

ATAL-Degrémont-China State Joint Venture

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

February 2011

Environmental Resources Management

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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 – Winnie Ko)
Certified by:	 (Registered Landscape Architect (R078) - Christina Ip)
Date:	14 March 2011

Your Ref:
Our Ref: 60017423/C/enfl/11031101

By Hand & By Fax (2833 9162)

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

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

11 March 2011

Dear Sir,

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

Monthly EM&A Report for February 2011

Reference is made to Environmental Team (ET)'s revised draft of the Monthly EM&A Report for February 2011 provided by email dated 10 March 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 3105 8537.

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

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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 fourth monthly Environmental Monitoring and Audit (EM&A) report presenting the EM&A works carried out during the period from 1 to 28 February 2011 in accordance with the EM&A Manual.

Summary of Construction Works undertaken during the Reporting Month

Works undertaken in the reporting month include:

- Site formation in P2;
- Tree transplanting preparation work in P1 and P2;
- Sheet piling in P2;
- Grouting of pipe pile wall in P2;
- Soil nailing in P2; and
- Ground investigation in P2.

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) | 5 sets |
| • 1-hour TSP Monitoring at each monitoring station (AM1 and AM2) | 15 sets |
| • Joint Environmental Site Inspection | 4 times |
| • Landscape & Visual Monitoring | 1 time |

Air Quality

Five sets of 24-hour TSP and fifteen 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 12,855 tonnes of public fill were delivered to the fill bank and 300 kg of metals, paper/cardboard and plastics were sent to recyclers in the reporting period. No general refuse and 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 28 February 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:

- Site formation in P2;
- Pipe piling in P2;
- Tree transplant from P1 and P2 to nursery;
- Sheet piling works in P2;
- Erection of tower crane in P2; and
- Interim operation of PPSTW in P1.

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 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 fourth EM&A report which summarises the impact monitoring results and audit findings for the EM&A programme during the reporting period from 1 to 28 February 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 the 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 this 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">• Site formation in P2• Sheet piling in P2• Tree transplanting preparation work in P1 & P2• Grouting of pipe pile wall in P2• Soil nailing in P2• Ground investigation in P2

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-RW0588-10	1 December 2010 – 30 May 2011	-
	GW-RW0074-11	28 January 2011 – 27 July 2011	-
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 3.1* 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 was conducted at the designated monitoring stations in accordance with the requirements stipulated in the EM&A Manual. 1-hour and 24-hour TSP levels were monitored at the frequency and duration stated in *Table 3.2*. The construction phase TSP monitoring was 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 1247), 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 foul 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 m³min⁻¹ which were within the range specified in the EM&A Manual (ie 0.6 – 1.7 m³min⁻¹);
- the programmable timer was set for a sampling period of 24 hours ± 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 5 sets of 24-hour and 15 sets of 1-hour TSP measurements were carried out 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 are presented in *Annex F*. The weather conditions during the monitoring period were 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*. The public fill and construction waste generated from the Project were disposed of at the Tuen Mun Area 38 Fill Bank and WENT Landfill, respectively. 100 kg of metals, 150 kg of paper/cardboard packaging and 50kg 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
February 2011	12,855 tonnes	8 kg	0 kg

Notes:

- (a) Inert C&D materials (public fill) include bricks, concrete, building debris, rubble and excavated soil. No public fill was reused in this Project during the reporting period. The public fill 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. 8 kg of general refuse including 3 kg disposed in the 3rd reporting month. Construction wastes other than metals and paper/cardboard packaging were disposed of at WENT Landfill. 100 kg of metals, 150 kg of paper/cardboard packaging and 50kg of plastics were recovered and sent to recyclers for recycling during the reporting period.
- (c) General refuse was disposed of at WENT by subcontractors.

7.1 WEEKLY SITE AUDITS

Joint site inspections were conducted by the representatives of the Contractor, SOR and the ET on 2, 11, 18 and 25 February 2011. The IEC was also present during the joint inspection on 11 February 2011. There was no non-compliance recorded during the site inspections.

Major findings observed during the reporting period were summarised as follows:

2 February 2011

- Roots of some transplanted trees in the nursery were still observed to be exposed. The Contractor was recommended to fill soil on top of the exposed roots within 3 working days so that the root can be totally covered.
- It was also still observed that there were two trees roped together, which one was inside the nursery and the other located on the slope outside. The tree outside the nursery was used as an anchor to support the newly transplanted tree inside the nursery. The Contractor was recommended to untie the rope within 3 working days to avoid further damages to trees outside the nursery. The Contractor was also recommended to erect proper support for the transplanted tree in order to maintain the health of trees in area within 3 working days.
- Some mills barriers were observed to be placed in between the retained trees and the access road along the southern boundary of site. Construction materials were also placed directly above the roots of the retained trees. The Contractor was recommended to relocate the barriers to between the retained trees and works area to avoid trespassing by works as well as the stockpiling of construction materials near tree roots in order to maintain health of trees within 3 working days. The Contractor was also reminded to avoid positioning mills barriers on top of tree roots to avoid compaction of soil above tree roots.
- A water hose directing site discharge to the sedimentation tank was observed to be leaking water. The Contractor was recommended to replace the hosing within 3 working days to avoid breaching and therefore discharge of untreated site runoffs into nearby drainages. The Contractor was also recommended to implement inspection on water hoses regularly to ensure early replacements if necessary.

11 February 2011

- It was still observed that there were two trees roped together, which one was inside the nursery and the other located on the slope outside. The tree outside the nursery was used as an anchor to support the newly

transplanted tree inside the nursery. The Contractor was recommended to untie the rope within 3 working days to avoid further damages to trees outside the nursery. The Contractor was also recommended to erect proper support for the transplanted tree in order to maintain the health of trees in area within 3 working days.

- The soil stockpiling area was observed to be exposed to strong winds. The Contractor was recommended to compact the soil in the area on a regular basis (the first should be conducted within 3 working days) to ensure wind erosion and muddy runoff from site is controlled to avoid impacts to nearby sensitive receivers.
- Rock breaking activities along the eastern boundary of the excavated area were observed to be generating dust. No dust suppressive measures were implemented. The Contractor was recommended to arrange and to implement dust suppressive measures (ie. water spraying) for all dusty works on site at all times within 3 working days.
- The sedimentation tank on site was observed to be improperly setup where treated water exits the tank from the bottom. The Contractor was recommended to review the setup of the tank and to ensure correct outlets are used for discharge of treated water within 3 working days to ensure quality of discharge and therefore compliance of conditions in the discharge permit. The Contractor was also reminded that all site discharges should be treated in sedimentation tanks prior to discharge off site.
- Oil stains were observed under an excavator at the soil stockpiling area. The Contractor was recommended to clear the oil stains within 3 working days and dispose the collected wastes as chemical wastes via licensed collectors. The Contractor was also recommended to inspect and maintain site equipments to ensure only equipments free of oil leakages are deployed on site. Secondary spillage containment measures should also be implemented for temporary storage of oily equipment and during minor maintenance of equipments on site.

