


China Harbour Engineering Company Limited

Contract No. DC/2009/09
Construction of Tai Po Sewage Treatment
Works – Stage V Phase II B

**Quarterly Environmental Monitoring
and Audit Summary Report
(April to June 2011)**

(Version 2.0)

Certified By


(Environmental Team Leader)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

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EXECUTIVE SUMMARY

Introduction

1. This is the 4th Quarterly Environmental Monitoring and Audit (EM&A) Summary Report prepared by Cinotech Consultants Limited (the Environmental Team, ET) for DSD Contract no. DC/2009/09 “Construction of Tai Po Sewage Treatment Works – Stage V Phase IIB”. This summary report presents EM&A works performed in the period between April and June 2011.
2. The construction activities undertaken in the reporting quarter include:
 - Construction of Decanting Chamber, FC11B, FC12B, Chemical & Oil Store;
 - Dismantling works;
 - Diversion works;
 - Drainage and Excavation works;
 - Landscaping works;
 - Piling Test for FC11B & FC12B;
 - Mini-piling works;
 - Pre-drilling works;
 - Steelworks for Shelter of Ferric Chloride Dosing System;
 - Proof drilling works;
 - Pipeline works; and
 - Paving works.

Environmental Monitoring and Audit Works

3. Environmental monitoring and audit works for the Project was performed regularly as stipulated in the EM&A Manual and the results were checked and reviewed. The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were also checked.
4. Summary of the events and action taken in the reporting quarter is tabulated in **Table I**.

Table I Summary Table for Events Recorded in the Reporting Quarter

Parameter	No. of Exceedance		No. of Events due to this Project	Action Taken
	Action Level	Limit Level		
1-hr TSP	0	0	0	N/A
24-hr TSP	0	0	0	N/A
Noise	0	0	0	N/A

Construction Noise

5. All construction noise monitoring was conducted as scheduled in the reporting quarter.
6. No Action Level (public complaint) / Limit Level exceedance was recorded in the reporting quarter.

Air Quality

7. The air quality monitoring was conducted as scheduled in this reporting period. No Action/Limit Level exceedance was recorded in the reporting period.

Landfill Gas

8. In the reporting period, excavation works were undertaken within the 250m Consultation Zone of Shuen Wan Landfill. Landfill gas monitoring was performed by the Safety Officer of the Contractor. No Action/Limit Level exceedance was recorded in the reporting period.

Environmental Complaint and Prosecution

9. No environmental complaint, prosecution or notification of summons was received in this reporting quarter.

Environmental Licensing and Permitting

10. Environmental related licenses/permits granted to the Project include the Environmental Permit (EP) for the Project, the Discharge Licence, Construction Noise Permit and the Waste Disposal (Chemical Waste) Licence.

Future Key Issues

11. The anticipated environmental impacts will be mainly on ponding water and surface runoff after rain as well as the noise nuisance and dust emission from the major construction activities will be undertaken in the coming quarter, including:
 - Construction of Decanting Chamber, FC11B, FC12B, FMC2B, Aeration Tank No.5 & 6, Bio-gas Holding Tank Support & Valve Chamber;
 - Demolition Existing Final Settlement Tank No.8 & 9;
 - Drainage and Excavation works;
 - Finishing works for Decanting Chamber, Bund Wall of Ferric Chloride Dosing System and Chemical & Oil Store;
 - Landscaping works;
 - Mini-piling works at MCL;
 - Pre-drilling works for FC7B & FC10B;
 - Proof-drilling at SDT;
 - Roadwork in Portion “A”; and
 - Pipeline works.

1. INTRODUCTION

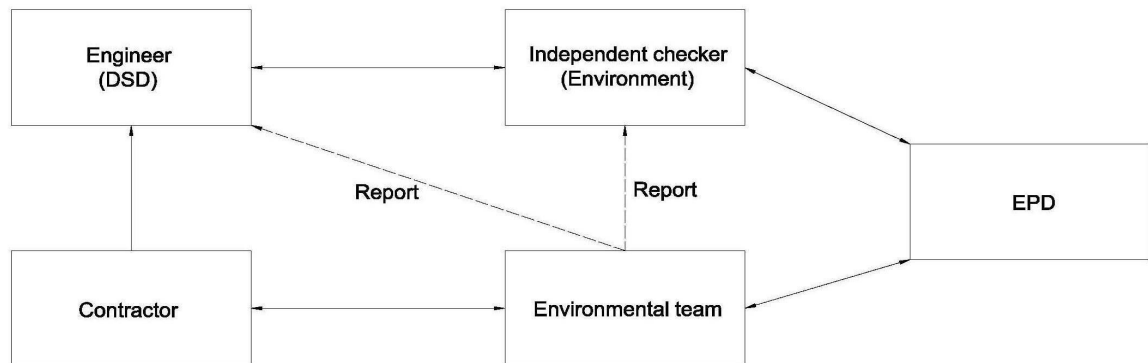
Background

- 1.1 Tai Po Sewage Treatment Works (TPSTW) is located within the Tai Po Industrial Estate. It currently comprises four Stages: I, II, IVA and IVB works. The TPSTW - Stage V aims to upgrade the existing STW to provide additional sewage treatment capacity from the present design flow of 88,000 m³/day to 130,000 m³/day to meet the demands of both the existing and future developments, and to meet the revised discharge license requirements.
- 1.2 The TPSTW Stage V, Phase I and Phase II are Designated Projects under the Environmental Impact Assessment Ordinance (Cap. 449) with the same EIAO Register No. AEIAR – 081/2004. A study of environmental impact assessment (EIA) was undertaken to evaluate various environmental impacts associated with the works within these two Designated Projects. An EIA Report as well as an Environmental Monitoring and Audit (EM&A) Manual were approved by the Environmental Protection Department (EPD) on 28 October 2004.
- 1.3 The Stage V works will be implemented in 2 phases. The design capacities of Phase I and Phase II works are 100,000 m³/d and 130,000 m³/d respectively. An Environmental Permit (EP) No. EP-265/2007 was issued on 22 March 2007 for the TPSTW Stage V Phase II to the Drainage Services Department (DSD) as the Permit Holder. The project “Tai Po Sewage Treatment Works – Stage V Phase IIB” formed part of the Phase II works, includes additional secondary treatment process units (1 primary clarifier; 3 bioreactors and 2 final clarifiers) in TPSTW for its future extended plant design capacity of 120,000 m³/day. A master construction programme of the Project is provided in **Appendix A**. A site layout plan is provided in **Figure 1.1**. The construction activities of the Project commenced on 3 July 2010.
- 1.4 Cinotech Consultants Ltd. was commissioned by the Contractor as the Environmental Team (ET) to undertake the EM&A works for the Project. Dr. Priscilla CHOY of Cinotech Consultants Ltd. was appointed as the ET Leader as per the Condition 2.1 of the EP. Ove Arup and Partners Hong Kong Limited. was appointed as the IEC under Condition 2.2 of the EP. This is the 4th quarterly EM&A summary report summarizing the EM&A works for the Project between April and June 2011.

Project Organizations

- 1.5 Different parties with different levels of involvement in the project organization include:
 - Project Proponent / Engineer’s Representative (ER) – Drainage Services Department
 - Environmental Team (ET) – Cinotech Consultants Ltd.
 - Independent Environmental Checker (IEC) – Ove Arup and Partners Hong Kong Limited
 - E&M Contractor –China Harbour Engineering Company Ltd.
- 1.6 The responsibilities of respective parties are detailed in Section 1.10 of the Final EM&A Manual of the Project.

1.7 The Project Organization during Construction Phase

1.8 The key contacts of the Project are shown in **Table 1.1**.**Table 1.1 Key Project Contacts**

Party	Role	Name	Position	Phone No.	Fax No.
DSD	SP Division	Mr. LAI cheuk-ho	Chief Engineer	2594 7500	2827 8700
		Mr. IP Shu-kuen	Senior Engineer	2594 7502	
		Mr. TSANG Lap-kei	Engineer	2594 7459	
Cinotech	Environmental Team	Dr. Priscilla CHOY	ET Leader	2151 2089	3107 1388
		Mr. TY Yeung	Project Coordinator and Audit Team Leader	2151 2099	
		Mr. Henry LEUNG	Monitoring Team Leader	2151 2087	
Arup	Independent Environmental Checker	Mr. Coleman NG	Independent Environmental Checker	2268 3097	2528 3031
		Mr. Lawrence KAN	Assistant to Independent Environmental Checker	2268 3212	
CHEC	Civil Contractor	Mr. TK CHEUNG	Project Manager	9863 2954	2603 6899
		Mr. Aaron AU	Site Agent	6345 0754	
		Mr. Jason TSE	Environmental Officer	9320 3608	

Construction Programme and Synopsis of Work1.9 The construction programme is presented in **Appendix A**. The site activities undertaken during the reporting quarter included:

- Construction of Decanting Chamber, FC11B, FC12B, Chemical & Oil Store;
- Dismantling works;
- Diversion works;
- Drainage and Excavation works;
- Landscaping works;
- Piling Test for FC11B & FC12B;
- Mini-piling works;
- Pre-drilling works;
- Steelworks for Shelter of Ferric Chloride Dosing System;
- Proof drilling works;
- Pipeline works; and
- Paving works.

Summary of EM&A Requirements

- 1.10 The EM&A programme requires construction phase air quality, noise monitoring and landfill gas monitoring as well as environmental site audits. The EM&A requirements are described in the following sections, including:
- All monitoring parameters;
 - Action and Limit levels for all environmental parameters;
 - Event / Action Plans;
 - Environmental mitigation measures, as recommended in the project EIA study final report; and
 - Environmental requirements in contract documents.
- 1.11 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in Section 4 of this report.
- 1.12 This report presents the monitoring results, observations, locations, equipment, period, methodology and QA/QC procedures of the required monitoring parameters, namely air quality and noise as well as audit works for the Project in the reporting period.

2. ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS

Monitoring Parameters and Monitoring Locations

- 2.1 The EM&A Manual designate locations for the ET to monitor environmental impacts in terms of noise and air quality due to the Project. The Project area and monitoring locations are depicted in **Figure 1.2**. **Appendix B** gives details of monitoring requirements.
- 2.2 In accordance with clause 8.8 of the EM&A Manual, the number and location of the monitoring stations and parameters can be referred to Monthly EM&A reports in order to cater for any changes in the surrounding environmental and the nature of works in progress. In the reporting months, there is no alteration made on changing the location of the monitoring stations.
- 2.3 The baseline checking was conducted on 26, 28 and 29 April 2011 for 1-hour TSP and 1 May 2011 for 24-hour TSP respectively when no dusty works activities are in operation. The baseline checking results were reviewed within the range of baseline monitoring results which were presented in Baseline Monitoring Report. Therefore, the current Action and Limit levels for 1-hour TSP and 24-hour TSP monitoring are considered as still representative and valid.

Monitoring Methodology and Calibration Details

- 2.4 Monitoring works/equipments were conducted/calibrated regularly in compliance with the EM&A Manual's requirements. Monitoring methodologies and calibration details can be referred to Monthly EM&A reports. Valid calibration certificates were attached in the appendices of the relevant Monthly EM&A reports.

Environmental Quality Performance Limits (Action and Limit Levels)

- 2.5 The environmental quality performance limits, i.e. Action and Limit Levels were derived from the baseline monitoring results. Should the measured environmental quality parameters exceed the Action/Limit Levels, the respective action plans would be implemented. The Action/Limit Levels for each environmental parameter are given in **Appendix C**.

Environmental Mitigation Measures

- 2.6 Relevant mitigation measures as recommended in the project EIA report have been stipulated in the EM&A Manual for the Contractor to implement. A summary of the Updated Environmental Mitigation Implementation Schedule (EMIS) is given in **Appendix H**.

3. MONITORING RESULTS

Weather Conditions

- 3.1 The weather during monitoring sessions was mainly sunny or cloudy. The weather conditions for each individual monitoring session were presented in corresponding of Monthly EM&A Reports.

Air Quality

- 3.2 Air quality monitoring was conducted as scheduled in the reporting period.
- 3.3 Graphical presentations of 1-hr TSP and 24-hr TSP monitoring results are shown in **Appendices D** and **E**, respectively.
- 3.4 All measured 1-hr and 24-hr TSP levels were below the Action/Limit Levels. No exceedance was recorded in the reporting quarter.

Construction Noise

- 3.5 All construction noise monitoring was conducted as scheduled in the reporting period.
- 3.6 Graphical representations of the monitoring results are shown in **Appendix F**. No Action Level (public complaint) / Limit Level exceedance was recorded in the reporting period.

Landfill Gas

- 3.7 All Landfill gas measurements were performed by the Safety Officer of the civil works Contractor (CHEC) in the reporting period.
- 3.8 Graphical representations of the monitoring results are shown in **Appendix G**. No Action/Limit Level exceedance was recorded in the reporting period.

4. AUDIT RESULTS

Implementation Status of Environmental Mitigation Measures

4.1 The implementation status of environmental mitigation measures (EMIS) is given in **Appendix H**.

Site Audit Summary

4.2 During site inspections in the reporting period, no non-conformance was identified. The observations and recommendations made in each site audit session in the reporting period are summarized in **Table 4.1**.

Table 4.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
<i>Water Quality</i>	8-April-2011	<u>Observation:</u> - The sedimentation tank was observed full of muddy water at FC11B&12B. The Contractor was reminded to clear the deposited mud and ensure it can be functioned properly at all the time.	The situation was observed rectified in audit session 110408.
	21-April-2011	<u>Observation:</u> - The ponding water should be avoided at outside the site office and A-Tank. The Contractor was reminded to pump the ponding water out regularly.	The situation was observed rectified in audit session 110428.
	28-April-2011	<u>Reminder:</u> - The water pipe should be repaired, to avoid wastage and seepage of water at FC11B&12B.	The situation was observed rectified in audit session 110505.
	28-April-2011	<u>Reminder:</u> - The ponding water should be cleared regularly, to avoid over-flow during rain at De-Watering House.	The situation was observed rectified in audit session 110505.
	5-May-2011	<u>Reminder:</u> - The ponding water should be cleared regularly at A-Tank.	The situation was observed rectified in audit session 110519.
	13-May-2011	<u>Reminder:</u> - The Contractor was reminded to clear the ponding water after raining.	The situation was observed rectified in audit session 110519.
	19-May-2011	<u>Observation:</u> - Silty water was observed along the u-channel at outside the site office. The Contractor was reminded to clear it, to avoid overflow of discharge.	The situation was observed rectified in audit session 110526.
	26-May-2011	<u>Reminder:</u> - The ponding water at A-Tank and within the sedimentation tank of Tank no. 7 should be cleared respectively.	The situation required follow-up action during the coming audit session.

