Admin Building.

Environmental Monitoring and Audit Progress

A summary of the monitoring activities undertaken in this reporting period is listed below:

- | | |
|---|---------|
| • 24-hour TSP Monitoring at each monitoring station (AM1 and AM2) | 6 sets |
| • 1-hour TSP Monitoring at each monitoring station (AM1 and AM2) | 18 sets |
| • Joint Environmental Site Inspection | 4 times |
| • Landscape & Visual Monitoring | once |

Air Quality

6 sets of 24-hour TSP and 18 sets of 1-hr TSP measurements were carried out at each of the designated monitoring stations during the reporting period. No exceedance was recorded during the reporting period.

Waste Management

Waste generated from this Project includes inert construction and demolition (C&D) materials (public fill) and non-inert C&D materials (construction wastes). A total of 425 tonnes of public fill were delivered to the fill bank. No metals and paper/cardboard was recovered and 15 kg of plastics were sent to recyclers in the reporting period. 6.12 tones of general refuse and no chemical waste was disposed of in the reporting period.

Environmental Site Inspection

Four weekly joint environmental site inspections were carried out by the representatives of the Contractor, the SOR and the Environmental Team (ET). Details of the audit findings and implementation status of the mitigation measures are presented in *Section 7.1*.

Landscape & Visual

Review on landscape and visual mitigation measures was performed on 26 August 2011. Details of the audit findings and implementation status of the mitigation measures are presented in *Sections 3.2 and 7.2*.

Environmental Exceedance/Non-conformance/Compliant/Summons and Prosecution

No exceedance was recorded during the reporting period.

No non-compliance event was recorded during the reporting period.

No environmental complaint and summon/prosecution was received in this reporting period.

Future Key Issues

Works to be undertaken in the next reporting month include:

- Constructing base slab and wall at PTW;
- Constructing base slab at Admin Building;
- Constructing pipe pile wall for Sludge Dewatering Building;
- Constructing main raft slab for Bay1;
- Constructing walls and cone shape central pit for Bay2;
- Constructing pipe trench base slab for Bay3;
- Constructing main raft slab for Bay 5; and
- Constructing piling platform at east side corridor for Zone 1 to 5.

Potential environmental impacts arising from the above construction activities are mainly associated with dust, construction noise, site runoff, waste management and landscaping issues.

1 INTRODUCTION

ERM-Hong Kong, Limited (ERM) was appointed by ATAL – Degrémont – China State Joint Venture (ADC-JV) (the Contractor) as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) programme for the *Contract No. DC/2008/03 of Design, Build and Operate Pillar Point Sewage Treatment Works (the Project)*.

1.1 PURPOSE OF THE REPORT

This is the 10th EM&A report which summarises the impact monitoring results and audit findings for the EM&A programme during the reporting period from 1 to 31 August 2011.

1.2 STRUCTURE OF THE REPORT

The structure of the report is as follows:

Section 1 : **Introduction**

details the scope and structure of the report.

Section 2 : **Project Information**

summarises background and scope of the Project, site description, project organization, construction programme, the construction works undertaken and the status of Environmental Permits (EP)/licences over the construction phase of the Project.

Section 3 : **Environmental Monitoring Requirements**

summarises the environmental monitoring including monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations, Action and Limit Levels, Event/Action Plans, environmental mitigation measures as recommended in the approved EIA report, EP and relevant environmental requirements stated in the Contract Specification.

Section 4 : **Implementation Status on Environmental Mitigation Measures**

summarises the implementation of environmental protection measures during the reporting period.

Section 5 : **Monitoring Results**

summarises the monitoring results obtained in the reporting period.

Section 6 : **Waste Management**

summarises the quantity of public fill and construction waste generated in the reporting period

Section 7 : **Environmental Site Inspection**

summarises the audit findings of the weekly site inspections undertaken within the reporting period.

Section 8 : **Environmental Non-conformance**

summarises any exceedance of environmental performance standard, and environmental complaints and environmental summons received within the reporting period.

Section 9 : **Further Key Issues**

summarises the impact forecast and monitoring schedule for the next reporting month.

Section 10 : **Review of the EM&A Data and Predictions**

compares the monitoring data and waste quantity against predictions in the approved Project EIA report.

Section 11 : **Conclusions**

2.1 BACKGROUND

The existing Pillar Point Sewage Treatment Works (PPSTW) is located to the north of the Tuen Mun River Trade Terminal and is abutting the Lung Mun Road to its north. It is a preliminary treatment works with screening and grit removal processes with treated effluent discharged to the sea (North Western Water Control Zone) via a twin submarine outfall. The *Review of the Tuen Mun and Tsing Yi Sewerage Master Plan (RTMTYSMP)* commissioned in February 1999, recommended to expand the sewage treatment capacity and to upgrade the plant to chemically enhanced primary treatment (CEPT) with disinfection in order to cater for the projected ultimate population and planned developments in the Tuen Mun area, and to improve the effluent quality and hence to reduce pollution loadings to the receiving waters.

The upgrading of the PPSTW comprises the following works:

- expanding the treatment capacity of the existing PPSTW to cope with the increased peak wet-weather sewage flow in Tuen Mun area;
- upgrading the sewage treatment level of the existing PPSTW to incorporate chemical treatment with disinfection at minimum removal rates of 70%, 55% and 99.9% of suspended solids (SS), biochemical oxygen demand (BOD) and *E.coli*, respectively;
- upgrading existing septic waste reception facilities at PPSTW; and
- providing and upgrading ancillary facilities including the administration building, workshop, laboratory, odour control facilities, sludge handling and dewatering facilities, access roads and minor landscaping works within the STW for the operation and maintenance of the upgraded STW.

The potential environmental impacts of the Project have been studied in the “*Upgrading of Pillar Point Sewage Treatment Works*” (EIAO Register No: AEIAR-145/2008). The EIA was approved on 10 June 2008 under the *Environmental Impact Assessment Ordinance* (EIAO) and an Environmental Permit (EP-321/2008) for the works was granted on 17 November 2008. Under the requirements of Condition 3.1 of EP-322/2008, an EM&A programme as set out in the EM&A Manual is required to be implemented.

The construction works commenced on 13 November 2010 and are scheduled for completion by 2014.

2.2 GENERAL SITE DESCRIPTION

The open area adjacent to the existing PPSTW has been designated for the upgrading works. The layout of the upgrading works is illustrated in *Annex A*.

2.3 CONSTRUCTION ACTIVITIES

A summary of the major construction activities undertaken in the reporting period is shown in *Table 2.1*. The locations of the construction activities are shown in *Annex B*. The construction programme of the Project in the reporting month and the upcoming 3 months is presented in *Annex L*.

Table 2.1 *Summary of Construction Activities Undertaken in Reporting Period*

Construction Activities Undertaken
<ul style="list-style-type: none">• Concrete structuring for Bay 2 base slab, cone shape central pit and outer wall construction;• Constructing sump pipe base slab for Bay 3, 4 and 5;• Constructing pipe trench between Bay 1 and Zone 2;• Constructing piling platform at east side of corridor of Zone 1 to 5;• Constructing base slab and wall at PTW;• Replacing of soft formation by rock fill;• Blinding concrete; and• Constructing base slab at Admin Building.

2.4 PROJECT ORGANISATION AND MANAGEMENT STRUCTURE

The project organization chart and contact details are shown in *Annex C*.

2.5

STATUS OF ENVIRONMENTAL APPROVAL DOCUMENTS

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

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

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
Environmental Permit	EP-321/2008	Throughout the Contract	Permit granted on 17 November 2008.
Notification of Construction Works under Air Pollution Control (Construction Dust) Regulation	Ref No. 308136	Throughout the Contract	-
Water Discharge License	WT00008027-2010	Till 31 December 2015	Wastewater discharge licence was issued by EPD on 7 December 2010.
Construction Noise Permit	GW-RW0471-11	28 July 2011 – 27 January 2012	-
Chemical Waste Producer Registration	5213-421-A2620-01	Throughout the Contract	Licence approved on 28 October 2010

3.1 AIR QUALITY MONITORING

3.1.1 Monitoring Location

The proposed air quality monitoring stations for the construction phase of the Project, as recommended in the approved EM&A Manual, are given in *Table 2.1* and shown in *Annex D*. The proposed locations (AM1 and AM2) have been agreed with the Drainage Services Department (DSD), Environmental Protection Department (EPD) and the Independent Environmental Checker (IEC).

Table 3.1 Construction Phase Air Monitoring Locations

Monitoring ID	Air Quality Monitoring Station
AM1	Tuen Mun EMSD Servicing Vehicle Station
AM2	River Trade Terminal Office

3.1.2 Monitoring Parameter and Frequency

The construction phase air quality monitoring has been conducted at the designated monitoring stations in accordance with the requirements stipulated in the EM&A Manual. 1-hour and 24-hour TSP levels have been monitored at the frequency and duration stated in *Table 3.2*. The construction phase TSP monitoring has been conducted as per the schedule presented in *Annex E*.

Table 3.2 Construction Phase Air Quality Monitoring Parameters and Frequency

Parameter	Frequency
24-hour TSP	Once every 6 days
1-hour TSP	3 times every 6 days

3.1.3 Action and Limit Levels

The Action and Limit levels have been established and presented in *Table 3.3*.

Table 3.3 Action and Limit Levels for Air Quality

Parameter	Air Monitoring Station	Action Level, μgm^{-3}	Limit Level, μgm^{-3}
24-hour TSP	AM1	183	260
	AM2	192	260
1-hour TSP	AM1	343	500
	AM2	383	500

3.1.4 Monitoring Equipment

Continuous 24-hour and 1-hour TSP monitoring were performed using High Volume Samplers (HVS) with appropriate sampling inlets installed, located at the designated monitoring stations.

The performance specification of HVS complied with the standard method “*Determination of Suspended Particulate Matter in the Atmosphere (High Volume Method)*” as stipulated in *US EPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50 Appendix B)*. Table 3.4 summarises the equipment that were deployed for the 24-hour and 1-hour TSP monitoring respectively.

Table 3.4 *TSP Monitoring Equipment*

Monitoring Station	Monitoring Equipment (HVS and Calibrator)
<i>24-hr and 1-hr TSP</i>	
AM1	GMW GS-2310 (S/N 7580), CM-AIR-43 (S/N 9833620)
AM2	GMW GS-2310 (S/N 1252), CM-AIR-43 (S/N 9833620)

3.1.5 *Monitoring Methodology*

The setup locations of the HVSs at monitoring stations were listed in *Table 3.1*. All HVSs were free-standing with no obstruction.

The following criteria were considered in the installation of the HVSs:

- appropriate support to secure the samplers against gusty wind were provided at AM1 and AM2;
- a minimum of 2m separation from walls, parapets and penthouses was required for rooftop samplers;
- no furnace or incinerator flues were nearby;
- airflow around the sampler was unrestricted; and
- permission was obtained to set up the samplers and to gain access to the monitoring stations.

Preparation of Filter Papers

- glass fibre filters were labelled and sufficient filters that were clean and without pinholes were selected;
- all filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25°C and not variable by more than $\pm 3^\circ\text{C}$; the relative humidity (RH) was 40%; and
- SGS Hong Kong Ltd, a HOKLAS accredited laboratory, implements comprehensive quality assurance and quality control programmes.

Field Monitoring

- the power supply was checked to ensure that the HVSs were working properly;

- the filter holder and the area surrounding the filter were cleaned;
- the filter holder was removed by loosening the fowl bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully;
- the filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter;
- the swing bolts were fastened to hold the filter holder down to the frame. The pressure applied should be sufficient to avoid air leakage at the edges;
- then the shelter lid was closed and secured with the aluminium strip;
- the HVSs were warmed-up for about 5 minutes to establish run-temperature conditions;
- a new flowrate record sheet was set into the flow recorder;
- the flow rates of the HVSs were checked and adjusted to between 1.22 - 1.37 $\text{m}^3\text{min}^{-1}$ which were within the range specified in the EM&A Manual (ie 0.6 – 1.7 $\text{m}^3\text{min}^{-1}$);
- the programmable timer was set for a sampling period of 24 hours \pm 1 hour, and the starting time, weather condition and the filter number were recorded;
- the initial elapsed time was recorded;
- at the end of sampling, the sampled filter was removed carefully and folder in half length so that only surfaces with collected particulate matter were in contact;
- it was then placed in a clean plastic envelope and sealed;
- all monitoring information was recorded on a standard data sheet; and
- filters were sent to SGS Hong Kong Ltd for analysis.

