China Harbour Engineering Company Limited

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

Quarterly Environmental Monitoring and Audit Summary Report (April to June 2013)

(Version 1.0)

Certified By	Chuph
	(Environmental Team Leader)
REMARKS:	J

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EXECUTIVE SUMMARY

Introduction

- 1. This is the 12th Quarterly Environmental Monitoring and Audit (EM&A) Summary Report prepared by Cinotech Consultants Limited (the Environmental Team, ET) for DSD Contract no. DC/2009/09 "Construction of Tai Po Sewage Treatment Works Stage V Phase IIB". This summary report presents EM&A works performed in the period between April and June 2013.
- 2. The construction activities undertaken in the reporting quarter include:
 - 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;
 - Modification works at Central Building Complex, Filtrate Treatment Plant and Inlet Work;
 - Modification works of Effluent Launder and Flow Splitter Box
 - 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; and
 - Installation of Irrigation System

Environmental Monitoring and Audit Works

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

Table I Summary Table for Events Recorded in the Reporting Quarter

Donomotor	No. of Ex	ceedance	No. of Events	Action Taken				
Parameter	Action Level	Limit Level	due to this Project					
1-hour TSP	0	0	0	N/A				
24-hour TSP	0 0		0	N/A				
Noise	0	0	0	N/A				

Construction Noise

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

Air Quality

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

Landfill Gas

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

Environmental Complaint and Prosecution

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

Environmental Licensing and Permitting

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

Future Key Issues

- 11. The anticipated environmental impacts will be mainly on ponding water and surface runoff as well as the noise nuisance and dust emission from the major construction activities will be undertaken in the coming quarter, including:
 - Cable ducting works;
 - Construction of Covered Walkway on roof of Sludge Dewatering House;
 - Construction of Sludge Digestion Tank No. 3, Draw-off Chamber No. 3 & FC7B;
 - Construction of thrust blocks for DN1500 air main;
 - Construction of Water Reclamation Facility for RO Plant;
 - Drainage and Road works;
 - Finishing works for Extension of Sludge Dewatering House, tanks & pillar box of Water Reclamation Facility, Effluent Launder, Pipe Chamber adjacent to PST5;
 - 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.

1. INTRODUCTION

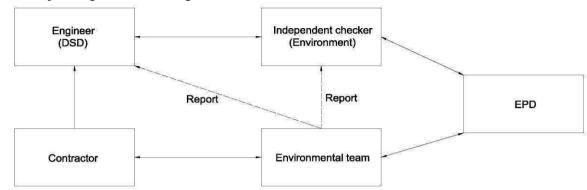
Background

- 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 Designed Projects. An EIA Report as well as an Environmental Monitoring and Audit (EM&A) Manual were approved by the Environmental Protection Department (EPD) on 28 October 2004.
- 1.3 The Stage V works will be implemented in 2 phases. The design capacities of Phase I and Phase II works are 100,000 m³/d and 130,000 m³/d respectively. An Environmental Permit (EP) No. EP-265/2007 was issued on 22 March 2007 for the TPSTW Stage V Phase II to the Drainage Services Department (DSD) as the Permit Holder. The project "Tai Po Sewage Treatment Works Stage V Phase IIB" formed part of the Phase II works, includes additional secondary treatment process units (1 primary clarifier; 3 bioreactors and 2 final clarifiers) in TPSTW for its future extended plant design capacity of 120,000 m³/day. A master construction programme of the Project is provided in Appendix A. A site layout plan is provided in Figure 1.1. The construction activities of the Project commenced on 3 July 2010.
- 1.4 Cinotech Consultants Ltd. was commissioned by the Contractor as the Environmental Team (ET) to undertake the EM&A works for the Project. Dr. Priscilla CHOY of Cinotech Consultants Ltd. was appointed as the ET Leader as per the Condition 2.1 of the EP. Ove Arup and Partners Hong Kong Ltd. was appointed as the IEC under Condition 2.2 of the EP. This is the 12th quarterly EM&A summary report summarizing the EM&A works for the Project between April and June 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
 - E&M Contractor China Harbour Engineering Company Ltd.
- 1.6 The responsibilities of respective parties are detailed in Section 1.10 of the Final EM&A Manual of the Project.

1.7 The Project Organization during Construction Phase



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

Party	Role	Name	Position	Phone No.	Fax No.			
		Mr. LAI cheuk-ho	Chief Engineer	2594 7500				
DSD	SP Division	Mr. IP Shu-kuen	Senior Engineer	2594 7502	2827 8700			
		Mr. TSANG Lap-kei	Engineer	2594 7459				
		Dr. Priscilla CHOY	ET Leader	2151 2089				
Cinotech	Environmental Team	Mr. Kevin LAM	Project Coordinator and Audit Team Leader	2151 2099	3107 1388			
		Mr. Henry LEUNG	Monitoring Team Leader	2151 2087				
A	Independent Environmental	Mr. Coleman NG	Independent Environmental Checker	2268 3097	2528 2021			
· · I	Checker	Mr. Lawrence KAN	Assistant to Independent Environmental Checker	2268 3212	2528 3031			
		Mr. TK CHEUNG	Project Manager	9863 2954				
CHEC	Civil Contractor	Mr. Aaron AU	Site Agent	6345 0754	2603 6899			
		Mr. Jason TSE	Environmental Offiecr	9320 3608				

Table 1.1Key Project Contacts

Construction Programme and Synopsis of Work

- 1.9 The construction programme is presented in **Appendix A**. The site activities undertaken during the reporting quarter 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;
 - Modification works at Central Building Complex, Filtrate Treatment Plant and Inlet Work;
 - Modification works of Effluent Launder and Flow Splitter Box
 - 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; and
 - Installation of Irrigation System

Summary of EM&A Requirements

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

2. ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS

Monitoring Parameters and Monitoring Locations

- 2.1 The EM&A Manual designate locations for the ET to monitor environmental impacts in terms of noise and air quality due to the Project. The Project area and monitoring locations are depicted in **Figure 1.2**. **Appendix B** gives details of monitoring requirements.
- 2.2 In accordance with clause 8.8 of the EM&A Manual, the number and location of the monitoring stations and parameters can be referred to Monthly EM&A reports in order to cater for any changes in the surrounding environmental and the nature of works in progress. In the reporting months, there is no alteration made on changing the location of the monitoring stations.

Monitoring Methodology and Calibration Details

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

Environmental Quality Performance Limits (Action and Limit Levels)

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

Environmental Mitigation Measures

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

3. MONITORING RESULTS

Weather Conditions

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

Air Quality

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

Construction Noise

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

Landfill Gas

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

4. AUDIT RESULTS

Implementation Status of Environmental Mitigation Measures

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

Site Audit Summary

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

Parameters	Date	Observations and Recommendations	Follow-up
	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	Reminder: 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.
Water Quality	12 Apr 2013	<u>Reminder:</u> Sandy and muddy matter at wheel washing bay should be settled out and removed regularly.	The identified observation was observed improved/rectified by the Contractor during the audit session on 2 May 2013.
	18 Apr 2013	Reminder: 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.
	10 May 2013	Reminder: Stagnant water at drip tray near FC7B should be pumped out to avoid accumulation.	The identified observation was observed improved/rectified by the Contractor during the audit session on 16 May 2013.
	10 May 2013	<u>Reminder:</u> Sandy and muddy matter at wheel washing bay should be settled out regularly to maintain the water quality.	The identified observation was observed improved/rectified by the Contractor during the audit session on 16 May 2013.
	10 May 2013	<u>Reminder:</u> Sandy and muddy materials near wheel washing bay should be removed to maintain the drainage well.	The identified observation was observed improved/rectified by the Contractor during the audit session on 6 Jun 2013.
	24 May 2013	Reminder: Stagnant water should be removed or cleared near the haul road to avoid accumulation.	The identified observation was observed improved/rectified by the Contractor during the audit session on 30 May 2013.

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 Table 4.1
 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
	28 Jun 2013	Reminder: Rain water should be cleared to avoid accumulation.	Follow up action is needed in the next reporting month.
	1 Mar 2013	Reminder: 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.
Air Quality	30 May 2013	Reminder: Muddy and sandy trails should be cleared at the haul road near wheel washing bay.	The identified observation was observed improved/rectified by the Contractor during the audit session on 6 Jun 2013.
	20 Jun 2013	<u>Reminder:</u> Stockpile should be covered by tarpaulin sheet to avoid dust generation.	The identified observation was observed improved/rectified by the Contractor during the audit session on 28 Jun 2013.
Noise	N/A	N/A	N/A
	12 Apr 2013	Reminder: 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	Reminder: 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.	The identified observation was observed improved/rectified by the Contractor during the audit session on 2 May 2013.
Waste / Chemical	2 May 2013	Reminder: C&D waste should be sorted and disposal of properly at PST5.	The identified observation was observed improved/rectified by the Contractor during the audit session on 10 May 2013.
Management	16 May 2013	Reminder: C&D waste near wheel washing bay should be disposal of properly.	The identified observation was observed improved/rectified by the Contractor during the audit session on 24 May 2013.
	24 May 2013	Reminder: C&D waste near sedimentation tank should be disposal of properly.	The identified observation was observed improved/rectified by the Contractor during the audit session on 30 May 2013.
	30 May 2013	Reminder: C&D waste near FC7B should be disposal of properly and sorted.	The identified observation was observed improved/rectified by the Contractor during the audit session on 6 Jun 2013.
	6 Jun 2013	Reminder: General refuse near wheel washing bay should be disposed of properly.	The identified observation was observed improved/rectified by the Contractor during the audit session on 14 Jun 2013.
Permit/Licens es	N/A	N/A	N/A

Status of Environmental Licensing and Permitting

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

Advice on Waste Management Status

4.4 d m³ of inert C&D waste, non-inert C&D waste and 40 m³ of general refuse were disposed in the reporting quarter. No paper/cardboard packaging was disposed in the reporting quarter. Excavated materials, as the main C&D materials generated in the reporting period, were stored inside the Site Area and Stockpiling Area of the Project. Besides, no chemical waste was generated in the reporting period. The amount of wastes generated by the activities of the Project in the reporting period fulfills the requirement of estimated volume of excavated material in EIA Report. The amount of wastes generated by the activities of the Project in the reporting period was attached in the appendices of the Monthly Reports for April to June 2013. Waste flow table please refer to **Appendix J**.