Parameters	Date	Observations and Recommendations	Follow-up
	26-May-2011	<u>Reminder:</u> - The deposited mud along the u-channel of outside the site office should be cleared.	The situation was observed rectified in audit session 110602.
	2-June-2011	<u>Reminder:</u> - The ponding water should be cleared between A-Tank and Tank no. 8b.	The situation was observed rectified in audit session 110623.
	16-June-2011	<u>Observation:</u> - Silty water was observed overflow at Dewatering House and outside the site office during rain. The Contractor was reminded to review the drainage system, to ensure the system can be functioned properly during rainy season.	The situation required follow-up action during the coming audit session.
	16-June-2011	<u>Reminder:</u> - The Contractor was reminded to provide sand bag bunding around the gully at Dewatering House and outside the site office.	The situation was observed rectified in audit session 110623.
	23-June-2011	<u>Observation:</u> - Bunding to surrounding area was not enough to direct the silty water at outside the site office. The Contractor was reminded to provide the mitigation measures to avoid overflow during rainy season.	The situation required follow-up action during the coming audit session.
	30-June-2011	<u>Observation:</u> - Silty water was observed discharging to haul road at outside the site office. The Contractor was reminded to review the effectiveness of drainage system as soon as possible.	The situation required follow-up action during the coming audit session.
	30-June-2011	<u>Reminder:</u> - The sedimentation tank should be maintained functioning effectively, to clear the deposited mud and silty water at FC11B&12B.	The situation required follow-up action during the coming audit session.
<i>Air Quality</i>	8-April-2011	<u>Reminder:</u> - Keep watering regularly at Tank no.7 along FC11B&12B haul road.	The situation was observed rectified in audit session 110421.
	14-April-2011	<u>Observation:</u> - The haul road should be watered regularly, to avoid dust generation at outside the site office and along FC11B&12B.	The situation was observed rectified in audit session 110421.
	28-April-2011	<u>Observation:</u> - Dust-generation activity was observed to be operated without water spraying. The Contractor was reminded to keep spraying water during work, to avoid dust generation at FC11B&12B.	The situation was observed rectified in audit session 110505.
	2-June-2011	<u>Reminder:</u> - The exposed cement bag should be covered with tarpaulin at FC11B&12B, to avoid dust generation.	The situation was observed rectified in audit session 110610.
<i>Waste / Chemical Management</i>	8-April-2011	<u>Observation:</u> - The haul road was observed that has oil stain at FC11B&12B. The Contractor was reminded to clear the oil stain properly as soon as possible.	The situation was observed rectified in audit session 110408.
	8-April-2011	<u>Reminder:</u> - The chemical waste storage area should be enclosed with no hole, to avoid water discharging to it during rain.	The situation was observed rectified in audit session 110408.

Parameters	Date	Observations and Recommendations	Follow-up
	14-April-2011	<u>Reminder:</u> - The discarded cement bag should be cleared at Chemical Storage House.	The situation was observed rectified in audit session 110421.
	21-April-2011	<u>Reminder:</u> - The general refuse at near Tank no.8b should be cleared.	The situation was observed rectified in audit session 110428.
	5-May-2011	<u>Reminder:</u> - The general refuse and C&D waste should be cleared at FC11B&12B.	The situation was observed rectified in audit session 110513.
	13-May-2011	<u>Reminder:</u> - The oil stain should be cleared at chemical waste storage at outside the site office.	The situation was observed rectified in audit session 110519.
	2-June-2011	<u>Observation:</u> - The discarded oil drum was observed to be disposed of improperly. The Contractor was reminded to dispose it as chemical waste at Tank no. 8b and Chemical Storage House.	The situation was observed rectified in audit session 110616.
	10-June-2011	<u>Reminder:</u> - The deposited silt should be cleared regularly at haul road of outside the site office.	The situation was observed rectified in audit session 110616.
	23-June-2011	<u>Reminder:</u> - The general refuse near Tank no.7 should be cleared regularly.	The situation was observed rectified in audit session 110630.
	30-June-2011	<u>Reminder:</u> - The general refuse should be cleared at FC11B&12B.	The situation required follow-up action during the coming audit session.

Status of Environmental Licensing and Permitting

- 4.3 Environmental licenses and permits including the Environmental Permit (EP), the Construction Noise Permit and Waste Disposal (Chemical Waste) License were in place and valid during the reporting quarter. A summary of environmental licensing and permit status is given in **Appendix I**.

Advice on Waste Management Status

- 4.4 9220m³ of inert C&D waste and 30m³ of non-inert C&D waste were disposed in the reporting period. Excavated materials, as the main C&D materials generated in the reporting period, were stored inside the Site Area and Stockpiling Area of the Project. Besides, 60m³ chemical waste was generated in the reporting period. The amount of wastes generated by the activities of the Project in the reporting period fulfills the requirement of estimated volume of excavated material in EIA Report. The amount of wastes generated by the activities of the Project in the reporting period was attached in the appendices of the Monthly Reports for April 2011 to June 2011. Waste flow table please refer to **Appendix J**.

5. NON-COMPLIANCE (EXCEEDANCES) OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMITS (ACTION AND LIMIT LEVELS)

Summary of Exceedances

- 5.1 Environmental monitoring works were performed in the reporting period and all monitoring results were checked and reviewed. A summary of exceedance is attached in **Appendix K**.
- 5.2 All measured 1-hr and 24-hr TSP levels were below the Action/Limit Levels. No exceedance was recorded in the reporting period.
- 5.3 No Action/Limit Level exceedance for the construction noise was recorded in the reporting period.
- 5.4 No Action/Limit Level exceedance for landfill gas monitoring was recorded in the reporting period.

Review of the Reasons for and the Implications of Non-compliance

- 5.5 There was no non-compliance from the site audits in the reporting quarter. The observations and recommendations made in each audit session were attached in the Monthly Reports.

6. ENVIRONMENTAL COMPLAINTS AND PROSECUTIONS

- 6.1 No environmental related complaint, prosecution or notification of summons was received in the reporting quarter.

7. COMMENTS, CONCLUSIONS AND RECOMMENDATIONS

- 7.1 Environmental monitoring and audit works were performed in the reporting quarter. The EM&A program was strictly following the requirement of methodology in EM&A manual. The monitoring work was considered as effective. In addition, site inspections were conducted on a weekly basis. The results were reviewed and checked.

Effectiveness of Mitigation Measures

- 7.2 The mitigation measures recommended in the EIA report and required by the EP are considered effective in minimizing environmental impacts. The Contractor has implemented the recommended mitigation measures except those mitigation measures not applicable at this stage.

Conclusion

- 7.3 All measured 1-hr and 24-hr TSP levels were below the Action/Limit Levels. No exceedance was recorded in the reporting quarter.
- 7.4 All measured noise levels were below the Action/Limit Levels. No exceedance was recorded in the reporting quarter.
- 7.5 All landfill gas monitoring levels were below the Action/Limit Levels. No exceedance was recorded in the reporting quarter.
- 7.6 There was no environmental complaint, prosecution or notification of summons received.
- 7.7 The anticipated environmental impacts will be mainly on ponding water and surface runoff after rain as well as the noise nuisance and dust emission from the major construction activities will be undertaken in the coming quarter, including:
- Construction of Decanting Chamber, FC11B, FC12B, FMC2B, Aeration Tank No.5 & 6, Bio-gas Holding Tank Support & Valve Chamber;
 - Demolition Existing Final Settlement Tank No.8 & 9;
 - Drainage and Excavation works;
 - Finishing works for Decanting Chamber, Bund Wall of Ferric Chloride Dosing System and Chemical & Oil Store;
 - Landscaping works;
 - Mini-piling works at MCL;
 - Pre-drilling works for FC7B & FC10B;
 - Proof-drilling at SDT;
 - Roadwork in Portion “A”; and
 - Pipeline works.

Recommendations

- 7.8 According to the environmental audit sessions performed in the reporting period, the following recommendations were made:

Water Impact

- To provide sediment tank for settling runoff prior to disposal.
- To avoid accumulation of stagnant water on site.
- To maintain sand bags placed along the u-channel at good condition and replace the broken bags.

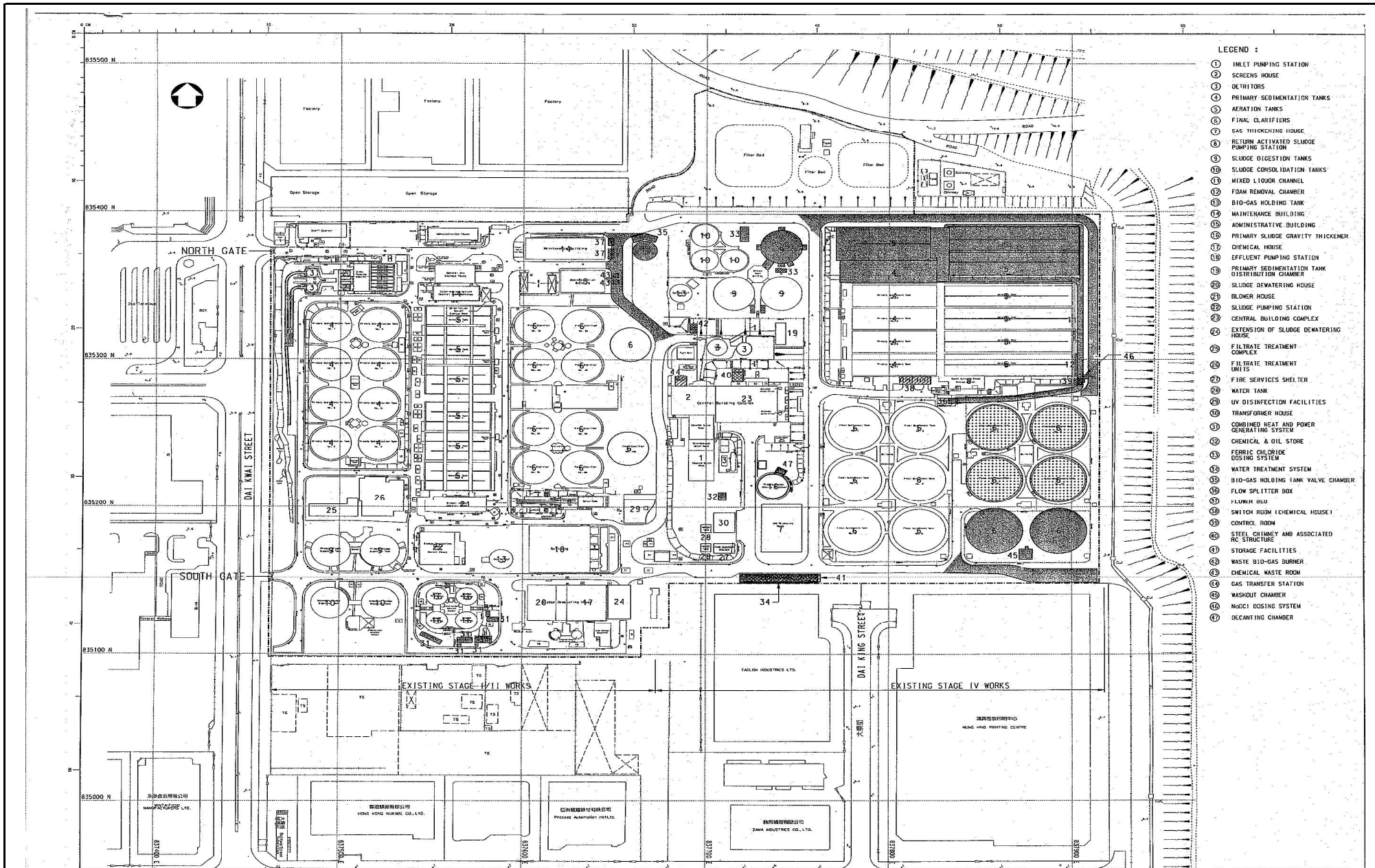
Dust Impact

- To spray with water on the surface of concrete breaking and dry dust haul road.
- Excavated dusty materials or stockpile of dusty materials should be covered by impervious sheeting, or sprayed with water so as to maintain entire surface wet.

Waste / Chemical Management

- To provide proper rubbish bins / skips for waste collection.
- To provide proper storage area for oil container on site.
- To avoid and check for any accumulation of waste materials or rubbish on site.
- Provide drip tray with adequate capacity and maintain well for equipment and chemical waste.

