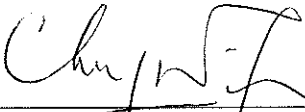


China Harbour Engineering Company Limited

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

**Monthly Environmental Monitoring
and Audit Report for
April 2013**

(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.

CINOTECH accepts no responsibility for changes made to this report by third parties.

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TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	1
Introduction	1
Environmental Monitoring and Audit Works.....	1
Environmental Licenses and Permits	2
Key Information in the Reporting Month.....	2
Future Key Issues	3
1 INTRODUCTION	4
Background	4
Construction Programme.....	6
Summary of EM&A Requirements	6
2 AIR QUALITY MONITORING	7
Monitoring Requirements	7
Monitoring Locations.....	7
Monitoring Equipment	7
Monitoring Parameters, Frequency and Duration	7
Monitoring Methodology and QA/QC Procedure.....	8
Instrumentation	8
HVS Installation.....	8
Filters Preparation	8
Operating/Analytical Procedures	9
Maintenance/Calibration	9
Results and Observations	10
3 NOISE MONITORING	11
Monitoring Requirements	11
Monitoring Locations.....	11
Monitoring Equipment	11
Monitoring Parameters, Frequency and Duration	11
Monitoring Methodology and QA/QC Procedures	12
Results and Observations	13
4 LANDFILL GAS MONITORING	14
Monitoring Requirements	14
Monitoring Parameters and Frequency	14
Monitoring Locations.....	14
Monitoring Equipment	15
Results.....	15
5 ENVIRONMENTAL AUDIT	16
Site Audits.....	16
Review of Environmental Monitoring Procedures.....	16
Status of Environmental Licensing and Permitting	16
Status of Waste Management	18
Implementation Status of Environmental Mitigation Measures	18
Summary of Exceedances	19
Implementation Status of Event Action Plans.....	19
Summary of Complaint and Prosecution.....	19
6 FUTURE KEY ISSUES	19
Monitoring Schedule for the Next Month	19
Construction Program for the Next Month.....	20
7 CONCLUSIONS AND RECOMMENDATIONS.....	21
Conclusions	21
Recommendations	21

LIST OF TABLES

Table I	Summary Table for Events Recorded in the Reporting Month
Table II	Summary Table for Key Information in the Reporting Month
Table 1.1	Key Project Contacts
Table 2.1	Locations for Air Quality Monitoring
Table 2.2	Air Quality Monitoring Equipment
Table 2.3	Impact Dust Monitoring Parameters, Frequency and Duration
Table 2.4	Summary Table of Air Quality Monitoring Results during the reporting month
Table 3.1	Location of Noise Monitoring Station
Table 3.2	Noise Monitoring Equipment
Table 3.3	Noise Monitoring Parameters, Frequency and Duration
Table 3.4	Summary Table of Noise Monitoring Results during the Reporting Month
Table 4.1	Landfill Gas Monitoring Equipment
Table 5.1	Summary of Environmental Licensing and Permit Status
Table 5.2	Observations and Recommendations of Site Audit

LIST OF FIGURE

Figure 1.1	Site Layout Plan
Figure 1.2	Locations of Air Quality and Noise Monitoring Stations
Figure 1.3	Landfill Gas Monitoring Area

LIST OF APPENDICES

Appendix A	Action and Limit Levels
Appendix B	Copies of Calibration Certificates
Appendix C	Environmental Monitoring Schedules
Appendix D	1-hour TSP Monitoring Results and Graphical Presentations
Appendix E	24-hour TSP Monitoring Results and Graphical Presentations
Appendix F	Noise Monitoring Results and Graphical Presentations
Appendix G	Records of Landfill Gas Measurement by the Contractor
Appendix H	Summary of Exceedance
Appendix I	Site Audit Summary
Appendix J	Event Action Plans
Appendix K	Updated Environmental Mitigation Implementation Schedule
Appendix L	Waste Generation in the Reporting Month
Appendix M	Complaint Log
Appendix N	Construction Programme

EXECUTIVE SUMMARY**Introduction**

1. This is the 34th monthly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for DSD Contract no. DC/2009/09 “Construction of Tai Po Sewage Treatment Works – Stage V Phase IIB”. This report documents the findings of EM&A Works conducted in April 2013.
2. The major site activities undertaken in the reporting month included:
 - Application protective coating at FC8B, FC9B and FC10B;
 - Cable ducting works ;
 - Construction of Mixed Liquor Channel & Sludge Digestion Tank;
 - Construction of gas pipe for Waste Gas-burner at Stage I/II Works;
 - Construction of covered walkway on roof of Sludge Dewatering House;
 - Construction of FC7B and Sludge Draw-off No. 3;
 - Construction of Pipework for Water Reclamation Facility;
 - Construction of pipe supports for DN1500 Air Main at AT7;
 - Landscaping works; and
 - Modification works at Central Building Complex and Inlet Works.

Environmental Monitoring and Audit Works

3. Environmental monitoring and audit works for the Project were performed regularly as stipulated in the Final 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 month is tabulated in **Table I**.

Table I Summary Table for Events Recorded in the Reporting Month

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

5. In the reporting month, 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. All the measured results were complied with the Limit Levels.

Environmental Licenses and Permits

6. 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.

Key Information in the Reporting Month

7. Summary of key information in this reporting month is tabulated in **Table II**.

Table II Summary Table for Key Information in the Reporting Month

Event	Event Details		Action Taken	Status	Remark
	Number	Nature			
Complaint received	0	---	N/A	N/A	---
Changes to the assumptions and key construction / operation activities recorded	0	---	N/A	N/A	---
Status of submissions under EP	1	Monthly EM&A Report (March 2013)	Submitted to EPD on 22 nd April 2013 (EP condition 6.6)	N/A	---
	1	Quarterly EM&A Report (Jan - Mar 2013)	Submitted to EPD on 22 nd April 2013 (EP condition 6.6)	N/A	---
Notifications of any summons & prosecutions	0	---	N/A	N/A	---

Future Key Issues

8. Major site activities for the coming two months will include:
 - Construction of Covered Walkway on roof of Sludge Dewatering House;
 - Cable ducting works;
 - Construction of gas pipe for Waste Gas-burner at Stage I/II Works;
 - Construction of Covered Walkway on roof of Sludge Dewatering House;
 - Construction of MLC and Foam Removal Chamber;
 - Construction of Sludge Digestion Tank No. 3, Draw-off Chamber No. 3 & FC7B;
 - Construction of Water Reclamation Facility for RO Plant;
 - Drainage and Road works;
 - Finishing works for Transformer House, Decanting Chamber and Extension of Sludge Dewatering House, tanks & pillar box of Water Reclamation Facility, Effluent Launder, Pipe Chamber adjacent to PST5;
 - Construction of thrust blocks for DN1500 air main;
 - Installation of Irrigation System;
 - Landscaping works;
 - Modification works at CBC, Filtrate Treatment Plant, Inlet Works; and
 - Modification works of Effluent Launder and Flow Splitter Box.

9. The future environmental concerns are air quality, noise impacts, waste management and surface runoff from construction works.

1 INTRODUCTION

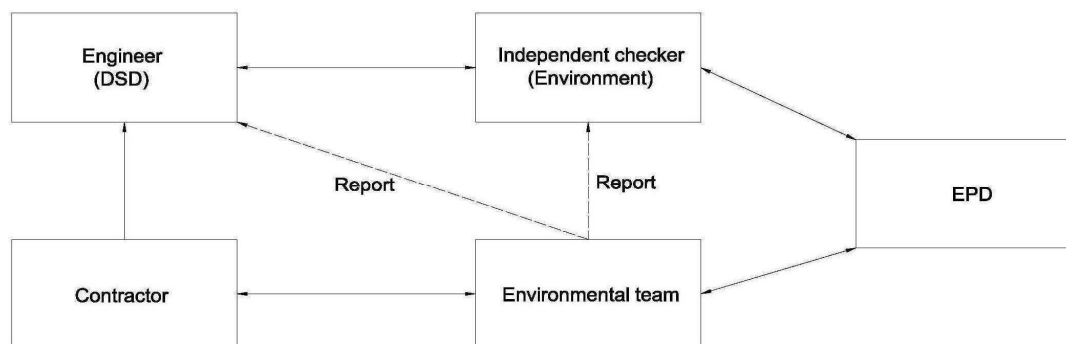
Background

- 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 N**. 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 34th monthly EM&A report summarizing the EM&A works for the Project in April 2013.

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
 - 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
		Ms. Woody POON	Project Coordinator and Audit Team Leader	2151 2035	
		Mr. Henry LEUNG	Monitoring Team Leader	2151 2087	
Arup	Independent Environmental Checker	Mr. Coleman NG	Independent Environmental Checker	2268 3097	2865 6493
		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

1.9 The site activities undertaken in the reporting month were:

- Application protective coating at FC8B, FC9B and FC10B;
- Cable ducting works ;
- Construction of Mixed Liquor Channel & Sludge Digestion Tank;
- Construction of gas pipe for Waste Gas-burner at Stage I/II Works;
- Construction of covered walkway on roof of Sludge Dewatering House;
- Construction of FC7B and Sludge Draw-off No. 3;
- Construction of Pipework for Water Reclamation Facility;
- Construction of pipe supports for DN1500 Air Main at AT7;
- Landscaping works; and
- Modification works at Central Building Complex and Inlet Works.

Summary of EM&A Requirements

1.10 The EM&A programme requires construction phase air quality and noise 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 5 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 month.

2 AIR QUALITY MONITORING

Monitoring Requirements

- 2.1 Monitoring of 1-hour and 24-hour Total Suspended Particulates (TSP) was conducted to monitor the air quality during construction phase. **Appendix A** shows the established Action/Limit Levels for the environmental monitoring works.
- 2.2 In accordance with Section 2.30 of the EM&A Manual, a baseline checking of ambient TSP levels shall be carried out every six months at each monitoring station, when no dusty works activities are in operation. The number and location of monitoring stations and parameters shall be reviewed by ET Leader every three months according to section 8.8 of EM&A Manual.

Monitoring Locations

- 2.3 Impact air quality monitoring was conducted at the 3 monitoring stations, as shown in **Figure 1.2**. **Table 2.1** describes the locations of the air quality monitoring stations.

Table 2.1 Locations for Air Quality Monitoring

Monitoring Stations	Description	Location of Measurement
CAM1	Government Staff Quarters	Rooftop
CAM2	Hung Hing Printing Centre	On the site boundary just next to the Hung Hing Printing Centre
CAM3	Talcon Industrial Ltd.	On the site boundary just next to Talcon Industrial Ltd.

Monitoring Equipment

- 2.4 **Table 2.2** summarizes the equipment used for the air quality monitoring.

Table 2.2 Air Quality Monitoring Equipment

Equipment	Model and Make	Qty.
HVS	Graseby GMW 2310 HVS, Model GS-2310105-1, Serial no. 10239 and 0810	2
	Tisch Environmental, Inc.; Model no. TE-5170, Serial no. 1704	1
Calibrator	Thermo Andersen.; Model no. G25A Serial no. 1536	1

Monitoring Parameters, Frequency and Duration

- 2.5 **Table 2.3** summarizes the monitoring parameters and frequencies of impact dust monitoring for the whole construction period.

Table 2.3 Impact Dust Monitoring Parameters, Frequency and Duration

Monitoring Stations	Parameter	Duration	Period	Frequency
CAM1, CAM2 and CAM3	1-hour TSP	1 hour	During daytime period	3 times / 6-day
	24-hour TSP	24 hours	24 hours	Once / 6-day

Monitoring Methodology and QA/QC Procedure

Instrumentation

- 2.6 High Volume Samplers (HVS) connected with appropriate sampling inlets were employed for air quality monitoring. Each sampler was composed of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complies with that required by USEPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50).

HVS Installation

- 2.7 The following guidelines were adopted during the installation of HVS:
- Sufficient support was provided to secure the samplers against gusty wind.
 - No two samplers were placed less than 2 meters apart.
 - The distance between the sampler and an obstacle, such as buildings, was at least twice the height that the obstacle protrudes above the sampler.
 - A minimum of 2 meters of separation from walls, parapets and penthouses was required for rooftop samples.
 - A minimum of 2 meters separation from any supporting structure, measured horizontally was required.
 - No furnaces or incineration flues were nearby.
 - Airflow around the sampler was unrestricted.
 - The samplers were more than 20 meters from the drip line.
 - Any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring.

Filters Preparation

- 2.8 Fiberglass filters were used which have a collection efficiency of larger than 99% for particles of 0.3 μm diameter. A HOKLAS accredited laboratory, Wellab Ltd., was responsible for the preparation of pre-weighed filter papers for Cinotech's monitoring team.
- 2.9 All filters, which were prepared by Wellab Ltd., 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 ± 3 °C; the relative humidity (RH) was < 50% and not variable by more than $\pm 5\%$. A convenient working RH was 40%.
- 2.10 Wellab Ltd. has a comprehensive quality assurance and quality control programmes.

Operating/Analytical Procedures

2.11 Operating/analytical procedures for the TSP monitoring were highlighted as follows:

- Prior to the commencement of the dust sampling, the flow rate of the HVS was properly set (between 1.1 and 1.4 m³/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard.
- The power supply was checked to ensure the sampler worked properly.
- On sampling, the sampler was operated for 5 minutes to establish thermal equilibrium before placing any filter media at the air quality monitoring station.
- The filter holding frame was then removed by loosening the four nuts and carefully a weighted and conditioned filter was centered with the stamped number upwards, on a supporting screen.
- The filter was aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter. Then the filter holding frame was tightened to the filter holder with swing bolts to avoid air leakage at the edges.
- The shelter lid was closed and secured with the aluminum strip.
- The timer was then programmed. Information was recorded on the record sheet, which included the starting time, the weather condition and the filter number (the initial weight of the filter paper can be found out by using the filter number).
- The flow rate of the HVS sampler would be verified to be constant and recorded on the data sheet after sampling.
- After sampling, the filter was removed and sent to the Wellab Ltd. for weighing. The elapsed time was also recorded.
- Before weighing, all filters were equilibrated in a conditioning environment for 24 hours. The conditioning environment should be between 25°C and 30°C and not vary by more than ±3°C; the relative humidity (RH) should be < 50% and not vary by more than ±5%. A convenient working RH is 40%. Weighing results were returned to Cinotech for further analysis of TSP concentrations collected by each filter.

Maintenance/Calibration

2.12 The following maintenance/calibration was required for the HVS:

- The high volume motors and their accessories were properly maintained. Appropriate maintenance such as routine motor brushes replacement and electrical wiring checking were made to ensure that the equipment and necessary power supply are in good working condition.
- Calibration of the HVS (five point calibration) using Calibration Kit was carried out every two months. Copies of calibration certificates are attached in **Appendix B**.
- The HVS calibration orifice will be calibrated annually.

Results and Observations

- 2.13 In the reporting month, 1-hr TSP monitoring was carried out as schedule at each designated monitoring station on 13 occasions. 24-hr TSP monitoring was carried out as scheduled at each designated monitoring station on 6 occasions. The monitoring schedule was updated and is shown in **Appendix C**. The weather during the monitoring sessions was mainly sunny and cloudy.
- 2.14 All measured 1-hr and 24-hr TSP levels were below the Action/Limit Levels. No exceedance was recorded in the reporting month.
- 2.15 The monitoring data and graphical presentations of 1-hour and 24-hour TSP monitoring results are shown in **Appendices D** and **E**, respectively.

Table 2.4 Summary Table of Air Quality Monitoring Results during the reporting month

Parameter	Minimum $\mu\text{g}/\text{m}^3$	Maximum $\mu\text{g}/\text{m}^3$	Average $\mu\text{g}/\text{m}^3$	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
1-hr TSP (CAM1)	54	268	144	315	500
24-hr TSP (CAM1)	27	79	57	171	260
1-hr TSP (CAM2)	102	268	168	336	500
24-hr TSP (CAM2)	33	121	85	177	260
1-hr TSP (CAM3)	110	302	173	344	500
24-hr TSP (CAM3)	40	126	90	192	260

- 2.16 According to our field observations, the major dust source identified at the designated air quality monitoring stations are as follows:

Station	Major Pollution Source
CAM1 – Government Staff Quarters	Road Traffic Dust
CAM2 – Hung Hing Printing Centre	Road Traffic Dust and Excavation
CAM3 – Talcon Industrial Ltd.	Road Traffic Dust and Excavation

3 NOISE MONITORING

Monitoring Requirements

- 3.1 Noise monitoring was conducted in accordance with the EM&A Manual. **Appendix A** shows the established Action and Limit Levels for the environmental monitoring works.
- 3.2 The number and location of monitoring stations and parameters shall be reviewed by ET Leader every three months according to section 8.8 of EM&A Manual.