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

Summary of Exceedances

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

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

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

6. ENVIRONMENTAL COMPLAINTS AND PROSECUTIONS

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

7. COMMENTS, CONCLUSIONS AND RECOMMENDATIONS

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

Effectiveness of Mitigation Measures

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

Conclusion

- 7.3 All measured 1-hour and 24-hour TSP levels were below the Action/Limit Levels. No exceedance was recorded in the reporting quarter.
- 7.4 All measured noise levels were below the Action/Limit Levels. No exceedance was recorded in the reporting quarter.
- 7.5 All landfill gas monitoring levels were below the Action/Limit Levels. No exceedance was recorded in the reporting quarter.
- 7.6 There was no environmental complaint, prosecution or notification of summons received.
- 7.7 The anticipated environmental impacts will be mainly on ponding water and surface runoff after rain as well as the noise nuisance and dust emission from the major construction activities will be undertaken in the coming quarter, including:
 - Cable ducting works;
 - Construction of Covered Walkway on roof of Sludge Dewatering House;
 - Construction of Sludge Digestion Tank No. 3, Draw-off Chamber No. 3 & FC7B;
 - Construction of thrust blocks for DN1500 air main;
 - Construction of Water Reclamation Facility for RO Plant;
 - Drainage and Road works;
 - Finishing works for Extension of Sludge Dewatering House, tanks & pillar box of Water Reclamation Facility, Effluent Launder, Pipe Chamber adjacent to PST5;
 - 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.

Recommendations

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

Water Impact

- Pump out stagnant water and avoid ponding water accumulation during rainy season.
- 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.
- Maintain sand bags placed along the u-channel at good condition and replace the broken bags.
- Provide sediment tank for settling runoff prior to disposal.
- Remove and settle out sand and silt at wheel washing facilities regularly.

Dust Impact

- Cover the excavated dusty materials or 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.

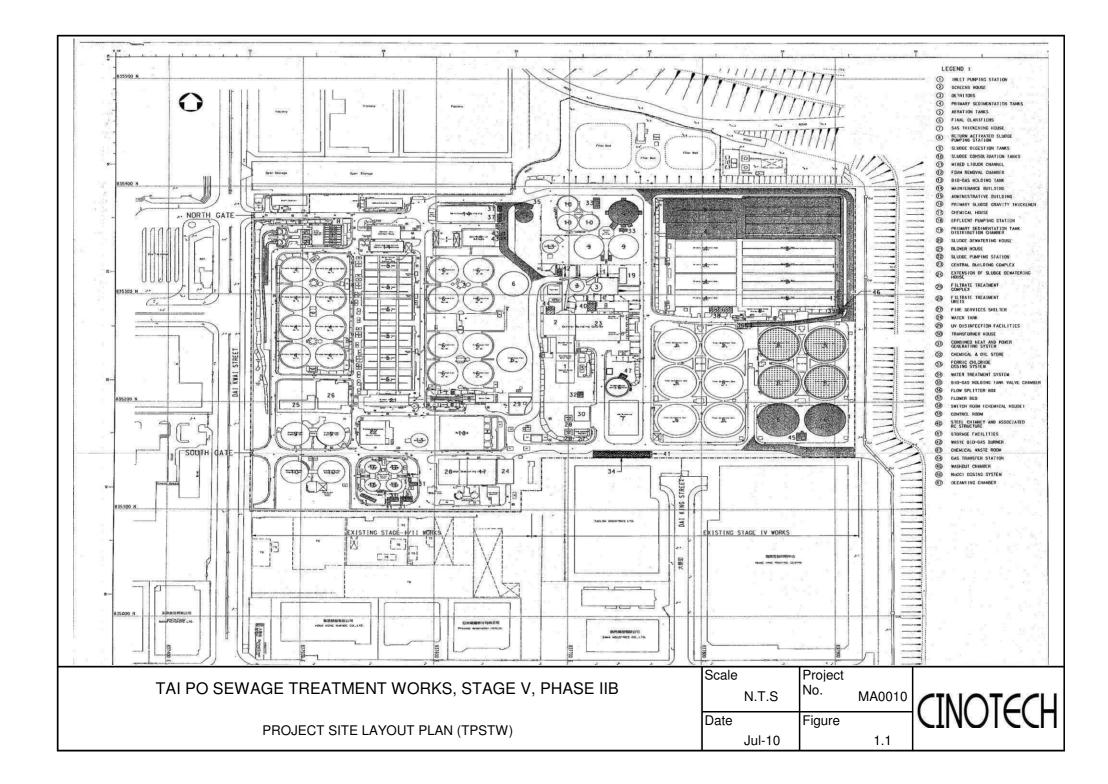
Noise

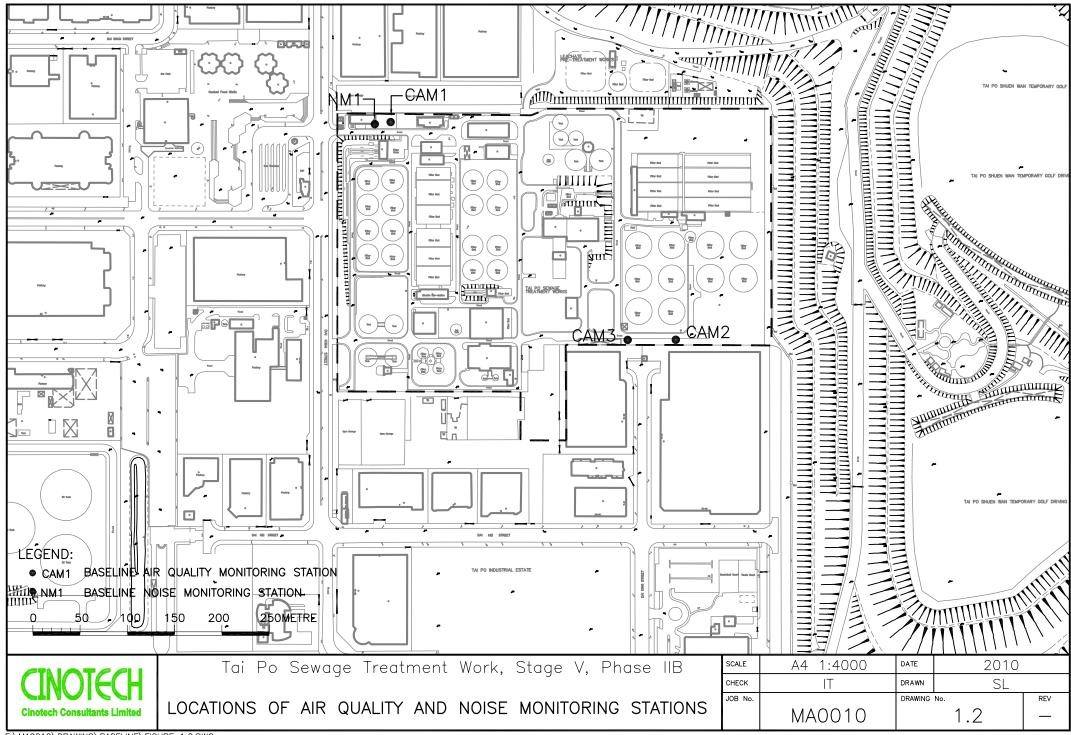
• Keep the monitoring equipment function properly.

Waste / Chemical Management

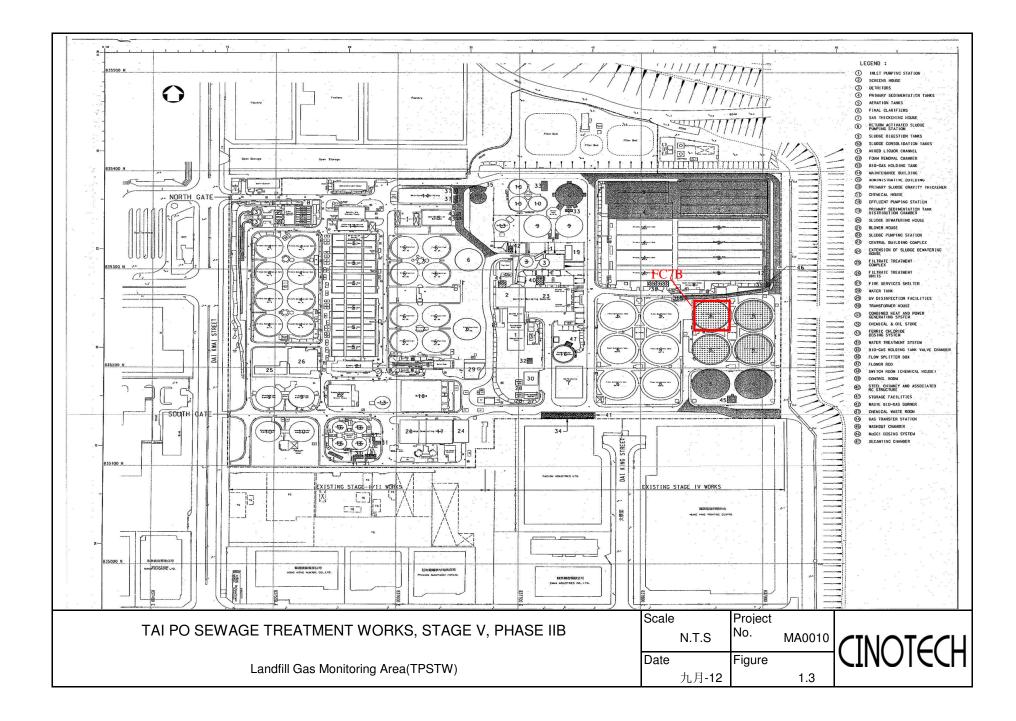
- Avoid and check for any accumulation of waste materials or rubbish on site.
- Avoid any discharge or accidental spillage of chemical waste or oil directly from the equipment.
- Provide drip tray with adequate capacity and maintain well for equipment and chemical waste.
- Provide proper rubbish bins / skips for waste collection.
- Sort and disposal of C&D waste and general refuse properly.
- Proper label the chemicals on site and store properly with drip tray.