Maintenance and Calibration

- the HVSs and their accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply; and
- the flow rate of each HVS with mass flow controller were calibrated using an orifice calibrator. Initial calibrations of the dust monitoring equipments were conducted upon installation and prior to commissioning. Five-point calibration was carried out for HVSs using CM-AIR-43 Calibration Kit. HVSs are calibrated on a bi-monthly basis. The calibration records for the HVSs are given in *Annex G*.

Wind Data Monitoring

Average wind data (wind speed and wind direction) during the monitoring period were obtained from the meteorological station at Tuen Mun of the Hong Kong Observatory (HKO) and were presented in *Annex F*.

3.1.6 *Event and Action Plan*

The Event/Action Plan (EAP) for air quality monitoring is presented in *Annex H*.

3.2 *LANDSCAPE AND VISUAL MONITORING*

In accordance with the EM&A Manual, monthly landscape and visual monitoring is required to ensure that the design, implementation and maintenance of landscape and visual mitigation measures recommended in the approved EIA Report are fully achieved. The monitoring procedures and criteria as described in the EM&A Manual were adopted.

3.3 *ENVIRONMENTAL MITIGATION MEASURES AND ENVIRONMENTAL REQUIREMENTS IN CONTRACT*

All relevant environmental mitigation measures listed in the EIA Report and the EM&A Manual as well as the specific environmental requirements stated in Contract Specification are summarised in *Annex I*. A summary of the key environmental mitigation measures implemented as per the Contract Requirements is also presented in *Annex I*.

IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS

The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Report, EM&A Manual and EP. The implementation status of the measures during the reporting period is summarised in *Annex I*.

5.1

AIR QUALITY

A total of 6 sets of 24-hour and 18 sets of 1-hour TSP measurements have been undertaken at each of the monitoring stations (AM1 and AM2) during the reporting period. The monitoring data for 24-hour TSP and 1-hour TSP together with wind data and graphical presentations for the past 4 months are presented in *Annex F*. The weather conditions during the monitoring period were ranges from Sunny to cloudy. The local impacts near the monitoring stations of AM1 and AM2 were mainly associated with vehicular emissions. No exceedance of Action and Limit Level of 1-hr and 24-hr TSP was recorded during the reporting period.

Wastes generated from this Project include inert construction and demolition (C&D) materials (public fill) and non-inert C&D materials (construction waste). Construction waste comprises of general refuse, metals and paper/cardboard packaging materials. Metals generated from the Project are also grouped into construction waste as the materials were not disposed of with others at public fill. Reference has been made to the Monthly Summary Waste Flow Table prepared by the Contractor (*Annex J*). With reference to relevant handling records and trip tickets of this Project, the quantities of different types of waste generated in the reporting month are summarised in *Table 6.1* below. The public fill and construction waste generated from the Project have been disposed of at the Tuen Mun Area 38 Fill Bank and WENT Landfill, respectively. No metal and paper/ cardboard packing was sent to recyclers for recycling during the reporting period. 15 kg of plastics were sent to recyclers for recycling during the reporting period.

Table 6.1 *Quantities of Waste Generated from the Project*

Month / Year	Quantity		
	C&D Materials Disposed of at Public Fill (inert) ^(a)	C&D Materials Disposed of at Landfill (Non-inert) (Construction waste) ^{(b) (c)}	Chemical Waste ^(d)
August 2011	425 tonnes	6.12 tonnes	0 L

Notes:

- (a) Inert C&D materials (public fill) include bricks, concrete, building debris, rubble and excavated soil. Total 425 tonnes of public fill were generated and were disposed of at the Tuen Mun Area 38 Fill Bank.
- (b) Non-inert C&D materials (construction wastes) include metals, paper / cardboard packaging waste, plastics and other wastes such as general refuse. Metals generated from the Project are grouped into construction wastes as the materials were not disposed of with others at the public fill. 6.12tonnes of general refuse is recorded in the reporting month. Construction wastes other than metals and paper/cardboard packaging were disposed of at WENT Landfill. No metal and paper/cardboard packaging was recovered and 15 kg of plastics were recovered and sent to recyclers for recycling during the reporting period.
- (c) General refuse was disposed of at WENT by subcontractors.
- (d) Chemical waste was collected though the licensed chemical waste collector, Dunwell Ind. (Holdings) Ltd, with the waste collection licence number 7111-757-W0015-WC.

7.1 WEEKLY SITE AUDITS

Joint site inspections were conducted by representatives of the Contractor, SOR and the ET on 5, 12, 19 and 26 August 2011. The IEC was also present during the joint inspection on 26 August 2011. There was no non-compliance recorded during the site inspections.

Major observations during the reporting period were summarised as follows:

5 August 2011

- Some tarpaulin sheet at the edge of slop which prevents eroded soil from entering the storm drain channel was missing at T1. The Contractor was reminded to properly cover the slope within three working days.
- Dusty C&D wastes were observed at P2 near the Gate 1. The Contractor was reminded to cover the dusty C&D wastes immediately with tarpaulin sheet or remove the C&D waste to prevent dust generation.
- Stagnant water was observed in P2 construction area. Mosquitoes were seen breeding inside. The Contractor was reminded to properly remove the stagnant within three working days.
- Stagnant water and general refuse were observed in P2 construction area under the metal framework. The Contractor was reminded to properly remove the stagnant and general refuse within three working days.
- Oil waste was observed on floor near Bay 3 at P2. The Contractor was reminded to remove the oil waste and to dispose of it as chemical waste immediately.

12 August 2011

- Stagnant water was observed at T1 under the main gate. The Contractor was reminded to fill the hole immediately to prevent accumulation of stagnant water.
- Stagnant water was observed at P2 in STW construction site. Larva of mosquito was also observed in the stagnant water. The Contractor was reminded to remove the stagnant water immediately.
- U-channel without slit trap near the Gate 1 at P2 was observed connected to the storm drain outside the site. The Contractor was reminded to provide silt trap within three working days to remove grit and loose soil before the storm water get into the storm drainage outside the site.
- Dusty waste without properly cover was observed in CEPT construction site. The Contractor was reminded to remove the dusty waste immediately.
- Stagnant water was observed in Bay 2 and Bay 4. The Contractor was reminded to remove the stagnant water.

19 August 2011

- General refuses were observed at various locations in P2. The Contractor was reminded to remove the refuses within 3 working days and to implement good housekeeping practices.
- Dusty material was observed near Gate 1 in P2. The Contractor was reminded to remove the material or cover the material with tarpaulin sheet within 3 working days.

26 August 2011

- Stagnant water was observed on tarpaulin sheet in T1. The Contractor was reminded to remove the stagnant water within 3 working days.
- General refuse was observed at P1 and PTW worksite in P2. The Contractor was reminded to remove the general refuse within 3 working days and implement good housekeeping practices.
- Large pile of exposed soil generating dust was observed near the entrance of stockpile area. The Contractor was reminded to provide tarpaulin sheet to properly cover the pile within 3 working days.
- Moss was observed at the bottom of car wheel washer. The Contractor was reminded to remove the moss within 3 working days and implement good housekeeping practices.

Follow-up actions were undertaken as reported by the Contractor and observed in the next weekly site inspections conducted in the reporting period.

7.2

LANDSCAPE AND VISUAL MONITORING

In accordance with the EM&A Manual, monthly landscape and visual monitoring is required to ensure that the design, implementation and maintenance of landscape and visual mitigation measures recommended in the EIA Report are fully achieved. Review on landscape and visual mitigation measures was performed on 26 August 2011. It was confirmed that most of the necessary landscape and visual mitigation measures as summarised in *Annex I* were implemented by the Contractor. The major findings were summarised as follow:

26 August 2011

- General refuses were observed inside the tree protection zone. The Contractor was reminded to remove the general refuses and was reminded that no refuse and construction material should be placed inside the tree protection zone.
- A rope was found tied to a tree to provide stability to its nearby facilities. The Contractor was reminded to remove the rope immediately and not to use any tree as anchor during construction to avoid damage to trees and affect their growth.

The Contractor was reminded to implement follow-up actions and the status of the follow-up actions will be reviewed in the first weekly site inspections in the next reporting period.

Key landscape and visual mitigation measures implemented in the reporting period include:

- Set up of a temporary tree nursery;
- Control dust and erosion of exposed soil;
- Stockpiling of topsoil for future reuse;
- Maintain existing tree record inventory; and
- Re-use existing top soil for new planting areas.

8.1.1 *Summary of Monitoring Exceedance*

No exceedances of Action and Limit Levels of 1-hr and 24-hr TSP were recorded during the reporting period.

8.1.2 *Summary of Environmental Non-Compliance*

No non-compliance event was recorded during the reporting period.

8.1.3 *Summary of Environmental Complaint*

No complaint was received during the reporting period. The cumulative summons/prosecution log is shown in *Annex K*.

8.1.4 *Summary of Environmental Summon and Successful Prosecution*

No summon was received during the reporting period. The cumulative summons/prosecution log is shown in *Annex K*.

9.1.1 *Key Issues for the Coming Month*

Works to be undertaken for the coming monitoring period are summarised in *Table 9.1 below*.

Table 9.1 *Construction Works to be Undertaken in the Next Reporting Period*

Work to be taken
<ul style="list-style-type: none"> • Constructing base slab and wall at PTW; • Constructing base slab at Admin Building; • Constructing pipe pile wall for Sludge Dewatering Building; • Constructing main raft slab for Bay1; • Constructing walls and cone shape central pit for Bay2; • Constructing pipe trench base slab for Bay3; • Constructing main raft slab for Bay 5; and • Constructing piling platform at east side corridor for Zone 1 to 5.

Potential environmental impacts arising from the above construction activities will mainly be associated with dust, construction noise, site runoff, waste management and landscaping issues.

9.1.2 *Monitoring Schedule for the Next Reporting Period*

The tentative schedule of TSP monitoring for the next reporting period was presented in *Annex E*. Environmental monitoring will be conducted at the same monitoring locations in the next reporting period. The monitoring programme has been reviewed and was considered adequate to cater for the nature of works in progress.

9.1.3 *Construction Programme for the Next Three Months*

The most updated construction programme for the Project is presented in *Annex L*.

10.1 AIR QUALITY

Since the EIA has included only qualitative assessment of dust impact during construction phase, a comparison was made between the monitoring results from the start of the Project and the Hong Kong Air Quality Objectives (HKAQO) (Table 10.1).

Table 10.1 Comparison of the HKAQO and Air Quality Monitoring Results

Monitoring Station	HKAQO, $\mu\text{g m}^{-3}$	Measured 24-hour TSP Monitoring Results, $\mu\text{g m}^{-3}$ (a) (b)	
	24 hour ⁽¹⁾	Average	Range
AM1	260	74	60 - 100
AM2	260	83	60 - 102

Notes:
 (a) Only 24-hour TSP monitoring results were compared as there is no 1 hour TSP criterion in HKAQO.
 (b) Average and range of data were calculated between the commencement of construction works and this reporting month.

The monitoring results show that the average and range of 24-hour TSP levels recorded since the commencement of the construction works have been well below the 24-hour TSP criterion in the HKAQO. Recommended mitigation measures in Section 3.7.1.1 of EIA have been implemented throughout the construction period and were considered effective.

10.2 WASTE MANAGEMENT

The estimated amount of waste generated in this Project and the accumulated quantities of waste generated up to this reporting month are presented in Table 10.2. The amount of inert C&D material sent to public fills is larger than the estimated amount in EIA. With reference to the C&D Material Assessment (Contractor's General Submission (CSF) No.: DC200803/CSF/SAF/060026/A), the difference in quantity is mainly due to differences in excavation depths and excavation methods in the Contract Works and that assumed in the Reference Design. Recommended mitigation measures in Sections 7.5.1.1 to 7.5.1.9 of the EIA will continue to be implemented during the construction stage.