FIGURES

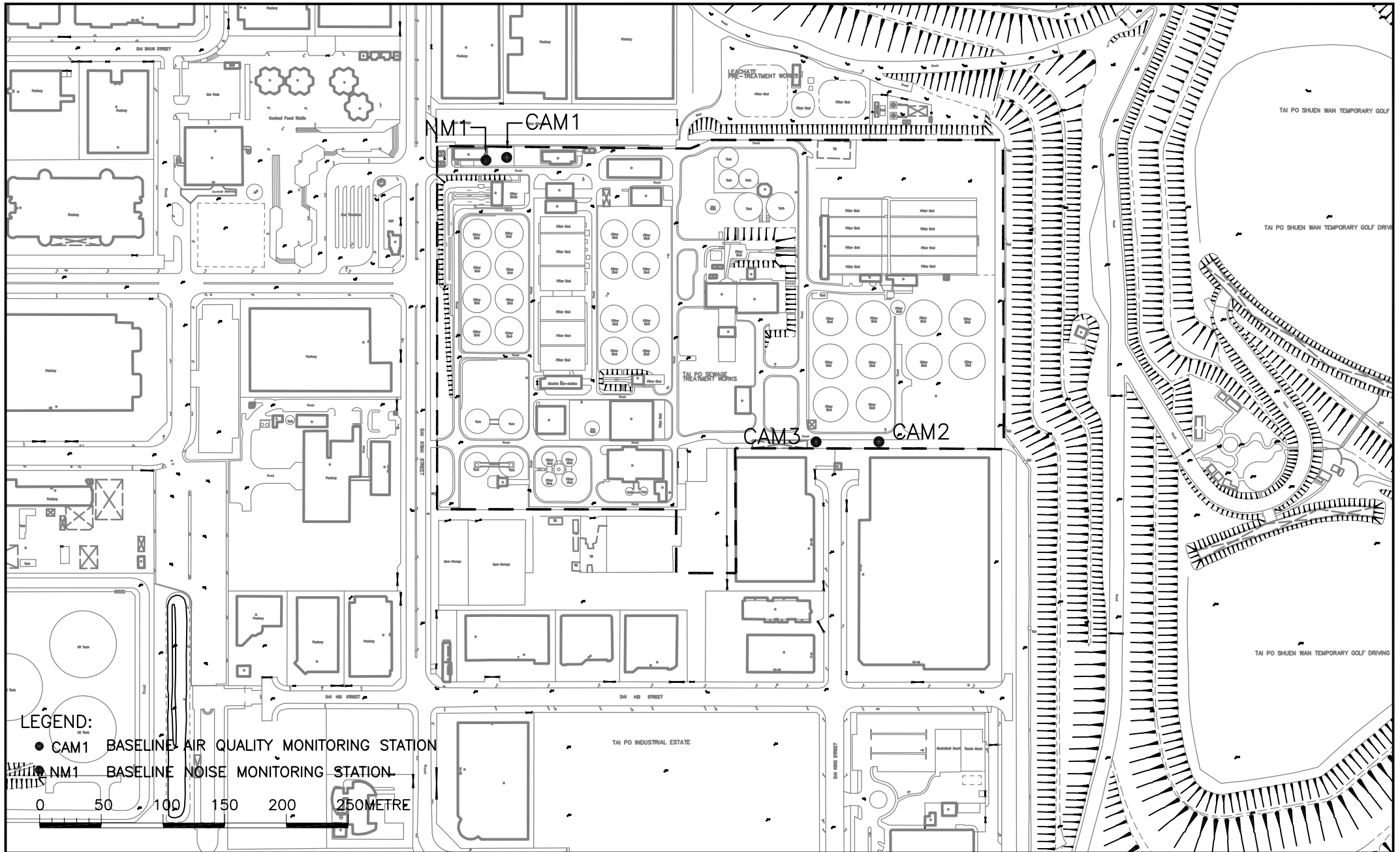


- LEGEND :
- ① INLET PUMPING STATION
 - ② SCREENS HOUSE
 - ③ DETRIERS
 - ④ PRIMARY SEDIMENTATION TANKS
 - ⑤ AERATION TANKS
 - ⑥ FINAL CLARIFIERS
 - ⑦ GAS THICKENING HOUSE
 - ⑧ REDUCTION ACTIVATED SLUDGE PUMPING STATION
 - ⑨ SLUDGE DIGESTION TANKS
 - ⑩ SLUDGE CONSOLIDATION TANKS
 - ⑪ MIXED LIQUOR CHANNEL
 - ⑫ FODM REMOVAL CHAMBER
 - ⑬ BIO-GAS HOLDING TANK
 - ⑭ MAINTENANCE BUILDING
 - ⑮ ADMINISTRATIVE BUILDING
 - ⑯ PRIMARY SLUDGE GRAVITY THICKENER
 - ⑰ CHEMICAL HOUSE
 - ⑱ EFFLUENT PUMPING STATION
 - ⑲ PRIMARY SEDIMENTATION TANK DISTRIBUTION CHAMBER
 - ⑳ SLUDGE DEWATERING HOUSE
 - ㉑ BLOWER HOUSE
 - ㉒ SLUDGE PUMPING STATION
 - ㉓ CENTRAL BUILDING COMPLEX
 - ㉔ EXTENSION OF SLUDGE DEWATERING HOUSE
 - ㉕ FILTRATE TREATMENT COMPLEX
 - ㉖ FILTRATE TREATMENT UNITS
 - ㉗ FIRE SERVICES SHELTER
 - ㉘ WATER TANK
 - ㉙ UV DISINFECTION FACILITIES
 - ㉚ TRANSFORMER HOUSE
 - ㉛ COMBINED HEAT AND POWER GENERATING SYSTEM
 - ㉜ CHEMICAL & OIL STORE
 - ㉝ FERRIC CHLORIDE DOSING SYSTEM
 - ㉞ WATER TREATMENT SYSTEM
 - ㉟ BIO-GAS HOLDING TANK VALVE CHAMBER
 - ㊱ FLOW SPLITTER BOX
 - ㊲ FLUMM HED
 - ㊳ SWITCH ROOM (CHEMICAL HOUSE)
 - ㊴ CONTROL ROOM
 - ㊵ STEEL CHIMNEY AND ASSOCIATED RC STRUCTURE
 - ㊶ STORAGE FACILITIES
 - ㊷ WASTE BIO-GAS BURNER
 - ㊸ CHEMICAL WASTE ROOM
 - ㊹ GAS TRANSFER STATION
 - ㊺ WASHOUT CHAMBER
 - ㊻ NODDI DOSING SYSTEM
 - ㊼ DEWATERING CHAMBER

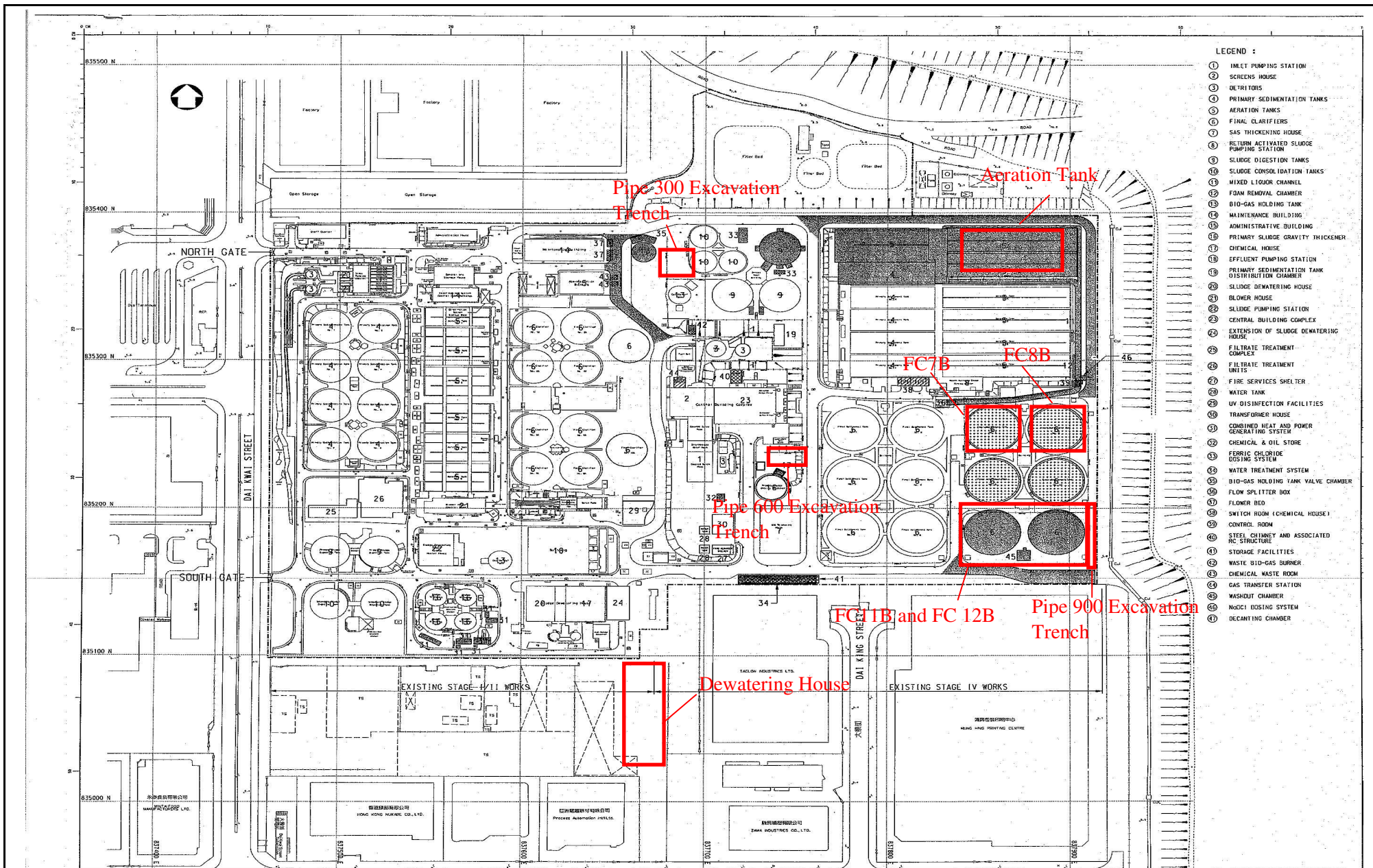
TAI PO SEWAGE TREATMENT WORKS, STAGE V, PHASE IIB

PROJECT SITE LAYOUT PLAN (TPSTW)

Scale	N.T.S	Project No.	MA0010	CINOTECH
Date	Jul-10	Figure	1.1	



SCALE	A4 1:4000	DATE	2010
CHECK	IT	DRAWN	SL
JOB No.	MA0010	DRAWING No.	1.2
		REV	—



- LEGEND :
- ① INLET PUMPING STATION
 - ② SCREENS HOUSE
 - ③ DETRITORS
 - ④ PRIMARY SEDIMENTATION TANKS
 - ⑤ AERATION TANKS
 - ⑥ FINAL CLARIFIERS
 - ⑦ SAS THICKENING HOUSE
 - ⑧ RETURN ACTIVATED SLUDGE PUMPING STATION
 - ⑨ SLUDGE DIGESTION TANKS
 - ⑩ SLUDGE CONSOLIDATION TANKS
 - ⑪ MIXED LIQUOR CHANNEL
 - ⑫ FOAM REMOVAL CHAMBER
 - ⑬ BIO-GAS HOLDING TANK
 - ⑭ MAINTENANCE BUILDING
 - ⑮ ADMINISTRATIVE BUILDING
 - ⑯ PRIMARY SLUDGE GRAVITY THICKENER
 - ⑰ CHEMICAL HOUSE
 - ⑱ EFFLUENT PUMPING STATION
 - ⑲ PRIMARY SEDIMENTATION TANK DISTRIBUTION CHAMBER
 - ⑳ SLUDGE DEWATERING HOUSE
 - ㉑ BLOWER HOUSE
 - ㉒ SLUDGE PUMPING STATION
 - ㉓ CENTRAL BUILDING COMPLEX
 - ㉔ EXTENSION OF SLUDGE DEWATERING HOUSE
 - ㉕ FILTRATE TREATMENT COMPLEX
 - ㉖ FILTRATE TREATMENT UNITS
 - ㉗ FIRE SERVICES SHELTER
 - ㉘ WATER TANK
 - ㉙ UV DISINFECTION FACILITIES
 - ㉚ TRANSFORMER HOUSE
 - ㉛ COMBINED HEAT AND POWER GENERATING SYSTEM
 - ㉜ CHEMICAL & OIL STORE
 - ㉝ FERRIC CHLORIDE DOSING SYSTEM
 - ㉞ WATER TREATMENT SYSTEM
 - ㉟ BIO-GAS HOLDING TANK VALVE CHAMBER
 - ㊱ FLOW SPLITTER BOX
 - ㊲ FLOWER BED
 - ㊳ SWITCH ROOM (CHEMICAL HOUSE)
 - ㊴ CONTROL ROOM
 - ㊵ STEEL CHIMNEY AND ASSOCIATED RC STRUCTURE
 - ㊶ STORAGE FACILITIES
 - ㊷ WASTE BIO-GAS BURNER
 - ㊸ CHEMICAL WASTE ROOM
 - ㊹ GAS TRANSFER STATION
 - ㊺ WASHOUT CHAMBER
 - ㊻ NODICI DOSING SYSTEM
 - ㊼ DECATING CHAMBER

TAI PO SEWAGE TREATMENT WORKS, STAGE V, PHASE IIB

Landfill Gas Monitoring Area(TPSTW)