FIGURES





F:\MA0010\DRAWING\BASELINE\FIGURE 1.2.DWG



APPENDIX A CONSTRUCTION PROGRAMME

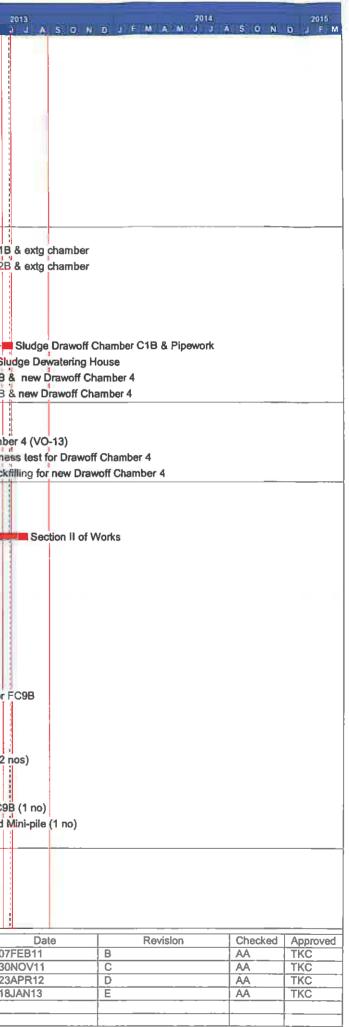
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General	and the second se											
1000	Possession of Site	0		28JAN10]	Possession of Site						
10000	Completion of Section I of Works (365+12d)	0		09FEB11		Completion of Section I of Works (365+12d)						
20000	Completion of Section II of Works (460d)	0		24DEC12			Completion of S	Sec				
30000	Completion of Section III of Works (670+11d)	0	-	13MAR12		Completion of Section III of Wo	• •					
40000	Completion of Section IV of Works (365+14d)	0		11FEB11								
50000	Completion of Section V of Works (1185d)	0		27APR13			♦ Co	om				
60000	T&C for FC11B & FC12B by E&MP	60	150CT12	10JAN13			T&C for FC11E	B 8				
60010	Notice on Suspension of Aeration Tank No. 4			27JAN13	-595d		Notice on Su	ısp				
60020	Notice on Suspension of Extg Chlorination House	10	18FEB13		-1d		Notice on	S				
60030	Notice on Suspension of Gas Holder Tank No. 2	10	18FEB13	27FEB13	-1d		Notice on	۱Ś				
60040	Takeover of Bio-gas Holding Tank Support Area	10	01MAY13	10MAY13	-58d		Ta Ta	ak				
60050	Notice on Functioning of FC7B - FC12B	10	15JUN13	24JUN13	-528d							
60060	Notice on Suspension of Aeration Tank No. 1-3	10	13SEP13	22SEP13	-618d		1					
Press			-	_			1 1	1				
1010	Site Clearance			27FEB10		Site Clearance		1				
1020	Contractor Site Office Set-up		07APR10			Contractor Site Office Set-up		1				
1030	Engineer's Accommodation	22270		02JUN10		Engineer's Accommodation		I				
1040	Initial Survey			29MAR10		Initial Survey		ł				
1050	Condition Survey			14JUN10		Condition Survey		1				
1060	Environmental Baseline Monitoring		09APR10			Environmental Baseline Monitoring						
1070	Replacing Floor Tile for Engineer's Accomodation	30	03AUG10	07OCT10	<u> </u>	Replacing Floor Tile for Engineer's Accomodation		Ļ				
0040	Particular Part		101111110			Environte Cross Base						
2010	Engineer's Green Roof		10MAY10			Engineer's Green Roof						
2020	Excavation and Lateral Support (ELS)		15MAY10		-	Excavation and Lateral Support (ELS)		I				
2030	Project Signboard (DELETED)		28DEC10			Project Signboard (DELETED)						
2040	Pile Load Test Set-up			20NOV10	-	Pile Load Test Set-up		i				
2050	Falsewk & Fwk for Pile Cap			19JUL10		Falsewk & Fwk for Wall Structure						
2060	Falsewk & Fwk for Wall Structure			19JUL10		Falsewik & Fwk for Top Slab						
2070	Falsewk & Fwk for Top Slab Multi-part Cover			19JUL10 10APR12		Multi-part Cover	8					
2080	FRP Handrall, Stair & Floor			10APR12 11JAN12		FRP Handrail, Stair & Floor						
2100	FRP Cover			11JAN12	<u> </u>	FRP Cover	i i					
2100	Green Roof System at Sludge Dewatering House		28MAY10	-		Green Roof System at Sludge Dewatering Hou	ISe					
	Green Roof System at Transformer House			270CT11		Green Roof System at Transformer House		ł				
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3010	Casing for Mini-pile	55	15MAY10	19AUG10		Casing for Mini-pile		ł				
3020	Casing for Replaced Socketted H-pile			19AUG10		Casing for Replaced Socketted H-pile	8	1				
3030	Steel Member for Socketted H-pile		28FEB10			Steel Member for Socketted H-nile		1				
3040	DI Water Pipe Puddle & Tee		28MAY10									
3050	DI Water Pipeline	180	28MAY10	29SEP10		DI Water Pipeline		1				
3060	Steel Member for Shelter			23NOV10		Steel Member for Shelter		3				
Section I o	fWorks							1				
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	Section I of Work (Substantial Completion)		29JAN10			Section I of Work (Substantial Completion)						
	Pre-drilling Works (18 nos)	and the second se	10MAR10			Pre-drilling Works (18 nos)						
-	Preliminary Pile		21SEP10			Preliminary Pile						
-	Load Test for Preliminary Pile		210CT10		ī	Load Test for Preliminary Pile						
	Alternative Proposed Mini-piling (56 nos)		Configuration and the second	08NOV10		Alternative Proposed Mini-piling (56 nos)						
	Proof Drilling (4 nos)		01NOV10			Proof Drilling (4 nos)						
10060	Load Test for Main Pile (1 no)	14	26NOV10	07DEC10		Load Test for Main Pile (1 no)		H				
	Net 10 12 11 1 2 1 2 2 2 2 2 2 2 2 2 2 2 2											
	Excavation for FC11B		15DEC10			Excavation for FC11B						
	Pile Head Construction for FC11B		12JAN11			Pile Head Construction for FC11B						
10130	Base Slab of FC11B	20	11FEB11	02MAR11		Base Slab of FC11B						
Start date Finish date Data date Run date Page numb c Primave	era Systems, Inc. Start milestone point					TPSTW Stage 5 Phase 2B Master Program	3	07F 30N 23A 18J				
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BJAN			E		AA	TKC				

Act ID	Description	Orig Early Dur Start	Early Finish	Total	2010 2011 2012
10140	Structural Wall for FC11B	Contract Contract	15APR11	- Langella	F M A M J J A S O N O J F M A M J J A S O N D J F M A M J J A S O N D J F M A M
10150	Watertightness Test for FC11B	20 26APR11	19MAY11		Watertightness Test for FC11B
10160	Concrete Coating for FC11B		29AUG11	_	Concrete Coating for FC11B
10170	Backfilling for FC11B (Stage I)	20 20MAY11	15AUG11		Backfilling for FC11B (Stage I)
10180	Excavation for 12B	15 13JAN11	15MAR11		Excavation for 12B
10190	Pile Head Construction for FC12B	15 22FEB11	16MAR11		Pile Head Construction for FC12B
10200	Base Slab of FC12B		30MAR11		Base Slab of FC12B
10210	Structural Wall for FC12B		25MAY11		Structural Wall for FC12B
10220	Watertightness Test for FC12B	20 03JUN11	15JUN11		Watertightness Test for FC12B
10230	Concrete Coating for FC12B		29AUG11		Concrete Coating for FC12B
10240	Backfilling for FC12B (Stage 1)	20 20 JUN11	15AUG11		Backfilling for FC12B (Stage 1)
10250	Pillar Box for FC11B & FC12B	30 20JUL11	13AUG11		► ■ Pillar Box for FC11B & FC12B
TOLOG		1 30/2030211	IJAOGIT		
11010	DN700 DI Pipe % FC11B & extg chamber	50 17SEP12	1700712		DN700 DI Pipe % FC110
11020	DN700 DI Pipe % FC12B & extg chamber		170CT12	_	DN700 DI Pipe % FC12
11030	Sludge Drawoff Chamber C2B-C3B & Pipework		28SEP10		Sludge Drawoff Chamber C2B-C3B & Pipework
11040	Sealing extg M/H E9 for sewer diversion		24FEB11		Stadge brawon chained C2D COD & heaving a sever diversion
11050	Removal of extg DN900 conc. pipe		07JUN11		Removal of extg DN900 conc. pipe
11060	Removal of extg DN505 conc. pipe		04MAY11		Removal of extg DN525 conc. pipe
11070	Sludge Drawoff Chamber C1B & Pipework			400	
			16JUN13	-493d	Cable Ducting at Si
11080	Cable Ducting at Sludge Dewatering House	150 12MAY12		_	DN500 DI Pipe % FC11B
11090	DN500 DI Pipe % FC11B & new Drawoff Chamber 4	30 10JAN12			DISOU DI Pipe % FC12B
11100	DN500 DI Pipe % FC12B & new Drawoff Chamber 4	30 10JAN12	0500112	_	
10010		-			Demolition of outer Demut Chember 4 (4/O 12)
	Demolition of extg Drawoff Chamber 4 (VO-13)		22DEC11		Demolition of extg Drawoff Chamber 4 (VO-13)
12020	Construction of new Drawoff Chamber 4 (VO-13)		03JUL12		Construction of new Drawoff Chamb
12025	Water-tightness test for Drawoff Chamber 4	14 18JAN13		86d	
	Backfilling for new Drawoff Chamber 4	30 19MAR13	17APR13	_433d	
Section II	Make				
20001	Notification from Engineer	90 22SEP11	22SEP11		► Notification from Engineer
20010	Section II of Works	460 22SEP11	15JUL13	-203d	
20020	Removal of extg Final Settlement Tank No. 7	90 18SEP10	10JAN11		Removal of extg Final Settlement Tank No. 7
20030	Removal of extg Final Settlement Tank No. 10	90 14DEC10	28MAR11		Removal of extg Final Settlement Tank No. 10
20040	Pre-drilling Works for FC78, 68 & 10B (27 nos)	45 12APR11	29JUN11		Pre-drilling Works for FC7B, 8B & 10B (27 nos)
20050	Removal of extg Final Settlement Tank No. 8	90 21FEB11	27JUN11		Removal of extg Final Settlement Tank No. 8
20060	Clearing extg Final Settlement Tank No. 9	7 120CT11	03NOV11		Clearing extg Final Settlement Tank No. 9
20070	Removal of extg Final Settlement Tank No. 9	90 14OCT11	05JAN12		Removal of extg Final Settlement Tank No. 9
20080	Pre-drilling Works for FC9B (9 nos)	45 20JAN12	20MAR12		Pre-drilling Works for FC9B (9 nos)
20090	Alternative Proposed Mini-plles for FC8B & FC10B	75 07JUN11	04NOV11		Alternative Proposed Mini-piles for FC8B & FC10B
20100	Alternative Proposed Minl-piles for FC7B	40 25NOV11	25FEB12		Alternative Proposed Mini-piles for FC7B
20110	Alternative Proposed Mini-piles for FC9B	40 16APR12	12JUL12		Alternative Proposed Mini-piles for
20120	Proof Drilling for FC10B (2 nos)	14 06SEP11			Proof Drilling for FC10B (2 nos)
20130	Proof Drilling for FC8B (2 nos)	20 23NOV11	08DEC11		►■ Proof Drilling for FC8B (2 nos)
	Proof Drilling for FC7B (2 nos)	14 21MAR12			Proof Drilling for FC7B (2 nos)
	Proof Drilling for FC98 (2 nos)	14 03SEP12			Proof Drilling for FC9B (2
20160	Load Test for extg Pile at FC8B & FC10B (2 nos)	20 30AUG11			Load Test for extg Pile at FC8B & FC10B (2 nos)
20170	Load Test for extg Pile at FC7B (1 no)	20 27SEP11			Load Test for extg Pile at FC7B (1 no)
20180	Load Test for extg Pile at FC9B (1 no)	10 13AUG12			Load Test for extg Pile at FC9
20190	Load Test for Altern. Proposed Mini-pile (1 no)	10 02AUG12			Load Test for Altern. Proposed
	Pre-drilling Works for Washout Chamber (1 no)	14 19MAY10		_	Pre-drilling Works for Washout Chamber (1 no)
Thisse City	ANN AD REPART ACTOR				
21010	Excavation for FC10B	30 27SEP11	15JUN12		Excavation for FC10B
	Pile Head Construction for FC10B	35 01NOV11			Pile Head Construction for FC10B
	Base Slab for FC10B	20 05DEC11			Base Slab for FC10B
	Structural Wall for FC10B	30 04AUG12			Structural Wall for FC10B
Start date	29JAN10 Early bar				
Finish date	25DEC13 Progress bar				0.
Data date	18JAN13 Critical bar				TPSTW Stage 5 Phase 2B
Run date Page numb	20JAN13 Summary bar				
	era Systems, Inc. 🔶 Start milestone point				Master Program
	Finish milestone point				