Monitoring Locations

- 3.3 Noise monitoring was conducted at one designated monitoring station as presented in **Table 3.1**. **Figure 1.2** shows the locations of the monitoring station.

Table 3.1 Location of Noise Monitoring Station

Monitoring Station	Description	Location of Measurement
NM1	Government Staff Quarters	The corridor at the first floor.

Monitoring Equipment

- 3.4 **Table 3.2** summarizes the noise monitoring equipment model being used.

Table 3.2 Noise Monitoring Equipment

Equipment	Model and Make	Quantity
Integrating Sound Level Meter	SVANTEK - SVAN 957	1
Calibrator	SVANTEK - SV30A	1
Wind Speed Anemometer	Vane Anemometer, Model AZ8904 (Serial no. 974835)	1

Monitoring Parameters, Frequency and Duration

- 3.5 **Table 3.3** summarizes the monitoring parameters, frequency and total duration of monitoring.

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

Station	Parameter	Period	Frequency
NM1	$L_{eq}(30 \text{ min.})$ (L_{10} and L_{90} were also recorded as supplementary information)	0700-1900 hrs. on normal weekdays	Once a week

- 3.6 If construction works are extended to include works during the hours of 1900 - 0700, additional weekly impact monitoring would be carried out during evening and night-time works. Applicable permits under NCO have been obtained by the Contractor. The details of the Construction Noise Permit can be referred to **Table 5.1**.

Monitoring Methodology and QA/QC Procedures

Field Monitoring

3.7 The monitoring procedures are as follows:

- The microphone head of the sound level meter was positioned 1m exterior of the noise sensitive facade and lowered sufficiently so that the building's external wall acts as a reflecting surface.
- The battery condition was checked to ensure good functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
 - frequency weighting : A
 - time weighting : Fast
 - measurement time : 30 minutes
- Prior to and after noise measurement, the meter was calibrated using the calibrator for 94.0 dB at 1000 Hz. If the difference in the calibration level before and after measurement is more than 1.0 dB, the measurement was considered invalid and repeat of noise measurement was required after re-calibration or repair of the equipment.
- The wind speed at the monitoring station was checked with the portable wind meter. Noise monitoring was cancelled in the presence of fog, rain, and wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s.
- Noise measurement was paused during periods of high intrusive noise if possible and observation was recorded when intrusive noise was not avoided.
- At the end of the monitoring period, the L_{eq} , L_{10} and L_{90} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.

Maintenance and Calibration

3.8 Maintenance and Calibration procedures were as follows:

- The microphone head of the sound level meter and calibrator were cleaned with a soft cloth at quarterly intervals.
- The sound level meter and calibrator were checked and calibrated at yearly intervals. Copies of calibration certificates are attached in **Appendix B**.

Results and Observations

- 3.9 In the reporting month, noise monitoring during non-restricted hours was conducted as scheduled at the designated location on 4 occasions. As advised by the Contractor, no construction activities will be undertaken during restricted hours as such noise monitoring during restricted hours was omitted. The noise monitoring schedule is provided in **Appendix C**.
- 3.10 The details of the monitoring results and graphical presentations are shown in **Appendix F**. The weather during the monitoring sessions was mainly sunny and fine.
- 3.11 No Action/Limit Level exceedance for construction noise monitoring was recorded in the reporting month.

Table 3.4 Summary Table of Noise Monitoring Results during the Reporting Month

Parameter	Minimum $L_{eq}(30min)$ dB(A)	Maximum $L_{eq}(30min)$ dB(A)	Average $L_{eq}(30min)$ dB (A)	Action Level	Limit Level
NM1	60.3	65.4	62.6	When one documented complaint is received	75dB(A)

- 3.12 According to our field observations, the major noise source identified at the designated air quality monitoring stations are as follows:

Station	Major Noise Source
NM1 – Government Staff Quarters	Road Traffic Construction of Main Site

4 LANDFILL GAS MONITORING

Monitoring Requirements

- 4.1 In accordance with Section 6 of the EM&A Manual, monitoring of landfill gas is required for construction works within the 250m Consultation Zone of Shuen Wan Landfill (the Consultation Zone). This Section reports the results of landfill gas measurements performed by the Safety Officer of the Contractor. **Appendix A** shows the Limit Levels for the monitoring works.

Monitoring Parameters and Frequency

- 4.2 The parameters for Landfill gas monitoring include Percentage of Combustible Gas (Methane), Carbon dioxide and Oxygen.
- 4.3 The Landfill gas monitoring is carried out before the entry of concern zone by the Contractor in the morning and afternoon.

Monitoring Locations

- 4.4 Monitoring of oxygen, methane and carbon dioxide was performed for excavations at 1m depth or more within the Consultation Zone. In this reporting month, the area required to be monitored for landfill gas are shown below and **Figure 1.3** shows the landfill gas monitoring locations.

- FC7B.

Remark:

Excavation works of 1m depth or more at FC8B, FC9B, FC10B, FC11B&12B, FMC1B, FMC2B, Dewatering House, Aeration Tank, DN1500 Air Main, Pipe 300, 600 and 900 Excavation Trench, DN 900 Sewage Pipe have been completed.

Monitoring Equipment

- 4.5 **Table 4.1** summarizes the equipment employed by the Contractor for the landfill gas monitoring.

Table 4.1 Landfill Gas Monitoring Equipment

Equipment	Model and Make	Quantity
Intrinsically safe, portable gas detector	Crowcon Custodian CDL Portable Gas Detector (Serial No. 24800 37076)	1

Results

- 4.6 In the reporting month, landfill gas monitoring was carried out by the Contractor at the aforesaid locations on total 48 occasions. No Action/Limit Level exceedance for Landfill gas monitoring was recorded in the reporting month. The monitoring results are provided in **Appendix G**.

5 ENVIRONMENTAL AUDIT

Site Audits

- 5.1 Site audits were carried out by ET on weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site. The summaries of site audits are attached in **Appendix H**.
- 5.2 Site audits were conducted on 5th, 12th, 18th and 25th April 2013 by ET. A joint site audit with the representative with IEC, ER, the Contractor and the ET was carried out on 12th April 2013. No site inspection was conducted by EPD during the reporting month. The details of observations during site audit can refer to **Table 5.2**.

Review of Environmental Monitoring Procedures

- 5.3 The monitoring works conducted by the monitoring team were inspected regularly. The following observations have been recorded for the monitoring works:

Air Quality Monitoring

- The monitoring team recorded all observations around the monitoring stations within and outside the construction site.
- The monitoring team recorded the temperature and weather conditions on the monitoring days.

Noise Monitoring

- The monitoring team recorded all observations around the monitoring stations, which might affect the monitoring result.
- Major noise sources were identified and recorded. Other intrusive noise attributing to the result was trimmed off by pausing the monitoring temporarily.

Landfill Gas Monitoring

- The Contractor has checked the condition of the equipment before monitoring to ensure the reliability.

Status of Environmental Licensing and Permitting

- 5.4 All permits/licenses obtained for the Project are summarized in **Table 5.1**.

Table 5.1 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	Expansion and upgrading of existing <u>Tai Po Sewage Treatment Works from 100,000 m³/day to 130,000 m³/day:</u> (a) additional secondary treatment process units(1 primary clarified; 3 bioreactors and 2 final clarifiers); (b) reconstruction of 4 existing final clarified; (c) provision of ultraviolet disinfection facilities; (d) additional sludge treatment facilities; and (e) ancillary works to existing treatment facilities.	Valid
Construction Noise Permit (CNP)				
GW-RN0512-11	01/01/12	30/06/12	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.	Expired
GW-RN0299-12	01/07/12	30/12/12	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.	Expired
GW-RN0614-12	01/01/13	30/06/13	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.	Valid
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	09/07/10	End of Project	Disposal of Chemical Waste including spent oil, lubricating oil, diesel oil and methanol, surplus paint, thinner	Valid

Status of Waste Management

- 5.5 The Construction and Demolition (C&D) materials generated in the reporting month were mainly inert C&D waste and C&D waste. The quantities of waste generated in this reporting month are summarized in **Appendix L**. No chemical waste was generated in the reporting month.

Implementation Status of Environmental Mitigation Measures

- 5.6 According to the EIA Study Report, Environmental Permit and the EM&A Manual of the Project, the mitigation measures detailed in the documents are recommended to be implemented during the construction phase. An updated summary of the EMIS is provided in **Appendix K**.
- 5.7 During site inspections in the reporting month, no non-conformance was identified. The observations and recommendations made during the audit sessions are summarized in **Table 5.2**.

Table 5.2 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
<i>Water Quality</i>	28 Mar 2013	<u>Reminder:</u> Drainage near sludge digestion tank should be maintained well to avoid muddy and sandy matter run off after rainy season.	The identified observation was observed improved/rectified by the Contractor during the audit session on 5 April 2013.
	28 Mar 2013	<u>Reminder:</u> The sand and silt at wheel washing bay should be removed and settle out regularly.	The identified observation was observed improved/rectified by the Contractor during the audit session on 5 April 2013.
	5 Apr 2013	<u>Reminder:</u> General refuse near wheel washing bay should be disposal of properly..	The identified observation was observed improved/rectified by the Contractor during the audit session on 12 Apr 2013.
	5 Apr 2013	<u>Reminder:</u> Drainage near wheel washing bay should be maintained well during rainy season.	The identified observation was observed improved/rectified by the Contractor during the audit session on 12 Apr 2013.
	12 Apr 2013	<u>Reminder:</u> Situation of water quality at sedimentation tank should be improved and maintained properly use of the equipment.	The identified observation was observed improved/rectified by the Contractor during the audit session on 18 Apr 2013.
	12 Apr 2013	<u>Reminder:</u> Sandy and muddy matter at wheel washing bay should be settled out and removed regularly.	Follow up action is needed in the next reporting month.
	18 Apr 2013	<u>Reminder:</u> Stagnant water at FC7B should be pumped out to avoid accumulation.	The identified observation was observed improved/rectified by the Contractor during the audit session on 25 Apr 2013.
<i>Air Quality</i>	1 Mar 2013	<u>Reminder:</u> Stockpile near sedimentation tank should be removed to avoid accumulation.	The identified observation was observed improved/rectified by the Contractor during the audit session on 18 Apr 2013.
<i>Noise</i>	N/A	N/A	N/A

Parameters	Date	Observations and Recommendations	Follow-up
<i>Waste / Chemical Management</i>	12 Apr 2013	<u>Reminder:</u> C & D waste near FC7B should be disposal of properly to avoid accumulation.	The identified observation was observed improved/rectified by the Contractor during the audit session on 18 Apr 2013.
	18 Apr 2013	<u>Reminder:</u> C & D waste should be sorted and disposal of properly near switch room.	The identified observation was observed improved/rectified by the Contractor during the audit session on 25 Apr 2013.
	25 Apr 2013	<u>Reminder:</u> General refuse near wheel washing bay should be disposal of properly.	Follow up action is needed in the next reporting month.
<i>Permit /Licenses</i>	N/A	N/A	N/A

Summary of Exceedances

- 5.8 No exceedance of monitoring results was recorded in the reporting month. Summary of exceedance is provided in **Appendix H**.

Implementation Status of Event Action Plans

- 5.9 The Event Action Plans for air quality, construction noise and landfill gas monitoring are presented in **Appendix J**. No exceedance was recorded and thus no action was required to be implemented.

Summary of Complaint and Prosecution

- 5.10 No environmental related complaint, prosecution or notification of summons was received in the reporting month.
- 5.11 There was no environmental complaint, prosecution or notification of summon received since the Project commencement. The Complaint Log is attached in **Appendix M**.

6 FUTURE KEY ISSUES

- 6.1 Key issues to be considered in the coming month include:
- Effluent discharge generated from surface runoff;
 - Dust generation from excavation works, backfilling works and stockpile of dusty materials;
 - Maintenance of de-silting facilities and drainage system, such as U-channels;
 - Accumulation of stagnant water in the site areas; and
 - Accumulation of C&D waste and general waste on site.

Monitoring Schedule for the Next Month

- 6.2 The tentative environmental monitoring schedule for the next month is shown in **Appendix C**.

Construction Program for the Next Month

6.3 A tentative construction programme is provided in **Appendix N**. The major construction activities in the coming month will include:

- Construction of Covered Walkway on roof of Sludge Dewatering House;
- Cable ducting works;
- Construction of gas pipe for Waste Gas-burner at Stage I/II Works;
- Construction of Covered Walkway on roof of Sludge Dewatering House;
- Construction of MLC and Foam Removal Chamber;
- Construction of Sludge Digestion Tank No. 3, Draw-off Chamber No. 3 & FC7B;
- Construction of Water Reclamation Facility for RO Plant;
- Drainage and Road works;
- Finishing works for Transformer House, Decanting Chamber and Extension of Sludge Dewatering House, tanks & pillar box of Water Reclamation Facility, Effluent Launder, Pipe Chamber adjacent to PST5;
- Construction of thrust blocks for DN1500 air main;
- Installation of Irrigation System;
- Landscaping works;
- Modification works at CBC, Filtrate Treatment Plant, Inlet Works; and
- Modification works of Effluent Launder and Flow Splitter Box.

7 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

- 7.1 Environmental monitoring and audit works were conducted in the reporting month. Site inspections were conducted on a weekly basis. The results were reviewed and checked.
- 7.2 No exceedance of monitoring results was recorded in the reporting month.
- 7.3 There was no environmental complaint, prosecution or notification of summons received.

Recommendations

- 7.4 According to the environmental audit performed in the reporting month, the following recommendations were made:

Water Impact

- Avoid blockage of gully inlets and ensure proper protection of the gully from ingress of sandy water.
- Ensure proper use and maintenance of the de-silting facilities.
- Provide sediment tank for settling runoff prior to disposal.
- Remove and settle out sand and silt at wheel washing facilities regularly.
- Pump out stagnant water and avoid ponding water accumulation during rainy season.

Dust Impact

- Cover the excavated dusty materials or dusty stockpile of dusty materials by impervious sheeting, or spray water on the dusty materials so as to maintain entire surface wet.
- Remove fugitive dusty material on the haul road periodically.
- Spray with water on the surface of concrete breaking and dry dust haul road.