18 February 2011

- Water with oil sheens was observed in the drip tray containing an oil drum located between drilling machine and the sub-contractor's storage area. The Contractor was recommended to clean the container regularly and dispose the wastewater as chemical waste within 3 working days. Preventive measures such as cover the entire oil drum and drip tray with tarpaulin sheet to avoid holding water was also recommended.
- It was observed that a drilling machine located along the northern boundary produced dark smoke during operation. The Contractor was recommended to check the machine and replace filter, if necessary, within 3 working days. Such practice should also be undertaken on a regular basis to prevent air pollution from the construction activities.
- The air compressors located along the southern boundary which are not in operation were observed contained by drip trays with size smaller than the compressors. The Contractor was recommended to provide

appropriate sized containers to prevent leakage or spillage of oil within 3 working days.

25 February 2011

- Loose soil entering the u-channel at the perimeter was observed at the nursery area. The Contractor was recommended to compact the soil before covering by tarpaulin and made the perimeter bunded by rocks or sandbags to prevent water quality impact to the stormwater within 3 working days.
- Oil drums and chemical drums were observed to be placed on the ground without drip trays adjacent to the excavator at the stockpile area. The Contractor was recommended to provide drip trays for the temporary storage of chemicals on site to avoid potential spillages within 3 working days. Waste chemical drums should also be stored in the chemical waste storage on site and disposed of properly via licensed collectors.
- It was observed that a water pipe from the container at the workers' rest area at southwest corner of the site was connected to the nearby stormwater drain at the site perimeter. The Contractor was recommended to review the water pipe setup to ensure all wastewater from the site is treated and discharged in compliance of conditions in the discharge permit within 3 working days.
- Rock breaking activities along the western boundary of the excavated area were observed to be generating dust. No dust suppressive measures were implemented. The Contractor was recommended to arrange and to implement dust suppressive measures (ie. water spraying) for all dusty works on site at all times within 3 working days.
- An air compressor located along the southern boundary which was not in operation was observed without drip tray. The Contractor was recommended to provide appropriate sized containers to prevent leakage or spillage of oil within 3 working days.

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. 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:

28 February 2011

- It was observed that most of the retained trees along the access road and near the works area at the southern boundary of site were not properly protected. Construction materials and machines were placed near and directly above the roots of the retained trees. The Contractor was recommended to relocate all construction materials and machines away from the roots of the retained trees, and keep the tree root zones clear to prevent tree damage. Contractor was also advised to install protective fences around every retained tree within 3 working days to avoid storing construction materials that will affect the health of the trees. Contractor was also advised to arrange their mills barrier in order to avoid any accidents within the site.
- It was also observed that some transplanted trees in the nursery were showing poor health condition. The Contractor was advised to review the health of the transplanted trees and take appropriate action to improve the condition of all affected transplanted trees in the nursery. It was also observed that one of the transplanted trees near T369 and T372 was untagged. The Contractor was advised to check the proper identification of the tree and put a tag as identification within 3 working days.

The Contractor was recommended 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*.

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

Work to be taken
• Site formation in P2
• Pipe piling in P2
• Tree transplant P1 and P2 to nursery
• Sheet piling works in P2
• Erection of tower crane in P2
• Interim operation of the PPSTW in P1

Potential environmental impacts arising from the above construction activities are mainly 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 as 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, the 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	77	63 – 100
AM2	260	88	75 – 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. 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)	Accumulated Actual Amount of Public Fill and Construction Waste Recorded ^(a) ^(b) (inert & non-inert)
Amount of C&D Materials Arising	61,489 m ³	56,428 m ³
Amount of C&D Materials Reused on site	14,926m ³	0 m ³
Amount of C&D Materials Sent to Public Fills	46,563m ³	56,428 m ³
General Refuse	Small	8 kg
Chemical Waste	Small	0 kg

Notes:

(a) The actual amount of C&D Materials was recorded since the commencement of construction works.

(b) Density conversion factor of 1.06 for soil and stones (Ref No. 17 05 04) from Scotland Business Waste Survey 2006 by the Scotland Environmental Protection Agency

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 works undertaken during the reporting period from 1 to 28 February 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 on 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

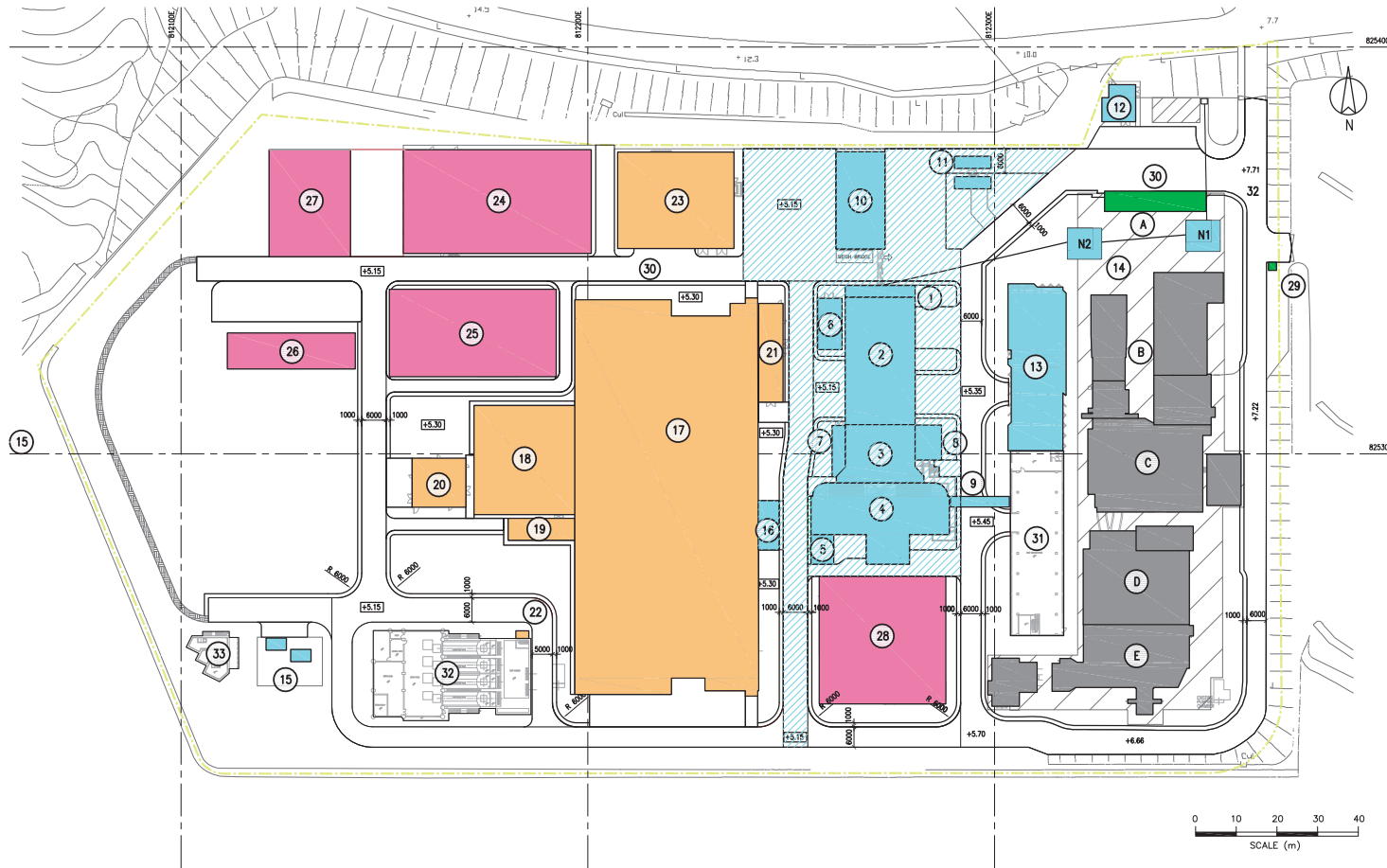
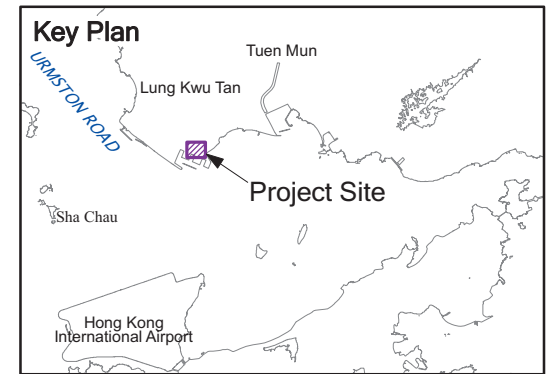
- A ADMINISTRATION BUILDING
- B INLET SCREW PUMPING STATION AND MOTOR HOUSE
- C COARSE SCREENS
- D BLOWER HOUSE AND GRIT CHANNELS
- E FINE SCREEN CHANNELS AND FLOWMETER CHAMBER