Table 10.2 *Quantity of Actual Amount of C&D Materials, General Wastes and Chemical Wastes Generated and EIA Estimation*

Type of Material	Estimated Amount of Public Fill and Construction Waste in EIA (inert & non-inert)	Estimated Amount of Public Fill and Construction Waste in C&D Material Assessment (CSF No.: DC200803/CSF/SAF/060026/A) ^(c)	Accumulated Actual Amount of Public Fill and Construction Waste Recorded ^(a) ^(b) ^(d) (inert & non-inert)
Amount of C&D Materials Arising	61,489 m ³	77,600 m ³	71,130 m ³
Amount of C&D Materials Reused on other site	-	-	3,164 m ³
Amount of C&D Materials Reused on site	14,926 m ³	18,000 m ³	0 m ³
Amount of C&D Materials Sent to Public Fills	46,563m ³	59,600 m ³	67,966m ³
General Refuse	Small	-	97.52 tonnes
Chemical Waste	Small	-	360 L

Notes:

- (a) The actual amount of C&D Materials was recorded since the commencement of construction works.
- (b) The density of soil and rock (bulked) is 1.8 tonnes/m³.
- (c) The estimated amount of C&D material generated from the Contract Works was revised in the C&D Material Assessment and submitted to the SO on 9 September 2010 (CSF No.: DC200803/CSF/SAF/060026/A) due to the new plant & facility layout.
- (d) The waste flow data for April and May 2011 was updated in June 2011 based on SOR's comments and has been confirmed by the Contractor. Detail of changes is shown in Annex J.

10.3

CONCLUSION OF REVIEW

The EIA predictions and the monitoring results since the commencement of construction works have been reviewed. The EIA concluded that the Project would not cause adverse impacts to the environment, and the monitoring results have also indicated the same so far. Mitigation measures recommended in the EP, EIA and EM&A Manual will continue to be implemented throughout the construction phase of the Project.

This EM&A Report presents the EM&A programme undertaken during the reporting period from 1 to 31 August 2011 in accordance with EM&A Manual and requirements of EP (EP-321/2008).

No exceedance of Action and Limit Levels of 24-hour TSP and 1-hour TSP was recorded at the monitoring stations during the reporting period.

Monthly landscape and visual monitoring was conducted in the reporting period. Most of the necessary landscape and visual mitigation measures recommended in the EIA Report were implemented by the Contractor. Follow-up actions would be implemented by the Contractor to improve protection measures on the retained or to-be transplanted trees.

No non-compliance event was recorded during the reporting period.

No complaint and summons/prosecution was received during the reporting period.

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

Annex A

Location of Project

PROPOSED FACILITIES AND BUILDINGS

SECTION 1 INLET PUMPING STATION AND PRELIMINARY TREATMENT WORKS

- ① INLET CHAMBER
- ② COARSE SCREENS AND INLET PUMPING STATION
- ③ FINE SCREEN CHANNELS
- ④ GRIT CHAMBERS
- ⑤ INLET FLOWMETER CHAMBER
- ⑥ PTW MCC ROOM

- ⑦ BLOWER ROOM
- ⑧ SCREENING SKIP HOUSE
- ⑨ ODOR DUCT SUPPORTING BRIDGE
- ⑩ SEPTIC WASTE RECEPTION STATION
- ⑪ WEIGHBRIDGE
- ⑫ ELECTRICAL BUILDING 1

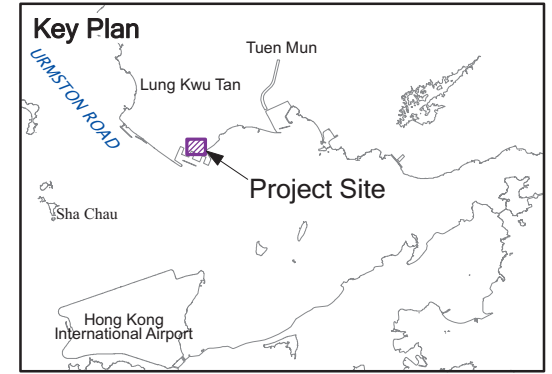
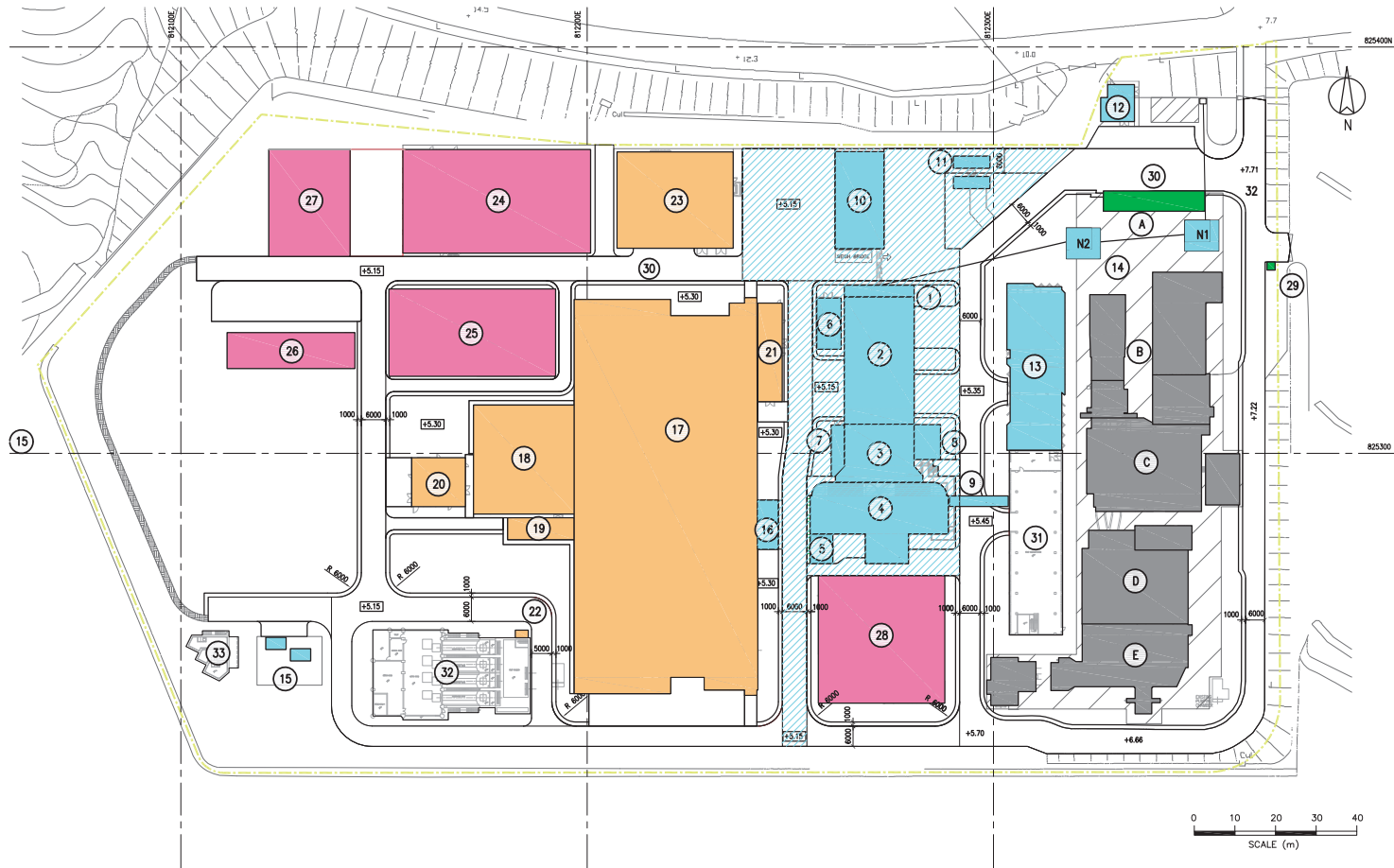
- ⑬ ADMINISTRATION BUILDING
- ⑭ INLET CHAMBERS
- ⑮ PAYMENT FLOWMETER CHAMBER
- ⑯ CEPT INLET CHAMBER

SECTION 2 CEPT TANKS UV DISINFECTION

- ⑰ CEPT TANKS
- ⑱ UV DISINFECTION CHANNELS
- ⑲ REUSE WATER PUMP ROOM
- ⑳ ELECTRICAL BUILDING 3
- ㉑ ELECTRICAL BUILDING 2
- ㉒ OUTFALL PUMPING STATION CONNECTION CHAMBER
- ㉓ CHEMICAL BUILDING

SECTION 3 SLUDGE TREATMENT & HANDLING AND ODOUR CONTROL

- ㉔ SLUDGE DEMATERING BUILDING
- ㉕ DEODORISATION UNITS (B)
- ㉖ SLUDGE SKIP STORAGE BUILDING
- ㉗ SLUDGE SKIP LOADING AREA
- ㉘ DEODORISATION UNITS (A)



SECTION 4 EXISTING BUILDINGS TO BE DEMOLISHED

- Ⓐ ADMINISTRATION BUILDING
- Ⓑ INLET SCREW PUMPING STATION AND MOTOR HOUSE
- Ⓒ COARSE SCREENS
- Ⓓ BLOWER HOUSE AND GRIT CHANNELS
- Ⓔ FINE SCREEN CHANNELS AND FLOWMETER CHAMBER

SECTION 5 EXTERNAL WORKS

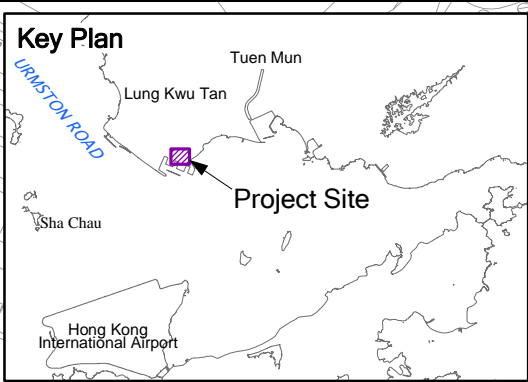
- ⑳ GATE HOUSE
- ㉑ CAR PARK

EXISTING BUILDING TO BE RETAINED

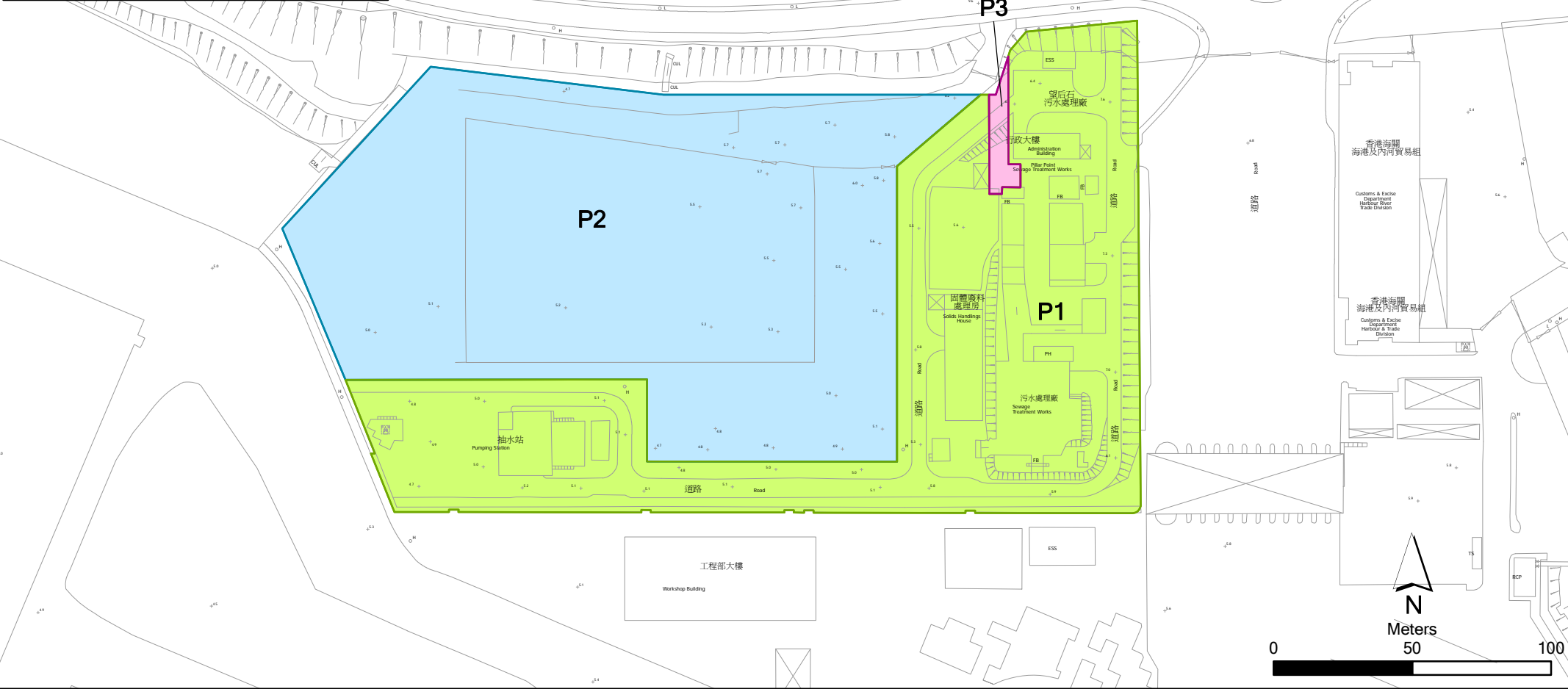
- ㉒ EXISTING SOLID HANDLING BUILDING
- ㉓ EXISTING OUTFALL PUMPING STATION
- ㉔ EXISTING TERMINAL MANHOLE