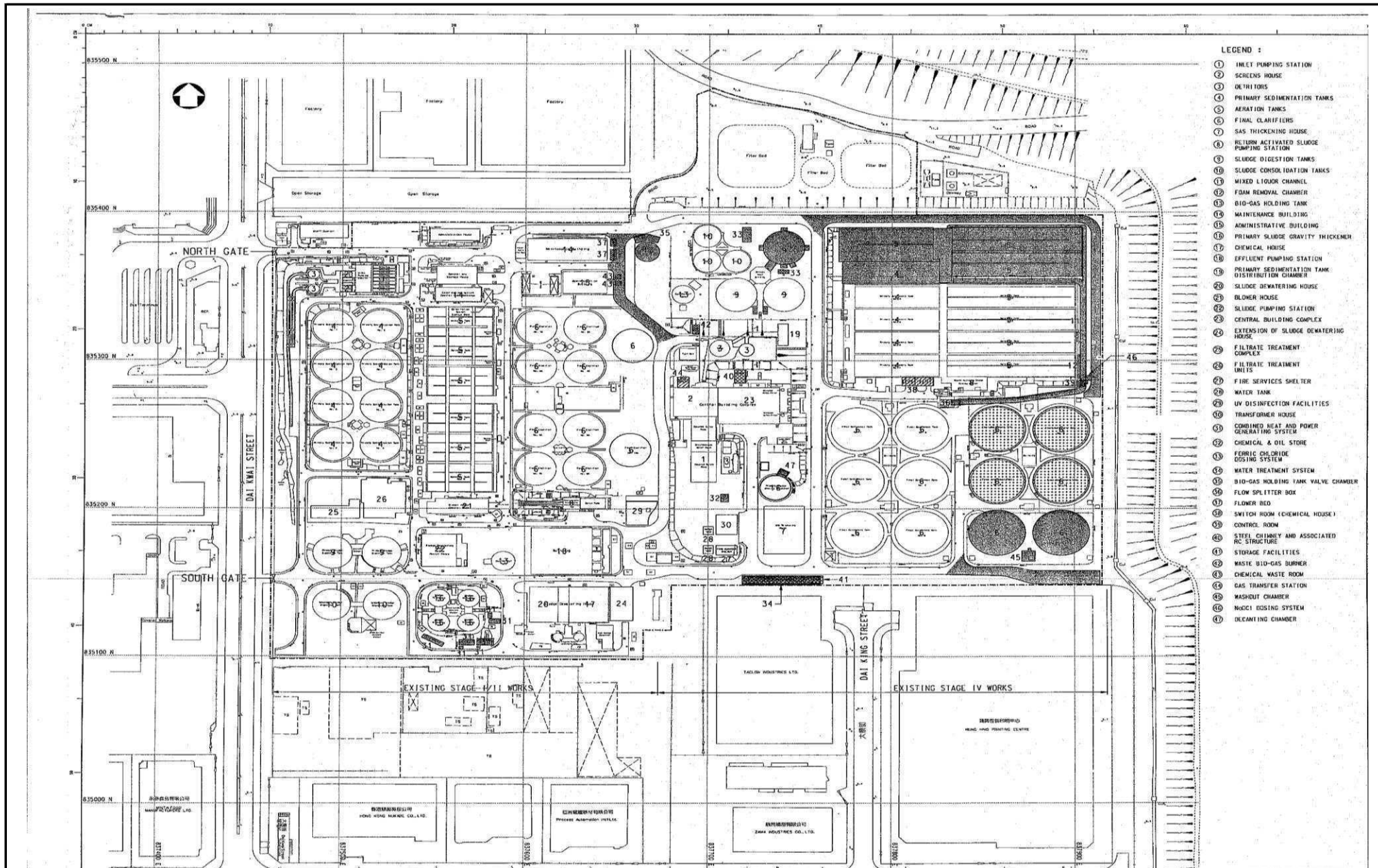
Noise

- Keep the monitoring equipment function properly.

Waste / Chemical Management

- Avoid accumulation of C&D waste materials or general refuse on site.
- Provide proper rubbish bins / skips for waste collection.
- Proper label the chemicals on site and store properly with drip tray.

FIGURES

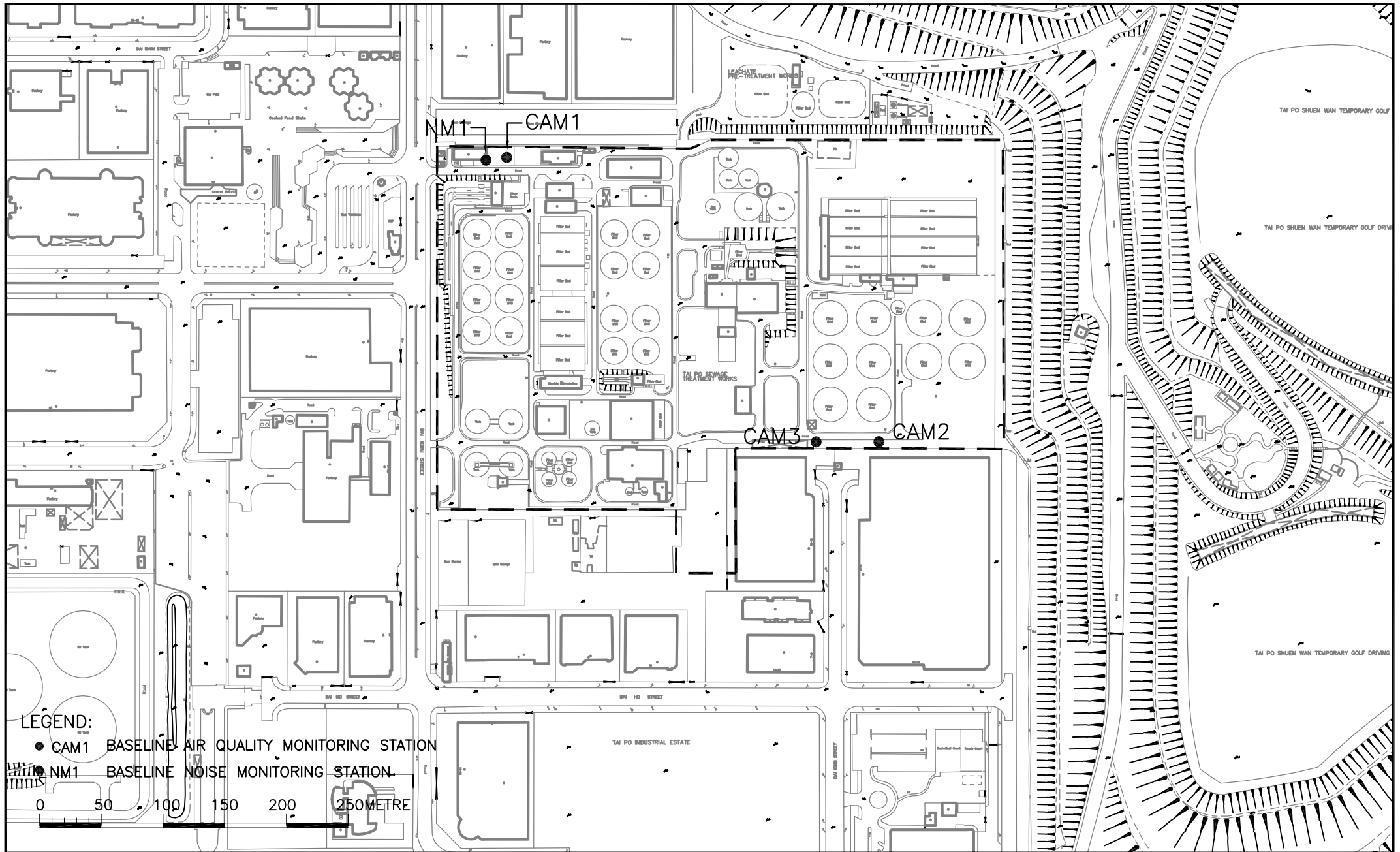


- LEGEND :**
- ① TRLET PUMPING STATION
 - ② SCREENS HOUSE
 - ③ ULTRAFILTS
 - ④ PRIMARY SEDIMENTATION TANKS
 - ⑤ AERATION TANKS
 - ⑥ FINAL CLARIFIERS
 - ⑦ SAS THICKENING HOUSE
 - ⑧ RETURN ACTIVATED SLUDGE PUMPING STATION
 - ⑨ SLUDGE DIGESTION TANKS
 - ⑩ SLUDGE CONSOLIDATION TANKS
 - ⑪ MIXED LIQUOR CHANNEL
 - 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 NAOCl DOSING SYSTEM
 - ㊼ DECAINING 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	



LEGEND:

- CAM1 BASELINE AIR QUALITY MONITORING STATION
- NM1 BASELINE NOISE MONITORING STATION

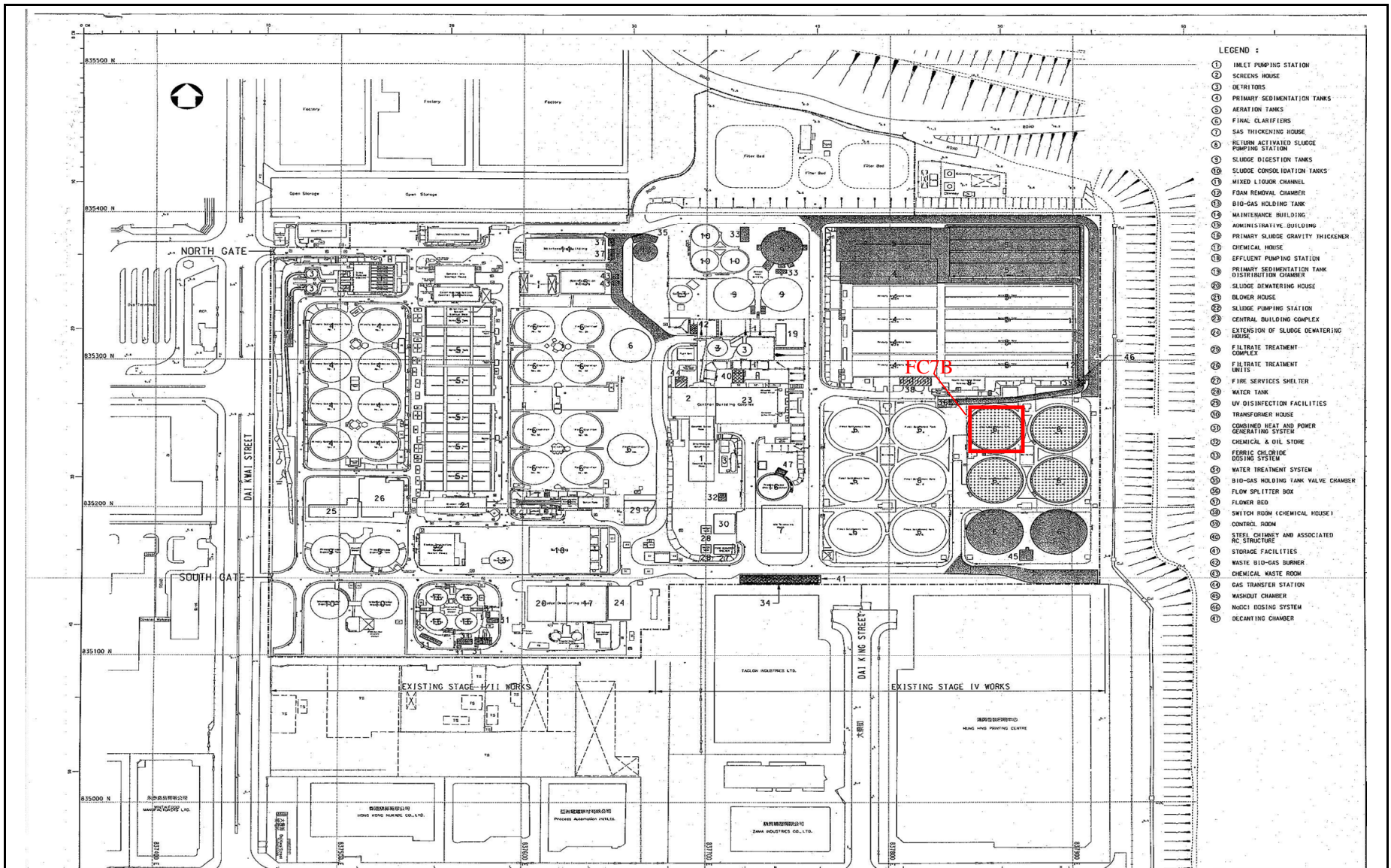
0 50 100 150 200 250METRE



Tai Po Sewage Treatment Work, Stage V, Phase IIB

LOCATIONS OF AIR QUALITY AND NOISE MONITORING STATIONS

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 DETRIORS
 - ④ PRIMARY SEDIMENTATION TANKS
 - ⑤ AERATION TANKS
 - ⑥ FINAL CLARIFIERS
 - ⑦ SAS HYDROLYSIS 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
 - ⓫ FLOW SPLITTER BOX
 - ⓬ FLOWER BED
 - ⓭ SWITCH ROOM (CHEMICAL HOUSE)
 - ⓮ CONTROL ROOM
 - ⓯ STEEL CHIMNEY AND ASSOCIATED RC STRUCTURE
 - ⓰ STORAGE FACILITIES
 - ⓱ WASTE BIO-GAS BURNER
 - ⓲ CHEMICAL WASTE ROOM
 - ⓳ GAS TRANSFER STATION
 - ⓴ WASHOUT CHAMBER
 - ⓵ NODICI DOSING SYSTEM
 - ⓶ DECANTING CHAMBER

TAI PO SEWAGE TREATMENT WORKS, STAGE V, PHASE IIB

Landfill Gas Monitoring Area(TPSTW)

Scale

N.T.S

Project No.

MA0010

Date

九月-12

Figure

1.3

CINOTECH

**APPENDIX A
ACTION AND LIMIT LEVELS**

APPENDIX A – 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 B
COPIES OF CALIBRATION
CERTIFICATES**

High-Volume TSP Sampler 5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA0010/37/0049

Station CAMI - Government Staff Quarter
 Date: 1-Mar-13
 Equipment No.: A-01-37

Operator: WK
 Next Due Date: 30-Apr-13
 Serial No. 1704

Ambient Condition			
Temperature, Ta (K)	293.4	Pressure, Pa (mmHg)	763.4

Orifice Transfer Standard Information					
Equipment No.:	A-04-04	Slope, mc	0.0574	Intercept, bc	-0.0478
Last Calibration Date:	3-Oct-12	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	2-Oct-13	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Calibration Point	Orifice			HVS	
	ΔH (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)] ^{1/2}	Qstd (CFM) X - axis	ΔW (HVS), in. of oil	[ΔW x (Pa/760) x (298/Ta)] ^{1/2} Y-axis
1	11.8	3.47	61.28	7.9	2.84
2	9.8	3.16	55.92	6.5	2.58
3	7.6	2.78	49.34	5.0	2.26
4	5.0	2.26	40.18	3.1	1.78
5	3.1	1.78	31.82	1.8	1.36

By Linear Regression of Y on X
 Slope, mw = 0.0505 Intercept, bw = -0.2472
 Correlation coefficient* = 0.9999

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation
From the TSP Field Calibration Curve, take Qstd = 43 CFM From the Regression Equation, the "Y" value according to
$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$
Therefore, Set Point; W = (mw x Qstd + bw) ² x (760 / Pa) x (Ta / 298) = <u>3.63</u>

Remarks: _____

Conducted by: Wk Tang Signature: Kwan Date: 1/3/13
 Checked by: Wk Signature: _____ Date: 1 March 2013

High-Volume TSP Sampler 5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA0010/37/0050

Station CAM1 - Government Staff Quarter
 Date: 29-Apr-13
 Equipment No.: A-01-37

Operator: WK
 Next Due Date: 28-Jun-13
 Serial No. 1704

Ambient Condition			
Temperature, Ta (K)	294.2	Pressure, Pa (mmHg)	761.5

Orifice Transfer Standard Information					
Equipment No.:	A-04-04	Slope, mc	0.0574	Intercept, bc	-0.0478
Last Calibration Date:	3-Oct-12	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	2-Oct-13	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Calibration Point	Orifice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	ΔW (HVS), in. of oil	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	11.9	3.48	61.38	8.0	2.85
2	9.8	3.15	55.78	6.5	2.57
3	7.3	2.72	48.25	5.0	2.25
4	5.1	2.28	40.47	3.3	1.83
5	3.0	1.74	31.23	1.9	1.39

By Linear Regression of Y on X

Slope, mw = 0.0485 Intercept, bw = -0.1197
 Correlation coefficient* = 0.9994

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; W = $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 3.80

Remarks: _____

Conducted by: Wk Tang Signature: Kwan Date: 29/4/13
 Checked by: H20 Signature: _____ Date: 29 April 2013

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA0010/A40/0049

Station CAM2 - Hung Hing Printing Centre Operator: WK
 Date: 1-Mar-13 Next Due Date: 30-Apr-13
 Equipment No.: A-01-40 Serial No. 10239

Ambient Condition			
Temperature, Ta (K)	293.6	Pressure, Pa (mmHg)	763.2

Orifice Transfer Standard Information					
Equipment No.:	A-04-04	Slope, mc	0.0574	Intercept, bc	-0.0478
Last Calibration Date:	3-Oct-12	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	2-Oct-13	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Calibration Point	Orifice			HVS	
	ΔH (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)] ^{1/2}	Qstd (CFM) X - axis	ΔW (HVS), in. of oil	[ΔW x (Pa/760) x (298/Ta)] ^{1/2} Y-axis
1	11.8	3.47	61.25	8.4	2.93
2	9.6	3.13	55.33	6.4	2.55
3	7.5	2.76	49.00	5.2	2.30
4	5.2	2.30	40.94	3.3	1.83
5	3.1	1.78	31.80	2.0	1.43

By Linear Regression of Y on X

Slope, mw = 0.0506 Intercept, bw = -0.2031
 Correlation coefficient* = 0.9982

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM
 From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; W = (mw x Qstd + bw)² x (760 / Pa) x (Ta / 298) = 3.82

Remarks: _____

Conducted by: Wk Tang Signature: [Signature] Date: 1/3/13
 Checked by: [Signature] Signature: [Signature] Date: 1 March 2013

High-Volume TSP Sampler 5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA0010/A40/0050

Station CAM2 - Hung Hing Printing Centre Operator: WK
 Date: 29-Apr-13 Next Due Date: 28-Jun-13
 Equipment No.: A-01-40 Serial No. 10239

Ambient Condition			
Temperature, Ta (K)	294.2	Pressure, Pa (mmHg)	761.5

Orifice Transfer Standard Information					
Equipment No.:	A-04-04	Slope, mc	0.0574	Intercept, bc	-0.0478
Last Calibration Date:	3-Oct-12	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	2-Oct-13	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Calibration Point	Orifice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	ΔW (HVS), in. of oil	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	11.7	3.45	60.87	8.1	2.87
2	9.7	3.14	55.50	6.5	2.57
3	7.6	2.78	49.22	5.0	2.25
4	5.0	2.25	40.08	3.2	1.80
5	3.2	1.80	32.23	2.0	1.42

By Linear Regression of Y on X
 Slope, mw = 0.0501 Intercept, bw : -0.2015
 Correlation coefficient* = 0.9997
 *If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM
 From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 3.76

Remarks: _____

Conducted by: Wk Tang Signature: [Signature] Date: 29/4/13
 Checked by: [Signature] Signature: _____ Date: 29 April 2013

TEST REPORT

APPLICANT: Cinotech Consultants Limited
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

Test Report No.:	C/12/120501
Date of Issue:	2012-05-02
Date Received:	2012-05-01
Date Tested:	2012-05-01
Date Completed:	2012-05-02
Next Due Date:	2013-05-01

ATTN: Mr. W.K Tang

Page: 1 of 1

Certificate of Calibration

Item for calibration:

Description : RS232 Integral Vane Digital Anemometer
Manufacturer : AZ Instrument
Model No. : AZ8904
Serial No. : 974835
Equipment No. : A-03-03

Test conditions:

Room Temperature : 23 degree Celsius
Relative Humidity : 67%
Pressure : 101.2 kPa

Methodology:

The anemometer has been calibrated in accordance with the documented procedures and using standard(s) and instrument(s) which are recommended by the manufacturer, or equivalent.