SECTION 5 EXTERNAL WORKS

- 29 GATE HOUSE
- 30 CAR PARK

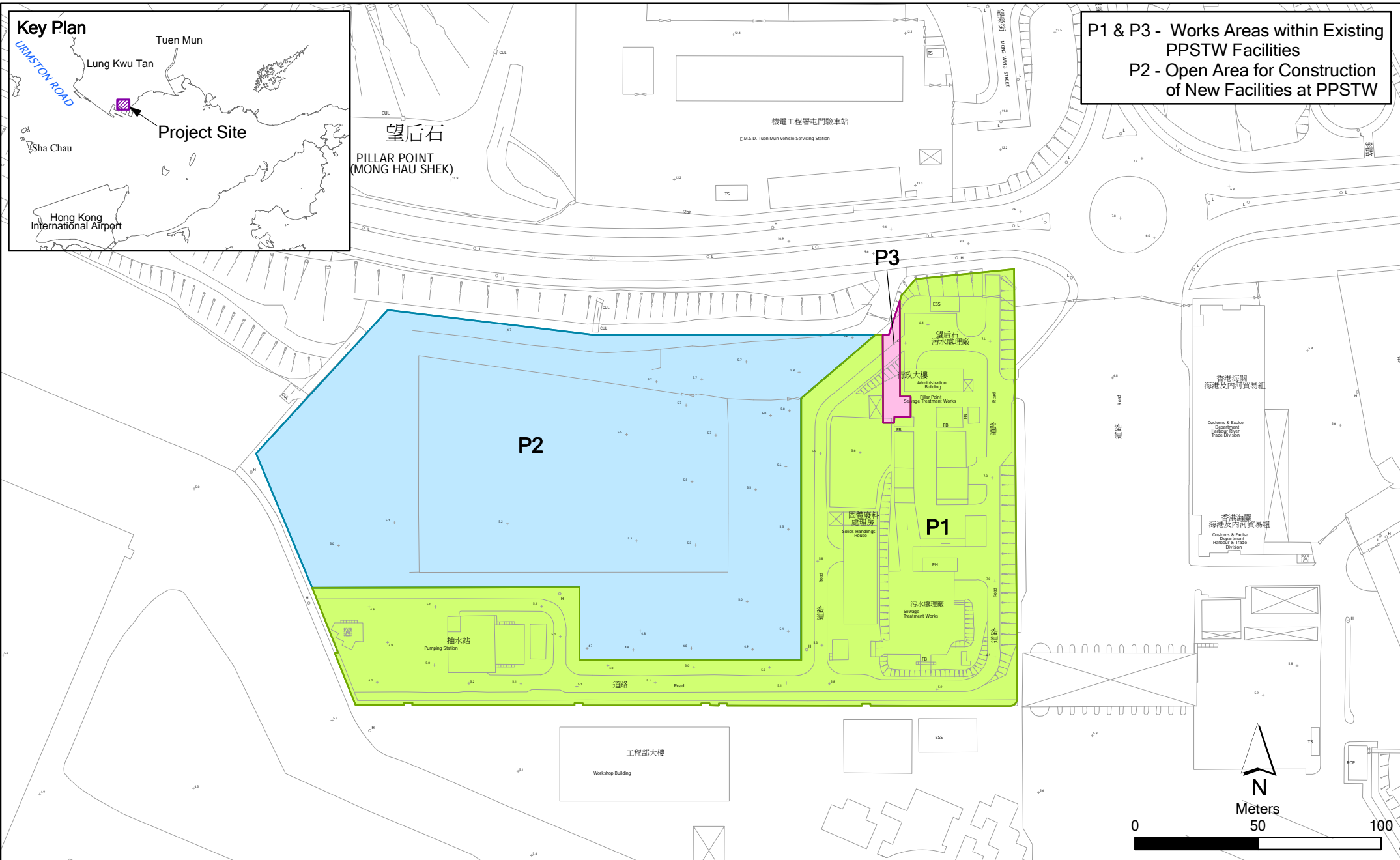
EXISTING BUILDING TO BE RETAINED

- 31 EXISTING SOLID HANDLING BUILDING
- 32 EXISTING OUTFALL PUMPING STATION
- 33 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