Annex B

Works Location



P1 & P3 - Works Areas within Existing PPSTW Facilities
P2 - Open Area for Construction of New Facilities at PPSTW



Annex B

Location of Works Areas

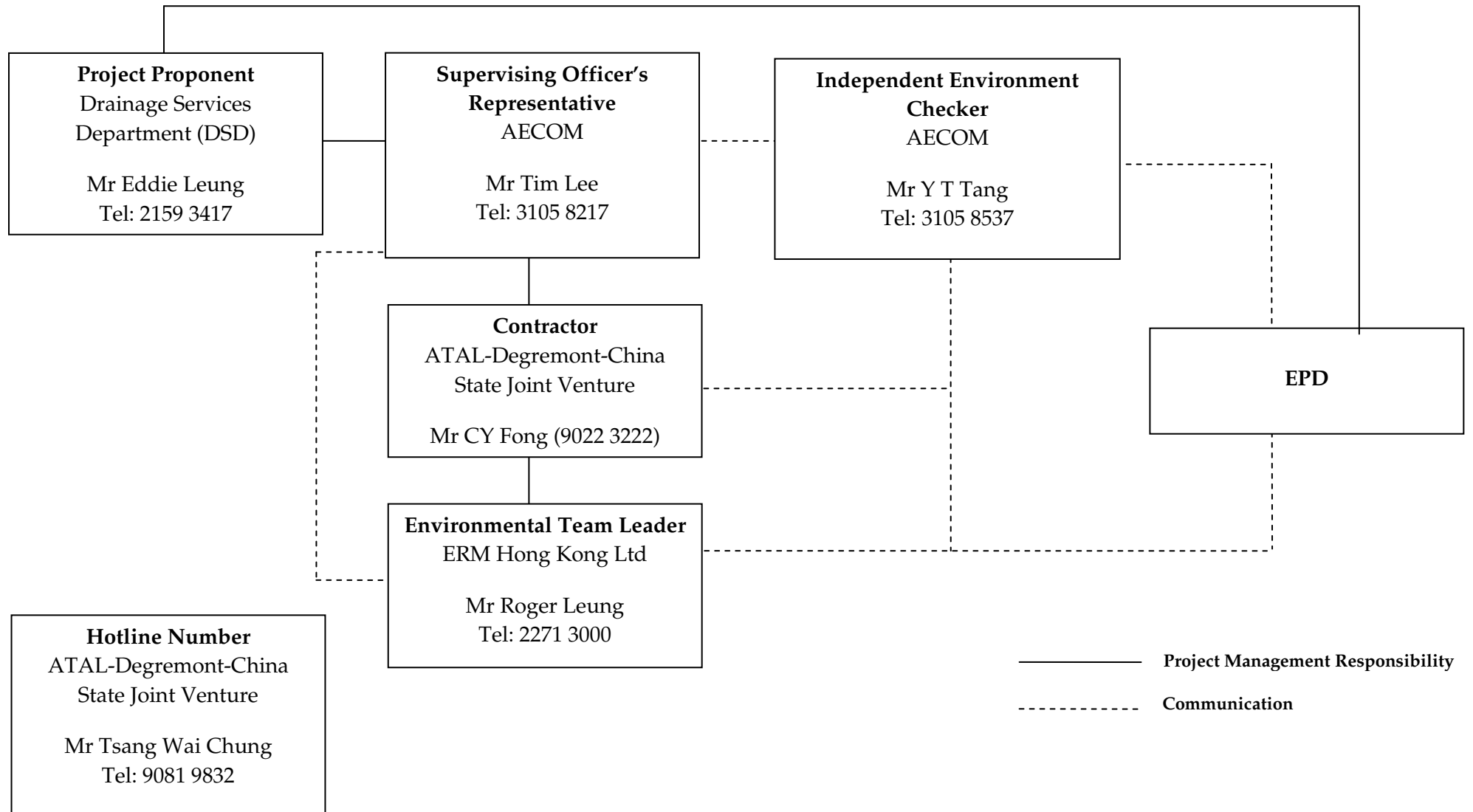
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Date: 15/12/2010

Environmental Resources Management

Annex C

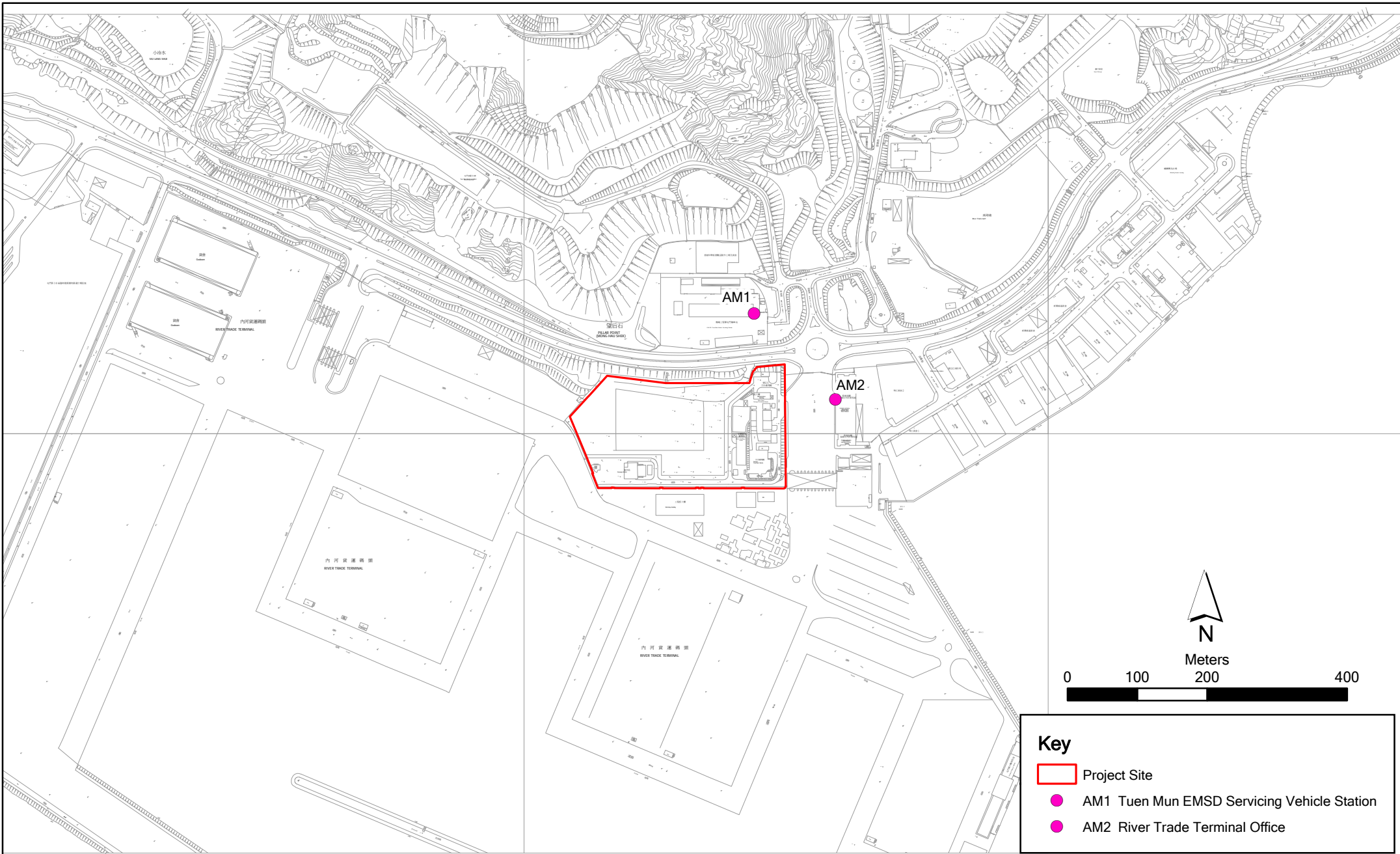
Project Organization Chart with Contact Details

Project Organization During Construction Phase (with contact details)



Annex D

Locations of Air Quality Monitoring Stations



Key

- Project Site
- AM1 Tuen Mun EMSD Servicing Vehicle Station
- AM2 River Trade Terminal Office

Annex D

Contract No. DC/2008/03 Design, Build and Operate of Pillar Point Sewage Treatment Works

File: 0119806_Site Boundary.mxd
Date: 15/12/2010

**Environmental
Resources
Management**





AM1 – Tuen Mun EMSD Servicing Vehicle Station



AM2 - River Trade Terminal Office

Annex E

Monitoring Schedule of Reporting Month and Next Month

**Contract No. DC/2008/03 - Design, Build and Operate Pillar Point Sewage Treatment Works
(Tuen Mun EMSD Servicing Vehicle Station - AM1 & River Trade Terminal Office - AM2)
August 2011**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	01-Aug	02-Aug	03-Aug	04-Aug	05-Aug	06-Aug
		3X1-hr & 1X 24-hr TSP				
07-Aug	08-Aug	09-Aug	10-Aug	11-Aug	12-Aug	13-Aug
	3X1-hr & 1X 24-hr TSP					3X1-hr & 1X 24-hr TSP
14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug
					3X1-hr & 1X 24-hr TSP	
21-Aug	22-Aug	23-Aug	24-Aug	25-Aug	26-Aug	27-Aug
				3X1-hr & 1X 24-hr TSP		
28-Aug	29-Aug	30-Aug	31-Aug			
			3X1-hr & 1X 24-hr TSP			

**Contract No. DC/2008/03 - Design, Build and Operate Pillar Point Sewage Treatment Works
(Tuen Mun EMSD Servicing Vehicle Station - AM1 & River Trade Terminal Office - AM2)
September 2011**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				01-Sep	02-Sep	03-Sep
04-Sep	05-Sep	06-Sep	07-Sep	08-Sep	09-Sep	10-Sep
		3X1-hr & 1X 24-hr TSP				
11-Sep	12-Sep	13-Sep	14-Sep	15-Sep	16-Sep	17-Sep
	3X1-hr & 1X 24-hr TSP					3X1-hr & 1X 24-hr TSP
18-Sep	19-Sep	20-Sep	21-Sep	22-Sep	23-Sep	24-Sep
					3X1-hr & 1X 24-hr TSP	
25-Sep	26-Sep	27-Sep	28-Sep	29-Sep	30-Sep	
				3X1-hr & 1X 24-hr TSP		