Act ID	Description	Orig Dur	and the second se	Early Finish	Total Float	2010
21050	Watertightness Test for FC10B	25	040CT12	120CT12		Watertightness Tes
21060	Concrete Coating for FC10B				-186d	
21070	Backfilling for FC10B			06NOV12		Backfilling for FC
	Excavation for FC8B			13APR12		Excavation for FC8B
21090	Pile Head Construction for FC8B			27APR12		Pile Head Construction for FC8B
	Base Slab for FC8B		20FEB12			Base Slab for FC8B
	Structural Wall for FC88		02JUN12			
	Watertightness Test for FC8B			07SEP12		Watertightness Test for
	Concrete Coating for FC8B			-	4004	
			1	08JUN13	-186d	
	Backfilling for FC8B			06NOV12		Backfilling for FC
	Excavation for FC9B			24DEC12		Excavation
	Pile Head construction for FC9B			24DEC12		
	Base Slab for FC9B		07NOV12			Base Sla
	Structural Wall for FC9B	30	17JAN13	16FEB13	-433d	Struc
	Watertightness for FC98	25	17FEB13	13MAR13	-130d	
21200	Concrete Coating for FC98	10	20MAY13	29MAY13	-186d	
21210	Backfilling for FC9B	21	13APR13	03MAY13	-130d	
21220	Excavation for FC7B			23FEB13	-221d	Exca
1230	Pile Head Construction for FC7B			30MAR13	-221d	
1240	Base Slab for FC7B		1	19APR13	-221d	
	Structural Wall for FC7B	_		19MAY13	-221d	
	Watertightness Test for FC7B		20MAY13		-221d	
	Concrete Coating for FC7B		19JUN13		-186d	
	Backfilling for FC7B					
1200		20	14JUL13	02AUG13	-221d	
2002	DN700 DI Pipe %FC8B & extg chamber	20	218ED12	100CT12	-	
	DN700 DI Pipe % FC10B & extg chamber		1			DN700 D1 Pipe % F
			21SEP12	-	400.1	
	DN700 DI Pipe % FC9B & extg chamber			12APR13	-130d	
	DN700 DI Pipe % FC7B & extg chamber	_	14JUN13		-221d	
1	DN500 DI Pipe % FC10B & new Drawoff Chamber 4		22SEP12			
	DN500 DI Pipe % FC9B & new Drawoff Chamber 4			16MAR13	-433d	
	DN500 DI Pipe % FC7B & new Drawoff Chamber 3	30	17JUN13	16JUL13	-234d	
	DN500 DI Pipe % FC8B & new Drawoff Chamber 3		17JUN13		-234d	
	Excavation of Inspection Pit T8	20	21DEC10	23DEC10		Excavation of Inspection Pit T8
22060	Sealing DN600 & DN800 Scum Pipes at RAS	10	180CT11	01NOV11		Sealing DN600 & DN800 Scum Pipes at RAS
22070	Removal of extg 3 nos. of dosing pipes & trench	15	07JAN12	03MAR12		Removal of extg 3 nos. of dosing pipes & tr
2080	Removal of DN800 Sludge Pipe for piling	15	01DEC11	08MAR12		Removal of DN800 Sludge Pipe for piling
2090	Removal of DN600 Sludge Pipe	30	18JAN13	16FEB13	-585d	
2100	Construction of FMC2B	60	20JUN12	08DEC12		Construction
2110	Modification of RAS Pumping Station		28JAN13		-450d	
	DN1000 DI Sludge Pipe		28JAN13		-595d	
	Backfilling for Sludge Pipe	_	27FEB13		-81d	Ba
	Construction of FMC1B + removal of DN800 pipe		17NOV11		-010	Construction of FMC1B
	Backfilling for FMC1B		29SEP12			Backfilling for FMC
-100 p		20	2995512	2400112	_	
8010	Pre-drilling for new Drawoff Chamber 3 (1 no)	7	25JUN11	02.00144		Pre-drilling for new Drawoff Chamber 3 (1 no)
	1st Delimotion of extg Drawoff Chamber 3 (VD13)		and an in the later of the			► I 1st Delimotion of extg Drawoff Chamber 3 (VO13)
			30NOV11			Mini-piling for
	Mini-piling for new Drawoff Chamber 3 (2 nos)		05NOV12			
	ELS for Drawoff Chamber 3		18JAN13		-493d	
	2nd Demolition of extg Drawoff Chamber 3 (VO13)		07FEB13		-493d	
	Construction of new Drawoff Chamber 3 (VQ13)		17FEB13		-493d	
3045	Watertightness Test for Drawoff Chamber 3 (VO13)	20	28MAY13	16JUN13	-234d	
	Backfilling for new Drawoff Chamber 3 (VO13)	30	17JUL13	15AUG13	-234d	
tion III o	Works					
		30	02APR10	02APR10		Notification from Engineer
ninii St	Notification from Engineer			waar of TALM		
0001	29JAN10					
nunir ste	29JAN10 Early bar	00	× *			
0001 N t date	29JAN10 25DEC13 18JAN13 Early bar Critical bar	00				TPSTW Stage 5 Phase 28
0001 N date date date date	29JAN10 Early bar 25DEC13 Progress bar 18JAN13 Critical bar					TPSTW Stage 5 Phase 2B
0001 N date h date date date	29JAN10 Early bar 25DEC13 Progress bar 18JAN13 Critical bar					TPSTW Stage 5 Phase 2B Master Program

2013. J J A S O N		2014 J J A S O N	2019 D F M					
FC10B								
Concrete Coating	I for FC10B							
B								
Concrete Coating	for FC8B							
C9B								
uction for FC98								
FC9B								
Wall for FC9B								
htness for FC9B	2002							
Concrete Coating for FC9B	DE HORB							
n for FC7B								
ead Construction fo	r FC7B							
e Slab for FC7B								
Structural Wall for F								
Watertightness T								
Concrete Coatir								
Backfilling fo	DF FC/B							
& extg chamber								
& extg chamber								
00 DI Pipe % FC9B	& extg chamber							
DN700 DI Pipe	e % FC7B & extg ch	amber						
& new Drawoff Ch								
DI Pipe % FC9B &								
DN500 DI Pip	е % FC7B&new Di e % FC8B&new Di							
f DN600 Sludge Pip	e							
AC2B								
cation of RAS Pump DI Sludge Pipe	ung Station							
ng for Sludge Pipe								
noval of DN800 pipe	e							
Drawoff Chamber 3 (2 nos)								
woff Chamber 3								
ition of extg Drawoff Chamber 3 (VO13)								
Watertightness Test for Drawoff Chamber 3 (VO13)								
Backfilling	for new Drawoff Ch	amber 3 (VO13)						
3 2 3								
1								
Date	Revision	Checked	Approved					
7FEB11	B	AA	TKC					
0NOV11 3APR12	C	AA	TKC TKC					
8JAN13	E	AA	ТКС					