Scale	N.T.S
Date	Jul-11

Project No.	MA0010
Figure	1.3



**APPENDIX A
CONSTRUCTION PROGRAMME**

Act ID	Description	Orig Dur	Early Start	Early Finish	Total Float	2010												2011												2012												2013											
						FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
General																																																					
Project Key Dates																																																					
1000	Possession of Site	0		28JAN10	1155d	Possession of Site																																															
10000	Completion of Section I of Works (365d)	0		28JAN11	790d													◆ Completion of Section I of Works (365d)																																			
20000	Completion of Section II of Works (460d)	0		01JUN12	330d																									◆ Completion of Section II of Works (460d)																							
30000	Completion of Section III of Works (670d)	0		28DEC11	486d																																					◆ Completion of Section III of Works (670d)											
40000	Completion of Section IV of Works (365d)	0		28JAN11	820d													◆ Completion of Section IV of Works (365d)																																			
50000	Completion of Section V of Works (1185d)	0		27APR13	0																																					◆ Completion of Section V of Works											
Preliminary																																																					
1010	Site Clearance	30	29JAN10	27FEB10	0	Site Clearance																																															
1020	Contractor Site Office Set-up	60	28FEB10	28APR10	84d	Contractor Site Office Set-up																																															
1030	Engineer's Accommodation	60	28FEB10	28APR10	1035d	Engineer's Accommodation																																															
1040	Initial Survey	60	29JAN10	29MAR10	25d	Initial Survey																																															
1050	Condition Survey	60	29JAN10	29MAR10	2d	Condition Survey																																															
1060	Environmental Baseline Monitoring	14	30MAR10	12APR10	1111d	Environmental Baseline Monitoring																																															
Submission for Approval																																																					
2010	Engineer's Green Roof	60	29APR10	27JUN10	1035d	Engineer's Green Roof																																															
2020	Excavation and Lateral Support (ELS)	30	29APR10	28MAY10	84d	Excavation and Lateral Support (ELS)																																															
2030	Project Signboard	30	29APR10	28MAY10	1065d	Project Signboard																																															
2040	Pile Load Test Set-up	30	30MAR10	28APR10	2d	Pile Load Test Set-up																																															
2050	Falsewk & Fwk for Pile Cap	30	29MAY10	27JUN10	90d	Falsewk & Fwk for Pile Cap																																															
2060	Falsewk & Fwk for Wall Structure	30	28JUN10	27JUL10	90d	Falsewk & Fwk for Wall Structure																																															
2070	Falsewk & Fwk for Top Slab	30	28JUL10	26AUG10	840d	Falsewk & Fwk for Top Slab																																															
2080	Multi-part Cover	45	27AUG10	10OCT10	840d	Multi-part Cover																																															
2090	FRP Handrail, Stair & Floor	45	11OCT10	24NOV10	840d	FRP Handrail, Stair & Floor																																															
2100	FRP Cover	30	11OCT10	09NOV10	900d	FRP Cover																																															
2110	Aluminium Flooring	45	25NOV10	08JAN11	840d	Aluminium Flooring																																															
2120	Green Roof System at Sludge Dewatering House	60	29APR10	27JUN10	310d	Green Roof System at Sludge Dewatering House																																															
2130	Green Roof System at Transformer House	60	29APR10	27JUN10	1035d	Green Roof System at Transformer House																																															
Material Fabrication & Delivery																																																					
3010	Casing for Mini-pile	55	29APR10	22JUN10	173d	Casing for Mini-pile																																															
3020	Casing for Socketted H-pile	55	28FEB10	23APR10	0	Casing for Socketted H-pile																																															
3030	Steel Member for Socketted H-pile	55	28FEB10	23APR10	0	Steel Member for Socketted H-pile																																															
3040	DI Water Pipe Puddle & Tee	180	29JAN10	27JUL10	90d	DI Water Pipe Puddle & Tee																																															
3050	DI Water Pipeline	180	29JAN10	27JUL10	1005d	DI Water Pipeline																																															
3060	Steel Member for Shelter	60	29JAN10	29MAR10	1125d	Steel Member for Shelter																																															
Section I of Works																																																					
Drilling Works																																																					
10010	Section I of Work	365	29JAN10	28JAN11	0	Section I of Work																																															
10100	Pre-drilling Works (18 nos)	45	10MAR10	23APR10	0	Pre-drilling Works (18 nos)																																															
10110	Preliminary Socketted H-pile	7	24APR10	30APR10	0	Preliminary Socketted H-pile																																															
10120	Load Test for Preliminary Pile	14	01MAY10	14MAY10	0	Load Test for Preliminary Pile																																															
10130	Socketted H-piling (56 nos)	84	15MAY10	06AUG10	0	Socketted H-piling (56 nos)																																															
10140	Proof Drilling (4 nos)	14	07AUG10	20AUG10	0	Proof Drilling (4 nos)																																															
10150	Load Test for Main Pile (1 no)	14	07AUG10	20AUG10	0	Load Test for Main Pile (1 no)																																															
10160	Removal of DN525 & DN900 conc. pipe	45	04JUL10	17AUG10	164d	Removal of DN525 & DN900 conc. pipe																																															
Final Classifier No. FC11B & FC12B																																																					
11010	Excavation for FC12B	21	21AUG10	10SEP10	0	Excavation for FC12B																																															
11020	Pile Head Construction for FC12B	17	11SEP10	27SEP10	4d	Pile Head Construction for FC12B																																															
11025	Base Slab of FC12B	22	18OCT10	18OCT10	7d	Base Slab of FC12B																																															
11030	Structural Wall for FC12B	35	19OCT10	22NOV10	7d	Structural Wall for FC12B																																															
11040	Watertightness Test for FC12B	20	23NOV10	12DEC10	7d	Watertightness Test for FC12B																																															
11050	Concrete Coating for FC12B	10	18DEC10	27DEC10	32d	Concrete Coating for FC12B																																															
11060	Backfilling for FC12B	20	13DEC10	01JAN11	7d	Backfilling for FC12B																																															
12010	Excavation for 11B	21	11SEP10	01OCT10	0	Excavation for 11B																																															
12020	Pile Head Construction for FC11B	17	02OCT10	18OCT10	0	Pile Head Construction for FC11B																																															

Start date	29JAN10
Finish date	27APR13
Data date	29JAN10
Run date	06APR10
Page number	1A
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	Early bar
	Progress bar
	Critical bar
	Summary bar
	Start milestone point
	Finish milestone point

China Harbour Engineering Co. Ltd.
TPSTW Stage 5 Phase 2B

Date	Revision	Checked	Approved
05FEB10	0	WML	TKC
07APR10	1	AA	TKC

**APPENDIX B
MONITORING REQUIREMENTS**

APPENDIX B – MONITORING REQUIREMENTS

Type of Monitoring	Parameter	Frequency	Duration	Location of Measurement
Noise ⁽¹⁾	L _{eq} (30 min.) (0700-1900 hrs. on normal weekdays)	Once per week	30 mins	<ul style="list-style-type: none"> NM1 (Outside the corridor of 1/F of Government Staff Quarter)
Air	1-hour TSP	3 times every six days	1 hour	<ul style="list-style-type: none"> CAM1 (on flat roof of Government Staff Quarters)
	24-hour TSP	Once every six days	24 hours	<ul style="list-style-type: none"> CAM2 (on ground within TPSTW and just next to the Printing Centre of Hung Hing Printing Centre) CAM3 (on ground within TPSTW and just next to Talcon Industrial Ltd.)
Landfill Gas	Methane (v/v) Carbon Dioxide (v/v) Oxygen (v/v)	2 times per day	N/A	<p><u>The Locations where the excavation is 1m depth or more and within the 250m Consultation Zone of Shuen Wan Landfill</u></p> <ul style="list-style-type: none"> FC11B and FC12B (Conducted in April and May 2011 only) Aeration Tank Dewatering House (Conducted in April and May 2011 only) FC7B (Conducted in June 2011 only) FC8B (Conducted in June 2011 only)

(1) If construction works are extended to include works during the hours of 1900 – 0700, additional weekly impact monitoring shall be carried out during evening and night-time works.

**APPENDIX C
ACTION AND LIMIT LEVELS**

APPENDIX C – Action and Limit Levels**1-Hour TSP**

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
CAM1	315	500
CAM2	336	
CAM3	344	

24-Hour TSP

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
CAM1	171	260
CAM2	177	
CAM3	192	

Construction Noise

Time Period	Action Level	Limit Level
0700-1900 hrs on normal weekdays	When one documented complaint is received	75 dB(A)
0700-2300 hrs on holidays; and 1900-2300 hrs on all other days		70* dB(A)
2300-0700 hrs of next day		55* dB(A)

Notes:

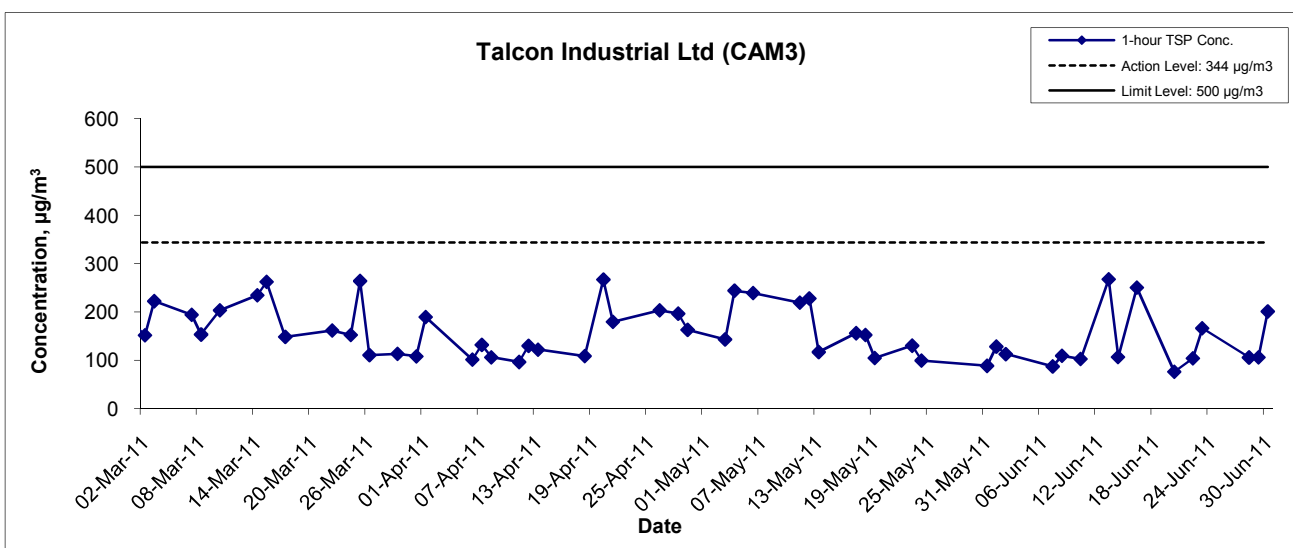
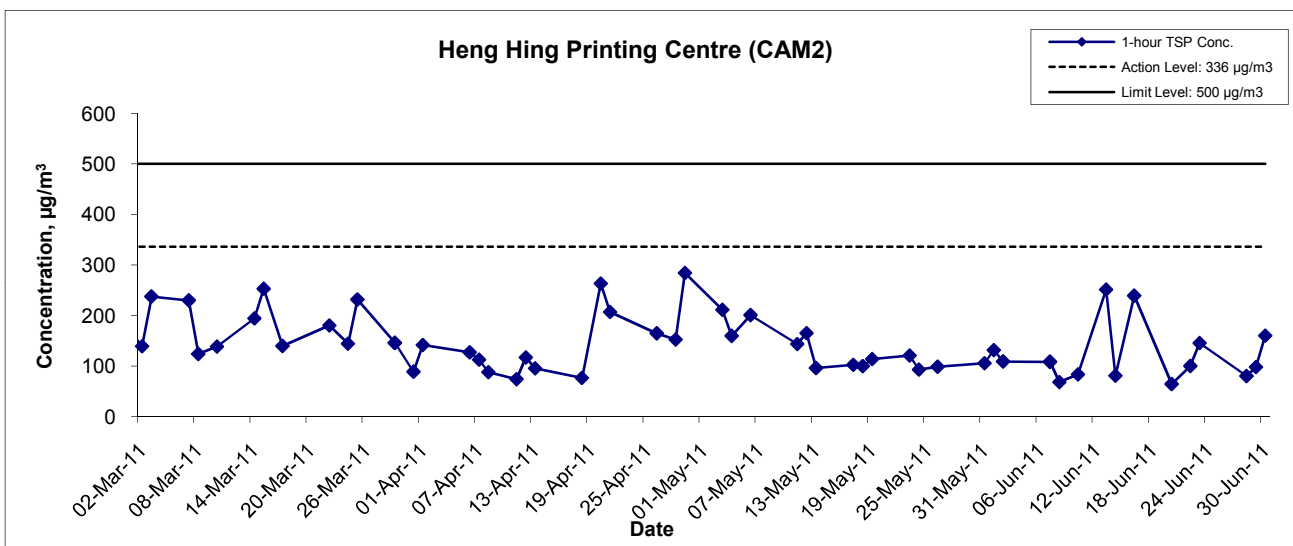
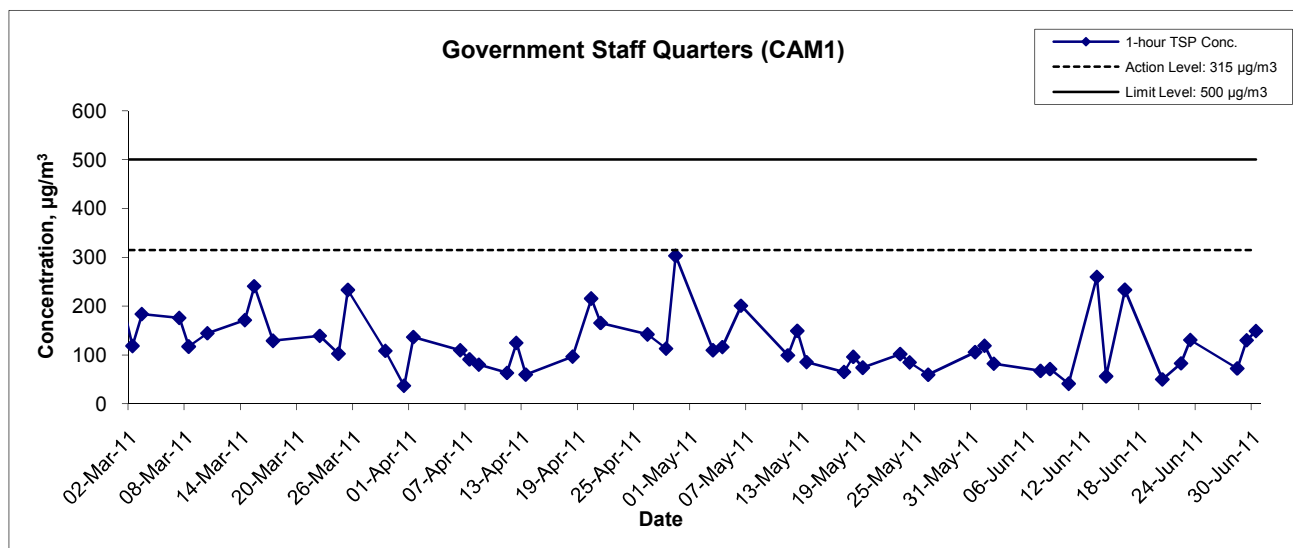
* The Area Sensitivity Rating for Station NM1 is taken as C, due to the nearby industrial area, according to Table 1 of EPD's Technical Memorandum on Noise from Construction Work other than Percussive Piling.