Annex F

24-hour and 1-hour TSP Monitoring Results

Annex F - 24-hour and 1-hour TSP Monitoring Results

1-hour TSP Monitoring Results

Station AM1

Date	Start Time	Finish Time	Weather	TSP Concentration ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)	Site Conditions / Observations / Remarks	Temperature ($^{\circ}\text{C}$)	Wind Speed* (m/s)	Sampler ID	Filter ID
02-Aug-11	13:10	14:10	Sunny	184	343	500	Construction work in progress	31	*	7580	9336
	14:10	15:10	Sunny	189	343	500	Construction work in progress	31.5	*	7580	9337
	15:10	16:10	Sunny	184	343	500	Construction work in progress	32.5	*	7580	9338
08-Aug-11	13:10	14:10	Fine	112	343	500	Construction work in progress	31	*	7580	9458
	14:10	15:10	Cloudy	108	343	500	Construction work in progress	30.5	*	7580	9459
	15:10	16:10	Cloudy	111	343	500	Construction work in progress	30	*	7580	9460
13-Aug-11	13:10	14:10	Sunny	130	343	500	Construction work in progress	30	*	7580	9474
	14:10	15:10	Sunny	114	343	500	Construction work in progress	30.5	*	7580	9475
	15:10	16:10	Sunny	124	343	500	Construction work in progress	31.5	*	7580	9476
19-Aug-11	13:10	14:10	Sunny	127	343	500	Construction work in progress	31	*	7580	9490
	14:10	15:10	Sunny	139	343	500	Construction work in progress	31.5	*	7580	9491
	15:10	16:10	Sunny	148	343	500	Construction work in progress	32.5	*	7580	9492
25-Aug-11	13:10	14:10	Fine	183	343	500	Construction work in progress	31	*	7580	9506
	14:10	15:10	Fine	168	343	500	Construction work in progress	31.5	*	7580	9507
	15:10	16:10	Fine	169	343	500	Construction work in progress	32.5	*	7580	9508
31-Aug-11	13:10	14:10	Sunny	97	343	500	Construction work in progress	31	*	7580	9522
	14:10	15:10	Sunny	110	343	500	Construction work in progress	31.5	*	7580	9523
	15:10	16:10	Sunny	101	343	500	Construction work in progress	32.5	*	7580	9524
				Min.	97						
				Max.	189						
				Average	139						

* Wind Speed data is presented in the Meteorological Data table

Annex F - 24-hour and 1-hour TSP Monitoring Results

1-hour TSP Monitoring Results

Station AM2

Date	Start Time	Finish Time	Weather	TSP Concentration (µg/m ³)	Action Level (µg/m ³)	Limit Level (µg/m ³)	Site Conditions / Observations / Remarks	Temperature (°C)	Wind Speed* (m/s)	Sampler ID	Filter ID
02-Aug-11	13:00	14:00	Sunny	148	383	500	Construction work in progress	31	*	1252	9332
	14:00	15:00	Sunny	130	383	500	Construction work in progress	31.5	*	1252	9333
	15:00	16:00	Sunny	136	383	500	Construction work in progress	32.5	*	1252	9334
08-Aug-11	13:00	14:00	Fine	142	343	500	Construction work in progress	31	*	1252	9454
	14:00	15:00	Cloudy	151	343	500	Construction work in progress	30.5	*	1252	9455
	15:00	16:00	Cloudy	138	343	500	Construction work in progress	30	*	1252	9456
13-Aug-11	13:00	14:00	Sunny	138	383	500	Construction work in progress	30	*	1252	9470
	14:00	15:00	Sunny	155	383	500	Construction work in progress	30.5	*	1252	9471
	15:00	16:00	Sunny	140	383	500	Construction work in progress	31.5	*	1252	9472
19-Aug-11	13:00	14:00	Sunny	169	383	500	Construction work in progress	31	*	1252	9486
	14:00	15:00	Sunny	222	383	500	Construction work in progress	31.5	*	1252	9487
	15:00	16:00	Sunny	212	383	500	Construction work in progress	32.5	*	1252	9488
25-Aug-11	13:00	14:00	Fine	144	383	500	Construction work in progress	31	*	1252	9502
	14:00	15:00	Fine	126	383	500	Construction work in progress	31.5	*	1252	9503
	15:00	16:00	Fine	141	383	500	Construction work in progress	32.5	*	1252	9504
31-Aug-11	13:00	14:00	Sunny	114	383	500	Construction work in progress	31	*	1252	9518
	14:00	15:00	Sunny	116	383	500	Construction work in progress	31.5	*	1252	9519
	15:00	16:00	Sunny	120	383	500	Construction work in progress	32.5	*	1252	9520
				Min.	114						
				Max.	222						
				Average	147						

* Wind Speed data is presented in the Meteorological Data table

Annex F - 24-hour and 1-hour TSP Monitoring Results

24-hour TSP Monitoring Results

Station AM1

Start		Finish		Weather	Filter Weight (g)		Elapsed Time Reading		Sampling Time (hrs)	Flow Rate (m ³ /min)			TSP Conc. (µg/m ³)	Action Level (µg/m ³)	Limit Level (µg/m ³)	Observations / Remarks	Sampler ID	Filter ID			
Date	Time	Date	Time		Initial	Final	Initial	Final		Initial	Final	Average									
02-Aug-11	16:10	03-Aug-11	16:10	Sunny	2.8690	3.0147	11414.18	11438.18	24.00	1.26	1.26	1.26	80	183	260	Construction work in progress	7580	9339			
08-Aug-11	16:10	09-Aug-11	16:10	Cloudy	2.8727	2.9966	11441.18	11465.18	24.00	1.26	1.26	1.26	68	183	260	Construction work in progress	7580	9461			
13-Aug-11	16:10	14-Aug-11	16:10	Sunny	2.8827	2.9977	11468.18	11492.18	24.00	1.26	1.26	1.26	63	183	260	Construction work in progress	7580	9477			
19-Aug-11	16:10	20-Aug-11	16:10	Sunny	2.8061	2.9295	11495.18	11519.18	24.00	1.26	1.26	1.26	68	183	260	Construction work in progress	7580	9493			
25-Aug-11	16:10	26-Aug-11	16:10	Fine	2.8347	2.9779	11522.18	11546.18	24.00	1.26	1.26	1.26	79	183	260	Construction work in progress	7580	9509			
31-Aug-11	16:10	01-Sep-11	16:10	Sunny	2.8621	2.9803	11549.18	11573.18	24.00	1.26	1.26	1.26	65	183	260	Construction work in progress	7580	9549			
												Min.	63								
												Max.	80								
												Average	71								

24-hour TSP Monitoring Results

Station AM2

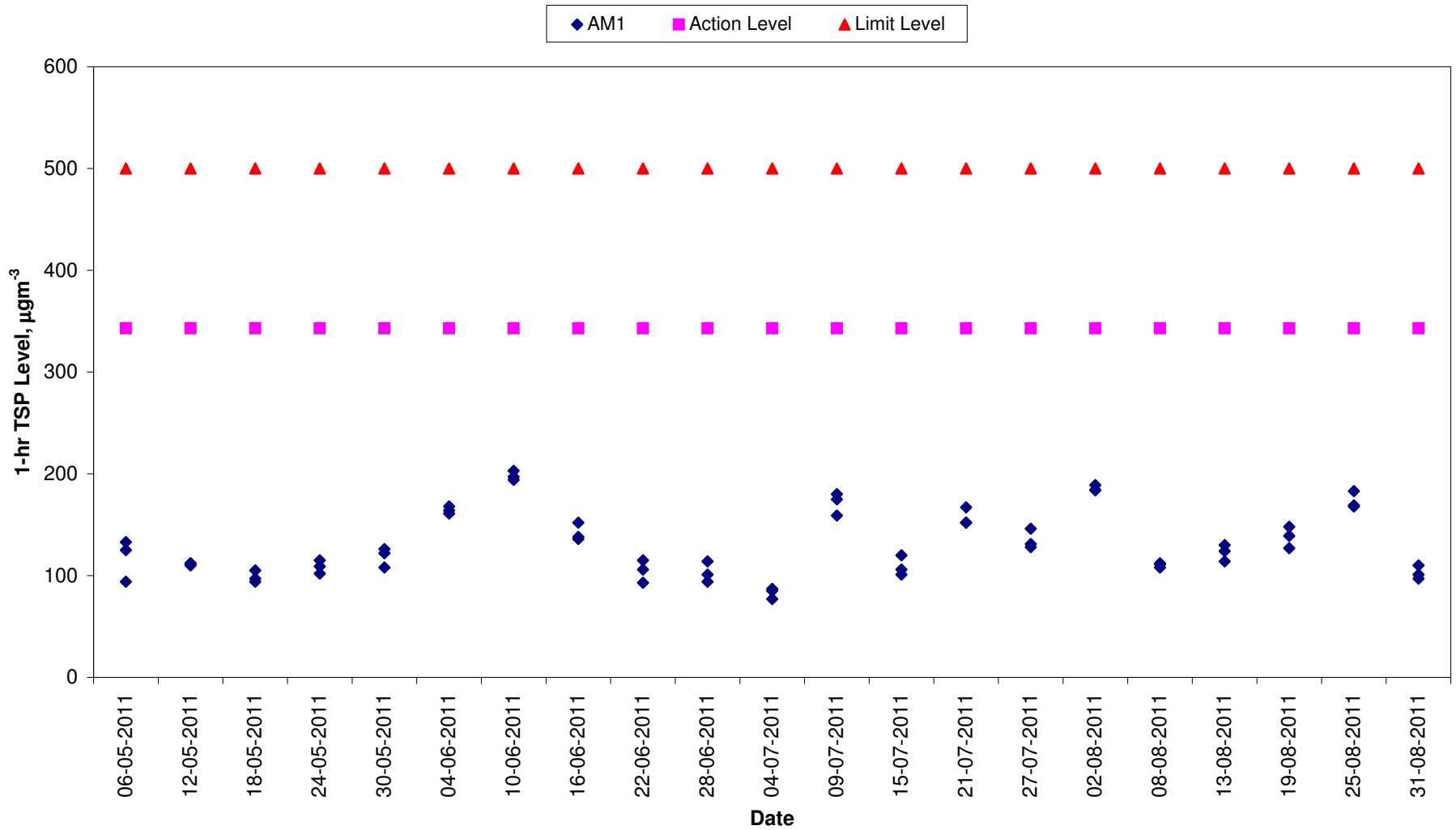
Start		Finish		Weather	Filter Weight (g)		Elapsed Time Reading		Sampling Time (hrs)	Flow Rate (m ³ /min)			TSP Conc. (µg/m ³)	Action Level (µg/m ³)	Limit Level (µg/m ³)	Observations / Remarks	Sampler ID	Filter ID			
Date	Time	Date	Time		Initial	Final	Initial	Final		Initial	Final	Average									
02-Aug-11	16:00	03-Aug-11	16:00	Sunny	2.8446	2.9776	19431.20	19455.20	24.00	1.24	1.24	1.24	74	192	260	Construction work in progress	1252	9335			
08-Aug-11	16:00	09-Aug-11	16:00	Cloudy	2.8744	2.9982	19458.00	19482.20	24.20	1.24	1.24	1.24	69	192	260	Construction work in progress	1252	9457			
13-Aug-11	16:00	14-Aug-11	16:00	Sunny	2.8591	2.9797	19485.20	19509.20	24.00	1.24	1.24	1.24	68	192	260	Construction work in progress	1252	9473			
19-Aug-11	16:00	20-Aug-11	16:00	Sunny	2.8272	2.9793	19512.20	19536.20	24.00	1.24	1.24	1.24	85	192	260	Construction work in progress	1252	9489			
25-Aug-11	16:00	26-Aug-11	16:00	Fine	2.8359	2.9661	19539.20	19563.20	24.00	1.24	1.24	1.24	73	192	260	Construction work in progress	1252	9505			
31-Aug-11	16:00	01-Sep-11	16:00	Sunny	2.8911	3.0119	19566.20	16590.20	24.00	1.24	1.24	1.24	68	192	260	Construction work in progress	1252	9521			
												Min.	68								
												Max.	85								
												Average	73								