File: 0119806_location of works.mxd
Date: 15/12/2010

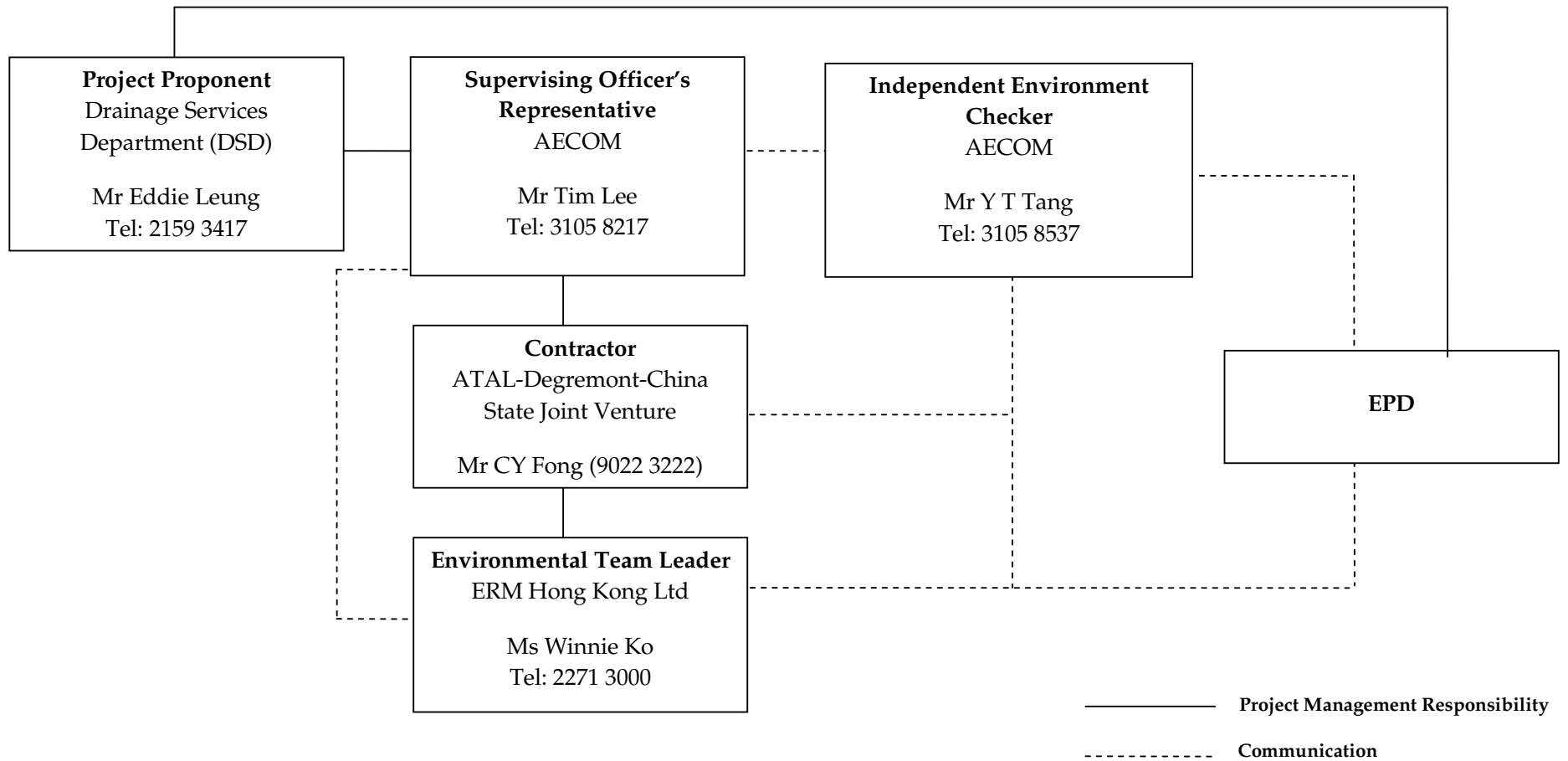
Environmental
Resources
Management



Annex C

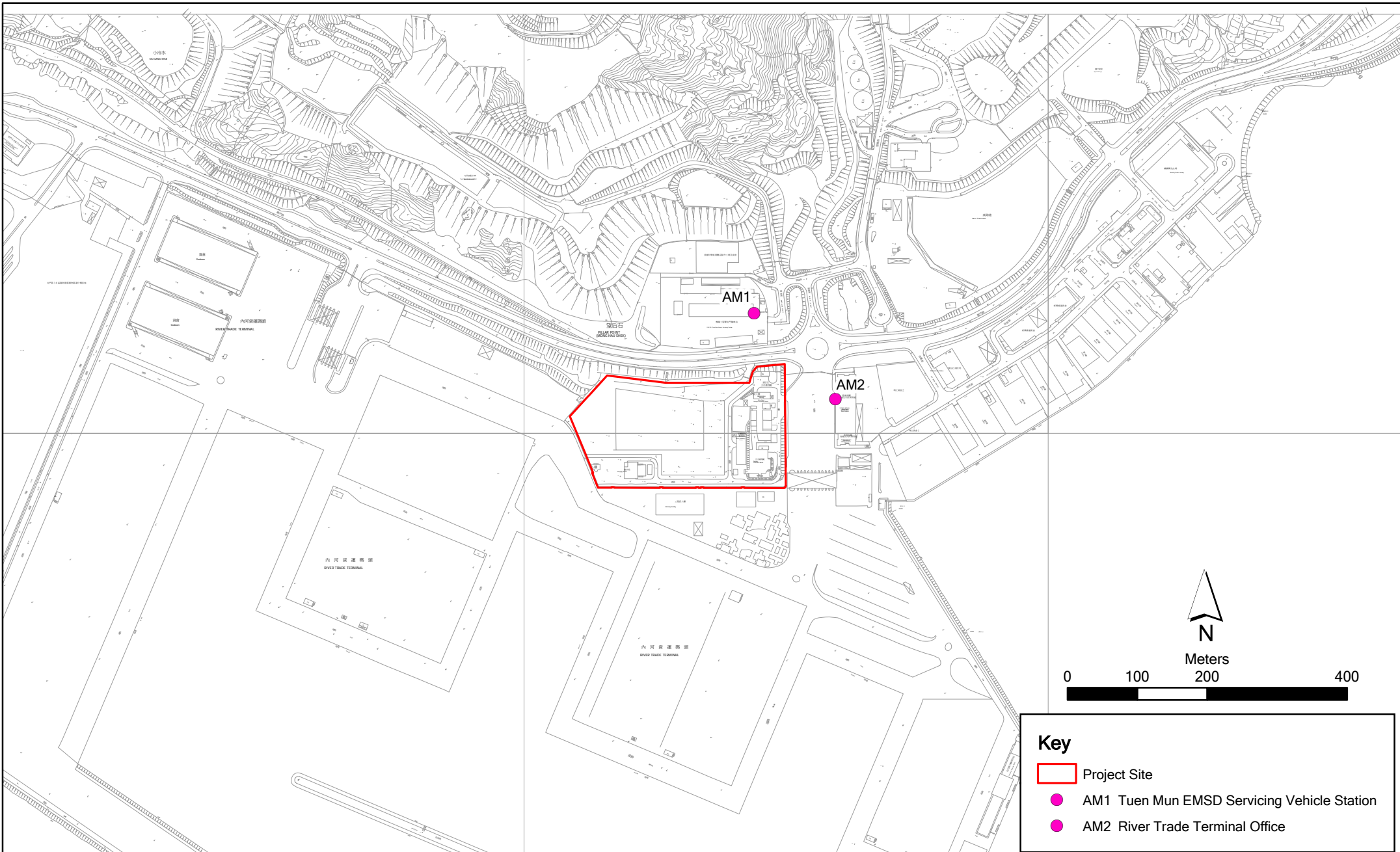
Project Organization Chart with Contact Details

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**



Annex D

Locations of Air Quality Monitoring Stations



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)
February 2011**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1-Feb	2-Feb	3-Feb	4-Feb	5-Feb
			3X1-hr & 1X 24-hr TSP	New Year Holiday	New Year Holiday	New Year Holiday
6-Feb	7-Feb	8-Feb	9-Feb	10-Feb	11-Feb	12-Feb
		3X1-hr & 1X 24-hr TSP				
13-Feb	14-Feb	15-Feb	16-Feb	17-Feb	18-Feb	19-Feb
	3X1-hr & 1X 24-hr TSP					3X1-hr & 1X 24-hr TSP
20-Feb	21-Feb	22-Feb	23-Feb	24-Feb	25-Feb	26-Feb
					3X1-hr & 1X 24-hr TSP	
27-Feb	28-Feb					