Results:

	Reference Set Point	Instrument Readings
Measuring Air Velocity, m/s	2.00	2.00
Temperature, °C	21.0	21.0

PREPARED AND CHECKED BY:

For and On Behalf of **WELLAB Ltd.**



PATRICK TSE
Laboratory Manager

TEST REPORT

Description	Calibration Orifice	Manufacturer	TISCH
Serial No.	0993	Temperature, Ta (K)	298
Model No.	TE-5025A	Pressure, Pa (mmHg)	759.2
Date	3 October 2012		

Plate	Diff.Vol (m ³)	Diff.Time (min)	Diff.Hg (mm)	Diff.H ₂ O (in.)
1	1.00	1.3820	3.2	2.00
2	1.00	0.9800	6.2	4.00
3	1.00	0.8770	7.8	5.00
4	1.00	0.8380	8.7	5.50
5	1.00	0.6930	12.7	8.00

DATA TABULATION

Vstd	(X axis) Qstd	(Y axis)
0.9947	0.7197	1.4134
0.9907	1.0109	1.9989
0.9886	1.1273	2.2348
0.9874	1.1783	2.3439
0.9822	1.4173	2.8268

Y axis= $\text{SQRT}[\text{H}_2\text{O}(\text{Pa}/760)(298/\text{Ta})]$

Qstd Slope (m) = 2.02751

Intercept (b) = -0.04785

Coefficient (r) = 0.99999

Va	(X axis) Qa	(Y axis)
0.9958	0.7205	0.8861
0.9918	1.0121	1.2531
0.9897	1.1285	1.4010
0.9885	1.1796	1.4694
0.9833	1.4189	1.7721

Y axis= $\text{SQRT}[\text{H}_2\text{O}(\text{Ta}/\text{Pa})]$

Qa Slope (m) = 1.26959

Intercept (b) = -0.03000

Coefficient (r) = 0.99999

CALCULATIONS

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

$Q_{std} = V_{std}/\text{Time}$

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

$Q_a = V_a/\text{Time}$

For subsequent flow rate calculations:

$Q_{std} = 1/m\{[\text{SQRT}(\text{H}_2\text{O}(\text{Pa}/760)(298/\text{Ta}))]-b\}$

$Q_a = 1/m\{[\text{SQRT}(\text{H}_2\text{O}(\text{Ta}/\text{Pa}))]-b\}$

PREPARED AND CHECKED BY:

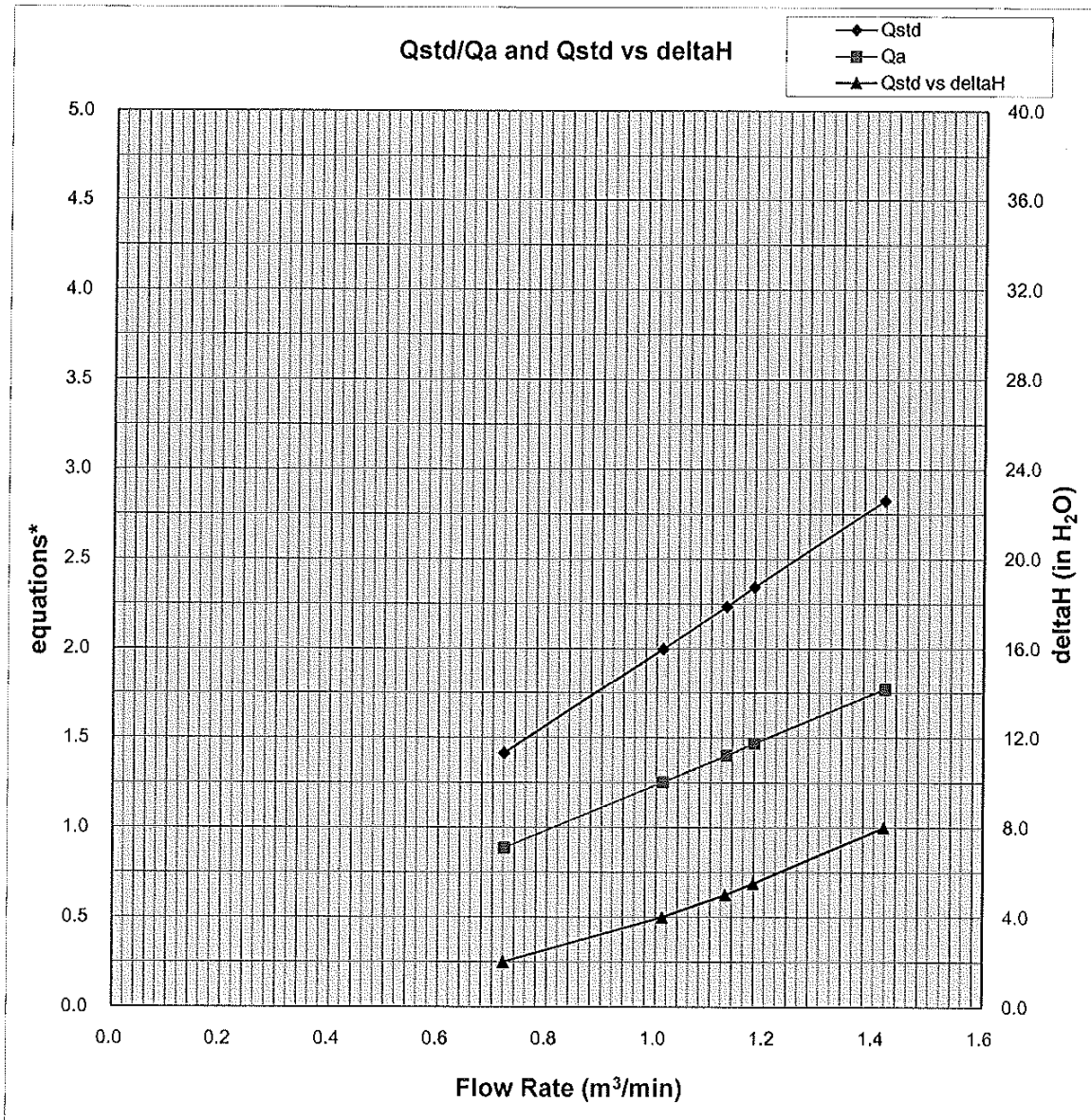
For and On Behalf of **WELLAB Ltd.**



PATRICK TSE

Laboratory Manager

TEST REPORT



Y-axis equations:

Qstd series: $\text{SQRT}[\Delta H(\text{Pa}/\text{Pstd})(\text{Tstd}/\text{Ta})]$

Qa series: $\text{SQRT}[\Delta H(\text{Ta}/\text{Pa})]$

TEST REPORT

APPLICANT: Cinotech Consultants Limited
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

Test Report No.:	C/N/130104
Date of Issue:	2013-01-05
Date Received:	2013-01-04
Date Tested:	2013-01-04
Date Completed:	2013-01-05
Next Due Date:	2014-01-04

ATTN: Mr. W. K. Tang

Page: 1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 955
Serial No.	: 14303
Microphone No.	: 35222
Equipment No.	: N-08-05

Test conditions:

Room Temperature	: 22 degree Celsius
Relative Humidity	: 59%

Test Specifications:

Performance checking at 94 and 114 dB

Methodology:

In-house method, according to manufacturer instruction manual

Results:

Reference Set Point, dB	Instrument Readings, dB
94	94.0
114	114.0

Remark: 1) This report supersedes the one dated 2012/01/21 with certificate number C/N/120120/1.

PREPARED AND CHECKED BY:

For and On Behalf of **WELLAB Ltd.**


PATRICK TSE
Laboratory Manager

TEST REPORT

APPLICANT: Cinotech Consultants Limited
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

Test Report No.:	C/N/121005/1
Date of Issue:	2012-10-07
Date Received:	2012-10-05
Date Tested:	2012-10-05
Date Completed:	2012-10-07
Next Due Date:	2013-10-06

ATTN: Mr. W.K. Tang

Page: 1 of 1

Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: SVANTEK
Model No.	: SV30A
Serial No.	: 24803
Equipment No.	: N-09-03

Test conditions:

Room Temperature	: 23 degree Celsius
Relative Humidity	: 64%

Methodology:

The Sound Level Calibrator has been calibrated in accordance with the documented procedures and using standard(s) and instrument(s) which are recommended by the manufacturer, or equivalent.

Results:

Sound Pressure Level (1kHz)	Measured SPL	Tolerance
At 94 dB SPL	94.0	94.0 ± 0.1 dB
At 114 dB SPL	114.0	114.0 ± 0.1 dB

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**


PATRICK TSE
Laboratory Manager

**APPENDIX C
ENVIRONMENTAL MONITORING
SCHEDULE**

**Contract No. DC/2009/09 - Construction of Tai Po Sewage Treatment Works - Stage 5 Phase 2B
Impact Air Quality and Noise Monitoring Schedule for April 2013**

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

The schedule may be changed due to unforeseen circumstances (adverse weather, etc)

**Contract No. DC/2009/09 - Construction of Tai Po Sewage Treatment Works - Stage 5 Phase 2B
Tentative Impact Air Quality and Noise Monitoring Schedule for May 2013**

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

The schedule may be changed due to unforeseen circumstances (adverse weather, etc)

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

Appendix D - 1-hour TSP Monitoring Results

Station CAM1

Government Staff Quarters

Date	Sampling Time	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m ³ /min.)		Av. flow (m ³ /min)	Total vol. (m ³)	Conc. (µg/m ³)
					Initial	Final		Initial	Final		Initial	Final			
2-Apr-13	09:00	Cloudy	293.6	763.9	3.1603	3.1777	0.0174	19033.1	19034.1	1.0	1.21	1.21	1.21	72.7	239
3-Apr-13	14:40	Cloudy	292.3	761.1	3.1004	3.1199	0.0195	19058.1	19059.1	1.0	1.21	1.21	1.21	72.8	268
5-Apr-13	09:00	Rainy	293.7	767.5	3.0580	3.0756	0.0176	19059.1	19060.1	1.0	1.22	1.21	1.21	72.9	241
9-Apr-13	16:30	Cloudy	293.2	762.1	3.1818	3.1861	0.0043	19084.1	19085.1	1.0	1.21	1.21	1.21	72.7	59
10-Apr-13	09:00	Cloudy	292.0	766.1	3.0935	3.1023	0.0088	19085.1	19086.1	1.0	1.22	1.22	1.22	73.0	121
11-Apr-13	09:00	Cloudy	290.7	766.3	3.1368	3.1472	0.0104	19086.1	19087.1	1.0	1.22	1.22	1.22	73.2	142
15-Apr-13	10:00	Cloudy	294.9	762.4	3.0588	3.0646	0.0058	19111.1	19112.1	1.0	1.21	1.21	1.21	72.5	80
16-Apr-13	09:00	Cloudy	294.9	760.3	3.0944	3.0983	0.0039	19112.1	19113.1	1.0	1.21	1.21	1.21	72.5	54
17-Apr-13	09:00	Cloudy	297.4	759.3	3.1235	3.1323	0.0088	19113.1	19114.1	1.0	1.20	1.20	1.20	72.1	122
22-Apr-13	13:00	Cloudy	292.7	763.5	3.1081	3.1170	0.0089	19138.1	19139.1	1.0	1.21	1.21	1.21	72.8	122
23-Apr-13	09:00	Sunny	293.7	764.9	3.1162	3.1282	0.0120	19139.1	19140.1	1.0	1.21	1.21	1.21	72.8	165
25-Apr-13	09:00	Sunny	297.3	762.2	3.0174	3.0260	0.0086	19140.1	19141.1	1.0	1.20	1.20	1.20	72.3	119
29-Apr-13	14:00	Cloudy	294.4	761.8	3.0299	3.0398	0.0099	19165.1	19166.1	1.0	1.21	1.21	1.21	72.6	136
														Min	54
														Max	268
														Average	144

Station CAM2

Heng Hing Printing Centre

Date	Sampling Time	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m ³ /min.)		Av. flow (m ³ /min)	Total vol. (m ³)	Conc. (µg/m ³)
					Initial	Final		Initial	Final		Initial	Final			
2-Apr-13	09:00	Cloudy	293.6	763.9	3.0678	3.0862	0.0184	28207.3	28208.3	1.0	1.21	1.21	1.21	72.9	252
3-Apr-13	15:00	Cloudy	292.5	761.0	3.0916	3.1111	0.0195	28232.3	28233.3	1.0	1.21	1.21	1.21	72.9	268
5-Apr-13	09:00	Rainy	293.7	767.5	3.1376	3.1519	0.0143	28233.3	28234.3	1.0	1.22	1.22	1.22	73.0	196
9-Apr-13	13:00	Cloudy	293.4	763.0	3.1354	3.1470	0.0116	28258.3	28259.3	1.0	1.21	1.21	1.21	72.9	159
10-Apr-13	09:00	Cloudy	292.0	766.1	3.1081	3.1165	0.0084	28259.3	28260.3	1.0	1.22	1.22	1.22	73.2	115
11-Apr-13	09:00	Cloudy	290.7	766.3	3.0911	3.1028	0.0117	28260.3	28261.3	1.0	1.22	1.22	1.22	73.3	160
15-Apr-13	10:00	Cloudy	294.9	762.4	3.0905	3.1003	0.0098	28285.3	28286.3	1.0	1.21	1.21	1.21	72.7	135
16-Apr-13	09:00	Cloudy	294.9	760.3	3.0739	3.0813	0.0074	28286.3	28287.3	1.0	1.21	1.21	1.21	72.6	102
17-Apr-13	09:00	Cloudy	297.4	759.3	3.0614	3.0721	0.0107	28287.3	28288.3	1.0	1.20	1.20	1.20	72.3	148
22-Apr-13	13:00	Cloudy	292.7	763.5	3.0834	3.0929	0.0095	28312.3	28313.3	1.0	1.22	1.22	1.22	73.0	130
23-Apr-13	09:00	Sunny	293.7	764.9	3.0704	3.0872	0.0168	28313.3	28314.3	1.0	1.22	1.22	1.22	72.9	230
25-Apr-13	09:00	Sunny	297.3	762.2	3.0368	3.0472	0.0104	28314.3	28315.3	1.0	1.21	1.21	1.21	72.4	144
29-Apr-13	14:00	Cloudy	294.4	761.8	3.0396	3.0505	0.0109	28339.1	28340.1	1.0	1.21	1.21	1.21	72.7	150
														Min	102
														Max	268
														Average	168