Meteorological Data Extracted from the Hong Kong Observatory

Date	Weather	Tuen Mun Station				
		Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
02-08-2011	Sunny	30.8	55-89	0.0	8.0	SE
03-08-2011	Sunny	30.5	58-89	0.0	7.5	SE
08-08-2011	Cloudy	30.4	68-93	22.1	11.0	SE
09-08-2011	Cloudy	28.2	73-96	9.9	9.0	SE
13-08-2011	Sunny	30.1	60-84	0.0	10.5	SE
14-08-2011	Sunny	30.1	50-86	Trace	10.0	SE
19-08-2011	Sunny	29.7	62-88	0.0	13.5	SE
20-08-2011	Sunny	30.1	63-96	3.7	10.0	E
25-08-2011	Fine	29.6	67-92	13.7	9.0	SE
26-08-2011	Fine	29.8	66-87	Trace	9.0	N
31-08-2011	Sunny	31.8	51-82	0.5	10.5	NW
01-09-2011	Sunny	28.5	65-82	0.1	10.0	N

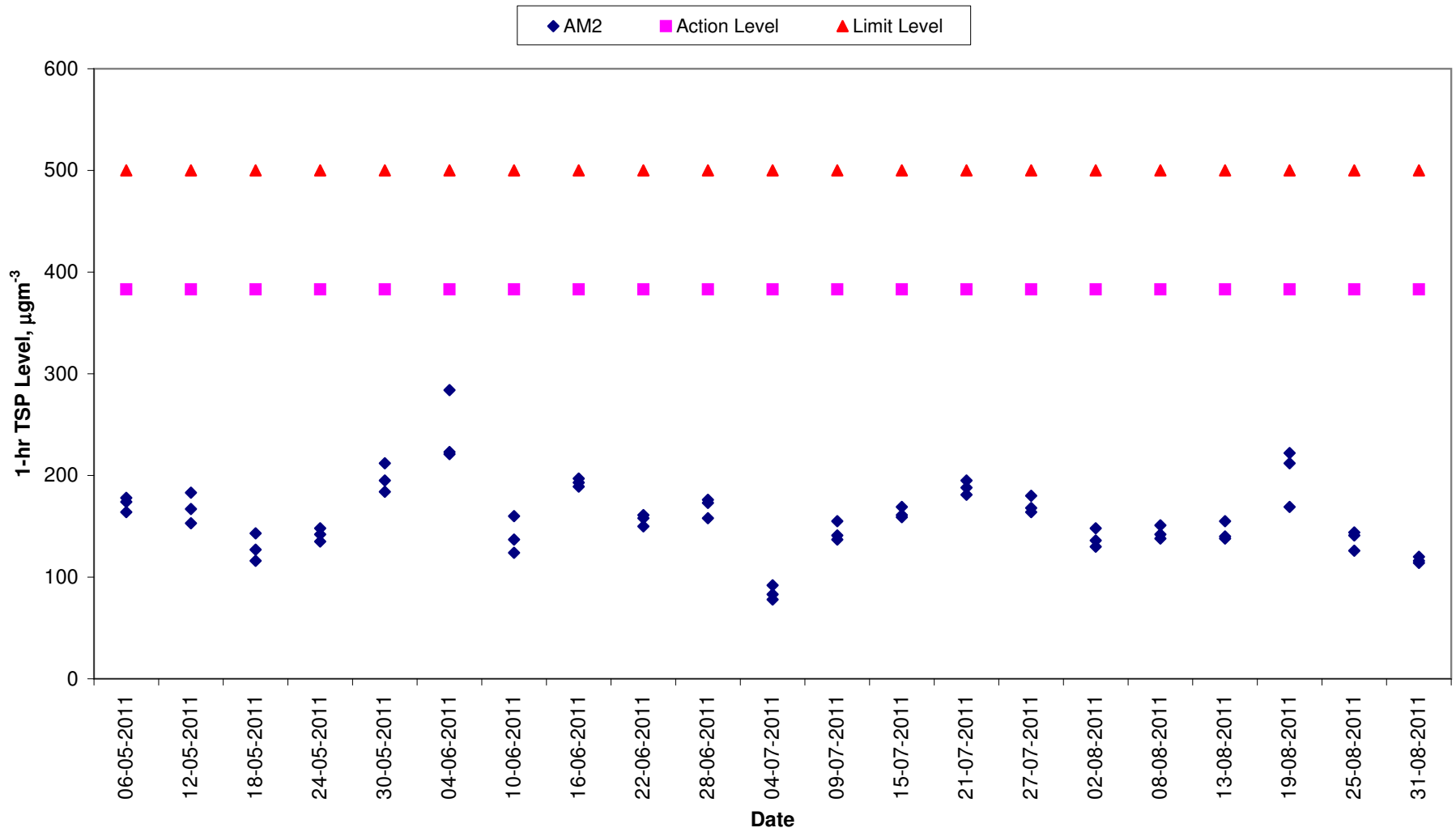
Annex F TSP Monitoring Results

1-hr TSP Levels for the Past 4 Months AM1 (Tuen Mun EMSD Vehicle Servicing Station)



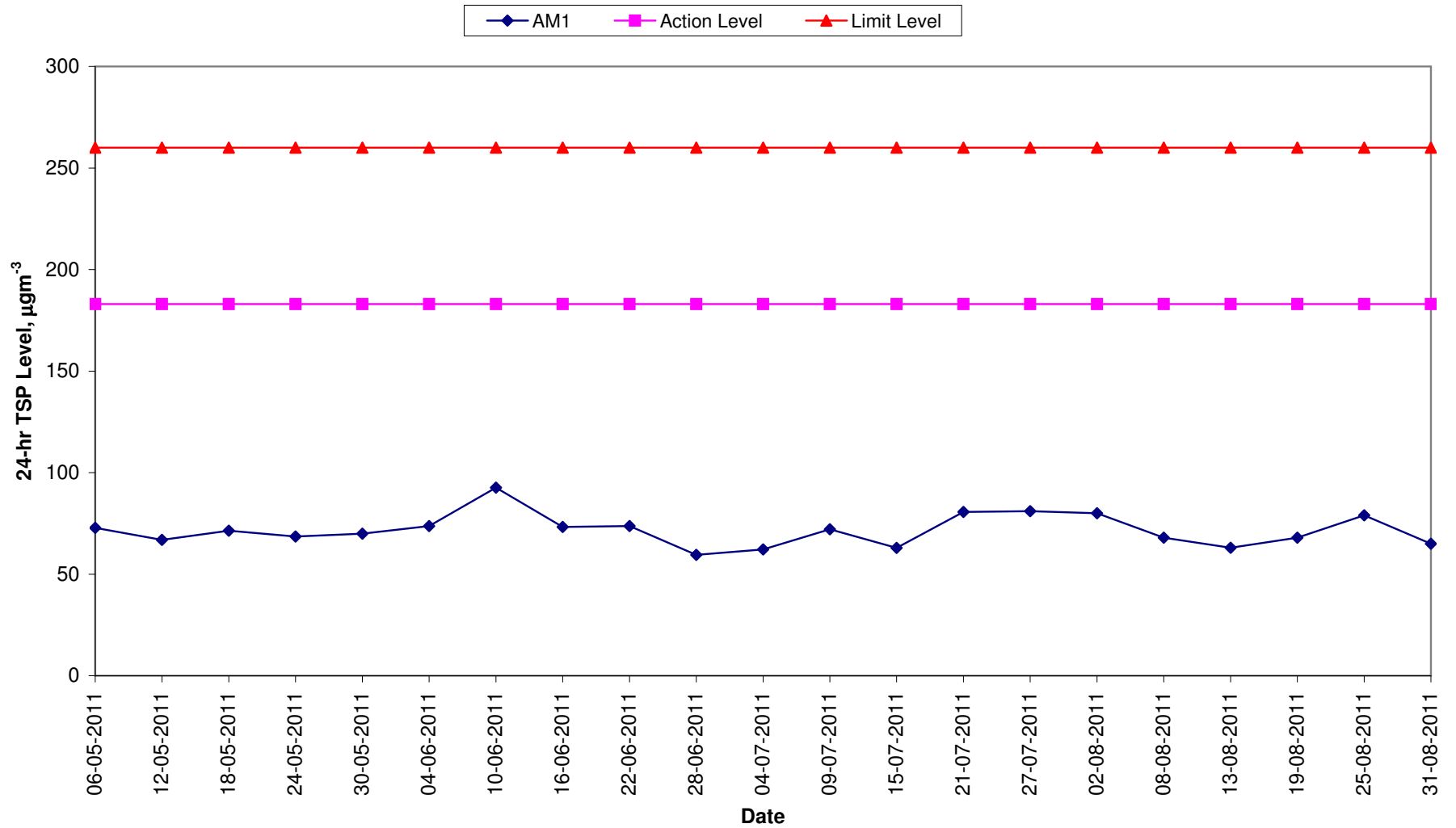
Annex F TSP Monitoring Results

1-hr TSP Levels for the Past 4 Months AM2 (River Trade Terminal Office)



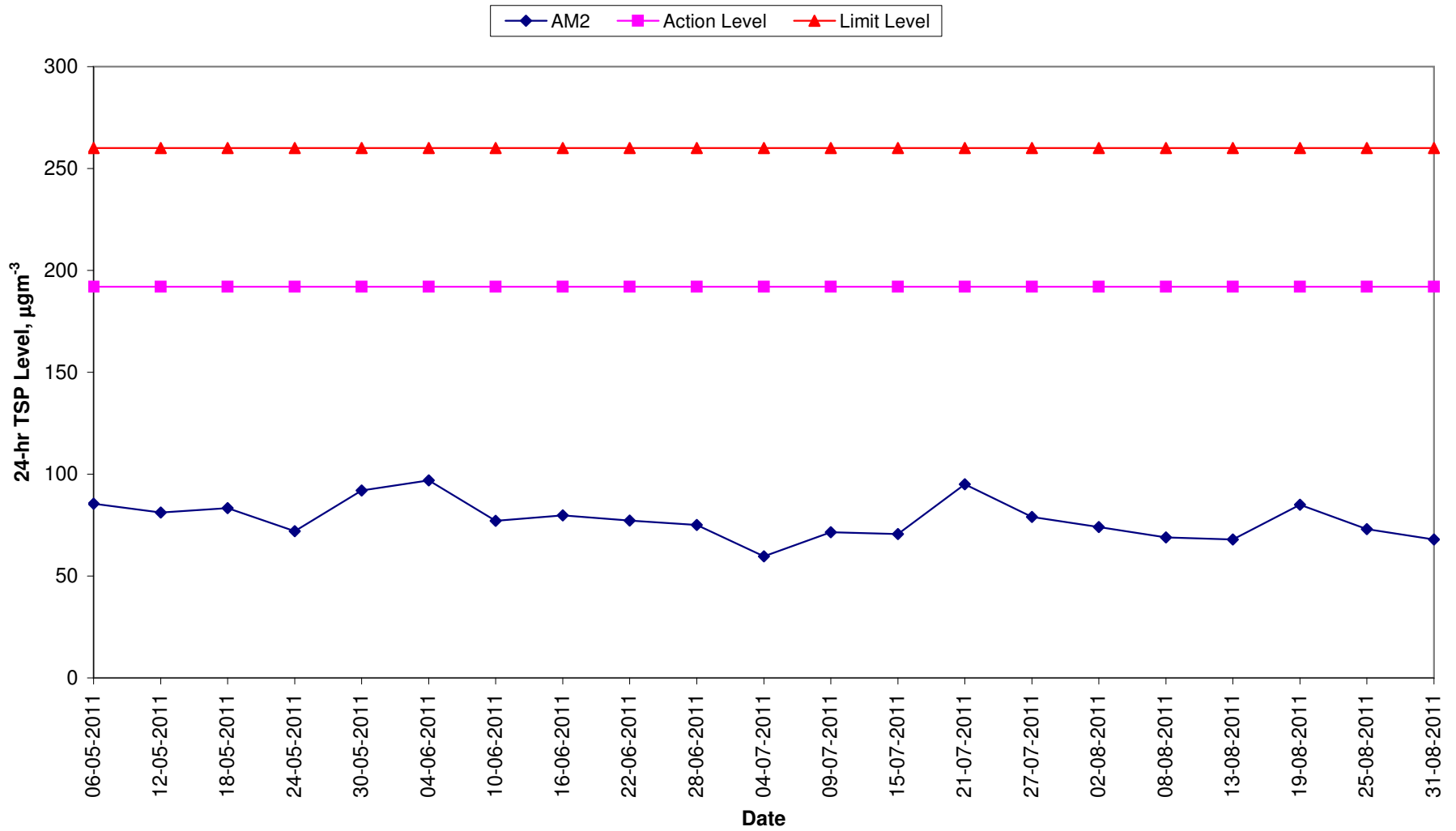
Annex F TSP Monitoring Results

**24-hr TSP Levels for the Past 4 Months
AM1 (Tuen Mun EMSD Vehicle Servicing Station)**



Annex F TSP Monitoring Results

24-hr TSP Levels for the Past 4 Months AM2 (River Trade Terminal Office)