Act ID	Description	Orig Early Early Total 2010 2011 2011 2012 Dur Start Finish Float рмамјја s о крјрмамјја s о крјрмамјја s о крјрмамјја s о крјрмамјја s о крјрм	2 A M J
30010	Section III of Works	670 03MAY10 02DEC13 -640d	
30020	Site Clearance	10 28MAY10 29JUL10 Site Clearance	
30030	Pre-drilling for PST5, AT5-AT7 (41 nos)	106 26MAY10 02OCT10 Pre-drilling for PST5, AT5-AT7 (41 nos)	
30040	Pre-drilling for Mixed Liquor Channel 1 (25 nos)	20 12MAY10 24AUG10 Pre-drilling for Mixed Liquor Channel 1 (25 nos)	
30050	Pre-drilling for Mixed Liquor Channel 2 (6 nos)	20 04OCT10 15OCT10 Pre-drilling for Mixed Liquor Channel 2 (6 nos)	6 6 7
30060	Prelimiary Socketted H-plling	7 18OCT10 23OCT10 Prelimiary Socketted H-piling	1
30070	Load Test for Preliminary Socketted H-pile	14 18NOV10 27NOV10	
30080	Socketted H-piling for PST5, AT5-AT7 (174 nos)	263 19OCT10 16MAR11 Socketted H-piling for PST5, AT5-AT7 (174 nos)	
30090	Proof Drilling for PST5 & AT5-AT7 (4 nos)	14 21MAR11 11APR11 Proof Drilling for PST5 & AT5~AT7 (4 nos)	
30100	Load Test for Socketted H-pile (2 nos)	14 18MAR11 31MAR11	
30110	Pre-drilling for Sludge Digestion Tank (7 nos)	18 28AUG10 29OCT10 Pre-drilling for Sludge Digestion Tank (7 nos)	
30120	Socketted H-piling for SD Tank (29 nos)	90 30JAN11 22MAR11 Socketted H-piling for SD Tank (29 nos)	
30130	Proof Drilling for Sludge Digestion Tank (2 no)	14 02APR11 03JUN11	
30140	Load Test for Sludge Digestion Tank (1 no)	7 01APR11 12APR11	
30150	Preliminary Mini-pile for Mixed Liquor Channel	7 03NOV10 29NOV10 14 03JAN11 10JAN11	
30160	Load Test for Preliminary Mini-pile (1 no)		
30170	Mini-piling for Mixed Liquor Channel (43 nos)		
30180	Mini-piling for Mixed Liquor Channel (16 nos) Mini-piling for MLC (M60–M67)	41 04APR11 07MAY11 55 31MAY11 17JUN11	
30190		42 28NOV11 07APR12	
	Mini-piling for MLC (M68–M79) Mini-piling for MLC (M17 & M20) (VO97)	42 20NOVT1 0/APRI2	ling for ML
30210	Proof Drilling for Mixed Liguor Channel (1 no)	7 25JUL11 29JUL11	
30230	Remaining Proof Drilling for MLC (1 no)	14 080CT12 170CT12	of Drilling fr
	Proof Drillig for add, 4 plles of MLC (VO97)		oof Drillig 1
30240	Load Test for Mixed Liquor Channel (1 no)	14 20APR12 27APR12	el (1 no)
	Pre-drilling for Blo-gas Holding Tank (3 nos)	10 20JUL10 26AUG10 Pre-drilling for Bio-gas Holding Tank (3 nos)	
	Minl-pillng for Blo-gas Holding Tank (4+8 nos)	52 10JAN11 03MAR11	
	Proof Drilling for Bio-gas Holding Tank (1 no)	7 11APR11 05MAY11 Proof Drilling for Bio-gas Holding Tank (1 no)	
	Load Test for Bio-gas Holding Tank Area (1 no)	14 04APR11 11APR11 Load Test for Bio-gas Holding Tank Area (1 no)	
FILLER	Summerinten Trett & Automore Trett		
31000	Excavation for AT5 & AT6 1st pour	30 17MAR11 25MAY11 Excavation for AT5 & AT6 1st pour	
31010	Excavation for AT5 & AT6 2nd pour	20 26MAY11 07SEP11 Excavation for AT5 & AT6 2nd pour	
31020	Pile Head for AT5 & AT6 1st pour (63 nos)	14 16APR11 07JUL11 Pile Head for AT5 & AT6 1st pour (63 nos)	
	Pile Head for AT5 & AT6 2nd pour (45 nos)	53 08JUL11 17SEP11 Pile Head for AT5 & AT6 2nd pour (45 nos)	
	Pile Cap for AT5 & AT6 1st pour	30 08JUL11 03AUG11	
	Pile Cap for AT5 & AT6 2nd pour	30 18SEP11 04OCT11	
	Structural Wall for AT5 & AT6 1st pour (14pours)	63 04AUG11 19DEC11 Structural Wall for AT5 & AT6 1st pour (14pours) 50 05OCT11 18EEB12	
	Structural Wall for AT5 & AT6 2nd pour (10pours)		opours
	Watertightness Test for AT5	30 04FEB12 16MAR12 Watertightness Test for AT5	
	Watertightness Test for AT6 Backfilling for AT5	30 23APR12 03MAY12 Waterlightness Test for A16 30 03MAR12 10APR12 Backfilling for AT5	
	Backfilling for AT6	30 30MAY12 02AUG12	
	Excavation for Effluent Chamber	10 01AUG11 01DEC11	
	Pile Head for Effluent Chamber (15 nos)	10 01SEP11 26OCT11	
	Pile Cap for Effluent Chamber	20 02DEC11 15DEC11	
	Structural Wall for Effluent Chamber	Structural Wall for Effluent Chamber	
	Top Stab & Upstand Wall of Effluent Chamber	30 02FEB12 31MAR12 Top Slab & Upstand Wall of Effluent C	Chamber
	Watertightness for Effluent Launder		uent Launo
	Excavation for PST5	20 01AUG11 24APR12 Excavation for PST5	
31210	Provision of Platform for Add. Load Test (VO56)	15 11APR12 21APR12 11 02MAY12 12MAY12	Test (VO
31215	Add. Load Test for AT7 (VO56)	11 02MAY12 12MAY12 Add. Load Test for AT7 (VO56)	
31218	Excavation for AT7	15 09JAN12 22JUN12 Excavation for A17	
31220	Pile Head for PST5 Pipe Chamber (6 nos)	14 19AUG11 04OCT11	
31230	Pile Cap for PST5 Pipe Chamber up to base soffit	201470CT41 LOANOV44	
31240	Plle Head for AT7 (30 nos)	20 01FEB12 12JUN12	
31245	Pile Head for PST5 (15 nos)	28 01FEB12 23APR12 Pile Head for PST5 (15 nos)	
Start date	29JAN10 Early bar		07
Finish date Data date	19 JAN12		071
Run date	20 JAN13	TPSTW Stage 5 Phase 2B	23/
Page numb	er 4A Summary bar		18.
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2013 J J A S O N	DJFMA	2014) M J J A	S-O-N	2015 D J F M
	Section III of W	orks		
MLC (M17 & M20) (\	/097)			
for MLC (1 no) g for add. 4 piles of	MLC (\/097)			
	WEG (¥037)			
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056)				
			Obert	A
Date 7FEB11	Revisi	un	Checked	Approved
	B		AA AA	TKC
0NOV11 3APR12 8JAN13	B C D E		AA AA AA AA	TKC TKC TKC TKC

Act ID	Description	Orig Dur	Early Start	Early Finish	Total Float	2010 И Ј Ј А S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M
31250	Pile Cap for AT7	Second 1	13FEB12	16JUL12		Pile Cap for AT7
	Pile Cap for PST5		23MAR12	-		Pile Cap for PST5
1260	Structural Wall for PST5 & AT7 (10 pours)			040CT12		
1270	Watertightness Test for PST5 & AT7		08SEP12	30NOV12		Wall for PST5
1280	Backfilling for PST5 & AT7	_ +	290CT12	14DEC12		Backfilling for PS
1290	Details of Sludge Digestion Tank No. 3		28FEB12	24APR12		Details of Sludge Digestion Tank No. 3
1300	Excavation for Sludge Digestion Tank No.3 (SDT3)		21MAY12			
1310	Pile Head Construction for SDT3 (29 nos)	_	15SEP12	170CT12		Pile Head Construction
1320	Base Slab for SDT3		300CT12			Base Slab for SDT
	Backfilling + Removing Struts for SDT3		22NOV12			Backfilling + Re
1330	Structural Wall for SDT3		25DEC12		-469d	
1340	Inclined Top Slab for SDT3		01MAR13		-469d	
1350	Watertightness Test for SDT3				-469d	
	Air Tightness Test for SDT3		05MAY13		-469d	
	Backfilling for SDT3					
			12MAY13		-437d	
	Excavation for MCL Bay 7 + Foam Removal House	_ +	270CT11			Excavation for MCL Bay 7 + Foam Removal House
	Pile Cap for MLC Bay 7 + Foam Removal House		07SEP11			Pile Cap for MLC Bay / + Foam Removal House
1420	Construction of MLC Bay 7 + Foam Removal House		08NOV11			Construction of MLC Bay 7 + Foam Removal House
500	Excavation for MLC (Bay 4&5)		11APR12			
	Excavation for MLC (Bay 1-2)		060CT12			Excavation for MLC (E
	Excavation for MLC (Bay 3 & 6)	_	18FEB13		-171d	
	Pile Cap + Structural Wall for MLC (Bay 4&5)		11MAY12			Pile Cap + S
	Pile Cap + Structural Wall for MLC (Bay 1-2)	60	22OCT12	31DEC12		Pile Cap + Str
	Construction of residual cantilever slab of AT6		01JAN13			Construction
_	Pile Cap + Structural Wall for MLC (Bay 3 & 6)	60	05MAR13	03MAY13	-171d	
550	Concreting surround for DN1500 Concrete Pipe	30	17SEP12	10DEC12		Concreting surro
600	Excavation for MLC (Bay 8&9)	30	14JAN13	16FEB13	-618d	Excavation Excavation Excavation
610	Plie Cap for MLC (Bay 8-1 & 9)	45	28JAN13	13MAR13	-618d	
1620	Structural Wall for MLC (Bay 8-1 & 9)	40	10FEB13	21MAR13	-618d	Struc
1625	Pile Cap + Structural Wall for MLC (Bay 8-2)	40	22MAR13	30APR13	-618d	
1630	Watertightness Test for MLC	15	01MAY13	15MAY13	-618d	
1635	Concrete Coating for MLC	30	16MAY13	14JUN13	-618d	
1640	Backfilling for MLC	7	16MAY13	22MAY13	-510d	
700	Excavation for Bio-gas Holding Tank Support	10	29APR11	09JUL11		Excavation for Bio-gas Holding Tank Support
1710	Pile Head for Bio-gas Holding Tank Support	15	11MAY11	05JUL11		Pile Head for Bio-gas Holding Tank Support
1720	Construction of Blo-gas Holding Tank Support	20	11JUL11	13AUG11		Construction of Bio-gas Holding Tank Support
1800	Excavation for Valve Chamber	20	18AUG11	04NOV11		Excavation for Valve Chamber
1810	Pile Head Construction for Valve Chamber	15	110CT11	260CT11		Pile Head Construction for Valve Chamber Pile Cap for Tank Support & Valve Chamber
1820	Pile Cap for Tank Support & Valve Chamber	30	05OCT11	26NOV11		Pile Cap for Tank Support & Valve Chamber
1830	Structural Wall for Valve Chamber	40	28NOV11	17JAN12		Structural Wall for Valve Chamber
840	Backfilling for Valve Chamber		28JAN12			Structural Wall for Valve Chamber Backfilling for Valve Cha
(CINE)	lectures					
2000	Excavaling Trial Pit No. T1 & T2 (Sl01)	20	1BJUN10	06AUG10		Excavating Trial Plt No. T1 & T2 (SI01)
	Diversion of DN150 Fire Fighting Main at SDT3		25AUG10			Diversion of DN150 Fire Fighting Main at SDT3
	Diversion of DN80 Wash Water Pipe at SDT3		20SEP10			Diversion of DN80 Wash Water Pipe at SDT3
	Diversion of PE Sewage Pipe at SDT3 (RFI/43)		180CT10			Diversion of PE Sewage Pipe at SDT3 (RFI/43)
	Removal of FF, WW & PE after diversion (RFI/43)		18JAN13		-320d	Removal o
	Pipework for AT5 - AT7		13APR12		52.00	Pipework for AT5 ~ AT7
_	Pipework for Pipe Chamber @PST5		17FEB13		-438d	
	Pipework Connection to AT5 & AT6	30	18JAN13	-	-4380 -320d	Pipework (
	Pipework for Effluent Chamber	10			-3200	Pipework for Effluen
			290CT12		400.4	
	Pipe Support at Effluent Launder (PVO)		02JAN13		-438d	
	DN900 Sewage Pipe to PST5		09AUG12			
	Pipework for SDT3		12MAY13		-469d	
	Pipework for MLC		18JAN13		-355d	
070	Pipework for Valve Chamber	29	07NOV11	13AUG12		Pipework for Valve Chamber
date	29JAN10 Early bar					
h date	25DEC13 Progress bar					TDSTW Stage 5 Phase 2B
date	18JAN13					TPSTW Stage 5 Phase 2B
date numbe	20JAN13					IT STW Stage ST hase 2D
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	ra Systems, Inc.					Master Program