Landfill Gas

Parameter	Limit Level	Action
Oxygen	<19%	Ventilate to restore oxygen to >19%
	<18%	Stop works Evacuate personnel / prohibit entry Increase ventilation to restore oxygen to >19%
Methane	>10% LEL (i.e. >0.5% by volume)	Post “No Smoking” signs Prohibit hot works Ventilate to restore methane to <10% LEL
	>20% LEL (i.e. >1% by volume)	Stop works Evacuate personnel / prohibit entry Increase ventilation to restore methane to <10%
Carbon Dioxide	>0.5%	Ventilate to restore carbon dioxide to <0.5%
	>1.5%	Stop works Evacuate personnel / prohibit entry Increase ventilation to restore carbon dioxide to <0.5%

**APPENDIX D
GRAPHICAL PRESENTATION OF 1-
HOUR TSP MONITORING RESULTS**

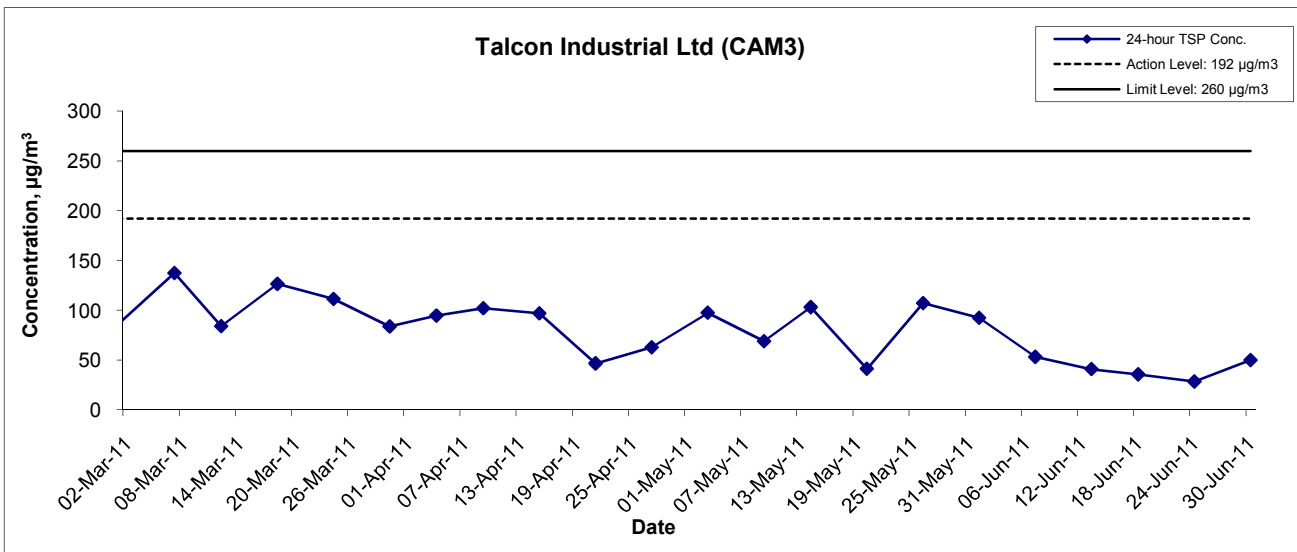
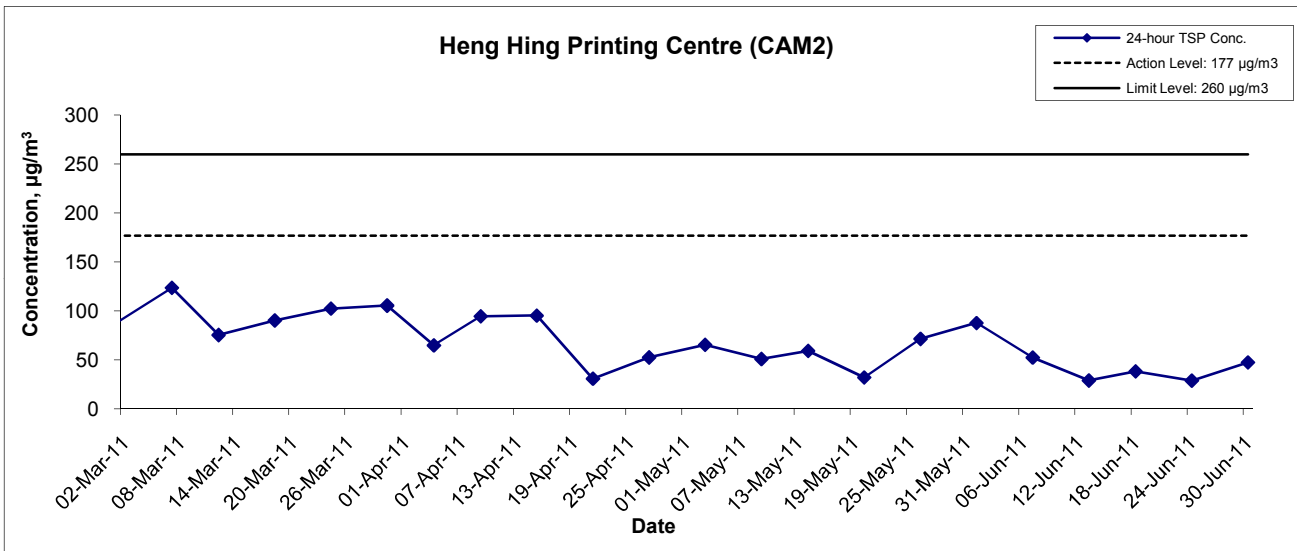
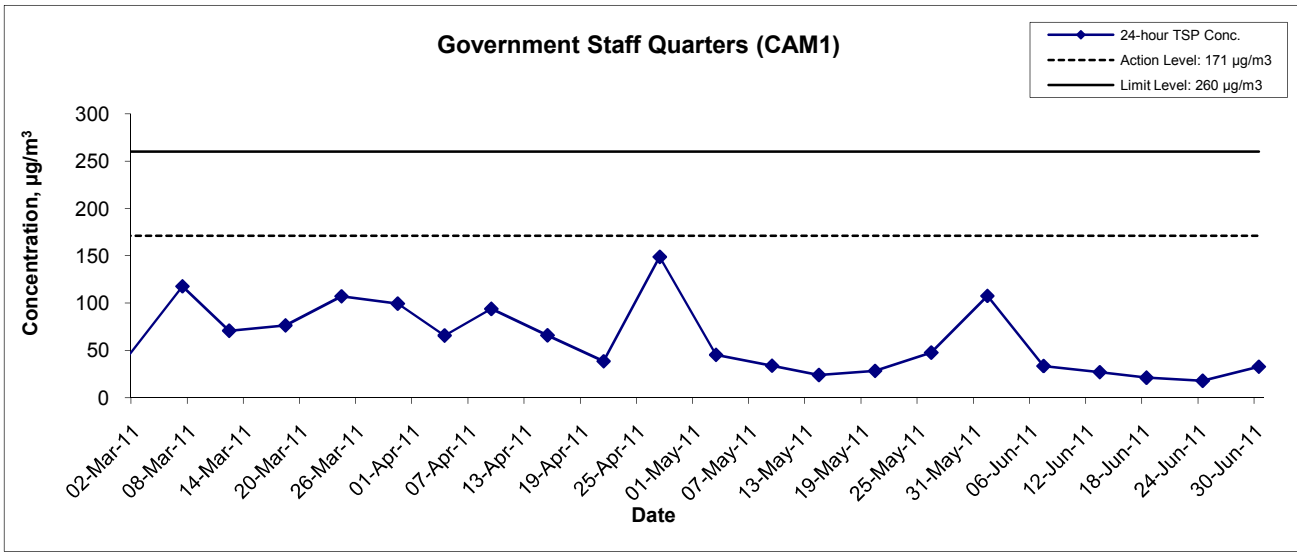
1-hr TSP Concentration Levels



Title	Contract No. DC/2009/09	Scale	Project No.	CINOTECH
	Construction of Tai Po Sewage Treatment Works - Stage V Phase II B	N.T.S	MA0010	
Graphical Presentation of 1-hour TSP Impact Monitoring Results		Date	Appendix	
		Jun 11	D	

**APPENDIX E
GRAPHICAL PRESENTATION OF 24-
HOUR TSP MONITORING RESULTS**

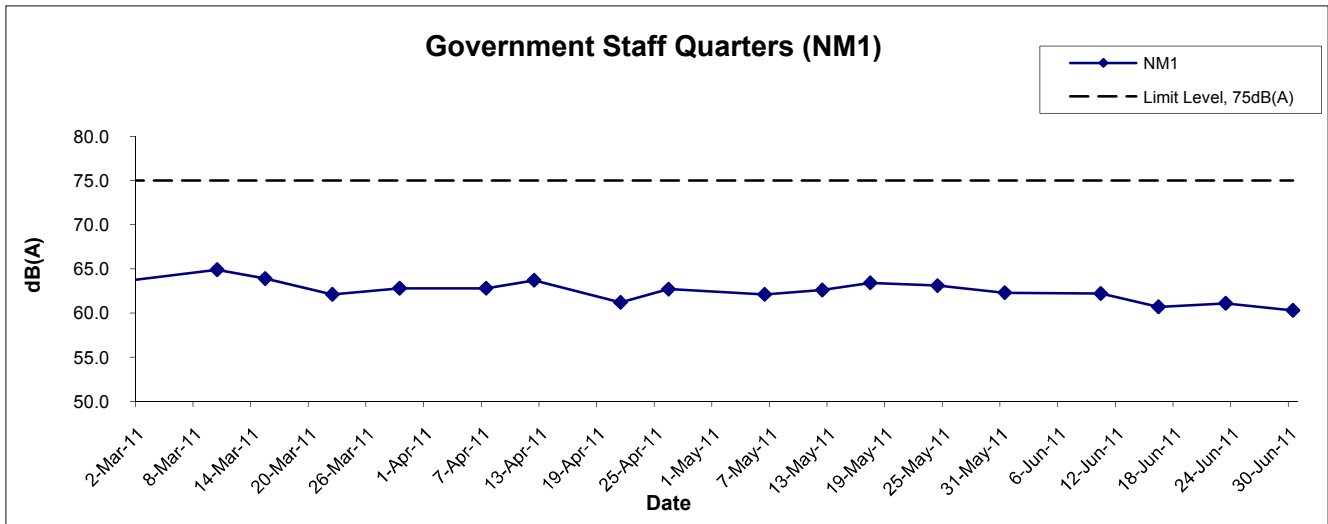
24-hr TSP Concentration Levels



Title Contract No. DC/2009/09 Construction of Tai Po Sewage Treatment Works - Stage V Phase II B Graphical Presentation of 24-hour TSP Impact Monitoring Results	Scale N.T.S	Project No. MA0010	
	Date Jun 11	Appendix E	