**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)
March 2011**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1-Mar	2-Mar	3-Mar	4-Mar	5-Mar
				3X1-hr & 1X 24-hr TSP		
6-Mar	7-Mar	8-Mar	9-Mar	10-Mar	11-Mar	12-Mar
			3X1-hr & 1X 24-hr TSP			
13-Mar	14-Mar	15-Mar	16-Mar	17-Mar	18-Mar	19-Mar
		3X1-hr & 1X 24-hr TSP				
20-Mar	21-Mar	22-Mar	23-Mar	24-Mar	25-Mar	26-Mar
	3X1-hr & 1X 24-hr TSP					3X1-hr & 1X 24-hr TSP
27-Mar	28-Mar	29-Mar	30-Mar	31-Mar		

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
2-Feb-11	13:15	14:15	Sunny	181	343	500	Construction work in progress	16	*	7580	8057
	14:15	15:15	Sunny	165	343	500	Construction work in progress	16	*	7580	8058
	15:15	16:15	Sunny	151	343	500	Construction work in progress	17	*	7580	8059
8-Feb-11	13:15	14:15	Sunny	148	343	500	Construction work in progress	23	*	7580	8131
	14:15	15:15	Sunny	129	343	500	Construction work in progress	23	*	7580	8132
	15:15	16:15	Sunny	116	343	500	Construction work in progress	24	*	7580	8133
14-Feb-11	13:15	14:15	Cloudy	94	343	500	Construction work in progress	10	*	7580	8148
	14:15	15:15	Cloudy	91	343	500	Construction work in progress	11	*	7580	8149
	15:15	16:15	Cloudy	90	343	500	Construction work in progress	11	*	7580	8150
19-Feb-11	13:10	14:10	Cloudy	95	343	500	Construction work in progress	14	*	7580	8260
	14:10	15:10	Cloudy	90	343	500	Construction work in progress	14	*	7580	8261
	15:10	16:10	Cloudy	100	343	500	Construction work in progress	14	*	7580	8262
25-Feb-11	13:10	14:10	Sunny	130	343	500	Construction work in progress	19	*	7580	8277
	14:10	15:10	Sunny	112	343	500	Construction work in progress	20	*	7580	8278
	15:10	16:10	Sunny	121	343	500	Construction work in progress	21	*	7580	8279
				Min.	90						
				Max.	181						
				Average	121						

* 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 ($\mu\text{g}/\text{m}^3$)	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
2-Feb-11	13:00	14:00	Sunny	202	383	500	Construction work in progress	16	*	1252	8053
	14:00	15:00	Sunny	214	383	500	Construction work in progress	16	*	1252	8054
	15:00	16:00	Sunny	190	383	500	Construction work in progress	17	*	1252	8055
8-Feb-11	13:00	14:00	Sunny	246	343	500	Construction work in progress	23	*	1252	8069
	14:00	15:00	Sunny	179	343	500	Construction work in progress	23	*	1252	8128
	15:00	16:00	Sunny	209	343	500	Construction work in progress	24	*	1252	8129
14-Feb-11	13:00	14:00	Cloudy	147	383	500	Construction work in progress	10	*	1252	8144
	14:00	15:00	Cloudy	116	383	500	Construction work in progress	11	*	1252	8145
	15:00	16:00	Cloudy	109	383	500	Construction work in progress	11	*	1252	8146
19-Feb-11	13:00	14:00	Cloudy	141	383	500	Construction work in progress	14	*	1252	8256
	14:00	15:00	Cloudy	113	383	500	Construction work in progress	14	*	1252	8257
	15:00	16:00	Cloudy	111	383	500	Construction work in progress	14	*	1252	8258
25-Feb-11	13:00	14:00	Sunny	189	383	500	Construction work in progress	19	*	1252	8273
	14:00	15:00	Sunny	207	383	500	Construction work in progress	20	*	1252	8274
	15:00	16:00	Sunny	223	383	500	Construction work in progress	21	*	1252	8275
				Min.	109						
				Max.	246						
				Average	173						

* 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								
2-Feb-11	16:15	3-Feb-11	16:15	Sunny	2.8437	3.0021	10601.18	10625.18	24.00	1.28	1.28	1.28	86	183	260	Construction work in progress	7580	8060		
8-Feb-11	16:15	9-Feb-11	16:15	Sunny	2.8211	2.9590	10628.18	10652.18	24.00	1.28	1.28	1.28	75	183	260	Construction work in progress	7580	8134		
14-Feb-11	16:15	15-Feb-11	16:15	Cloudy	2.8626	2.9884	10655.18	10679.18	24.00	1.28	1.28	1.28	68	183	260	Construction work in progress	7580	8151		
19-Feb-11	16:10	20-Feb-11	16:10	Cloudy	2.8547	2.9703	10682.18	10706.18	24.00	1.28	1.28	1.28	63	183	260	Construction work in progress	7580	8263		
25-Feb-11	16:10	26-Feb-11	16:10	Sunny	2.8164	2.9408	10709.18	10733.18	24.00	1.28	1.28	1.28	67	183	260	Construction work in progress	7580	8280		
												Min.	63							
												Max.	86							
												Average	72							