Annex G

Calibration Reports for HVSs

TSP Monitoring Equipment

Monitoring Station ID	Location	Monitoring Equipment		Last Calibration Date	Next Calibration Date
<i>24-hr and 1-hr TSP</i>		HVS	Calibrator		
AM1	Tuen Mun EMSD Vehicle Servicing Station	GMW GS-2310 (S/N 7580)	CM-AIR-43 (S/N 1785)	04 July 2011	04 September 2011
AM2	River Trade Terminal Office	GMW GS-2310 (S/N 1252)	CM-AIR-43 (S/N 1785)	04 July 2011	04 September 2011

High-Volume TSP Sampler
5-Point Calibration Record

Location : EMSD
Calibrated by : P.F. Yeung
Date : 04/07/2011

Sampler

Model : GMWS-2310 ACCU-VOL
Serial Number : S/N 7580

Calibration Orifice and Standard Calibration Relationship

Serial Number : 1785
Service Date : 25 May 2011
Slope (m) : 2.00506
Intercept (b) : -0.02062
Correlation Coefficient(r) : 0.99999

Standard Condition

Pstd (hpa) : 1013
Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1009
Ta(K) : 303

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1 18 holes	11.4	3.342	1.677	52	51.5
2 13 holes	9.6	3.067	1.540	47	46.5
3 10 holes	7.4	2.692	1.353	40	39.6
4 7 holes	4.6	2.123	1.069	29	28.7
5 5 holes	2.7	1.626	0.821	20	19.8

Sampler Calibration Relationship

Slope(m): 37.219 Intercept(b): -10.874 Correlation Coefficient(r): 0.9999

Checked by: Magnum Fan

Date: 06/07/2011

High-Volume TSP Sampler
5-Point Calibration Record

Location : River Trade
 Calibrated by : K.T.Ho
 Date : 04/07/2011

Sampler

Model : GMWS-2310 ACCU-VOL
 Serial Number : S/N 1252

Calibration Orifice and Standard Calibration Relationship

Serial Number : 1785
 Service Date : 25 May 2011
 Slope (m) : 2.00506
 Intercept (b) : -0.02062
 Correlation Coefficient(r) : 0.99999

Standard Condition

Pstd (hpa) : 1013
 Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1009
 Ta(K) : 303

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1 18 holes	11.4	3.342	1.677	66	65.3
2 13 holes	9.4	3.035	1.524	58	57.4
3 10 holes	7.6	2.729	1.371	51	50.5
4 7 holes	4.7	2.146	1.080	37	36.6
5 5 holes	2.7	1.626	0.821	24	23.8

Sampler Calibration Relationship

Slope(m):48.235 Intercept(b): -15.735 Correlation Coefficient(r): 0.9999

Checked by: Magnum Fan

Date: 06/07/2011

Annex H

Event/Action Plan for Air Quality Monitoring

Table H1 *Event Action Plan for Air Quality Monitoring*

Action Level/Limit Level	Environmental Team Leader (ETL)	Independent Environmental Checker (IEC)	Supervising Officer Representative (SOR)	Contractor
<i>Action Level</i>				
Exceedance for one sample	<ul style="list-style-type: none"> Identify source, investigate the causes of complaint and propose remedial measures; Inform IEC and SOR; Repeat measurement to confirm findings; Increase monitoring frequency to daily. 	<ul style="list-style-type: none"> Check monitoring data submitted by ET; Check Contractor’s working method. 	<ul style="list-style-type: none"> Notify Contractor and DSD. 	<ul style="list-style-type: none"> Rectify any unacceptable practice; Amend working methods if appropriate.
Exceedance for two or more consecutive samples	<ul style="list-style-type: none"> Identify source; Inform IEC and SOR; Advise the SOR on the effectiveness of the proposed remedial measures; Repeat measurements to confirm findings; Increase monitoring frequency to daily; Discuss with IEC and Contractor on remedial actions required; If exceedance continues, arrange meeting with IEC and SOR; If exceedance stops, cease additional monitoring. 	<ul style="list-style-type: none"> Check monitoring data submitted by ET; Check Contractor’s working method; Discuss with ET and Contractor on possible remedial measures; Advise the ET on the effectiveness of the proposed remedial measures; Supervise Implementation of remedial measures. 	<ul style="list-style-type: none"> Confirm receipt of notification of exceedance in writing; Notify Contractor and DSD; Ensure remedial measures properly implemented. 	<ul style="list-style-type: none"> Submit proposals for remedial actions to IEC within three working days of notification; Implement the agreed proposals; Amend proposal if appropriate.

Action Level/Limit Level	Environmental Team Leader (ETL)	Independent Environmental Checker (IEC)	Supervising Officer Representative (SOR)	Contractor
<i>Limit Level</i>				
Exceedance for one sample	<ul style="list-style-type: none"> Identify source, investigate the causes of exceedance and propose remedial measures; Inform IEC, SOR, DSD and EPD; Repeat measurement to confirm finding; Increase monitoring frequency to daily; Assess effectiveness of Contractor's remedial actions and keep IEC, EPD, DSD and SOR informed of the results. 	<ul style="list-style-type: none"> Check monitoring data submitted by ET; Check Contractor's working method; Discuss with ET and Contractor on possible remedial measures; Advise the SOR on the effectiveness of the proposed remedial measures; Supervise implementation of remedial measures. 	<ul style="list-style-type: none"> Confirm receipt of notification of exceedance in writing; Notify Contractor; Ensure remedial measures properly implemented. 	<ul style="list-style-type: none"> Take immediate action to avoid further exceedance; Submit proposals for remedial actions to IEC within three working days of notification; Implement the agreed proposals; Amend proposal if appropriate.
Exceedance for two or more consecutive samples	<ul style="list-style-type: none"> Notify IEC, SOR, DSD and EPD; Identify source; Repeat measurement to confirm findings; Increase monitoring frequency to daily; Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; Arrange meeting with IEC and SOR to discuss the remedial actions to be taken; Assess effectiveness of Contractor's remedial actions and keep IEC, EPD, DSD and SOR informed of the results; If exceedance stops, cease additional monitoring. 	<ul style="list-style-type: none"> Discuss amongst SOR, ET, and Contractor on the potential remedial actions; Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the SOR accordingly; Supervise the implementation of remedial measures. 	<ul style="list-style-type: none"> Confirm receipt of notification of exceedance in writing; Notify Contractor; In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; Ensure remedial measures properly implemented; If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	<ul style="list-style-type: none"> Take immediate action to avoid further exceedance; Submit proposals for remedial actions to IEC within three working days of notification; Implement the agreed proposals; Resubmit proposals if problem still not under control; Stop the relevant portion of works as determined by the SOR until the exceedance is abated.

Annex I

Implementation Schedule of Mitigation Measures

Annex I Summary of Mitigation Measures Implementation Schedule

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
<i>Summary of Environmental Mitigation Measures in the EIA and EM&A Manual</i>			
<i>Construction Phase</i>			
Air Quality	Dust mitigation measures stipulated in <i>the Air Pollution Control (Construction Dust) Regulation</i> shall be incorporated to control Post emission. Notice shall be given to authority prior to commencing of work.	Work sites / during construction period	Δ. Notice of works commencement was submitted to EPD on 3 August 2010.
Water Quality	The practices outlined in ProPECC PN 1/94 Construction Site Drainage should be adopted. It is recommended to install perimeter channels in the works areas to intercept runoff as site boundary prior to the commencement of any earthwork. To prevent storm runoff from washing across exposed soil surfaces, intercepting channels should be provided. Drainage channels are also required to convey site runoff to sand/silt traps and oil interceptors. Provision of regular cleaning and maintenance can ensure the normal operation of these facilities throughout the construction period. Any practical options for the diversion and re-alignment of drainage should comply with both engineering and environmental requirements in order to ensure adequate hydraulic capacity of all drains.	Work site/During the construction period	Δ
Water Quality	There is a need to apply to EPD for a discharge license under the WPCO for discharging effluent from the construction site. The discharge quality is required to meet the requirements specified in the discharge license. All the runoff and wastewater generated from the works areas should be treated so that it satisfies all the standards listed in the TM-DSS. Reuse and recycling of the treated effluent can minimize water consumption and reduce the effluent discharge volume. The beneficial uses of the treated effluent may include dust suppression, wheel washing and general cleaning. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring should be carried out in accordance with the WPCO license which is under the ambit of regional office (RO) of EPD.	Work site/During the construction period	Δ. Discharge licence was awarded by EPD on 7 December 2010.
Water Quality	The construction programme should be properly planned to minimize soil excavation, if any, in rainy seasons. This prevents soil erosion from	Work site/During the construction period	Δ

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
	<p>exposed soil surfaces. Any exposed soil surfaces should also be properly protected to minimize dust emission. In areas where a large amount of exposed soil exists, earth bunds or sand bags should be provided. Exposed stockpiles should be covered with tarpaulin or impervious sheets at all times. The stockpiles of materials should be placed at locations away from any stream course so as to avoid releasing materials into the water bodies. Final surfaces of earthworks should be compacted and protected by permanent work. It is suggested that haul roads should be paved with concrete and the temporary access roads protected using crushed stone or gravel, wherever practicable. Wheel washing facilities should be provided at all site exists to ensure that earth, mud and debris would not be carried out of the works areas by vehicles.</p>		
Water Quality	<p>Good sites practices should be adopted to clean the rubbish and litter on the construction sites so as to prevent the rubbish and litter from spreading from the site area. It is recommended to clean the construction sites on a regular basis.</p>	Work site/During the construction period	<>
Water Quality	<p>The presence of construction workers generates sewage. It is recommended to provide sufficient chemical toilets in the works areas. The toilet facilities should be more than 30m from any watercourse. A licensed water collector should be deployed to clean the chemical toilets on a regular basis. The construction workers can also make use of the existing toilet facilities within the PPSTW as necessary.</p>	Work site/During the construction period	√
Water Quality	<p>Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the project. Regular environmental audit on the construction phase of the project. Regular environmental audit on the construction site can provide an effective control of any malpractices and can achieve continual improvement of environmental performance on site.</p>	Work site/During the construction period	√
Waste Management	<p>Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in</p>	Work site/During the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
	particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.		
Waste Management	Any service shop and maintenance facilities should be located on hard standings within a bunded area, and stumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.	Work site/During the construction period	Δ
Waste Management	<p>Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance details the requirements to deal with the chemical wastes. General requirements are given as follows:</p> <ul style="list-style-type: none"> • Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport. • Chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents. • Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area. 	Work site/During the construction period	Δ
Waste Management	<p><i>Good Site Practices</i> Recommendations for good site practices during the construction activities include:</p> <ul style="list-style-type: none"> • Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site • Training of site personnel in proper waste management and chemical handling procedures • Provision of sufficient waste disposal points and regular collection of waste • Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by 	Work site/During the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
	<p>transporting wastes in enclosed containers</p> <ul style="list-style-type: none"> • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors. • Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Facility. 		
Waste Management	<p><i>Waste Reduction Measures</i></p> <p>Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:</p> <ul style="list-style-type: none"> • Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal. • Encourage collection of aluminium cans by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the work force • Proper storage and site practices to minimise the potential for damage or contamination of construction materials. • Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste. 	Work site/ During planning & design stage, and construction stage	√
Waste Management	<p><i>General Refuse</i></p> <p>General refuse should be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.</p>	Work site / During the construction period	Δ
Waste Management	<p><i>Construction and Demolition Material</i></p> <p>In order to minimise the impact resulting from collection and</p>	Work site / During design stage & construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
	<p>transportation of C&D material for off-site disposal, the excavated material generated from site formation works for the proposed new facilities and units at the STW should be reused on-site as far as practicable. The surplus excavated material should be disposed of at the designated public fill reception facility, as agreed with the Secretary of the Public Fill Committee, for other beneficial uses.</p>		
Waste Management	<p>Mitigation measures and good site practices should be followed to control potential environmental impact from handling and transportation of C&D material. The mitigation measures include:</p> <ul style="list-style-type: none"> • Where it is unavoidable to have transient stockpiles of C&D material pending collection for disposal, the transient stockpiles shall be located away from waterfront or storm drains as far as possible. • Open stockpiles of construction materials or construction wastes on-site should be covered with tarpaulin or similar fabric. • Skip hoist for material transport should be totally enclosed by impervious sheeting. • Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site • The area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores. • The load of dusty materials carried by vehicle leaving a construction site should be covered entirely by clean impervious sheeting to ensure dust materials do not leak from the vehicle. • All dusty materials should be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet. • The height from which excavated materials are dropped should be controlled to a minimum practical height to limit fugitive dust generation from unloading. 	Work site / During design stage & construction period	Δ
Waste Management	<p>When disposing C&D material at a public filling facility, it shall be noted that the material shall only consist of earth, building debris and broken rock and concrete. The material shall be free from marine mud,</p>	Work site/ During design stage & construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
	household refuse, plastic, metals, industrial and chemical waste, animal and vegetable matter, and other material considered to be unsuitable by the Filling Supervisor. In order to monitor the disposal of the surplus C&D material at the designed public fill reception facility and to control fly tipping, a trip-ticket system should be included as one of the contractual requirements and implemented by an Environmental Team undertaking the Environmental Monitoring and Audit work with reference to the ETWB TCW No. 31/2004 "Trip Ticket System for Disposal of Construction and Demolition Materials" as attached in Appendix 7-1. An Independent Environmental Checker should be responsible for auditing the results of the system.		
Waste Management	<p><i>Chemical Waste</i></p> <p>If chemical wastes are produced at the construction site, the Contractor would be required to register with the EPD as a Chemical Waste Producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, to either the Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.</p>	Work site / During the construction period	Δ
Landscape & Visual	<p><u>Temporary Tree Nurseries</u></p> <p>Temporary tree nurseries may be set up for the transplanted tree and proposed trees at an early stage to allow small trees to grow during the construction periods. By the time when planting area becomes available, trees mature and increase in trunk & spread size. They will require minimal pruning and suffer much less damage during transplanting when comparing the travel distance from an on-site nursery to an off-site nursery.</p>	Work site/ During design stage & construction period	√. A tree nursery has been set up off-site near the site office.