**APPENDIX F
GRAPHICAL PRESENTATION OF
NOISE MONITORING RESULTS**

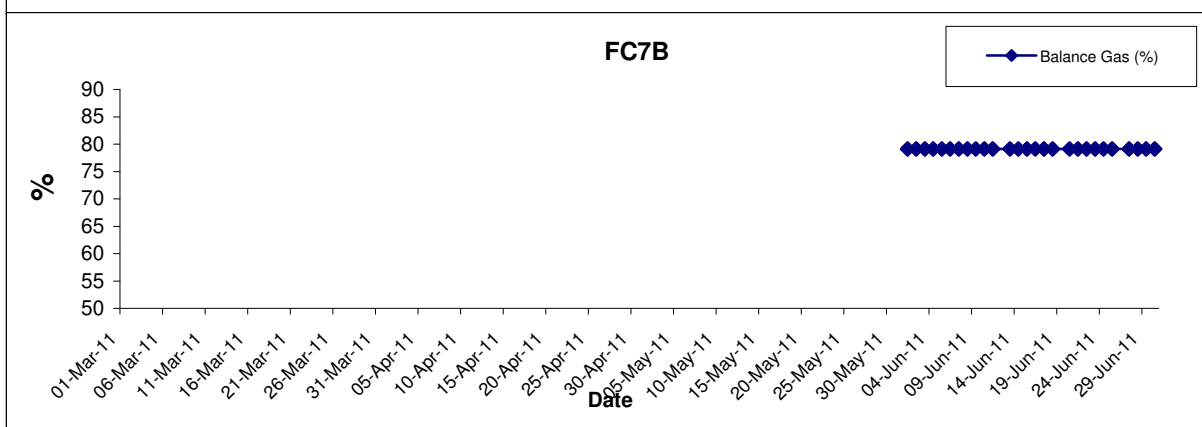
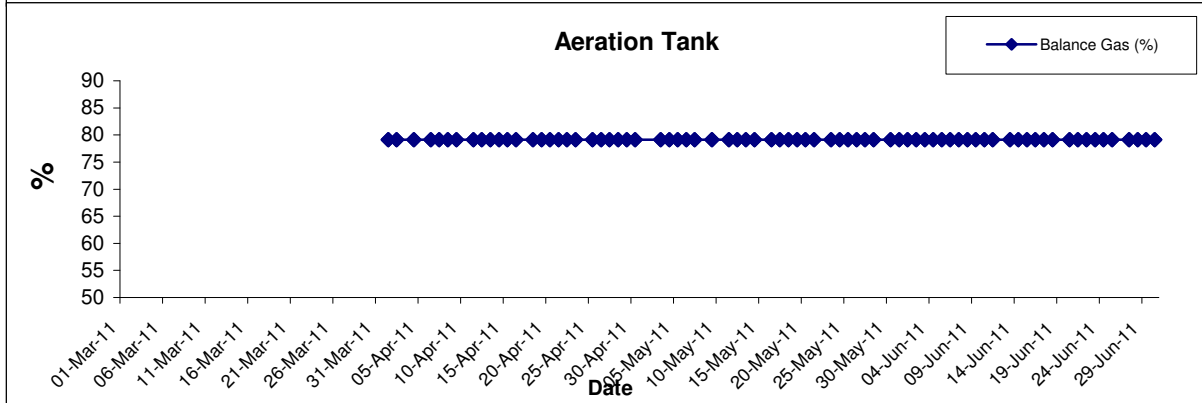
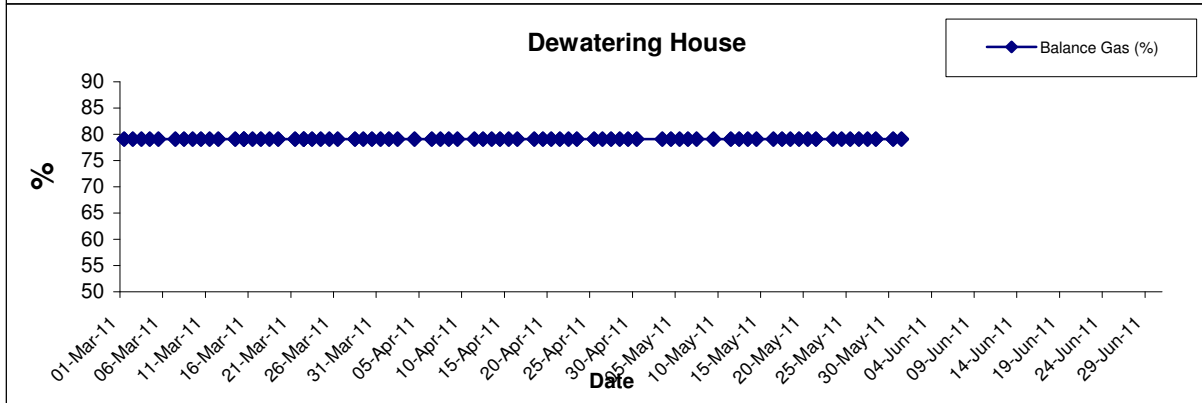
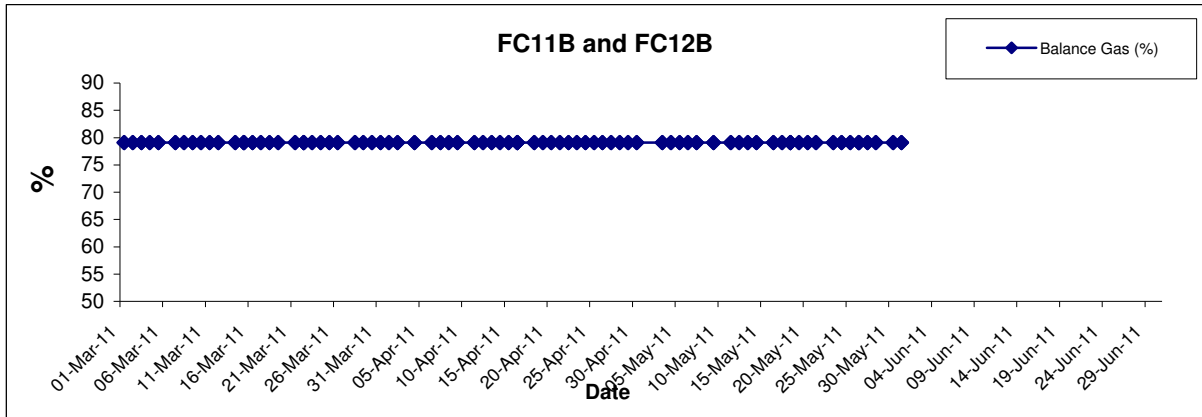
Noise Levels



Title Contract No. DC/2009/09 Construction of Tai Po Sewage Treatment Works - Stage V Phase II B Graphical Presentation of Construction Noise Monitoring Results	Scale N.T.S	Project No. MA0010	
	Date Jun 11	Appendix F	

**APPENDIX G
GRAPHICAL PRESENTATION OF
LANDFILL GAS MEASUREMENT BY
THE CONTRACTOR**

Balance Gas



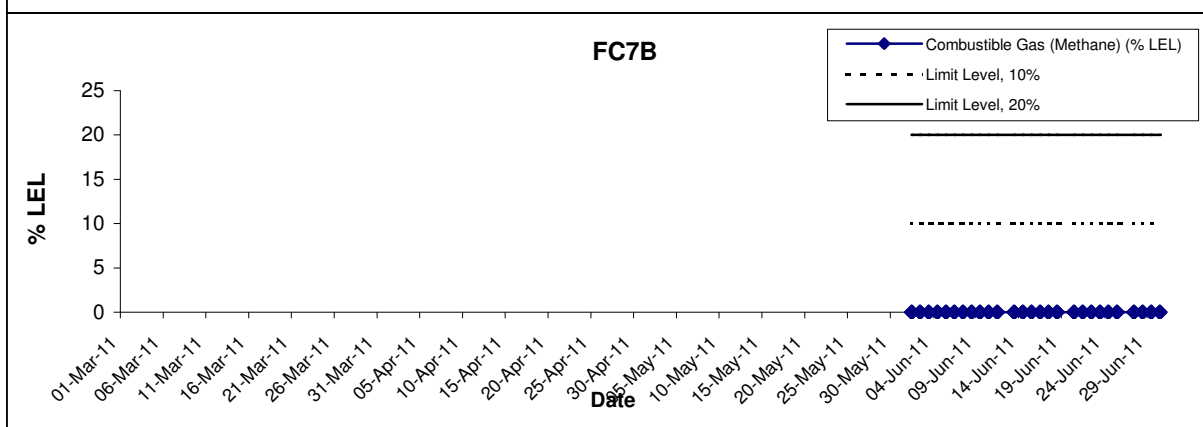
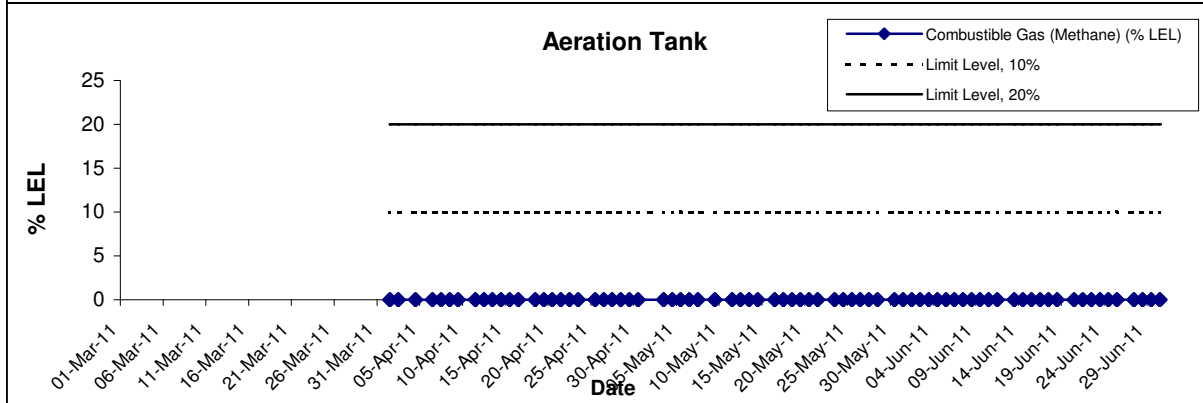
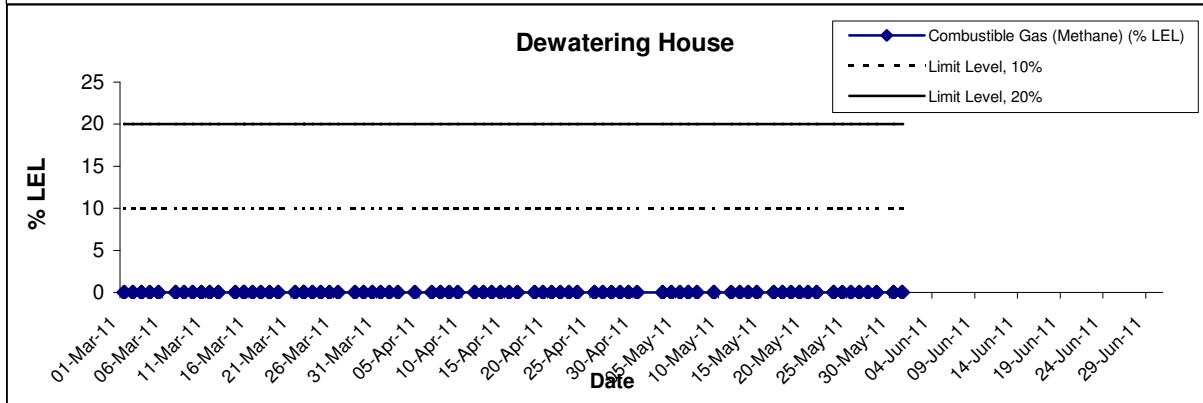
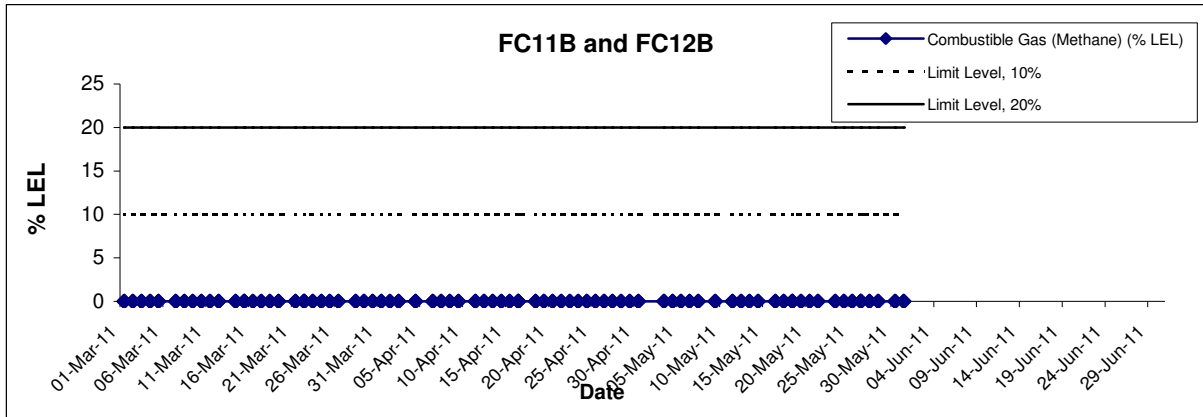
Title Contract No. DC/2009/09
 Construction of Tai Po Sewage Treatment Works - Stage V
 Phase II B
 Graphical Presentation of Landfill Gas Measurement

Scale N.T.S
 Date June 11

Project No. MA0010
 Appendix G

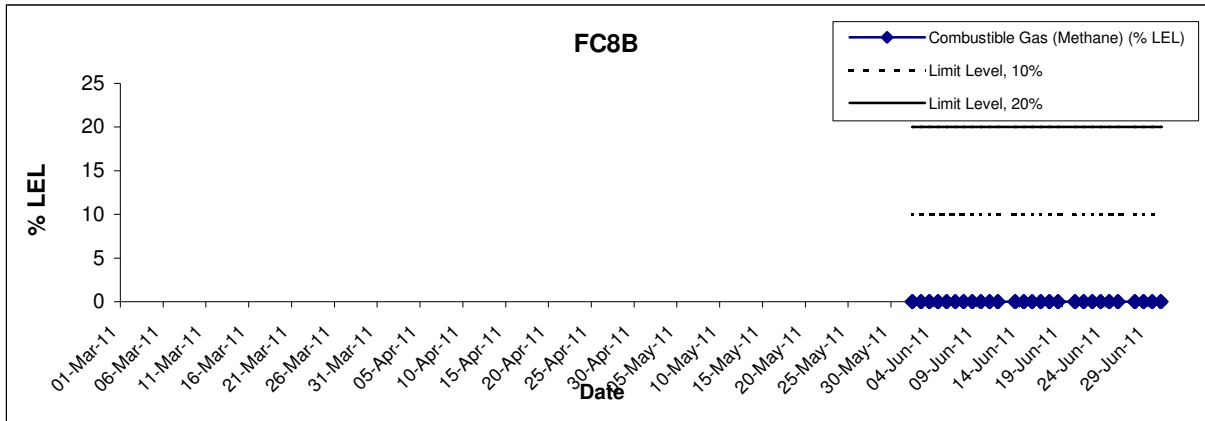


Combustible Gas (Methane)