24-hour TSP Monitoring Results

Station AM2

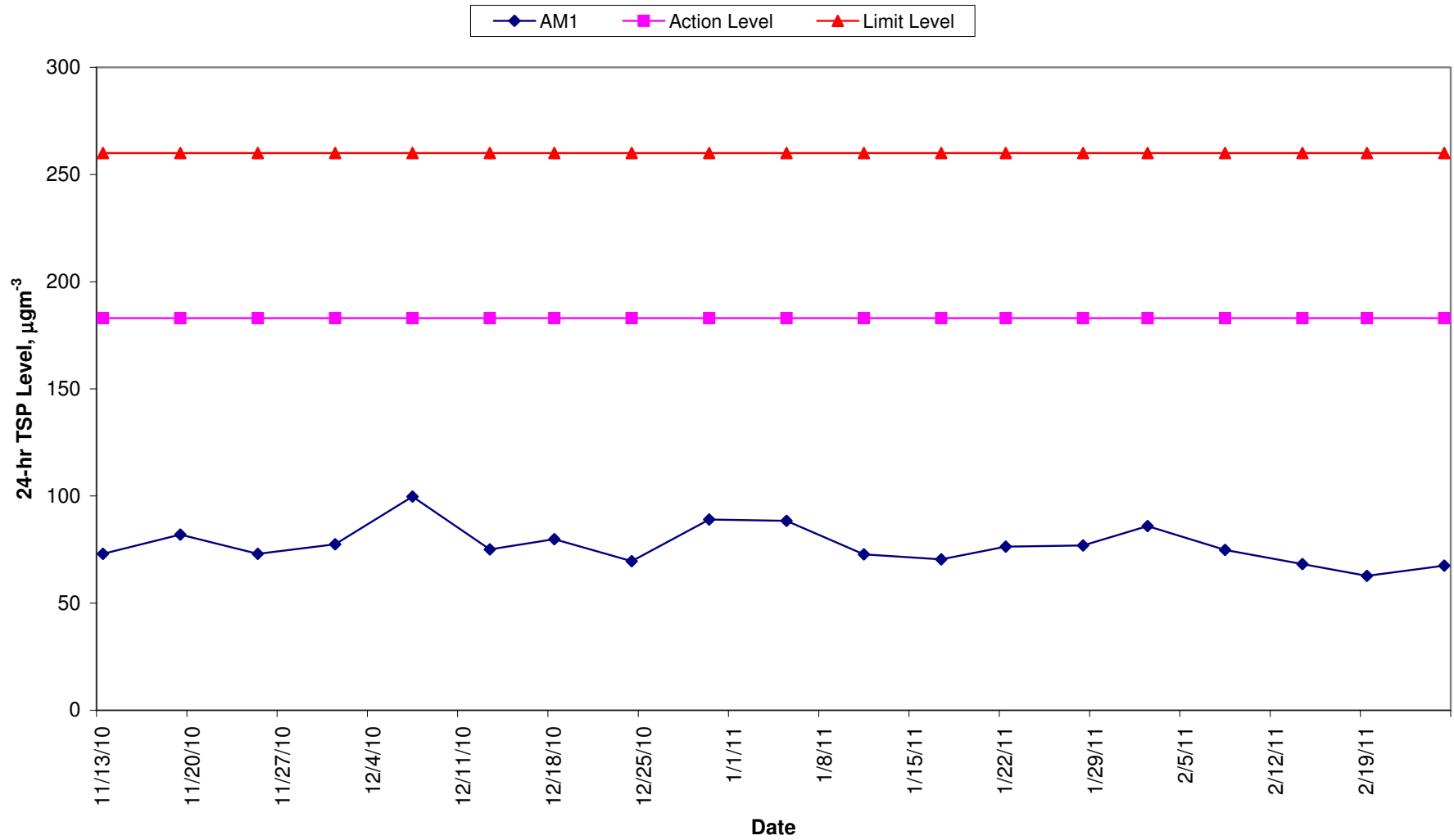
Start		Finish		Weather	Filter Weight (g)		Elapsed Time Reading		Sampling Time (hrs)	Flow Rate (m ³ /min)			TSP Conc. (µg/m ³)	Action Level (µg/m ³)	Limit Level (µg/m ³)	Observations / Remarks	Sampler ID	Filter ID		
Date	Time	Date	Time		Initial	Final	Initial	Final		Initial	Final	Average								
2-Feb-11	16:10	3-Feb-11	16:10	Sunny	2.8915	3.0486	18594.20	18618.20	24.00	1.19	1.19	1.19	92	192	260	Construction work in progress	1252	8056		
8-Feb-11	16:00	9-Feb-11	16:00	Sunny	2.8565	3.0211	18621.20	18645.20	24.00	1.19	1.19	1.19	96	192	260	Construction work in progress	1252	8130		
14-Feb-11	16:00	15-Feb-11	16:00	Cloudy	2.8377	2.9746	18648.20	18672.20	24.00	1.19	1.19	1.19	80	192	260	Construction work in progress	1252	8147		
19-Feb-11	16:00	20-Feb-11	16:00	Cloudy	2.8146	2.9424	18675.20	18699.20	24.00	1.19	1.19	1.19	75	192	260	Construction work in progress	1252	8259		
25-Feb-11	16:00	26-Feb-11	16:00	Sunny	2.8559	3.0114	18702.20	18726.20	24.00	1.19	1.19	1.19	91	192	260	Construction work in progress	1247	8276		
												Min.	75							
												Max.	96							
												Average	87							

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
2/2/2011	Sunny	14.9	56	0.0	7.1	NE
2/3/2011	Sunny	15.9	67	0.0	5.7	S
2/8/2011	Sunny	20.3	73	0.0	6.6	SW
2/9/2011	Sunny	20.6	75	0.0	9.3	SE
2/14/2011	Cloudy	9.6	67	1.0	12.4	NE
2/15/2011	Cloudy	9.9	84	4.0	8.6	NE
2/19/2011	Cloudy	11.4	93	4.0	10.8	NE
2/20/2011	Cloudy	13.3	73	0.0	6.4	NE
2/25/2011	Sunny	19.4	76	0.0	6.5	SE
2/26/2011	Sunny	19.5	69	0.0	7.7	SE