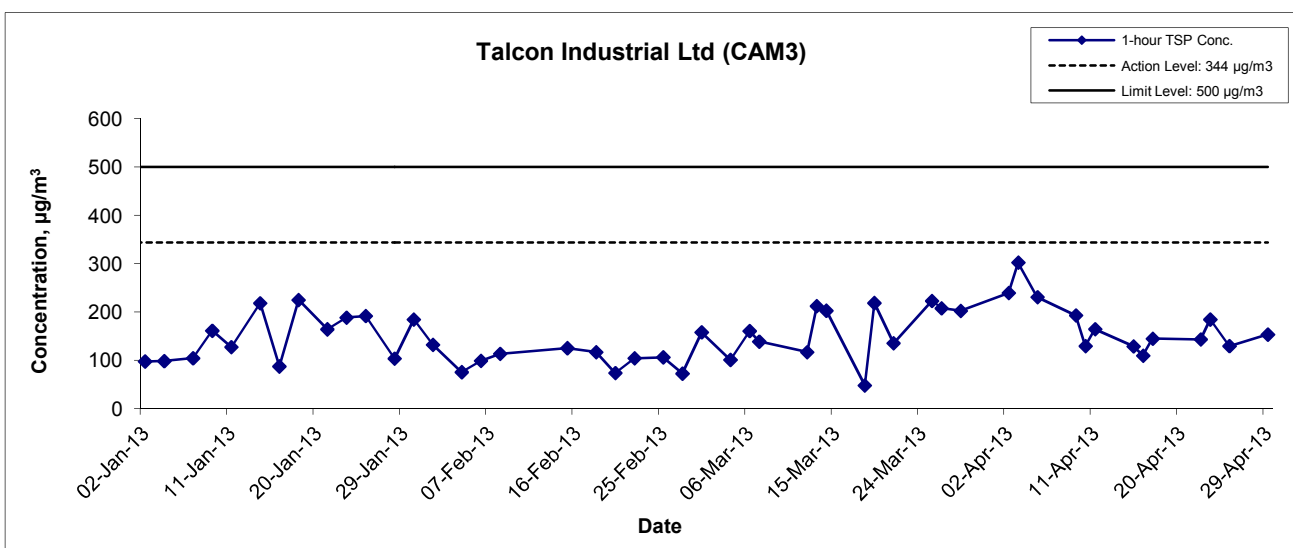
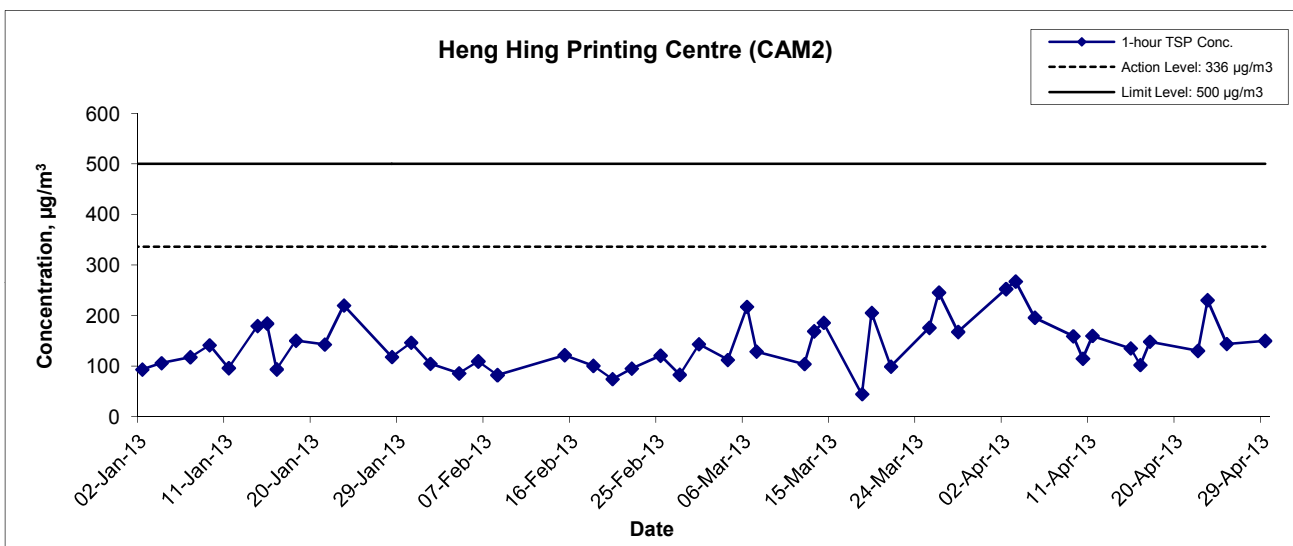
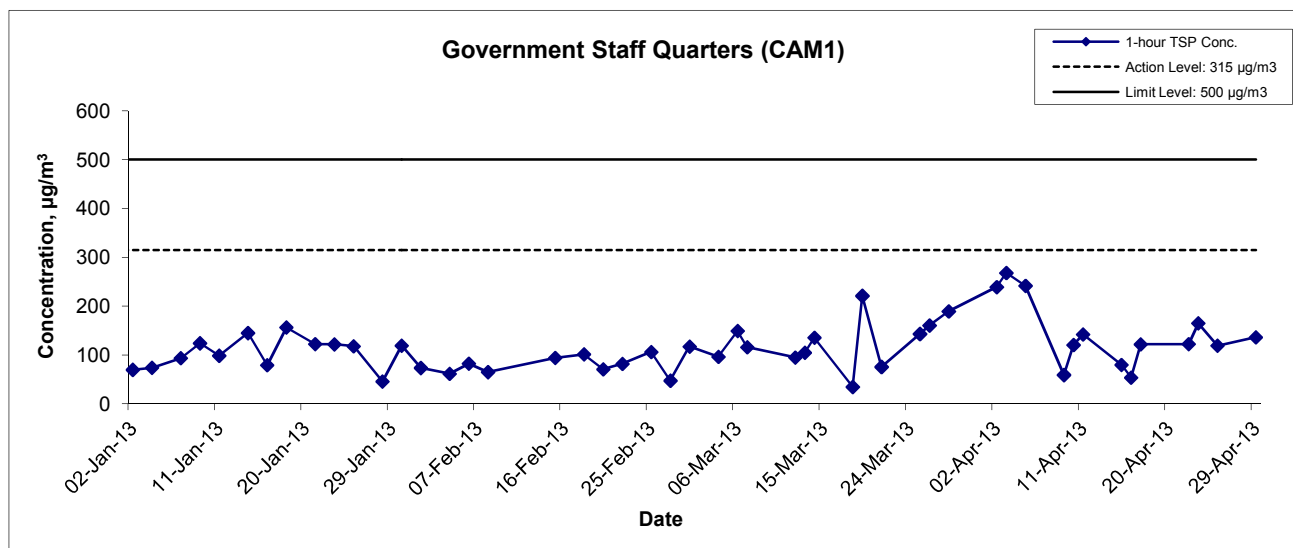
Appendix D - 1-hour TSP Monitoring Results

Station CAM3

Talcon Industrial Ltd

Date	Sampling Time	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m ³ /min.)		Av. flow (m ³ /min)	Total vol. (m ³)	Conc. (µg/m ³)
					Initial	Final		Initial	Final		Initial	Final			
2-Apr-13	09:00	Cloudy	293.6	763.9	3.1473	3.1648	0.0175	21443.9	21444.9	1.0	1.22	1.22	1.22	73.1	239
3-Apr-13	15:00	Cloudy	292.5	761.0	3.1331	3.1552	0.0221	21468.9	21469.9	1.0	1.22	1.22	1.22	73.1	302
5-Apr-13	09:00	Rainy	293.7	767.5	3.1430	3.1599	0.0169	21469.9	21470.9	1.0	1.22	1.22	1.22	73.3	231
9-Apr-13	13:00	Cloudy	293.2	762.1	3.1318	3.1459	0.0141	21494.9	21495.9	1.0	1.22	1.22	1.22	73.1	193
10-Apr-13	09:00	Cloudy	292.0	766.1	3.1125	3.1220	0.0095	21495.9	21496.9	1.0	1.22	1.22	1.22	73.4	129
11-Apr-13	09:00	Cloudy	290.7	766.3	3.0456	3.0577	0.0121	21496.9	21497.9	1.0	1.23	1.23	1.23	73.5	165
15-Apr-13	10:00	Cloudy	294.9	762.4	3.0742	3.0836	0.0094	21521.9	21522.9	1.0	1.21	1.21	1.21	72.9	129
16-Apr-13	09:00	Cloudy	294.9	760.3	3.1826	3.1906	0.0080	21522.9	21523.9	1.0	1.21	1.21	1.21	72.8	110
17-Apr-13	09:00	Cloudy	297.4	759.3	3.0812	3.0917	0.0105	21523.9	21524.9	1.0	1.21	1.21	1.21	72.5	145
22-Apr-13	13:00	Cloudy	292.7	763.5	3.0849	3.0954	0.0105	21548.9	21549.9	1.0	1.22	1.22	1.22	73.2	143
23-Apr-13	09:00	Sunny	293.7	764.9	3.0524	3.0659	0.0135	21549.9	21550.9	1.0	1.22	1.22	1.22	73.1	185
25-Apr-13	09:00	Sunny	297.3	762.2	3.0962	3.1056	0.0094	21550.9	21551.9	1.0	1.21	1.21	1.21	72.6	129
29-Apr-13	14:00	Cloudy	294.4	761.8	3.0950	3.1062	0.0112	21575.9	21576.9	1.0	1.22	1.21	1.22	72.9	154
														Min	110
														Max	302
														Average	173

1-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 1-hour TSP Impact Monitoring Results	Scale N.T.S	Project No. MA0010	
	Date Apr 13	Appendix D	

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

Appendix E - 24-hour TSP Monitoring Results

Station CAM1 Government Staff Quarters

Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m ³ /min.)		Av. flow (m ³ /min)	Total vol. (m ³)	Conc. (µg/m ³)
				Initial	Final		Initial	Final		Initial	Final			
2-Apr-13	Cloudy	294.1	762.2	3.1263	3.2485	0.1222	19034.1	19058.1	24.0	1.21	1.21	1.21	1742.9	70
8-Apr-13	Cloudy	291.3	763.6	3.1070	3.2450	0.1380	19060.1	19084.1	24.0	1.22	1.22	1.22	1751.7	79
13-Apr-13	Cloudy	292.3	767.1	3.0278	3.1425	0.1147	19087.1	19111.1	24.0	1.22	1.22	1.22	1752.6	65
19-Apr-13	Sunny	297.9	769.7	3.0993	3.1459	0.0466	19114.1	19138.1	24.0	1.21	1.21	1.21	1740.6	27
25-Apr-13	Sunny	297.8	761.7	3.1098	3.1675	0.0577	19141.1	19165.1	24.0	1.20	1.20	1.20	1733.0	33
30-Apr-13	Sunny	299.7	769.8	3.0641	3.1808	0.1167	19166.1	19190.1	24.0	1.21	1.21	1.21	1744.3	67
													Min	27
													Max	79
													Average	57

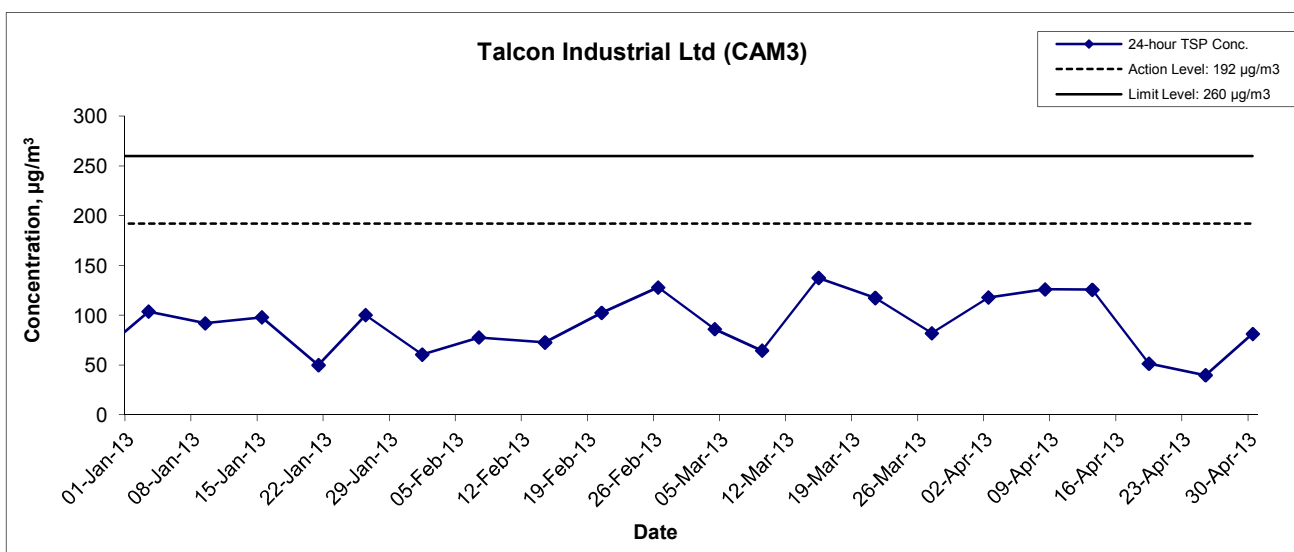
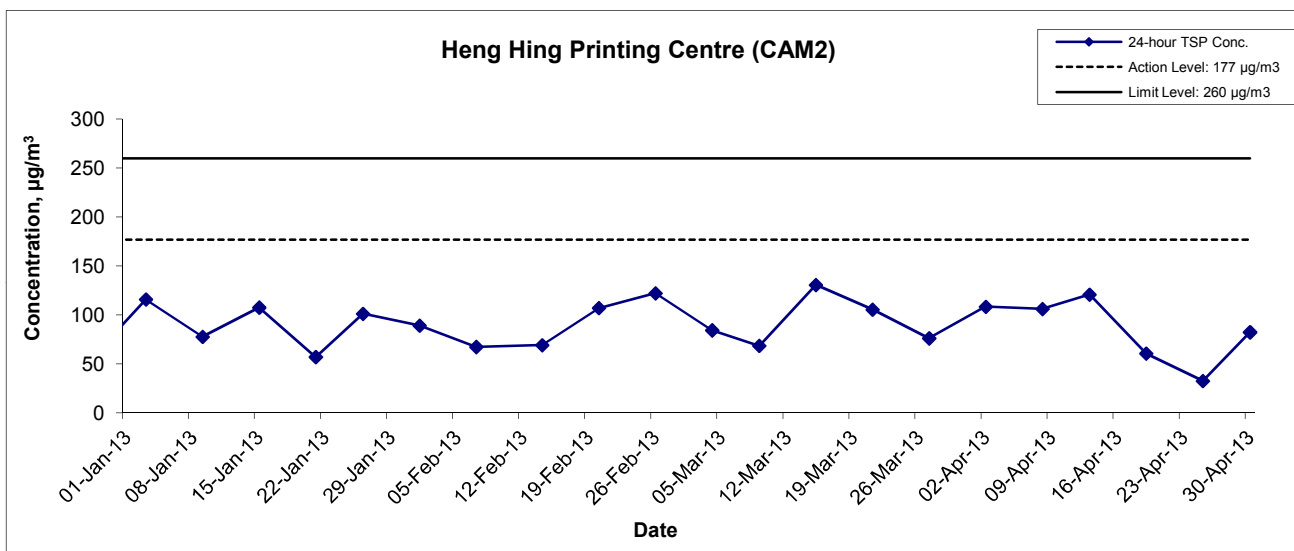
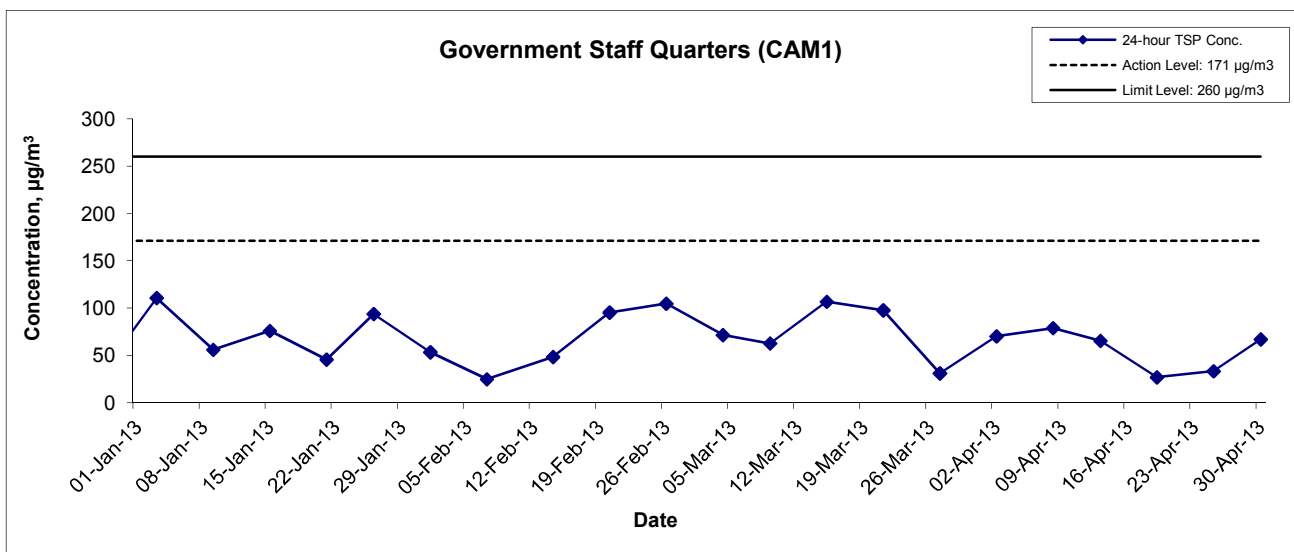
Station CAM2 Heng Hing Printing Centre

Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m ³ /min.)		Av. flow (m ³ /min)	Total vol. (m ³)	Conc. (µg/m ³)
				Initial	Final		Initial	Final		Initial	Final			
2-Apr-13	Cloudy	294.1	762.2	3.0883	3.2776	0.1893	28208.3	28232.3	24.0	1.21	1.21	1.21	1746.2	108
8-Apr-13	Cloudy	291.3	763.6	3.0603	3.2466	0.1863	28234.3	28258.3	24.0	1.22	1.22	1.22	1755.2	106
13-Apr-13	Cloudy	292.3	767.1	3.0149	3.2271	0.2122	28261.3	28285.3	24.0	1.22	1.22	1.22	1756.1	121
19-Apr-13	Sunny	297.9	769.7	3.1621	3.2676	0.1055	28288.3	28312.3	24.0	1.21	1.21	1.21	1743.8	61
25-Apr-13	Sunny	297.5	761.9	3.1544	3.2109	0.0565	28315.3	28339.3	24.0	1.21	1.21	1.21	1736.8	33
30-Apr-13	Sunny	299.7	769.8	3.0729	3.2174	0.1445	28340.3	28364.3	24.0	1.22	1.22	1.22	1755.1	82
													Min	33
													Max	121
													Average	85

Station CAM3 Talcon Industrial Ltd

Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m ³ /min.)		Av. flow (m ³ /min)	Total vol. (m ³)	Conc. (µg/m ³)
				Initial	Final		Initial	Final		Initial	Final			
2-Apr-13	Cloudy	294.1	762.2	3.0774	3.2839	0.2065	21444.9	21468.9	24.0	1.22	1.22	1.22	1751.2	118
8-Apr-13	Cloudy	291.3	763.6	3.0965	3.3183	0.2218	21470.9	21494.9	24.0	1.22	1.22	1.22	1760.5	126
13-Apr-13	Cloudy	292.3	767.1	3.0905	3.3119	0.2214	21497.9	21521.9	24.0	1.22	1.22	1.22	1761.5	126
19-Apr-13	Sunny	297.9	769.7	3.1535	3.2435	0.0900	21524.9	21548.9	24.0	1.21	1.21	1.21	1748.7	51
25-Apr-13	Sunny	297.5	761.9	3.1073	3.1765	0.0692	21551.9	21575.9	24.0	1.21	1.21	1.21	1741.4	40
30-Apr-13	Sunny	299.7	769.8	3.0838	3.2250	0.1412	21576.9	21600.9	24.0	1.21	1.21	1.21	1736.1	81
													Min	40
													Max	126
													Average	90

24-hr TSP Concentration Levels



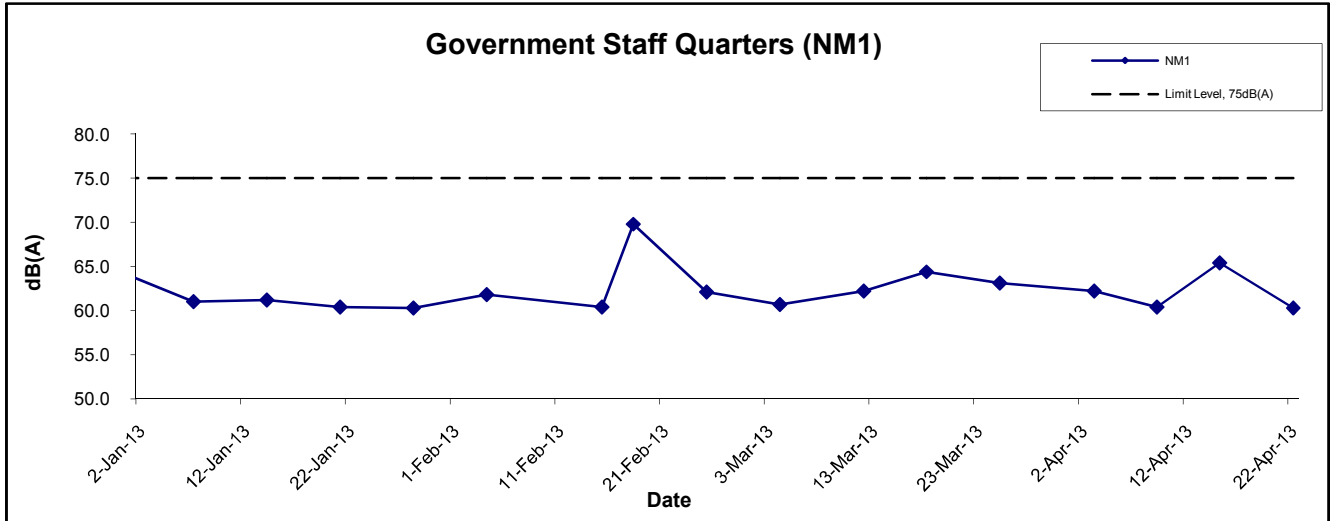
Title Contract No. DC/2009/09 Construction of Tai Po Sewage Treatment Works - Stage V Phase II B Graphical Presentation of 24-hour TSP Impact Monitoring Results	Scale N.T.S	Project No. MA0010	
	Date Apr 13	Appendix E	

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

Appendix F - Noise Monitoring Results

Location NM1 - Government Staff Quarters					
Date	Time	Weather	dB (A) (30-min)		
			L _{eq}	L ₁₀	L ₉₀
3-Apr-13	14:40	Cloudy	62.2	64.4	58.8
9-Apr-13	16:40	Cloudy	60.4	61.8	57.3
15-Apr-13	10:10	Sunny	65.4	67.7	61.2
22-Apr-13	13:00	Cloudy	60.3	61.5	57.7
		Average	62.6	63.9	58.8
		Minimum	60.3	61.5	57.3
		Maximum	65.4	67.7	61.2

Noise Levels



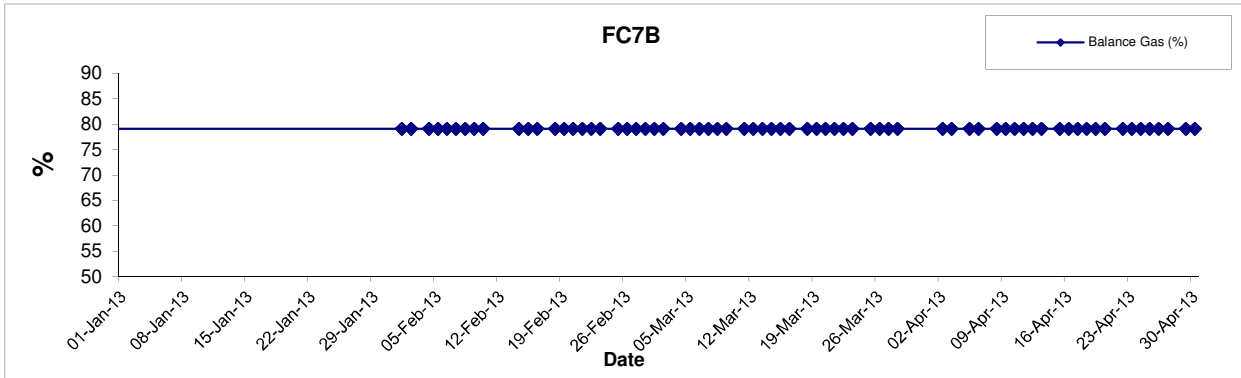
Title Contract No. DC/2009/09 Construction of Tai Po Sewage Treatment Works - Stage V Phase II B Graphical Presentation of Construction Noise Monitoring Results	Scale N.T.S	Project No. MA0010	
	Date Apr 13	Appendix F	

**APPENDIX G
RECORDS OF LANDFILL GAS
MEASUREMENT BY THE
CONTRACTOR**

APPENDIX G - RECORDS OF LANDFILL GAS MEASUREMENT BY THE CONTRACTOR

Location	Date of Measurement	Sampling time	Balance gas (%)	Combustible Gas (Methane) (% LEL)	Carbon dioxide (%)	Oxygen (%)
FC7B	2-Apr-13	8:30 AM	79.1	0	0	20.9
	2-Apr-13	1:30 PM	79.1	0	0	20.9
	3-Apr-13	8:30 AM	79.1	0	0	20.9
	3-Apr-13	1:30 PM	79.1	0	0	20.9
	5-Apr-13	8:30 AM	79.1	0	0	20.9
	5-Apr-13	1:30 PM	79.1	0	0	20.9
	6-Apr-13	6:30 PM	79.1	0	0	20.9
	6-Apr-13	11:30 PM	79.1	0	0	20.9
	8-Apr-13	8:30 AM	79.1	0	0	20.9
	8-Apr-13	1:30 PM	79.1	0	0	20.9
	9-Apr-13	8:30 AM	79.1	0	0	20.9
	9-Apr-13	1:30 PM	79.1	0	0	20.9
	10-Apr-13	8:30 AM	79.1	0	0	20.9
	10-Apr-13	1:30 PM	79.1	0	0	20.9
	11-Apr-13	8:30 AM	79.1	0	0	20.9
	11-Apr-13	1:30 PM	79.1	0	0	20.9
	12-Apr-13	8:30 AM	79.1	0	0	20.9
	12-Apr-13	1:30 PM	79.1	0	0	20.9
	13-Apr-13	8:30 AM	79.1	0	0	20.9
	13-Apr-13	1:30 PM	79.1	0	0	20.9
	15-Apr-13	8:30 AM	79.1	0	0	20.9
	15-Apr-13	1:30 PM	79.1	0	0	20.9
	16-Apr-13	8:30 AM	79.1	0	0	20.9
	16-Apr-13	1:30 PM	79.1	0	0	20.9
	17-Apr-13	8:30 AM	79.1	0	0	20.9
	17-Apr-13	1:30 PM	79.1	0	0	20.9
	18-Apr-13	8:30 AM	79.1	0	0	20.9
	18-Apr-13	1:30 PM	79.1	0	0	20.9
	19-Apr-13	8:30 AM	79.1	0	0	20.9
	19-Apr-13	1:30 PM	79.1	0	0	20.9
20-Apr-13	8:30 AM	79.1	0	0	20.9	
20-Apr-13	1:30 PM	79.1	0	0	20.9	
22-Apr-13	8:30 AM	79.1	0	0	20.9	
22-Apr-13	1:30 PM	79.1	0	0	20.9	
23-Apr-13	8:30 AM	79.1	0	0	20.9	
23-Apr-13	1:30 PM	79.1	0	0	20.9	
24-Apr-13	8:30 AM	79.1	0	0	20.9	
24-Apr-13	1:30 PM	79.1	0	0	20.9	
25-Apr-13	8:30 AM	79.1	0	0	20.9	
25-Apr-13	1:30 PM	79.1	0	0	20.9	
26-Apr-13	8:30 AM	79.1	0	0	20.9	
26-Apr-13	1:30 PM	79.1	0	0	20.9	
27-Apr-13	8:30 AM	79.1	0	0	20.9	
27-Apr-13	1:30 PM	79.1	0	0	20.9	
29-Apr-13	8:30 AM	79.1	0	0	20.9	
29-Apr-13	1:30 PM	79.1	0	0	20.9	
30-Apr-13	8:30 AM	79.1	0	0	20.9	
30-Apr-13	1:30 PM	79.1	0	0	20.9	

Balance Gas

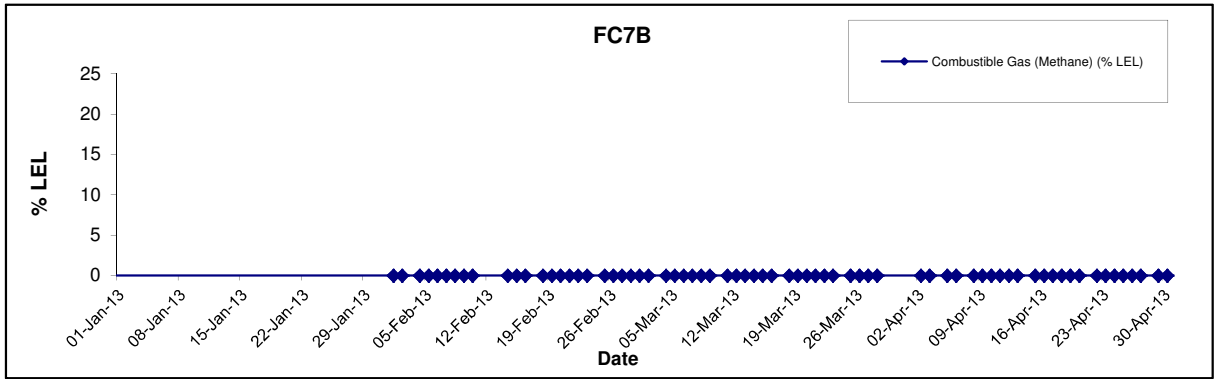


Title
 Contract No. DC/2009/09
 Construction of Tai Po Sewage Treatment Works - Stage V Phase II B
 Graphical Presentation of Landfill Gas Measurement

Scale	N.T.S	Project No.	MA0010
Date	Apr 13	Appendix	G

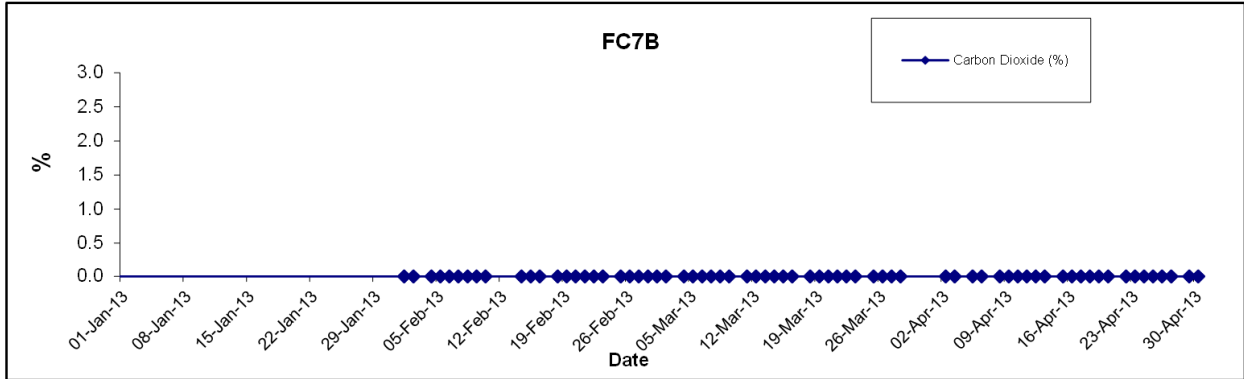


Combustible Gas (Methane)