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
	Besides, these trees may also be positioned as visual mitigation during the construction period.		
Landscape & Visual	<u>No-intrusion Zone</u> To maximize protection to existing trees and ground vegetation, construction contracts may designate “No-intrusion Zone” to various areas within the site boundary with rigid and durable fencing for each individual no-intrusion zone. The contractor should close monitor and restrict the site working staff not to enter the “no-intrusion zone”, even for non-direct construction activities and storage of equipment.	Work site/During design stage & construction period	√
Landscape & Visual	<u>Hoarding</u> Hoarding or boundary fencing for construction shall be considered. It should be sensitively designed, subtle, camouflaged and more ‘permeable’ so that they fit into the existing environment when looking from outside.	Work site/During design stage & construction period	√
Landscape & Visual	<u>Dust and Erosion Control for Exposed Soil</u> Excavation works and demolition of existing building blocks and which will be highly visible form surrounding areas should be well planned and with precautions to suppress dust. Exposed soil shall be covered or ‘camouflaged’ and watered often. Areas that are expected to be left with bare soil for a long period of time after excavation shall be properly covered with suitable protective fabric. Silt and erosion shall be controlled by ground barriers around the slope cutting area..	Work site/During design stage & construction period	<>
Landscape & Visual	<u>Existing Tree Record Inventory</u> All retained trees should be record photographically at the commencement of the Contract, and carefully protected during the construction period. Detailed tree protection specification shall be allowed and included in the Contract Specification, which specifying the	Work site/During design stage & construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
	tree protection requirement, submission and approval system, and the tree monitoring system.		
Landscape & Visual	<u>Construction Light</u> All security floodlights for construction sites shall be equipped with adjustable shield, frosted diffusers and reflective covers, and be carefully controlled to minimize light pollution and night-time glare to nearby residences and GIC users. The Contractor shall consider other security measures which shall minimize the visual impacts.	Work site / During design stage & construction period	√
Landscape & Visual	<u>Tree Transplanting</u> Apart from the 18 numbers of " <i>Leucaena leucocephala</i> ", which are proposed to be felled in accordance with ETWB TCW No. 3/2006, all the affected trees shall be transplanted. Where practicable, trees shall be directly transplanted to permanent on-site locations. The location of the transplanted tree is shown in Figure 8.9.1 .	Work site / During design stage & construction period	Δ. Tree transplantation in progress.
Landscape & Visual	<u>Tree Compensation Ratio</u> The total number of compensatory trees planted in the project area shall not be less than 1:1 ratios by new trees. Required numbers and locations of compensatory trees shall be determined and agreed with Government during the tree felling application process under ETWCTC 3/2006. Compensatory trees shall be at least heavy standard size to create "immediate" greening effect. 81 numbers of " <i>Cassia surattensis</i> " will be provided as the additional compensatory planting for loss of greenery in the area due to removal of the affected trees. The location of the additional compensatory planting is shown in Figure 8.9.1 .	Work site / During design stage & construction period	N/A
Landscape & Visual	<u>Re-use of Existing Soil and Advance formation of Planting Area</u> Existing topsoil shall be re-used where possible for new planting areas within the project. Advance formation of planting area and early implementation of the plating works can minimize adverse impact on trees. The construction program shall consider using the soil removed	Work site / During design stage & construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
	from one phase for backfilling another. Suitable storage ground, gathering ground and mixing ground may be set up on-site as necessary.		
Landscape & Visual	<p><u>Establishment Period</u></p> <p>12 month establishment period for the soft landscape works will be allowed in the main contract. Most construction contracts in Hong Kong require the Contractor to carry out routine horticultural operations, including watering, pruning, weeding, pest control, replacement of dead plants etc. to ensure healthy establishment of new planting during a 12 month establishment period. This period also serves as a kind of warranty / guarantee on the quality of the plants supplied and installed by the Contractor. Monthly monitoring during the first year of establishment period is recommended.</p>	Work site/ During operation period	N/A. To be implemented during operation phase of Project.
Landscape & Visual	<p><u>Re-instatement of excavated Area</u></p> <p>All excavated area and disturbed area for utilities diversion, temporary road diversion, and pipeline works will be reinstated to former conditions, subject to applicable Government Standards.</p>	Work site / During design stage & operation period	N/A. To be implemented during operation phase of Project.
Landscape & Visual	<p><u>Appearance and Greening for the proposed structures</u></p> <p>Compatible design, construction materials and surface finishes of the proposed structure should match with the nearby existing external appearance of PPSTW buildings for achieving visual uniformity. Finishing materials shall have due consideration to form, basic color, color/ tone variation, micro-and macro-texture, and reflectivity/ light absorbance to avoid glare. Planting, such as turf, low groundcovers and climbers, may also be planted on top of these elements to provide greening and aesthetic effect.</p>	Work site / During design stage & operation period	N/A. To be implemented during operation phase of Project.
<i>Summary of Key Environmental Mitigation Measures in Contract Requirements</i>			
Air Quality	Only Ultra-low-sulphur diesel (ULSD) should be used for all diesel-operated plants and equipments on site	Work sites / during construction period	√
Air Quality and Noise	Plants and equipments of good operation conditions should be used on site.	Work sites / during construction period	√
Noise	No diesel hammers should be used for piling works	Work sites / during construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Noise	Construction Noise Permits (CNP) should be applied for works conducted outside non-restricted hours.	Work sites / during construction period	√
Noise	Quiet construction equipments and the quietest practicable working methodologies should be adopted for works whenever feasible. Noise labels should be provided for air compressors. Hoods and cover panels of generators and air compressors should be closed during operation. Noise labels should be provided for air compressors and hand-held percussive breakers.	Work sites / during construction period	√
Waste Management	Temporary works construction on site should minimize the use of timber to reduce the quantity of C&D waste generated during works period.	Work sites / during construction period	√
Landscape and Visual	Retained or to-be-transplanted trees on site should be properly protected from physical damages and soil compacts with temporary fencing or hessian armouring whenever feasible.	Work sites / during construction period	<>

Remark:

- √ Compliance of Mitigation Measures
- <> Compliance of Mitigation but need improvement
- x Non-compliance of Mitigation Measures
- ▲ Non-compliance of Mitigation Measures but rectified by ATAL-Degrémont-China State JV
- Δ Deficiency of Mitigation Measures but rectified by ATAL-Degrémont-China State JV
- N/A Not Applicable in Reporting Period

Annex J

Waste Flow Table

Contract No. : DC/2008/03 - Design, Build and Operate Pillar Point Sewage Treatment Works

Monthly Summary Waste Flow Table

Month	Actual Quantities of Inert C&D Materials (Public Fill) Generated					Actual Quantities of Non-inert C&D Materials (Construction Waste) Generated				
	Total Quantity Generated	Rocks & Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Metals (see Note 1)	Paper/ cardboard packaging (see Note 1)	Plastics (see Note 2)	Chemical Waste	Others, e.g. general refuse (see Note 3)
	tonne	tonne	tonne	tonne	tonne	kilogram	kilogram	kilogram	Litre	tonne
Nov 2010	2,248	0	0	0	2,248	60	100	0	0	18.05 (see Note 4)
Dec 2010	11,314 (see Note 4)	0	0	0	11,314	100	120	20	0	28.4 (see Note 4)
Jan 2011	58,383 (see Note 4)	0	0	0	58,383	250	280	60	0	4.59 (see Note 4)
Sub-total	71,945	0	0	0	71,945	410	500	80	0	51.04
Feb 2011	12,855	0	0	0	12,855	100	150	50	0	2.43 (see Note 4)
Mar 2011	22,859	0	0	0	22,859	150	180	55	0	9.02
Apr 2011	8,547 (see Note 7)	0	0	5,684(see Note 5, 7)	2,863 (see Note 7)	50	30	15	0	5.78
Sub-total	44,261	0	0	5,684	38,577	300	360	120	0	17.23
May 2011	6,293 (see Note 7)	0	0	11 (see Note 5, 7)	6,282 (see Note 7)	45	25	10	360 (see Note 7)	8.83
Jun 2011	4,587 (see Note 7)	0	0	0 (see Note 7)	4,587 (see Note 7)	40	30	15	0	7.10
Jul 2011	523	0	0	0	523	15	5	10	0	7.20
Sub-total	11,403	0	0	11	11,392	100	60	35	360	23.13
Aug 2011	425	0	0	0	425	0	0	15	0	6.12
Total	128,034	0	0	5,695	122,339	810	920	250	360	97.52

- Notes:
- (1) Metal and paper/cardboard packaging were collected by recycler for recycling.
 - (2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material collected by recycler for recycling.
 - (3) General refuse was disposed of at WENT by subcontractors.
 - (4) The waste flow data for November and December 2010, January and February 2011 was updated in March 2011 based on SOR's comments and has been confirmed by the Contractor.
 - (5) The inert C&D materials were reused in the Contract No. EP/SP/58/08 at Tuen Mun Tsang Tsui.
 - (6) Chemical waste was collected through the licensed chemical waste collector, Dunwell Ind. (Holdings) Ltd, with the waste collection licence number 7111-757-W0015-WC.
 - (7) The waste flow data for April, May and June 2011 was updated in August 2011 based on SOR's comments and has been confirmed by the Contractor.

Annex K

Environmental Complaint,
Environmental Summon
and Presecution Log

Annex K Cumulative Complaint and Summons/Prosecutions Log

Reporting Month	Number of Complaints in Reporting Month	Number of Summons/Prosecutions in Reporting Month
November 2010	0	0
December 2010	0	0
January 2011	0	0
February 2011	0	0
March 2011	0	0
April 2011	0	0
May 2011	0	0
June 2011	0	0
July 2011	0	0
August 2011	0	0
Overall Total	0	0

Annex L

Construction Programme of the Project