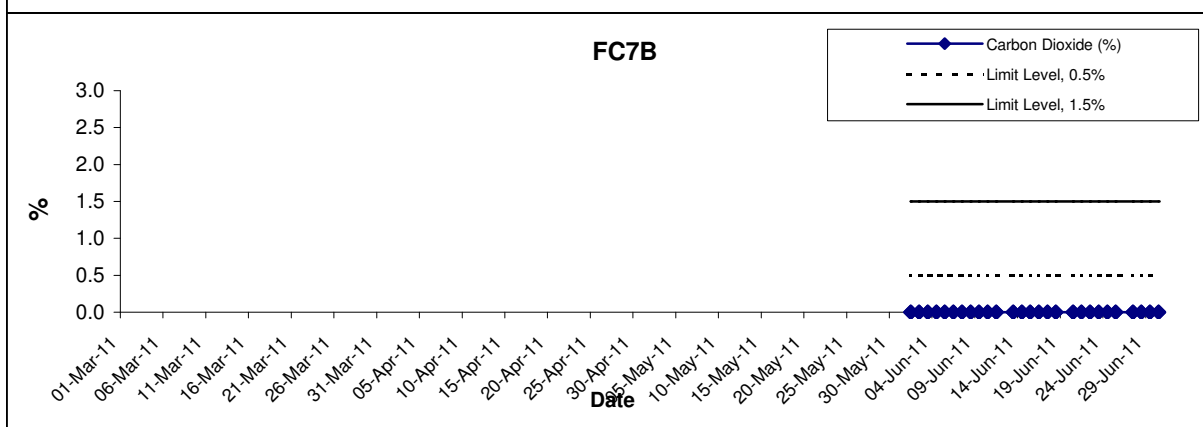
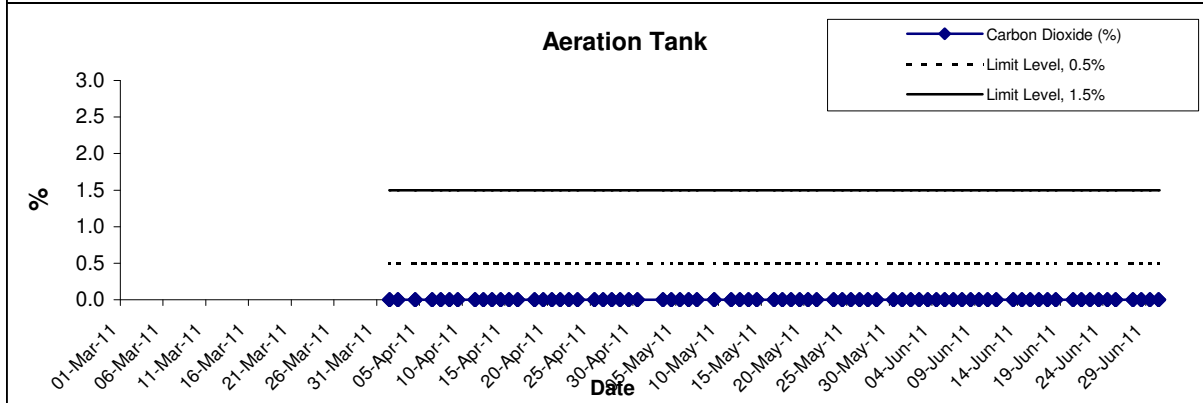
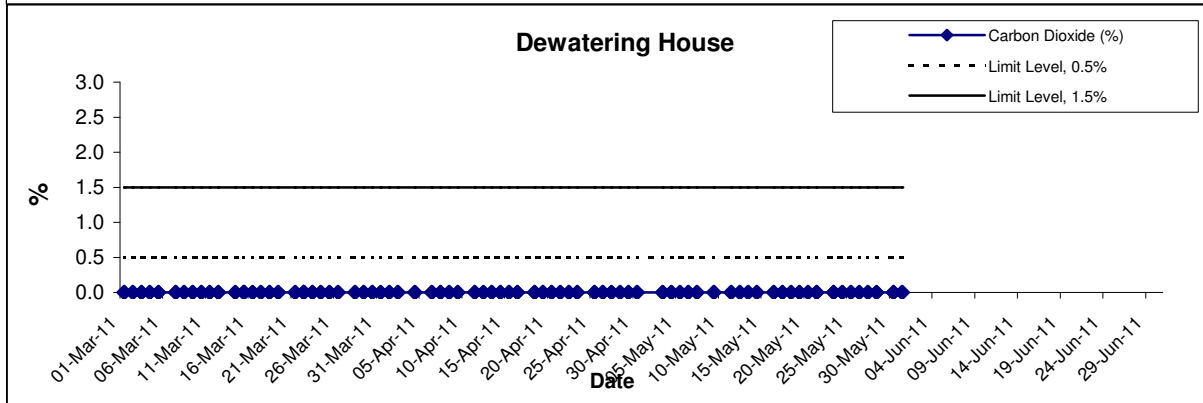
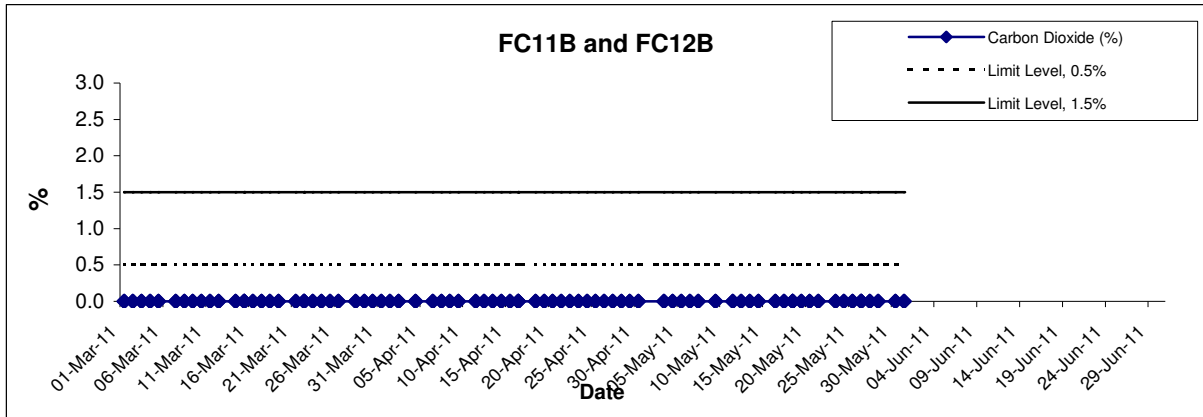
Title Contract No. DC/2009/09 Construction of Tai Po Sewage Treatment Works - Stage V Phase II B Graphical Presentation of Landfill Gas Measurement	Scale	N.T.S	Project No.	MA0010	CINOTECH
	Date	June 11	Appendix	G	

Combustible Gas (Methane)



Title Contract No. DC/2009/09 Construction of Tai Po Sewage Treatment Works - Stage V Phase II B Graphical Presentation of Landfill Gas Measurement	Scale N.T.S	Project No. MA0010	CINOTECH
	Date June 11	Appendix G	

Carbon Dioxide

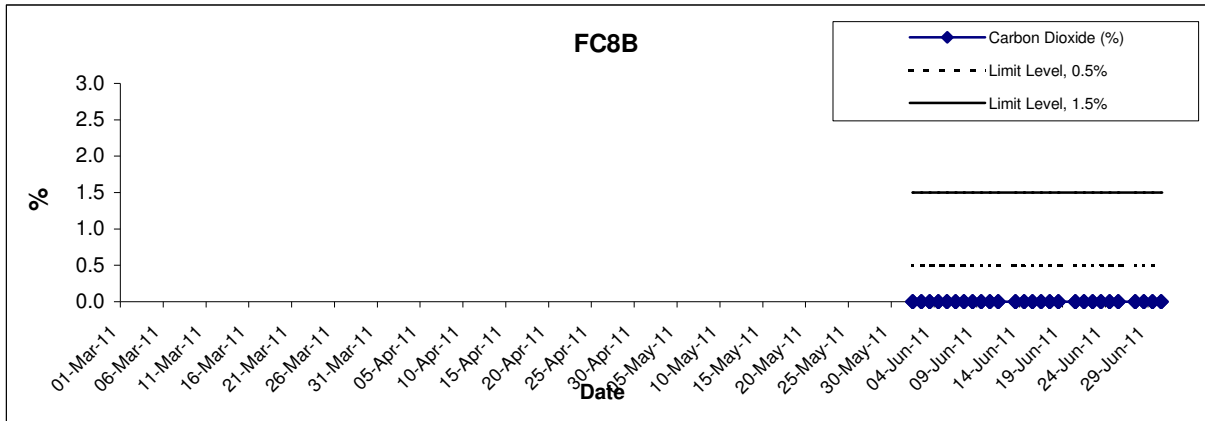


Title Contract No. DC/2009/09
 Construction of Tai Po Sewage Treatment Works - Stage V
 Phase II B
 Graphical Presentation of Landfill Gas Measurement

Scale	N.T.S	Project No.	MA0010
Date	June 11	Appendix	G



Carbon Dioxide



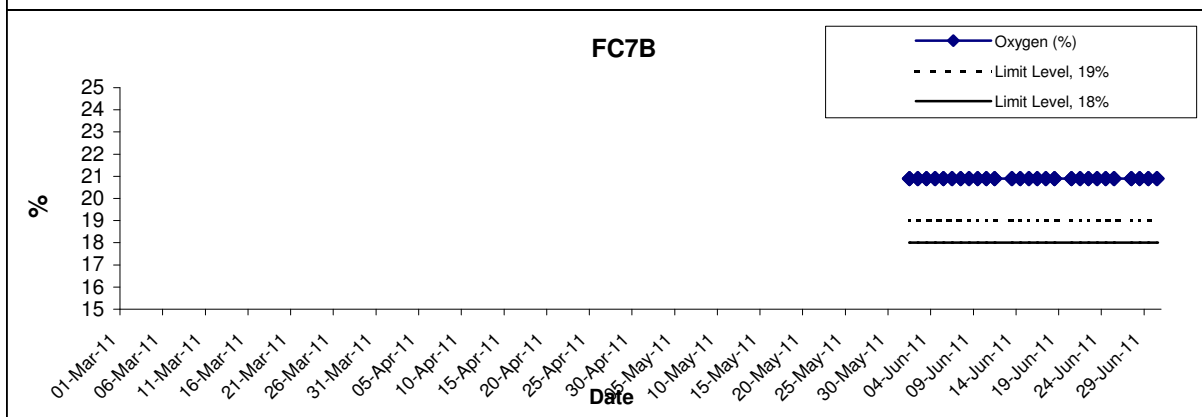
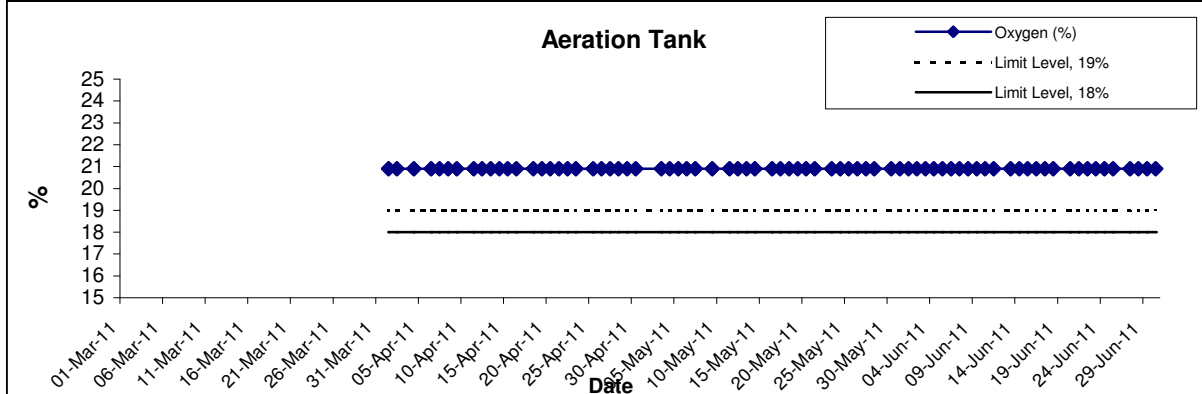
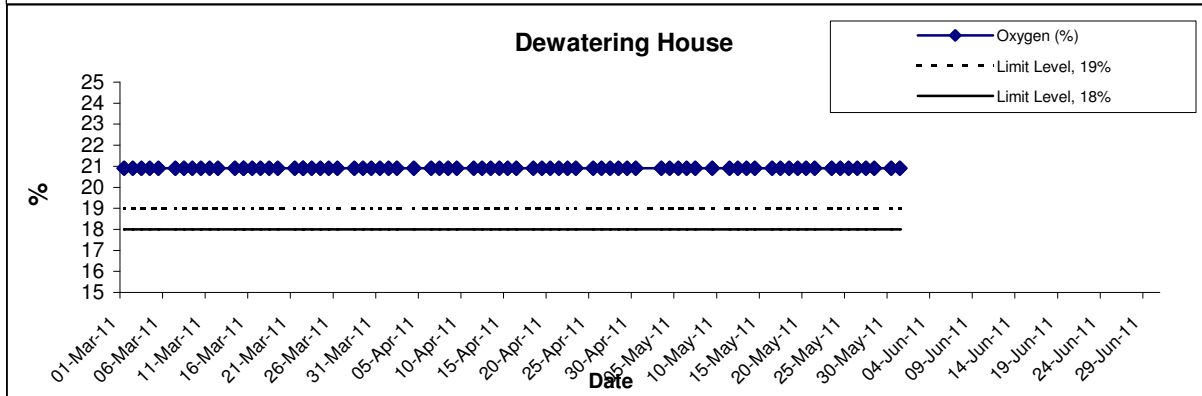
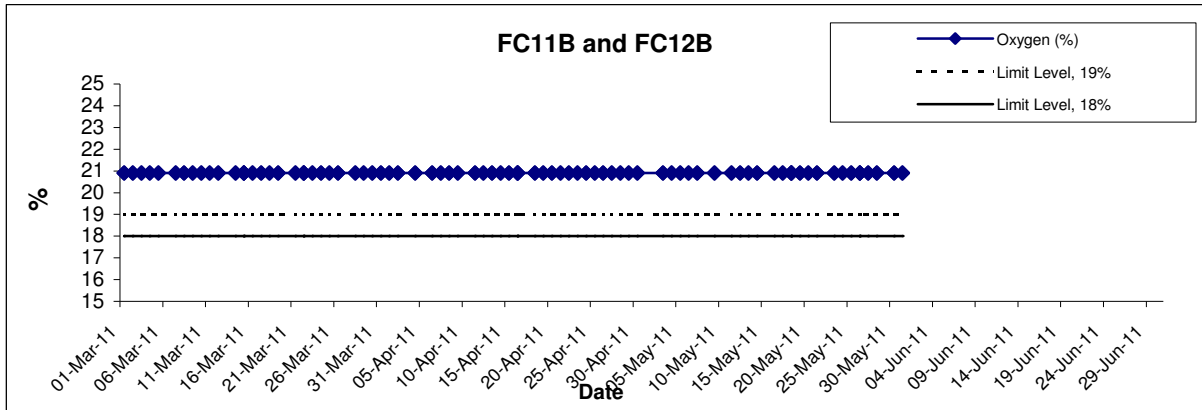
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 Construction of Tai Po Sewage Treatment Works - Stage V
 Phase II B
 Graphical Presentation of Landfill Gas Measurement