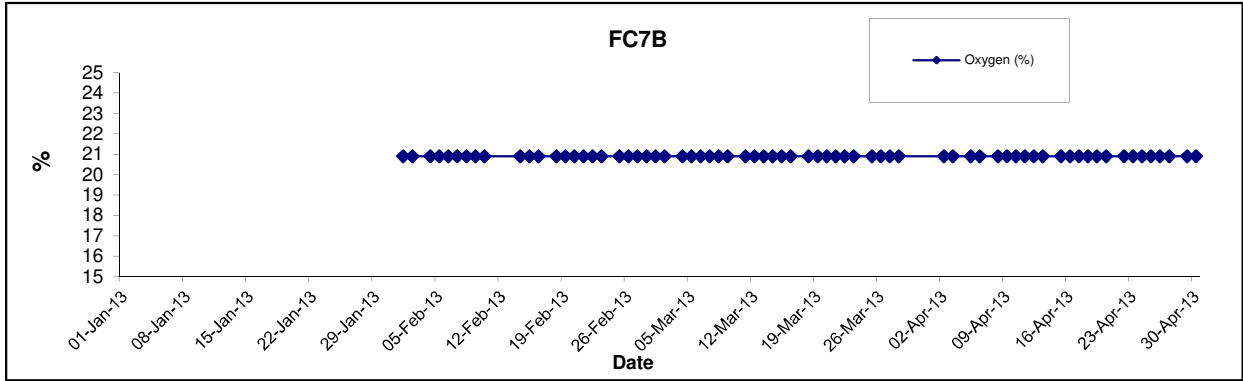
Title Contract No. DC/2009/09 Construction of Tai Po Sewage Treatment Works - Stage V Phase II B Graphical Presentation of Landfill Gas Measurement	Scale	N.T.S	Project No.	MA0010	CINOTECH
	Date	Apr 13	Appendix	G	

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 Apr 13	Appendix G	

Oxygen



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 Apr 13	Appendix G	

**APPENDIX H
SUMMARY OF EXCEEDANCE**

APPENIDX H – SUMMARY OF EXCEEDANCE

Reporting Month: April 2013

- 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 I
SITE AUDIT SUMMARY**

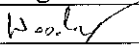

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	130405
Date	5 April 2013 (Friday)
Time	10:00-10:45

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
130405-R01 130405-R02	<p>Part B - Water Quality</p> <ul style="list-style-type: none"> General refuse near wheel washing bay should be disposal of properly. Drainage near wheel washing bay should be maintained well during rainy season 	E 1iii. B 7
130301-R01	<p>Part C - Air Quality</p> <ul style="list-style-type: none"> Stockpile near sedimentation tank should be removed to avoid accumulation. 	C 7
130405-R01	<p>Part D - Noise</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part E - Waste / Chemical Management</p> <ul style="list-style-type: none"> General refuse near wheel washing bay should be disposal of properly. <p>Part F - Permit / Licenses</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part G - Reminder</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Others</p> <p>Follow-up on previous audit section (Ref. No.:130328), outstanding items 130301-R01 have not been rectified and shall be reviewed during next site inspection.</p>	E 1iii.

	Name	Signature	Date
Recorded by	Woody Poon		9 April 2013
Checked by	Dr. Priscilla Choy		9 April 2013

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	130412
Date	12 April 2013 (Friday)
Time	10:00-10:35

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
130412-R02	Part B - Water Quality <ul style="list-style-type: none"> Situation of water quality at sedimentation tank should be improved and maintained properly use of the equipment. 	B 5iv.
130412-R03	<ul style="list-style-type: none"> Sandy and muddy matter at wheel washing bay should be settled out and removed regularly 	B 14iii.
130301-R01	Part C - Air Quality <ul style="list-style-type: none"> Stockpile near sedimentation tank should be removed to avoid accumulation. 	C 7
	Part D - Noise <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. 	
130412-R01	Part E - Waste / Chemical Management <ul style="list-style-type: none"> C & D waste near FC7B should be disposal of properly to avoid accumulation. 	E 4ii.
	Part F - Permit / Licenses <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. 	
	Part G - Reminder <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. 	
	Others Follow-up on previous audit section (Ref. No.:130405), outstanding items 130301-R01 have not been rectified and shall be reviewed during next site inspection.	

	Name	Signature	Date
Recorded by	Woody Poon	<i>Woody</i>	12 April 2013
Checked by	Dr. Priscilla Choy	<i>Hif</i>	12 April 2013

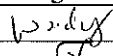

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	130418
Date	18 April 2013 (Thursday)
Time	2:00-3:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
130412-R03 130418-R02	<p>Part B - Water Quality</p> <ul style="list-style-type: none"> Sandy and muddy matter at wheel washing bay should be settled out and removed regularly Stagnant water at FC7B should be pumped out to avoid accumulation 	B 14iii. B12
130418-R01	<p>Part C - Air Quality</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part D - Noise</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part E - Waste / Chemical Management</p> <ul style="list-style-type: none"> C & D waste should be sorted and disposal of properly near switch room. <p>Part F - Permit / Licenses</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part G - Reminder</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Others</p> <p>Follow-up on previous audit section (Ref. No.:130412), outstanding items 130412-R03 have not been rectified and shall be reviewed during next site inspection.</p>	E 4ii.

	Name	Signature	Date
Recorded by	Woody Poon		18 April 2013
Checked by	Dr. Priscilla Choy		18 April 2013

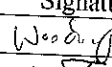

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	130425
Date	25 April 2013 (Thursday)
Time	2:00-3:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
130412-R03	<p>Part B - Water Quality</p> <ul style="list-style-type: none"> Sandy and muddy matter at wheel washing bay should be settled out and removed regularly 	B 14iii.
130425-R01	<p>Part C - Air Quality</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part D - Noise</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part E - Waste / Chemical Management</p> <ul style="list-style-type: none"> General refuse near wheel washing bay should be disposal of properly. <p>Part F - Permit / Licenses</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Part G - Reminder</p> <ul style="list-style-type: none"> No environmental deficiency was identified during the site inspection. <p>Others</p> <p>Follow-up on previous audit section (Ref. No.:130412), outstanding items 130412-R03 have not been rectified and shall be reviewed during next site inspection.</p>	E 1iii.

	Name	Signature	Date
Recorded by	Woody Poon		25 April 2013
Checked by	Dr. Priscilla Choy		25 April 2013

APPENDIX J
EVENT ACTION PLANS

APPENDIX J (1) – Event Action Plan for Air Quality Monitoring (Construction Phase)

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
ACTION LEVEL				
1. Exceedance for one sample	<ol style="list-style-type: none"> Identify source, investigate the causes of exceedance and propose remedial measures; Inform IEC and ER; Repeat measurement to confirm finding; Increase monitoring frequency to daily. 	<ol style="list-style-type: none"> Check monitoring data submitted by ET; Check Contractor's working method. 	<ol style="list-style-type: none"> Notify Contractor. 	<ol style="list-style-type: none"> Rectify any unacceptable practice; Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> Identify source; Inform IC(E) and ER; Advise the ER 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 ER; If exceedance stops, cease additional monitoring. 	<ol 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. 	<ol style="list-style-type: none"> Confirm receipt of notification of exceedance in writing; Ensure remedial measures properly implemented. 	<ol 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.
LIMIT LEVEL				
1. Exceedance for one sample	<ol style="list-style-type: none"> Identify source, investigate the causes of exceedance and propose remedial measures; Inform Contractor, IEC, ER, and EPD; Repeat measurement to confirm finding; Increase monitoring frequency to daily; Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results. 	<ol 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 ER on the effectiveness of the proposed remedial measures; Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> Confirm receipt of notification of exceedance in writing; Notify Contractor; Ensure remedial measures properly implemented. 	<ol 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; 4. Amend proposal if appropriate.
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> Notify IEC, ER, Contractor 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 ER to discuss the remedial actions to be taken; Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results; If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> Discuss amongst ER, ET, and Contractor on the potential remedial actions; Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; Supervise the implementation of remedial measures. 	<ol 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. 	<ol 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 ER until the exceedance is abated.

APPENDIX J (2) – Event Action Plan for Construction Noise Monitoring (Construction Phase)

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

APPENDIX J (3) – Event Action Plan for Landfill Gas Monitoring (Construction Phase)

Parameter	Limit Level	Action Required
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% LEL
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 K
UPDATED ENVIRONMENTAL
MITIGATION IMPLEMENTATION
SCHEDULE**

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

Type of Impact	Recommended Mitigation Measures	Status
Air Quality	Dust mitigation measures stipulated in the Air Pollution Control (Construction Dust) Regulation shall be incorporated to control dust emission. Notice shall be given to authority prior to commencing of work	√
Noise	Use of quiet PME	N/A
	<p>Good Site Practice</p> <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. 	√
Water Quality	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
Waste Management	<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>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>General Refuse 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>Construction & Demolition (C&D) Material 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>	√

Type of Impact	Recommended Mitigation Measures	Status
	<p>Bentonite Slurry</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 L
WASTE GENERATION IN THE
REPORTING MONTH**

Appendix 25.2 to Particular Specification

Name of Department: DSD

Contract No.: DC/2009/09

(Notes: The following Waste Flow Table should be used for contracts either not included under the Pay for Safety and Environment Scheme or exempted from the full requirement for environmental management)

Waste Flow Table

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 '000m3)
Jan	1.031	0	0	0	1.031	0	0.8	0	0	0	0.01
Feb	2.255	0	0	0	2.255	0	0	0	.0	0	0.01
Mar	1.620	0	0	0	1.620	0	0	0	0	0	0.01
Apr	0.004	0	0	0	0.004	0	0	0	0	0	0.01
May											
June											
Sub-total	4.910	0	0	0	4.910	0	0.8	0	0	0	0.04
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.

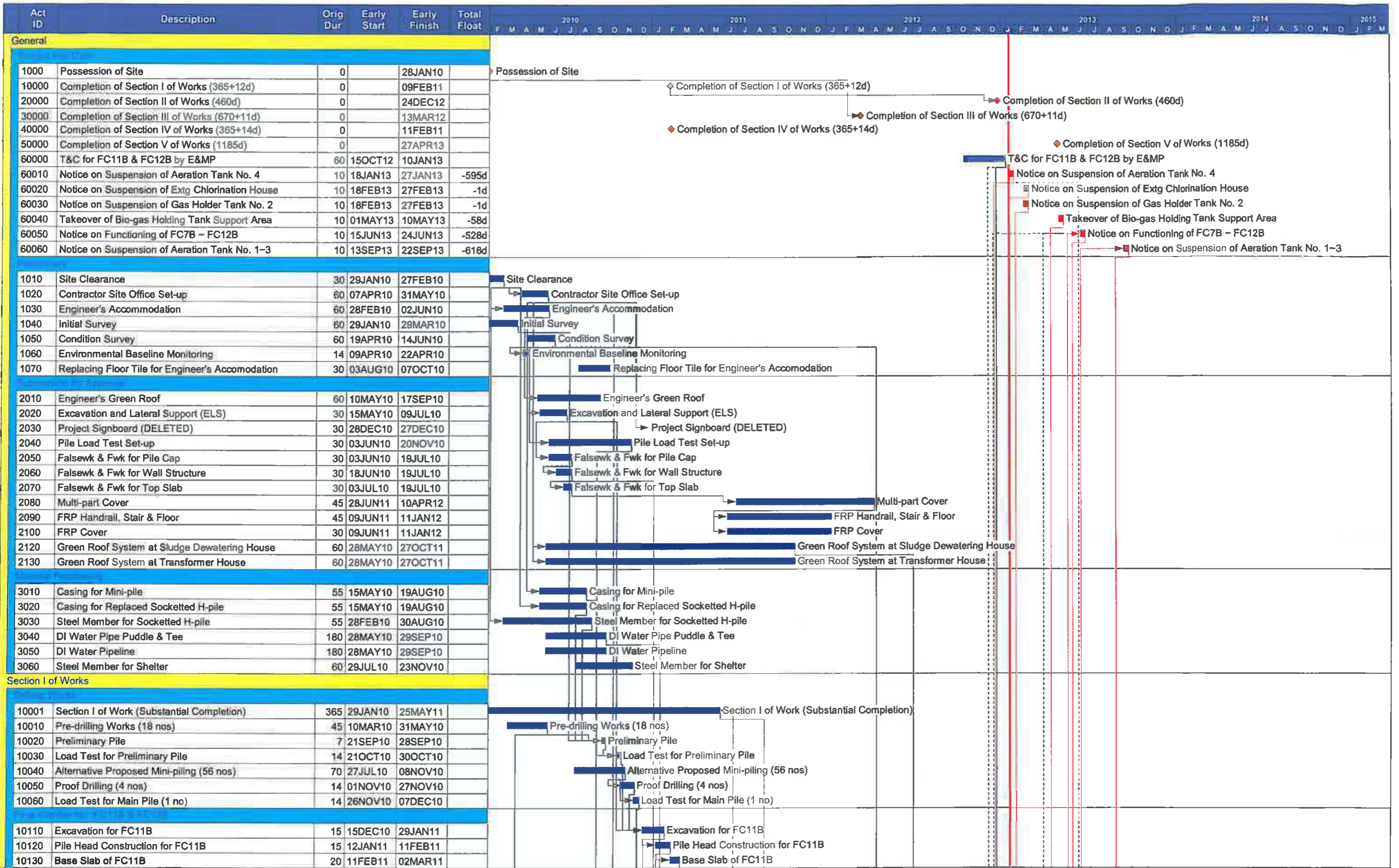
**APPENDIX M
COMPLAINT LOG**

APPENDIX M – COMPLAINT LOG**Reporting Month:** April 2013

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 month.