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2013 2014 2019
J J A S O N D J E M A M J J A S O N D J E M
 AT7 (10 pours)
 for PST5 & AT7
15 & AT7
Digestion Tank No.3 (SDT3)
for SDT3 (29 nos)
noving Struts for SDT3
Wall for SDT3
ned Top Slab for SDT3
atertightness Test for SDT3
ir Tightness Test for SDT3
Backfilling for SDT3
ouse
y 4&5)
y 1-2)
on for MLC (Bay 3 & 6)
ructural Wall for MLC (Bay 4&5)
ctural Wall for MLC (Bay 1-2)
of residual cantilever slab of AT6
le Cap + Structural Wall for MLC (Bay 3 & 6)
nd for DN1500 Concrete Pipe
for MLC (Bay 8&9)
for MLC (Bay 8-1 & 9)
ral Wall for MLC (Bay 8-1 & 9)
Cap + Structural Wall for MLC (Bay 8-2)
Vatertightness Test for MLC
Concrete Coating for MLC
Backfilling for MLC
ber
FF, WW & PE after diversion (RFI/43)
Pipework for Pipe Chamber @PST5
nnection to AT5 & AT6
Chamber
ort at Effluent Launder (PVO)
to PST5
Pipework for SDT3
for MLC
                         Revision
    Date
                                           Checked Approved
7FEB11
0NOV11
                  В
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8JAN13
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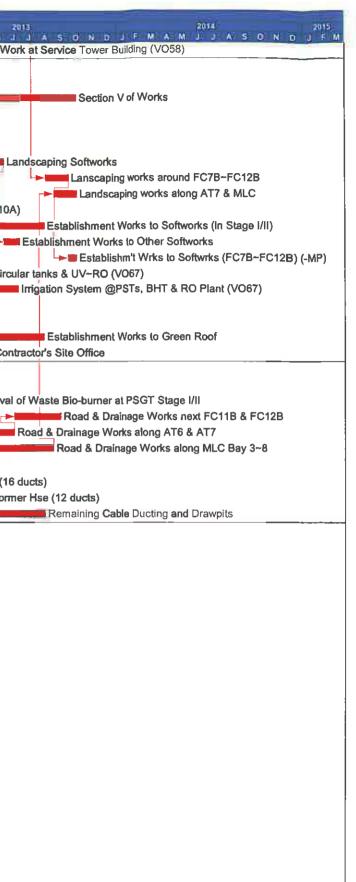
Act ID	Description	Orig Dur	Early Start	Early Finish	Total Float	2010 2011 2011 2012 FMAMJJASONOJEMAMJJASONDJEMAM
32080	DN1500 Air Main	90	08AUG11	15FEB13	-339d	DN1500 A
32090	Gas Pipe to Gas Transfer Station			28APR13	-1d	
32100	Gas Pipe connecting Gas Holder Tank			28APR13	-1d	Ga
	lait E. Wenty at Weltin	1 1				
	Removal of extg Control Room			07FEB13	-331d	Removal of
33020	Modi. of Chemical House for Switch Room (VO57)			05OCT12		Modi. of Chemical House
33030	Modi. of extg Flow Splitter Box Stage I (VO16)		28JAN13	28MAR13	-380d	Modi.
	Modi. of extg Flow Splitter Box Stage II (VO16)			23AUG13	-528d	
	Modification of extg Aeration Tank No. 4		2BJAN13	26FEB13	-350d	Modificat
	Modification of extg Aeration Tank No. 1~3	60	23SEP13	21NOV13	-618d	
	Modification of extg Effluent Launder Stage I	60 2	2BJAN13	28MAR13	-380d	Modifi
	Modification of extg Effluent Launder Stage II			23AUG13	-118d	
33080	Shelter for NaOCI Dosing System	60	23MAY13	21JUL13	-510d	
	Watertightness Test for NaOCI Dosing Shelter	15	22JUL13	05AUG13	-510d	
ection IV	of Works					
40010	Section IV of Works	005		0505040	40404	
				25DEC13	-1048d	
	Pre-drilling for Decanting Chamber (1 no)		CONTRACTOR OF CO	11MAY10		Pre-drilling for Decanting Chamber (1 no)
	Dismantling Extg Cantilever of PSGT (VO02)		and the second data and the se	02AUG10		Dismantling Extg Cantilever of PSGT (VO02)
	Minl-piling for Decanting Chamber (4 nos)		A ALL SALES AND A	130CT10		Minl-piling for Decanting Chamber (4 nos)
40050	Proof Drilling (2 nos)	28	190CT10	260CT10		Proof Drilling (2 nos)
41010	Execution for Description Chember	1 40/4	2200740	02101/40		The Evenuetion for Description Chamber
	Excavation for Decanting Chamber	+		03NOV10		Excavation for Decanting Chamber
	Pile Cap for Decanting Chamber			15DEC10		Pile Cap for Decanting Chamber
	Structural Wall for Decanting Chamber		16DEC10			Structural Wall for Decanting Chamber
	FRP Cover for Decanting Chamber	+ +-		170CT12		FRP Cover for Decantin
	Excavation for Chemical & Oil Store			19AUG10		Excavation for Chemical & Oil Store
41060	Base Slab for Chemical & Oil Store	20 2	20AUG10	13SEP10		Base Slab for Chemical & Oil Store
41070	Structural Wall for Chemical & Oil Store	40 1	4SEP10	01NOV10		Structural Wall for Chemical & Oil Store
	Top Slab for Chemical & Oil Store	20 2	25OCT10	01NOV10		Top Slab for Chemical & Oil Store
41090	Conc. Plinth at CHPG Stage I/II (VO64)	120 0	07FEB12	29JAN13	-718d	Conc. Plinth
41100	Conc. Plinth at Waste Burner (VO60)	120 0	07FEB12	260CT12		Conc. Plinth at Waste
42010	Removal of Chemical Waste Room	2013	23JUL10	24 11 10		Removal of Chemical Waste Room
	Removal of Flower Bed			2400E10		Removal of Flower Bed
	Removal of Waste Blo-gas Burner at Stage I/II			16FEB13	7064	Removal
	Removal of Chimney & Associated RC Structure		_		-796d	
			7FEB13		-796d	Removal of Storage Faciliti
	Removal of Storage Facilities		29AUG12			Water R
	Water Reclamation Facility for RO Plant (VO97)			07MAR13	-755d	
	Shelter for FeCl3 Dosing System		1NOV10			Shelter for FeCl3 Dosing System
	Rectification of Shelter for FeCl3 Dosing System			22JAN11		Rectification of Shelter for FeCl3 Dosing System
	Steelwork for FeCI3 Dosing Shelter		ODEC10			Steelwork for FeCl3 Dosing Shelter
	Watertightness Test for FeCI3 Dosing Shelter	+	4MAR11			Watertightness Test for FeCI3 Dosing Shelter
	Removal of FeCI3 Dosing System		4APR12			Removal of FeCI3 Dosing System
	Modifi of Central Blg Complex (VO43)		0NOV11		-1048d	
	Modification of SAS Thickening House (VO53)	120 1	40CT11	07FEB13	-727d	Modification
	Modi. of Primary Sludge Gravity Thickener (VO02)	60 2	2DEC10	12NOV12		Modi, of Primary Slut
42150	Modification of Filtrate Treatment Plant (VO33)	120 1	4JAN13	12MAY13	-821d	
12160	Modification of Chlorination House (VO18)	150 0	7NOV11	30JAN13	-719d	Modification
42170	Floor Opening at Service Tower Building (16 nos)	30 2	40CT11	310CT11		E Floor Opening at Service Tower Building (16 nos)
12180	Modi. of Genset Rm at Inlet Works (VO101)	90 0	2NOV12	13FEB13	-733d	Modi. of G
12190	Covered Walkway @ Sludge Dewatering House (VO94)	100 2	2DEC12	31MAR13	-779d	Cover
13010	Road & Drainage Works in Portion A	120 4	211110			Road & Drainage Works In Portion A
	Digit	1201	2JUL10			
4010	Additional Works for FeCI3 Dosing System	100 2	8APR11	10AUG11		Additional Works for FeCl3 Dosing System
rt date	29JAN10 Early bar					
sh date	25DEC13 Propress bar					
a date	18JAN13 Critical bar					TPSTW Stage 5 Phase 2B
a date pe numbe	20JAN13 Summary bar					
	ra Systems, Inc.					Master Program
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	witch Room (V	/057)							
· ·		Box Stage I (VO16)	`						
		xtg Flow Splitter Bo		(1/016)					
	extg Aeration	-	r otage i	1(1010)					
	T	Modification of extg	Aaration	Took No. 1	- 2				
		-		TORK NU. 1	-3				
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		OCI Dosing System		51 - ft					
	vvatertightno	ess Test for NaOCI	Dosing a						
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	IPG Stage I/II	(1004)							
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1	of Chimney &	Associated RC Stru	icture						
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eclam	ation Facility f	or RO Plant (VO97))						
		Modifi of Centra	l Bla Cor	nolex (VO4:	3)				
of S	AS Thickening	House (VO53)			- /				
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	dification of Filtrate Treatment Plant (VO33)								
	of Chlorination House (VO18)								
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Ac ID	Description	Orig Early Dur Start	Early Finish	Total Float	2010. FMAMJJASONDJEMAMJJASONDJEMAMJJASONDJEMA	A 14 3
4402	0 Additional Work at Service Tower Building (VO58)	20 18JAN13	06FEB13	-726d		
Section	V of Works					
Tip Hilds						
5001	0 Section V of Works	1185 29JAN10	140CT13	-170d		
5002	0 Tree Survey	60 08MAR10	09APR10		Tree Survey	
5003	0 Tree Transplanting & Felling Tree	90 22APR10	260CT10		Tree Transplanting & Felling Tree	
5004	0 Establishment Works to Transplanted Tree	365 03NOV10	02NOV11		Establishment Works to Transplanted Tree	
5005	0 Landscaping Softworks	650 21JUL10	27MAY13	-60d		La
5005	6 Lanscaping works around FC7B-FC12B	45 16AUG13	29SEP13	-171d		
5005	8 Landscaping works along AT7 & MLC	45 01SEP13	150CT13	-171d		
5006	0 Establishment Works to Softworks (FC1A-FC10A)	365 12MAR11	11MAR12		Establishment Works to Softworks (FC1A-	~FC10A
5006	5 Establishment Works to Softworks (in Stage I/II)	365 14AUG12	13AUG13	-108d		, page 1990 and 1990
5007	0 Establishment Works to Other Softworks	30 28MAY13	26JUN13	-60d		╞╞╢╝
5007	2 Establishm't Wrks to Softwrks (FC7B~FC12B) (-MP)	16 30SEP13	150CT13	-171d		
5008	0 Irrigation System @circular tanks & UV~RO (VO67)	120 2BJUL12	310CT12		Irrigation System	@circu
5008	5 Irrigation System @PSTs, BHT & RO Plant (VO67)	45 11MAY13	24JUN13	-58d		┶⋗∎
5009	Green Roof at Sludge Dewatering System	120 05JAN12	19MAR12		Green Roof at Sludge Dewatering System	a
5010	0 Green Roof at Transformer House	120 05JAN12	19MAR12		Green Roof at Transformer House	
5011	0 Establishment Works to Green Roof	365 14AUG12	13AUG13	-108d		
5012	0 Green Roof at Contractor's Site Office	20 28NOV12	17DEC12		Green Roof	at Cont
5101	1053	45 18MAY10	25AUG10		Diversion of DN600 Concrete Pipe	
5102	5.000 H II	60 18JAN13	18MAR13	40d		emoval
5103	Road & Drainage Works next FC11B & FC12B	90 17JUN13	14SEP13	-140d		
5104	A CONTRACTOR CONTRACTOR CONTRACTOR	120 17FEB13	16JUN13	-140d		
5104	5 Road & Drainage Works along MLC Bay 3~8	120 04MAY13	31AUG13	-171d		>
5105	Cable Ducting and Drawpits for FC11B & FC12B	20 16JUL11	14AUG11		Cable Ducting and Drawpits for FC11B & FC12B	
5107	Cable Ducting % CBC & Transformer Hse (16 ducts)	60 03NOV11	13APR12		Cable Ducting % CBC & Transformer H	•
5108	Cable Ducting % CBC & Transformer Hse (12 ducts)	60 01MAR12	24JUL12		Cable Ducting % CBC & Tra	ansform
5110	Remaining Cable Ducting and Drawpits	350 28MAY12	15AUG13	-110d		