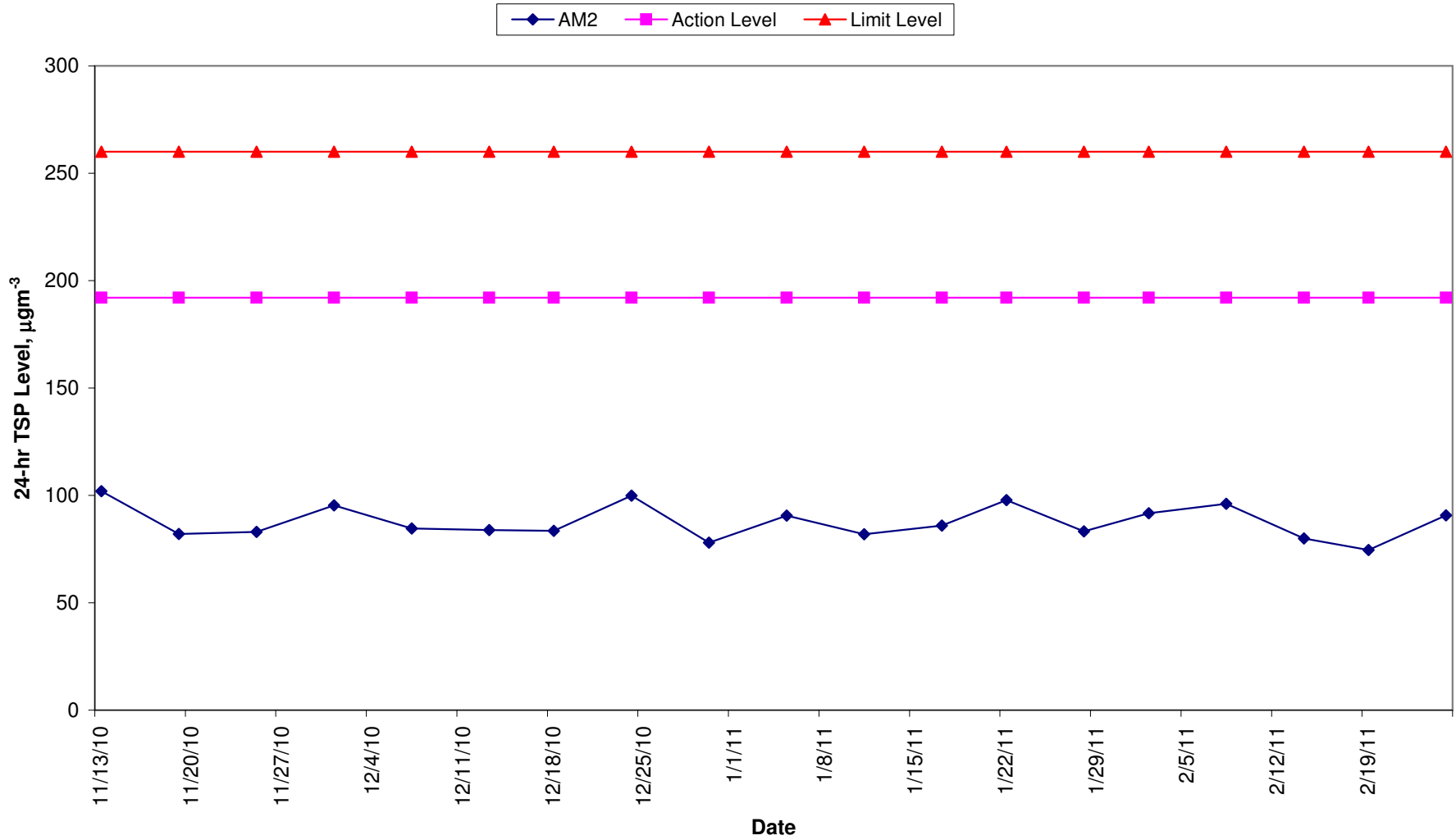
Annex F1 TSP Monitoring Results

24-hr TSP Levels AM1 (Tuen Mun EMSD Vehicle Servicing Station)



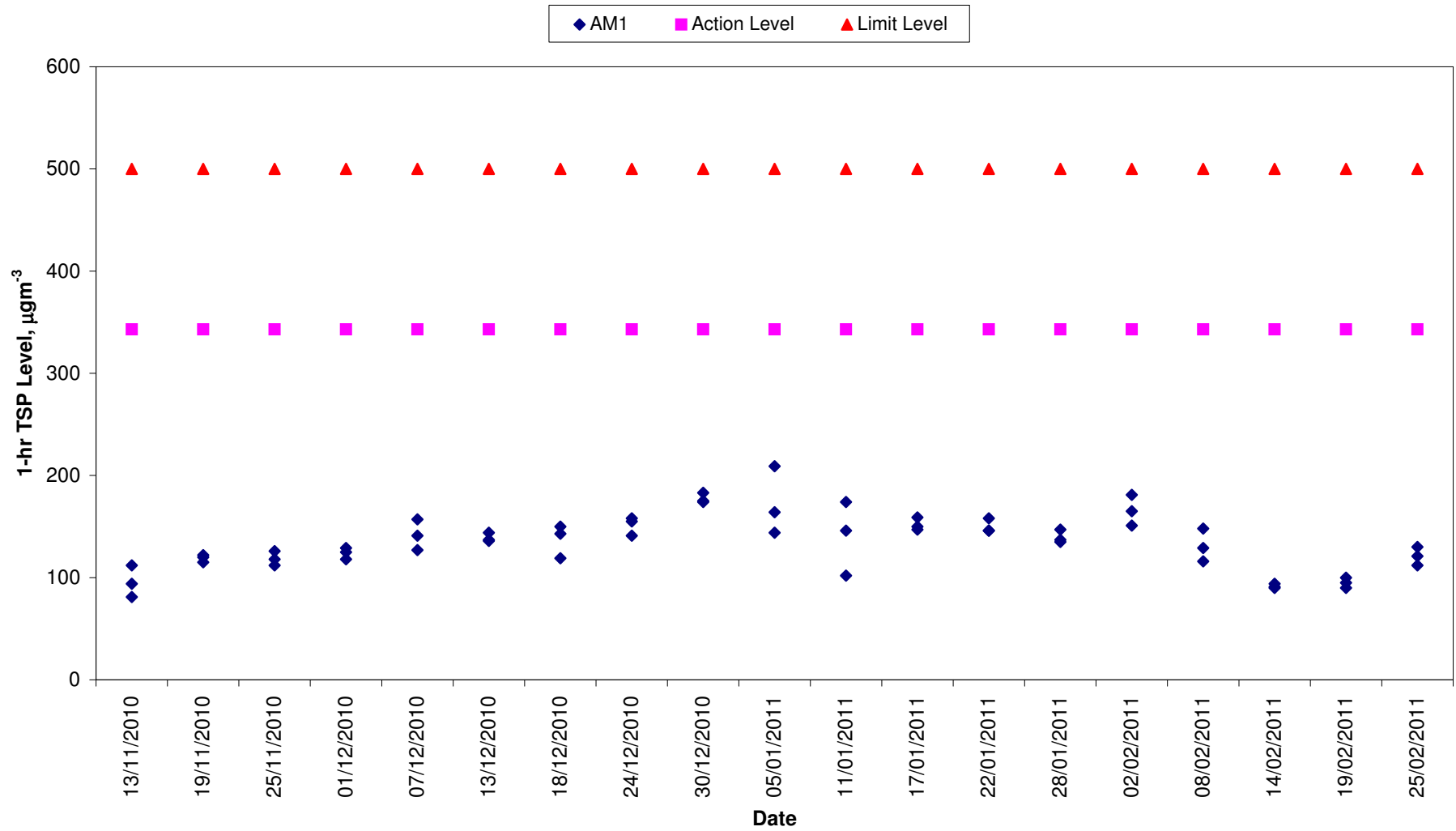
Annex F2 TSP Monitoring Results

24-hr TSP Levels AM2 (River Trade Terminal Office)