APPENDIX N
CONSTRUCTION PROGRAMME

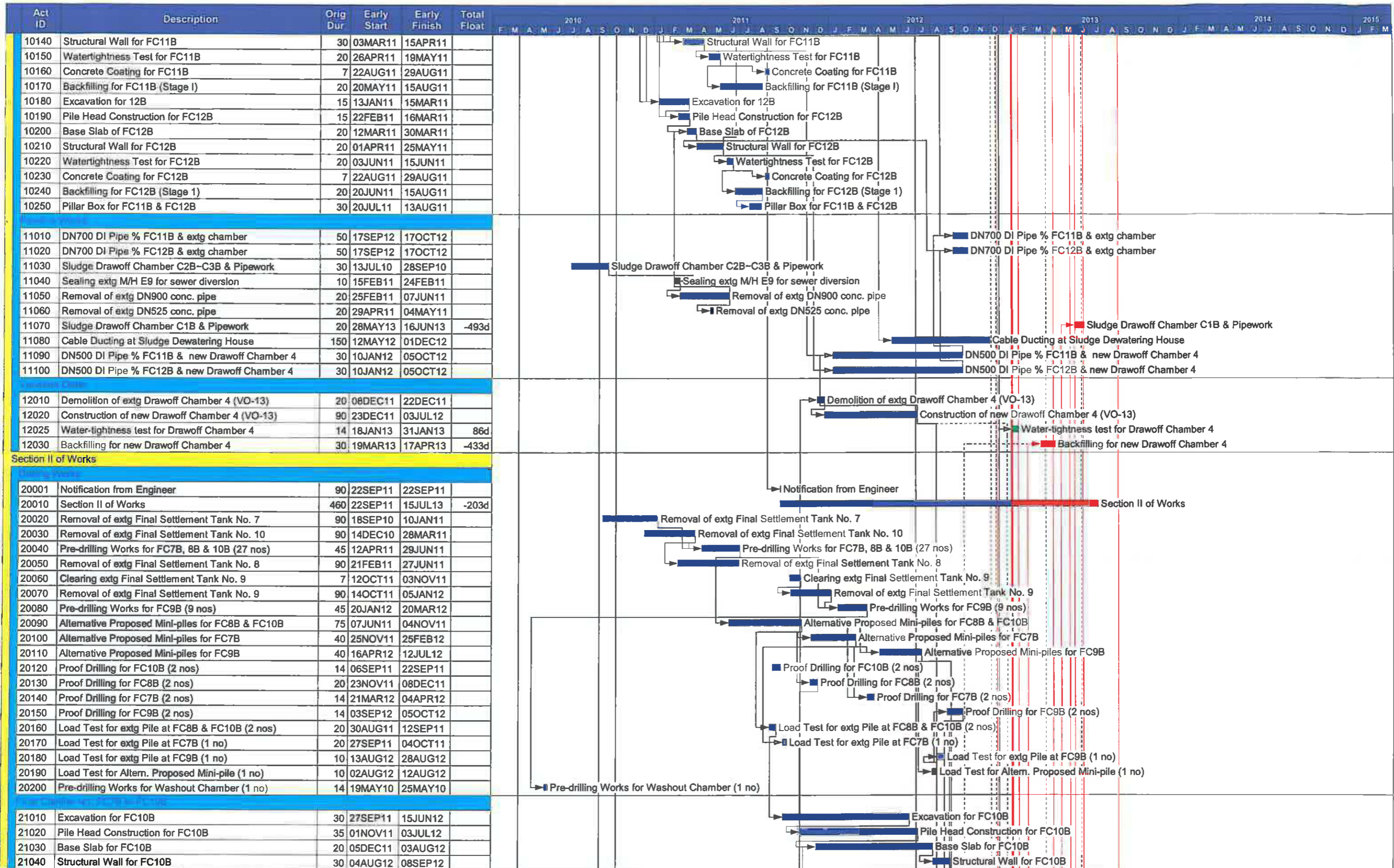


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Data date	18JAN13
Run date	20JAN13
Page number	1A
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	Summary bar
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	Finish milestone point

**TPSTW Stage 5 Phase 2B
Master Program**

Date	Revision	Checked	Approved
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30NOV11	C	AA	TKC
23APR12	D	AA	TKC
18JAN13	E	AA	TKC

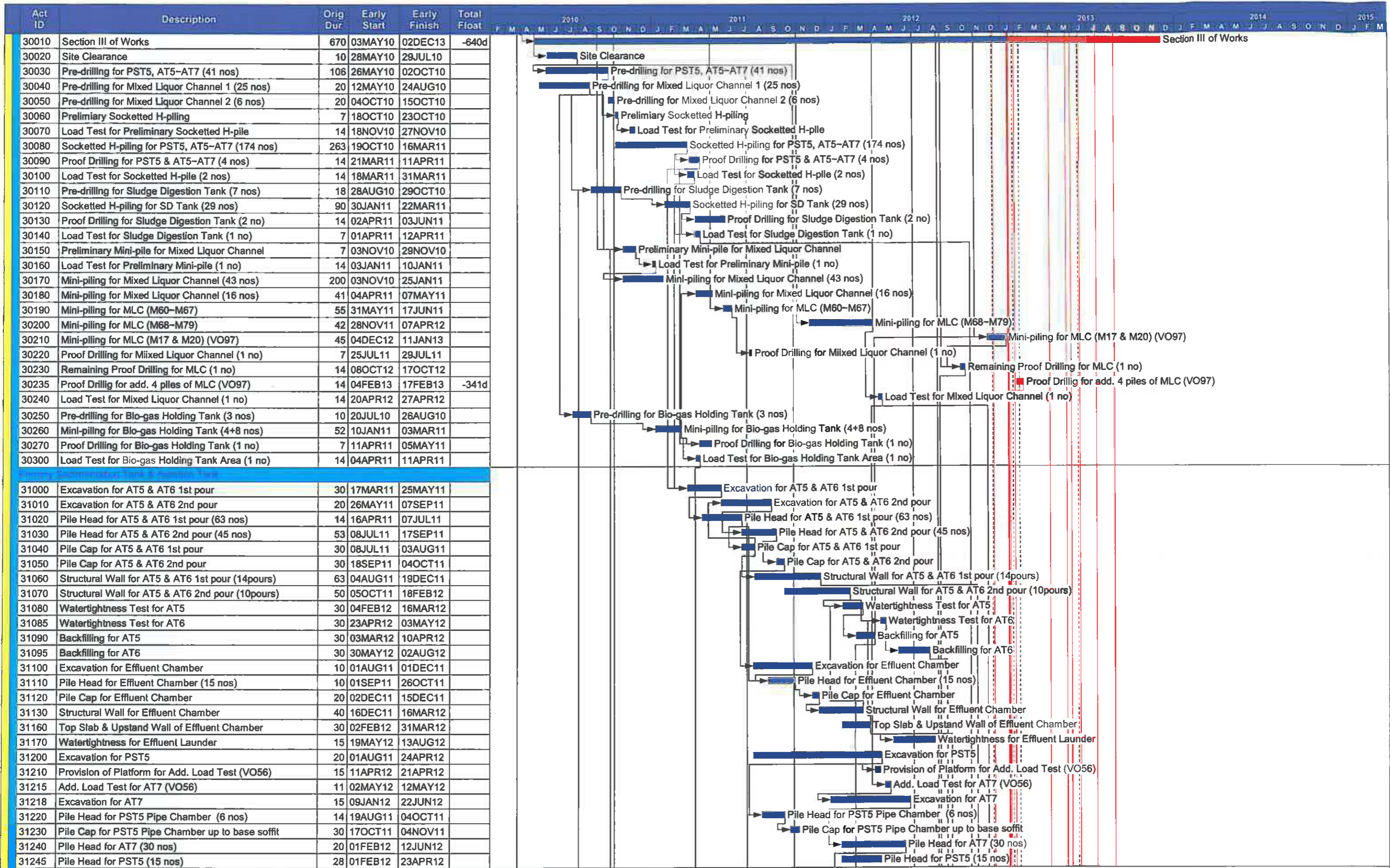


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Master Program

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18JAN13	E	AA	TKC



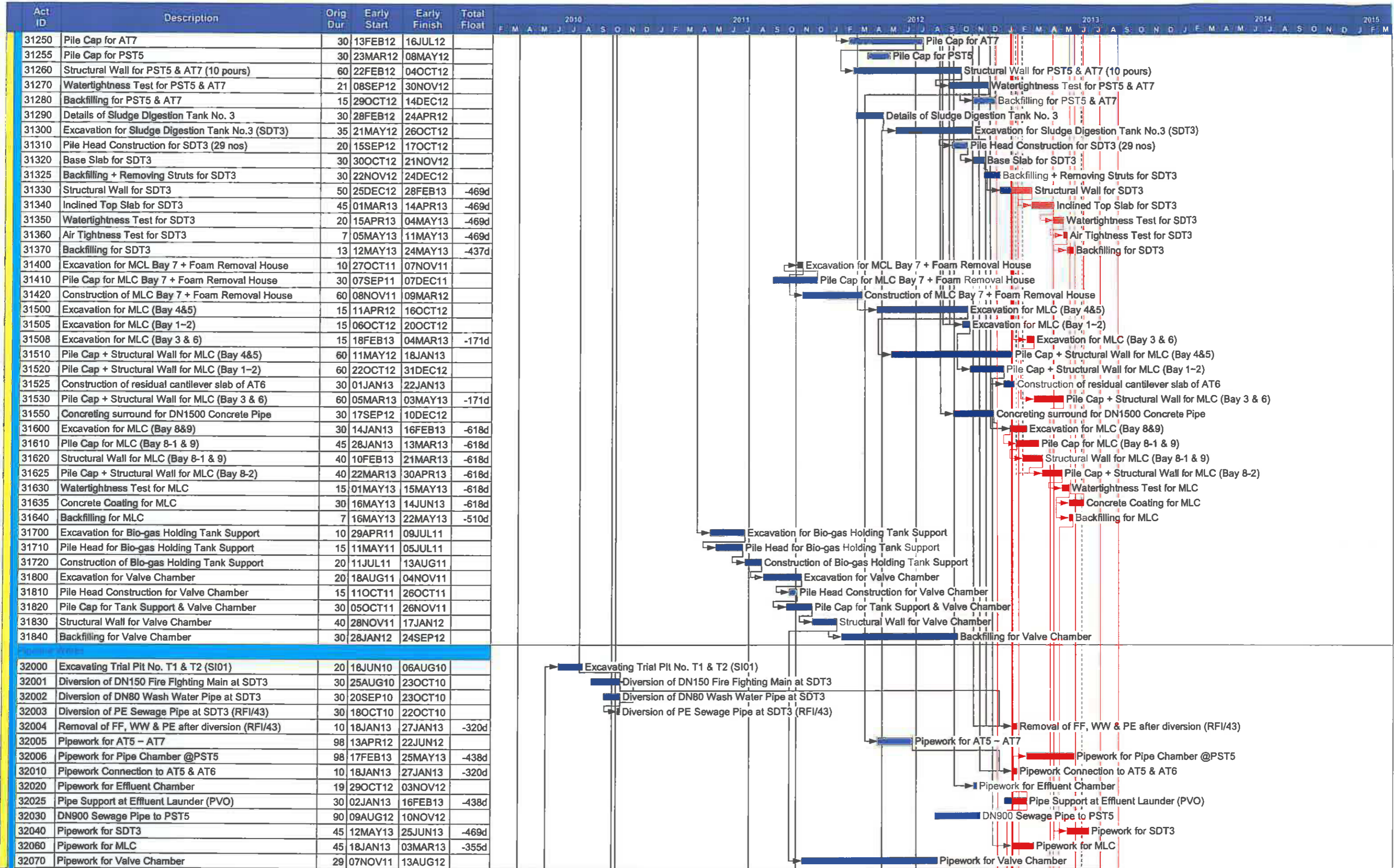
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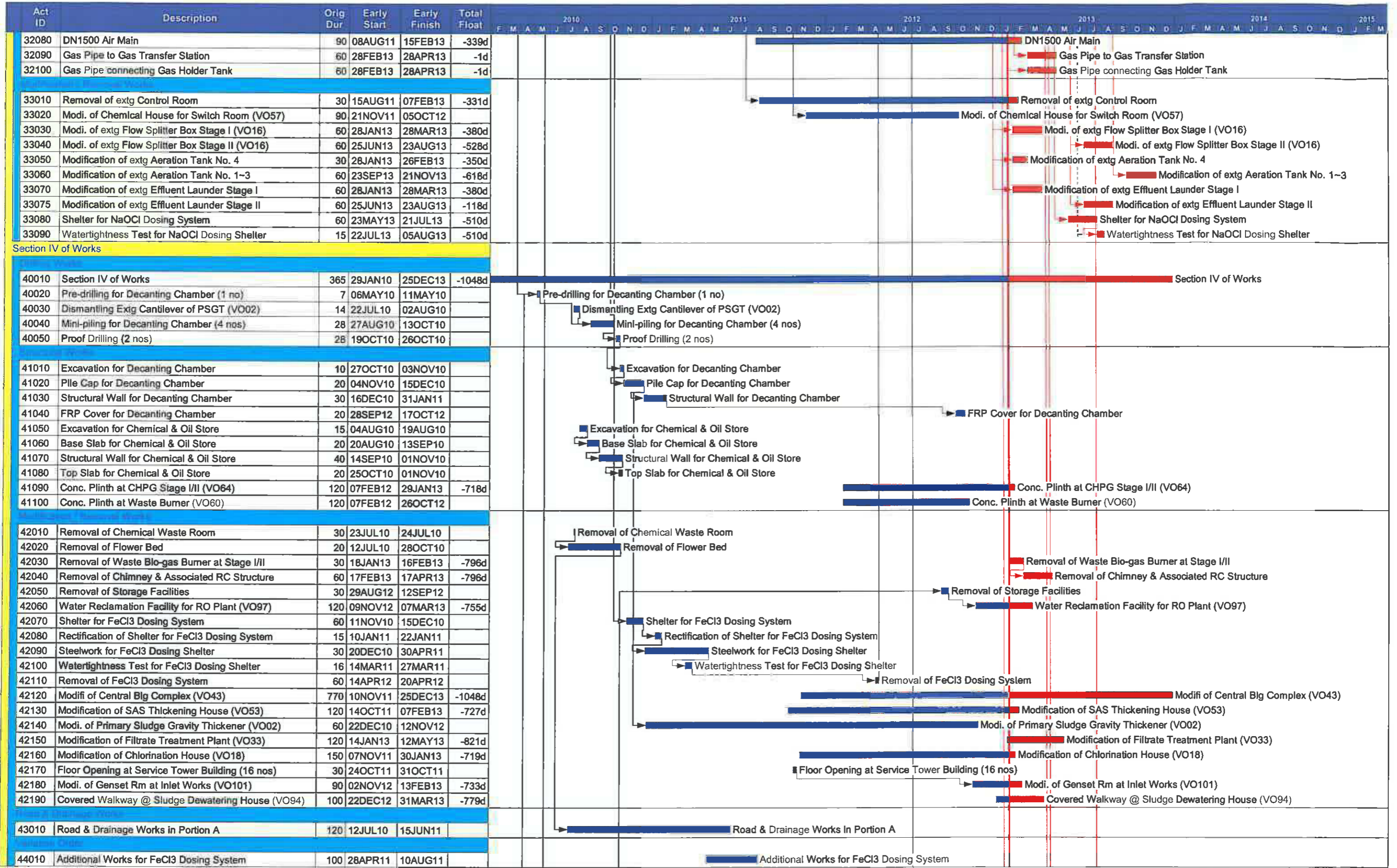
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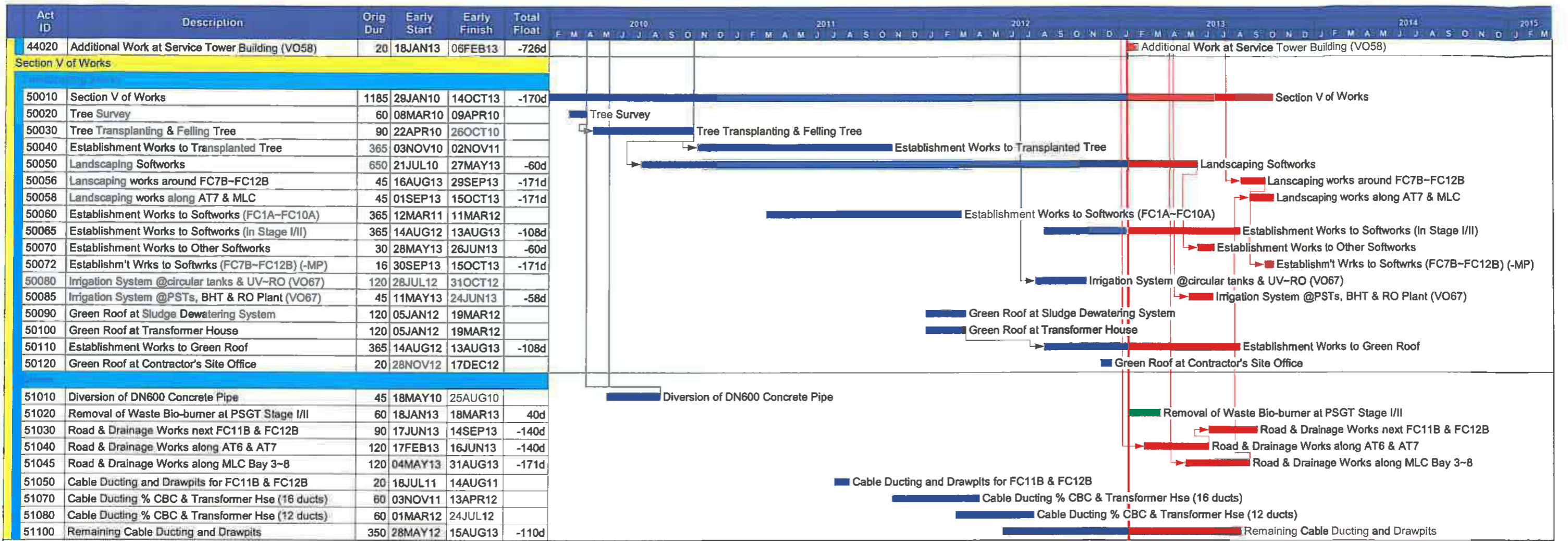


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