TPSTW Stage 5 Phase 2B

Master Program



Date	Revision	Checked	Approved
)7FEB11	B	AA	ТКС
30NOV11	C	AA	TKC
23APR12	D	AA	TKC
IBJAN13	E	AA	ТКС

APPENDIX B MONITORING REQUIREMENTS

APPENDIX B – MONITORING REQUIREMENTS

Type of Monitoring	Parameter	Frequency	Duration	Location of Measurement
Noise ⁽¹⁾	L _{eq} (30 min.) (0700-1900 hrs. on normal weekdays)	Once per week	30 mins	• NM1 (Outside the corridor of 1/F of Government Staff Quarter)
	1-hour TSP	3 times every six days	1 hour	CAM1 (on flat roof of Government Staff Quarters)
Air	24-hour TSP	Once every six days	24 hours	 CAM2 (on ground within TPSTW and just next to the Printing Centre of Hung Hing Printing Centre) CAM3 (on ground within TPSTW and just next to Talcon Industrial Ltd.)
Landfill Gas	Methane (v/v) Carbon Dioxide (v/v) Oxygen (v/v)	2 times per day	N/A	The Locations where the excavation is 1m depth or more and within the 250m Consultation Zone of Shuen Wan Landfill • FC7B

APPENDIX C ACTION AND LIMIT LEVELS

APPENDIX C – Action and Limit Levels

1-Hour TSP

Location	Action Level, µg/m ³	Limit Level, µg/m ³	
CAM1	315		
CAM2	336	500	
CAM3	344		

24-Hour TSP

Location	Action Level, μg/m ³	Limit Level, µg/m ³
CAM1	171	
CAM2	177	260
CAM3	192	

Construction Noise

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

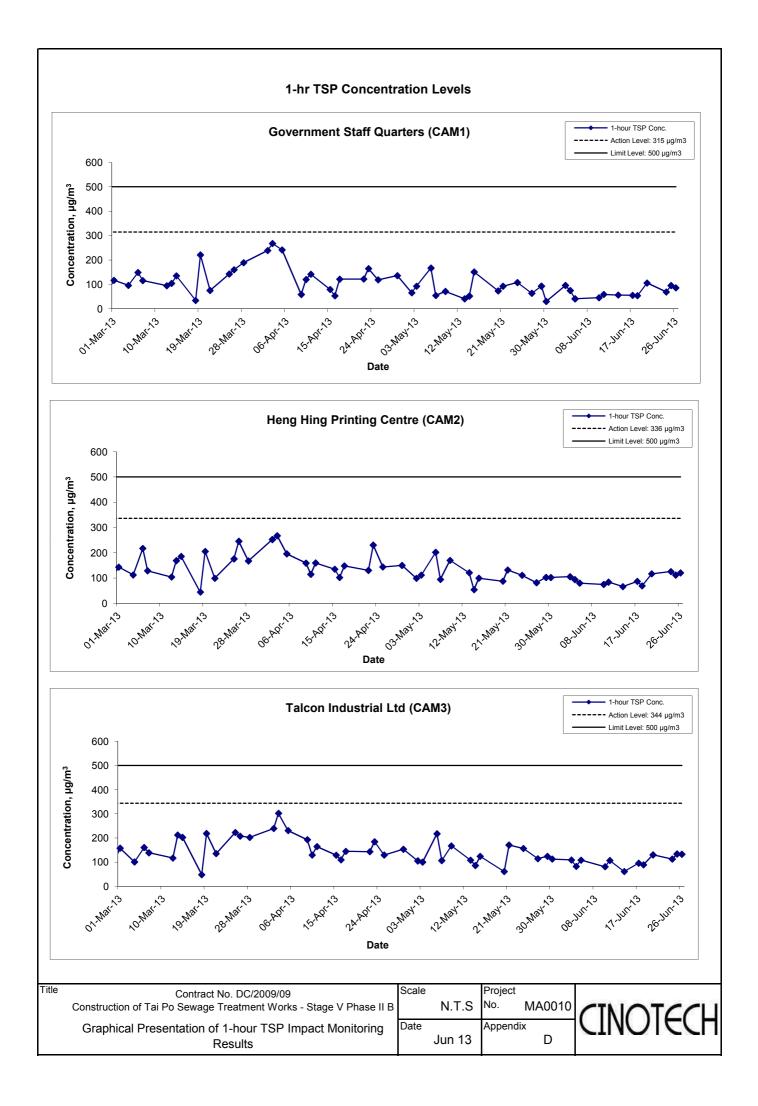
Notes:

* 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.