Scale N.T.S
 Date June 11

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 Appendix G



Oxygen



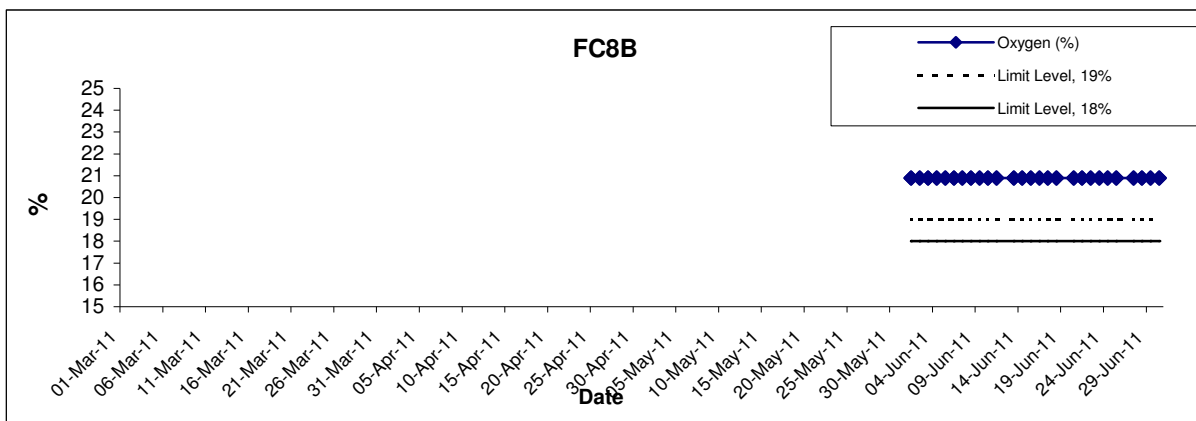
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 Construction of Tai Po Sewage Treatment Works - Stage V
 Phase II B
 Graphical Presentation of Landfill Gas Measurement

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Carbon Dioxide



Title Contract No. DC/2009/09 Construction of Tai Po Sewage Treatment Works - Stage V Phase II B Graphical Presentation of Landfill Gas Measurement	Scale N.T.S	Project No. MA0010	CINOTECH
	Date June 11	Appendix G	

**APPENDIX H
UPDATED ENVIRONMENTAL
MITIGATION IMPLEMENTATION
SCHEDULE**

**APPENDIX H – Updated Environmental Mitigation Implementation Schedule
(During Construction Phase)**

Type of Impact	Recommended Mitigation Measures	Status
<i>Air Quality</i>	Dust mitigation measures stipulated in <i>the Air Pollution Control (Construction Dust) Regulation</i> shall be incorporated to control dust emission. Notice shall be given to authority prior to commencing of work	√
<i>Noise</i>	Use of quiet PME	N/A
	Good Site Practice <ul style="list-style-type: none"> • Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; • Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program; • Mobile plant, if any, should be sited as far from NSRs as possible; • Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • Material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities. 	√
<i>Water Quality</i>	The practices outlined in ProPECC PN 1/94 Construction Site Drainage should be adopted to minimize the potential water quality impacts from construction site runoff and various construction activities. The recommendation to install perimeter drains to collect site runoff and to properly treat the runoff by settlement tank/treatment system shall apply to all sites including those for mainlaying works. Minimum distances of 100 m should be maintained between the discharge points of construction site runoff and the existing WSD saltwater intake at Tai Po.	√
	A discharge licence needs to be applied from EPD for discharging effluent from the construction site. The discharge quality is required to meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas should be treated so that it satisfies with all the standards listed in the TM. 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. Monitoring of the discharge quality of treated effluent should be part of the Environmental Monitoring and Audit (EM&A) programme. Detailed effluent sampling programme for water quality control during construction phase should be submitted to EPD, AFCD and WSD for approval prior to commencement of the construction works.	√
	The construction programme should be properly planned to minimize soil excavation, if any, in rainy seasons. This prevents soil erosion from exposed soil surfaces. Any exposed soil surfaces should also be properly protected to minimize dust emission. In areas where a large amount of exposed soils exist, earth bunds or sand bags should be provided. Exposed stockpiles should be covered with tarpaulin or impervious sheets at all time. The stockpiles of materials should be placed in the locations away from any stream courses 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 are protected using crushed stone or gravel, wherever practicable. Wheel washing facilities should be provided at all site exits to ensure that earth, mud and debris would not be carried out of the works areas by vehicles.	√
	Good site practices should be adopted to clean the rubbish and litter on the construction sites so as to prevent the rubbish and litter from dropping into the nearby environment. It is recommended to clean the construction sites on a regular basis.	√

Type of Impact	Recommended Mitigation Measures	Status
	It is recommended to provide sufficient chemical toilets in the works areas. The toilet facilities should not be less than 30 m from any watercourse. A licensed waste 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 TPSTW as necessary.	√
	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. Implementation of environmental audit on the construction site can provide an effective control of any malpractices and can achieve continual improvement of environmental performance on site.	√
	It is required to register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.	√
	Any service shop and minor maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken with the areas appropriately equipped to control these discharges.	√
	<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 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. 	√
	Marine water quality monitoring should be carried out under emergency condition or during maintenance of the THEES tunnel to verify the findings of the water quality modelling. It is recommended that the maintenance of the THEES tunnel, if unavoidable, should be conducted during winter season or low flow periods and to avoid the “blooming” season of algae (normally from April to June) if practicable. Details of the monitoring requirements are specified in the EM&A Manual.	N/A

Type of Impact	Recommended Mitigation Measures	Status
<p>Waste Management</p>	<p>Good site practices during the construction activities include:</p> <ul style="list-style-type: none"> • Nomination of approved personnel, 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 waste handling procedures. • Provision of sufficient waste disposal points and regular collection for disposal. • Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers. • Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Facility. • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors. • A Waste Management Plan shall be prepared and this WMP shall be submitted to the Engineer for approval. One may make reference to ETWB TCW No. 15/2003 for details. • In order to monitor the disposal of C&D materials at landfills and public filling areas, and to control fly tipping, a trip-ticket system shall be included as one of the contractual requirements and implemented by an Environmental Team undertaking the Environmental Monitoring and Audit work. One may make reference to WBTC No. 21/2002 for details. • A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) shall be proposed. 	<p>√</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. • To encourage collection of aluminum cans by individual collectors, separate labelled bins shall be provided to segregate this waste from other general refuse generated by the work force. • Any unused chemicals or those with remaining functional capacity shall be recycled. • Maximize the use of reusable steel formwork to reduce the amount of C&D material. • Prior to disposal of C&D waste, it is recommended that wood, steel and other metals shall be separated for re-use and / or recycling to minimize the quantity of waste to be disposed of to landfill. • Proper storage and site practices to minimize the potential for damage or contamination of construction materials. • Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste. • Minimize over ordering of concrete, mortars and cement grout by doing careful check before ordering 	<p>√</p>
	<p><i>General Refuse</i></p> <p>General refuse shall be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D material. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light material.</p>	<p>√</p>
	<p><i>Construction & Demolition (C&D) Material</i></p> <p>C&D material generated from the site formation and demolition works shall be sorted on-site into inert C&D material (i.e. public fill) and C&D waste. In order to minimise the impact resulting from collection and transportation of C&D material for off-site disposal, the excavated material comprising fill material shall be reused on-site as backfilling material as far as practicable. C&D waste, such as wood, plastic, steel and other metals shall be reused or recycled and, as a last resort, disposed of to landfill. A suitable area shall be designated within the site for temporary stockpiling of C&D material and to facilitate the sorting process.</p>	<p>√</p>

Type of Impact	Recommended Mitigation Measures	Status
	<p><i>Bentonite Slurry</i></p> <p>Bentonite slurries used in construction works should be reconditioned and reused wherever practicable. Residual used bentonite slurry should be disposed of from the site as soon as possible. The Contractor should explore alternative disposal outlets for the residual used bentonite slurry and disposal at landfill should be the last resort.</p>	N/A
Landfill Gas Hazard	<p>All personnel who work on the site and all visitors to the site should be aware of the possibility of ignition of gas in the vicinity of excavations. Safety notices should be displayed at prominent position around the site. Adequate fire extinguisher equipment and fire resistant clothing should be made available on site.</p>	√
	<p>Service runs within the consultation zone should be designated as “special routes” and utilities companies should be informed of this and should implement precautionary measures.</p>	√
	<p>Precautionary measures to minimize landfill gas hazard during excavation:</p> <ul style="list-style-type: none"> • No smoking or burning shall be allowed • No worker shall work alone at any time in the confined space or any excavation trenches • Construction equipment shall be equipped with a vertical exhaust at least 0.6 m above ground level and /or with a park arrestors • Electrical motors and electrical extension cords shall be explosive-proof or intrinsically safe • Permit to Work procedures to be adopted for welding, flame cutting or other hot works in trenches or confined spaces • Forced ventilation if working in a trench deeper than 1 m • Close all valves immediately after piping assembly or conduiting construction. For the large diameter pipes, pipe end shall be capped on one side. Forced ventilation shall also be provided before commissioning of the pipeline and staff entering and working in it • Routine monitoring shall be conducted in all excavations to ensure the works area to be free of landfill gas before any man enters the area. • Landfill gas precautionary measures involved with excavation and piping works shall be included in the Safety Plan • Monitoring shall be conducted at the cracks on the ground floor during ground-works construction 	√
	<p>Where there are any temporary site offices, or any other buildings which have enclosed spaces with the capacity to accumulate landfill gas, then they should either:</p> <ul style="list-style-type: none"> • be located on an area which has been proven to be free of landfill gas (by survey with portable gas detectors) and monitored manually by the Safety Officer or an approved wand appropriately qualified person to ensure that hazardous concentration of landfill gas does not occur; or • be raised clear of the ground. If buildings are raised clear of the ground, a minimum, clear separation (as measured from the highest point on the ground surface to the underside of lowest floor joist) should be 500mm 	√

Note:

- √ – Compliance of mitigation measures
X – Non-compliance of mitigation measures
N/A – Not applicable

**APPENDIX I
SUMMARY OF ENVIRONMENTAL
LICENSING AND PERMIT STATUS**

APPENDIX I – Summary of Environmental Licensing and Permit Status

Permit / License No.	Valid Period		Details	Status
	From	To		
Environmental Permit (EP)				
EP-265/2007	22/3/2007	N/A	<p><u>Expansion and upgrading of existing Tai Po Sewage Treatment Works from 100,000 m³/day to 130,000 m³/day:</u></p> <p>(a) additional secondary treatment process units(1 primary clarified; 3 bioreactors and 2 final clarifiers);</p> <p>(b) reconstruction of 4 existing final clarified;</p> <p>(c) provision of ultraviolet disinfection facilities;</p> <p>(d) additional sludge treatment facilities; and</p> <p>(e) ancillary works to existing treatment facilities.</p>	Valid
Construction Noise Permit (CNP)				
GW-RN0137-10	17/5/2010	16/11/2010	<p>Use of powered mechanical equipment for carrying out construction work at 7 Dai Kwai Street, Tai Po Industrial Estate, Tai Po, N.T. during 0000 – 2400 hours on general holidays (including Sundays), 0000 – 0700 hours and 1900 – 2400 hours on any day not being a general holiday.</p>	Expired
GW-RN0387-10	17/11/10	16/05/11		Vaild
GW-RN0036-11	01/02/11	31/07/11		Vaild

Permit / License No.	Valid Period		Details	Status
	From	To		
Discharge Licence				
WT00007782-2010	25/10/10	31/10/15	Discharge of industrial trade effluent: <i>Water Control Zone:</i> Tolo Harbour and Channel <i>Discharge Points:</i> Communal drain for the carriage of surface drainage water	Valid
Waste Disposal (Chemical Waste)				
WPN : 5213-727-C2397-16	09/7/10	End of Project	Disposal of Chemical Waste including spent oil, lubricating oil, diesel oil and methanol, surplus paint, thinner	Valid

**APPENDIX J
WASTE GENERATION IN THE
REPORTING QUARTER**

APPENDIX J – WASTE GENERATION IN THE REPORTING QUARTER

Monthly Summary Waste Flow Table April to June 2011 (Year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete (see Note 3)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastic (see Note 2)	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
Jan	5.1	0	0	0	5.1	0	1.4	0	0	0	0.01
Feb	2.87	0	0	0.17	2.7	0	1.3	0	0	0	0.01
Mar	6.2	0	0	3.5	2.7	0	1.5	0	0	0	0.01
Apr	3.16	0	0	2.91	0.25	0	1.4	0	0	0	0.01
May	4.56	0	0	3.85	0.71	0	1.4	0	0	0.06	0.01
June	1.50	0	0	1.25	0.25	0	1.2	0	0	0	0.01
Sub-total	23.39	0	0	11.68	11.71	0	8.2	0	0	0.06	0.06
July											
Aug											
Sept											
Oct											
Nov											
Dec											
Total											

- Notes: (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
 (2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
 (3) Broken concrete for recycling into aggregates.

APPENDIX J – WASTE GENERATION IN THE REPORTING QUARTER

Monthly Summary Waste Flow Table October to December 2010 (Year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete (see Note 3)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastic (see Note 2)	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
Jan											
Feb											
Mar											
Apr											
May											
June											
Sub-total											
July	3.11	0	0	0	3.11	0	0	0	0	0	0.01
Aug	0.04	0	0	0	0.04	0	0	0	0	0	0
Sept	0.07	0	0	0	0.07	0	0	0	0	0	0.01
Oct	0.17	0	0	0	0.17	0	1.2	0	0	0	0.01
Nov	1.25	0	0	0	1.25	0	1.4	0	0	0	0.01
Dec	3.71	0	0	2.23	3.71	0	1.4	0	0	0	0.01
Total	8.35	0	0	2.23	8.35	0	4.00	0	0	0	0.05

- Notes:
- (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
 - (2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
 - (3) Broken concrete for recycling into aggregates.

**APPENDIX K
SUMMARY OF EXCEEDANCE**

APPENDIX K – SUMMARY OF EXCEEDANCE

Reporting Period: April to June 2011

a) Exceedance Report for 1-hr TSP (NIL)

b) Exceedance Report for 24-hr TSP (NIL)

c) Exceedance Report for Construction Noise (NIL)

d) Exceedance Report for Landfill Gas (NIL)

**APPENDIX L
COMPLAINT LOG**

APPENDIX L – COMPLAINT LOG**Reporting Period:** April to June 2011

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
N/A	N/A	N/A	N/A	N/A	N/A

Remarks: No environmental complaint was received in the reporting period.