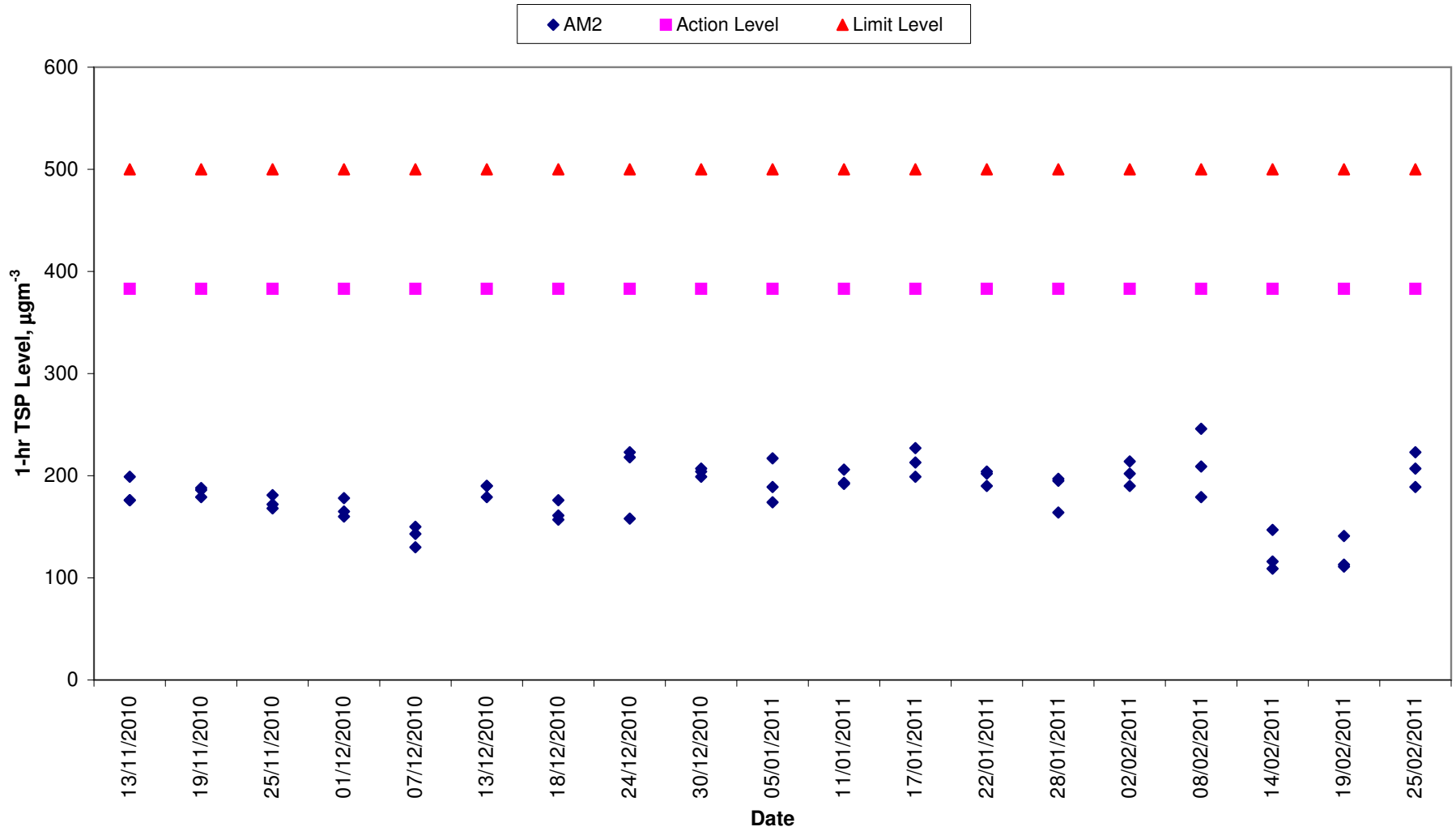
Annex F3 TSP Monitoring Results

1-hr TSP Levels AM1 (Tuen Mun EMSD Vehicle Servicing Station)



Annex F4 TSP Monitoring Results

1-hr TSP Levels 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 9833620)	14 January 2011	14 March 2011
AM2	River Trade Terminal Office	GMW GS-2310 (S/N 1247)	CM-AIR-43 (S/N 9833620)	14 January 2011	14 March 2011

High-Volume TSP Sampler
5-Point Calibration Record

Location : EMSD
 Calibrated by : P.F.Yeung
 Date : 14/01/2011

Sampler

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

Calibration Office and Standard Calibration Relationship

Serial Number : 1785
 Service Date : 10 May 2010
 Slope (m) : 2.01637
 Intercept (b) : -0.02316
 Correlation Coefficient(r) : 0.99996

Standard Condition

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

Calibration Condition

Pa (hpa) : 1020
 Ta(K) : 289

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1 18 holes	10.8	3.349	1.672	52	53.0
2 13 holes	8.6	2.988	1.493	46	46.9
3 10 holes	6.5	2.598	1.300	40	40.8
4 7 holes	4.1	2.063	1.035	31	31.6
5 5 holes	2.5	1.611	0.811	24	24.5

Sampler Calibration Relationship

Slope(m):33.162 Intercept(b): -2.523 Correlation Coefficient(r): 0.9999

Checked by: Magnum Fan

Date: 23/01/2011

High-Volume TSP Sampler
5-Point Calibration Record

Location : River Trade
Calibrated by : K.T.Ho
Date : 14/01/2011

Sampler

Model : GMWS-2310 ACCU-VOL
Serial Number : S/N 1247

Calibration Office and Standard Calibration Relationship

Serial Number : 1785
Service Date : 10 May 2010
Slope (m) : 2.01637
Intercept (b) : -0.02316
Correlation Coefficient(r) : 0.99996

Standard Condition

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

Calibration Condition

Pa (hpa) : 1020
Ta(K) : 289

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1 18 holes	11.4	3.440	1.718	66	67.3
2 13 holes	9.4	3.124	1.561	58	59.1
3 10 holes	7.6	2.809	1.405	50	50.9
4 7 holes	4.7	2.209	1.107	35	35.7
5 5 holes	2.7	1.674	0.842	22	22.4

Sampler Calibration Relationship

Slope(m): 51.232 Intercept(b): 20.879 Correlation Coefficient(r): 0.9999

Checked by: Magnum Fan

Date: 23/01/2011

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	√
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 particular the Waste Disposal (Chemical Waste) (General) Regulation</p>	Work site/ During the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
	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	√
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 transporting wastes in enclosed containers 	Work site/ During the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
	<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	Δ
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 transportation of C&D material for off-site disposal, the excavated</p>	Work site / During design stage & construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
	<p>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, household refuse, plastic, metals, industrial and chemical waste, animal</p>	Work site/During design stage & construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
	<p>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.</p>		
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> <p>Besides, these trees may also be positioned as visual mitigation during</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
	the construction period.		
Landscape & Visual	<p><u>No-intrusion Zone</u></p> <p>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.</p>	Work site/ During design stage & construction period	Δ
Landscape & Visual	<p><u>Hoarding</u></p> <p>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.</p>	Work site/ During design stage & construction period	√
Landscape & Visual	<p><u>Dust and Erosion Control for Exposed Soil</u></p> <p>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..</p>	Work site/ During design stage & construction period	√
Landscape & Visual	<p><u>Existing Tree Record Inventory</u></p> <p>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 tree protection requirement, submission and approval system, and the tree monitoring system.</p>	Work site/ During design stage & construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Landscape & Visual	<p><u>Construction Light</u></p> <p>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.</p>	Work site / During design stage & construction period	√
Landscape & Visual	<p><u>Tree Transplanting</u></p> <p>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.</p>	Work site / During design stage & construction period	Δ. Tree transplantation in progress.
Landscape & Visual	<p><u>Tree Compensation Ratio</u></p> <p>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.</p>	Work site / During design stage & construction period	N/A
Landscape & Visual	<p><u>Re-use of Existing Soil and Advance formation of Planting Area</u></p> <p>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 from one phase for backfilling another. Suitable storage ground, gathering ground and mixing ground may be set up on-site as necessary.</p>	Work site / During design stage & construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
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	√
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	Work sites / during construction period	Δ

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
	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.		
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	Δ

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
	tonne	tonne	tonne	tonne	tonne	kilogram	kilogram	kilogram	kilogram	kilogram
Nov 2010	2,248	0	0	0	2,248	60	100	0	0	0
Dec 2010	9,316	0	0	0	9316	100	120	20	0	0
Jan 2011	35,395	0	0	0	35,395	250	280	60	0	0 (see Note 3)
Feb 2011	12,855	0	0	0	12,855	100	150	50	0	8
Total	59,814	0	0	0	59,814	510	650	130	0	8

- 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. No record of general refuse disposal in the reporting period is available for waste quantity estimation.

Annex K

Environmental Complaint,
Environmental Summons
and Persecution 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
Overall Total	0	0

Annex L

Construction Programme of the Project