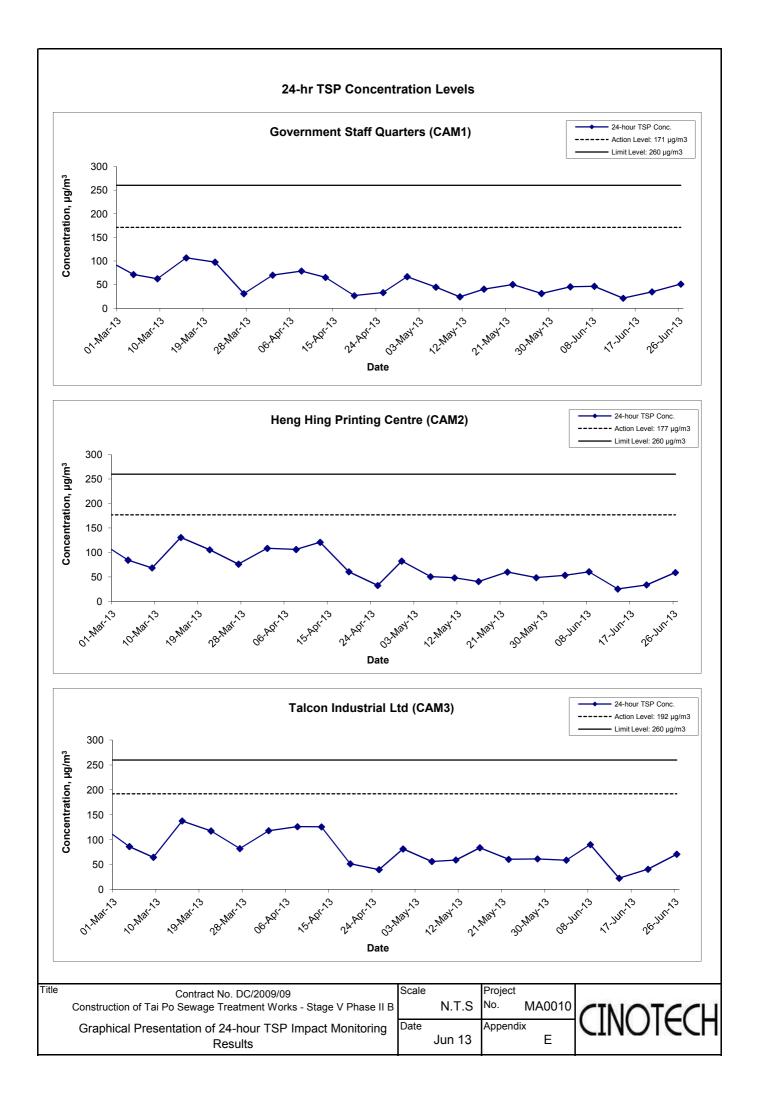
Landfill Gas

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

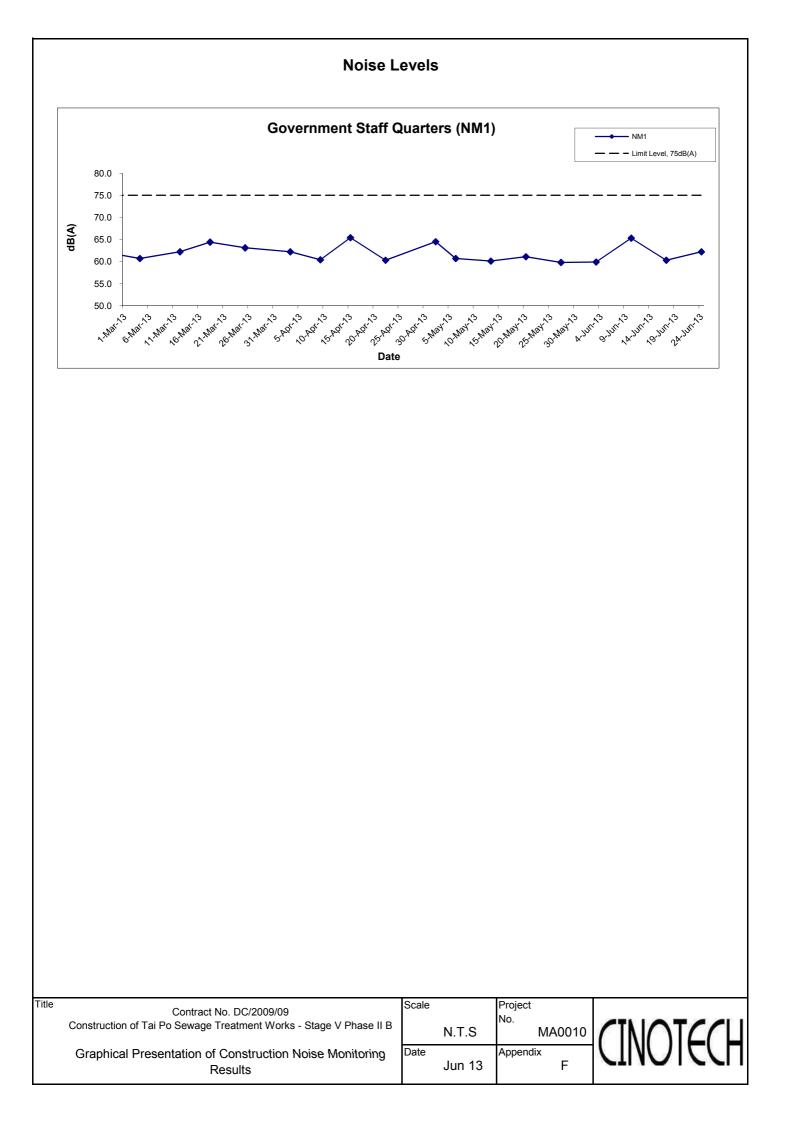
APPENDIX D GRAPHICAL PRESENTATION OF 1-HOUR TSP MONITORING RESULTS



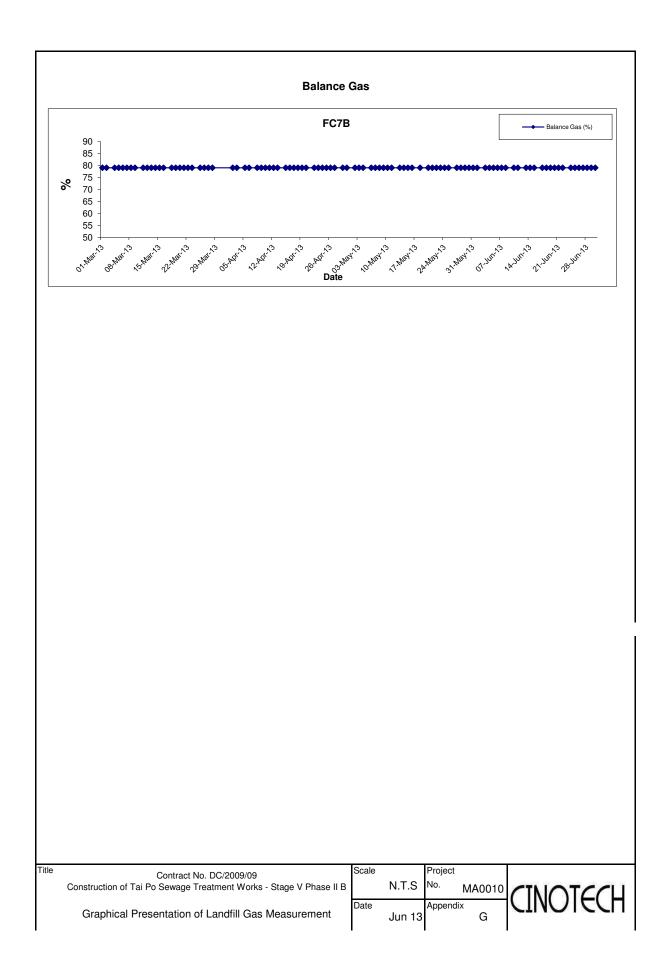
APPENDIX E GRAPHICAL PRESENTATION OF 24-HOUR TSP MONITORING RESULTS

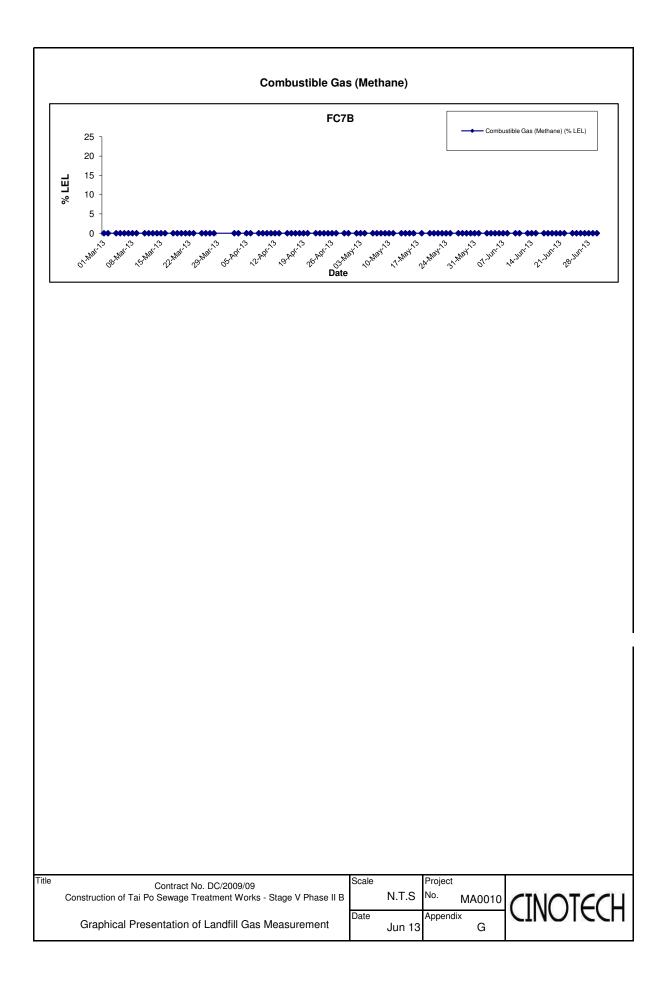


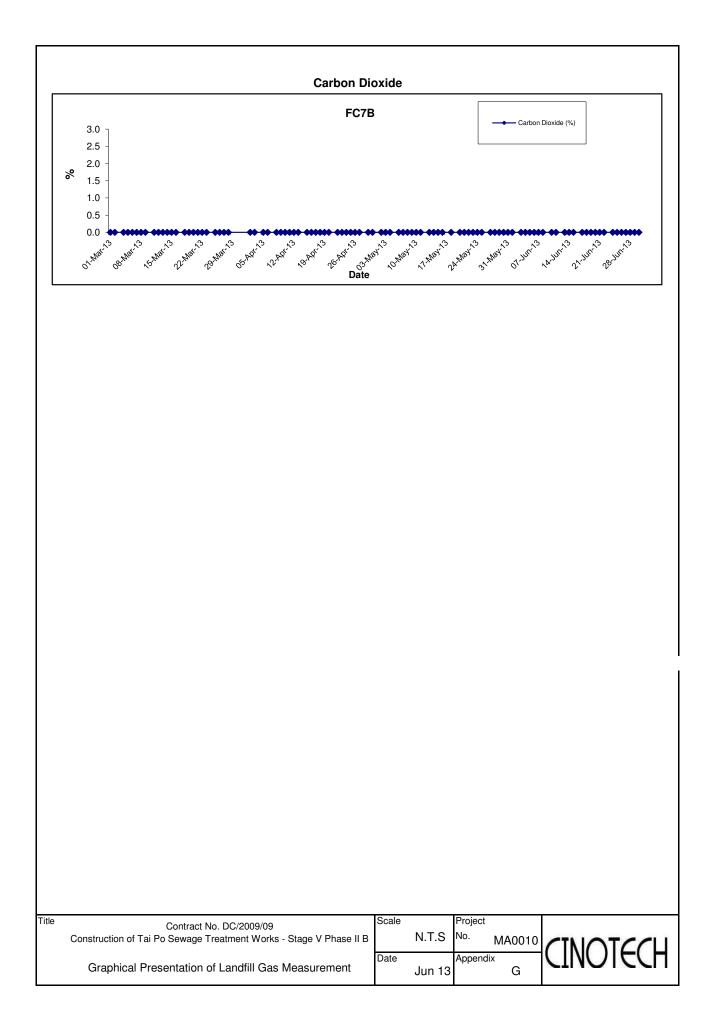
APPENDIX F GRAPHICAL PRESENTATION OF NOISE MONITORING RESULTS

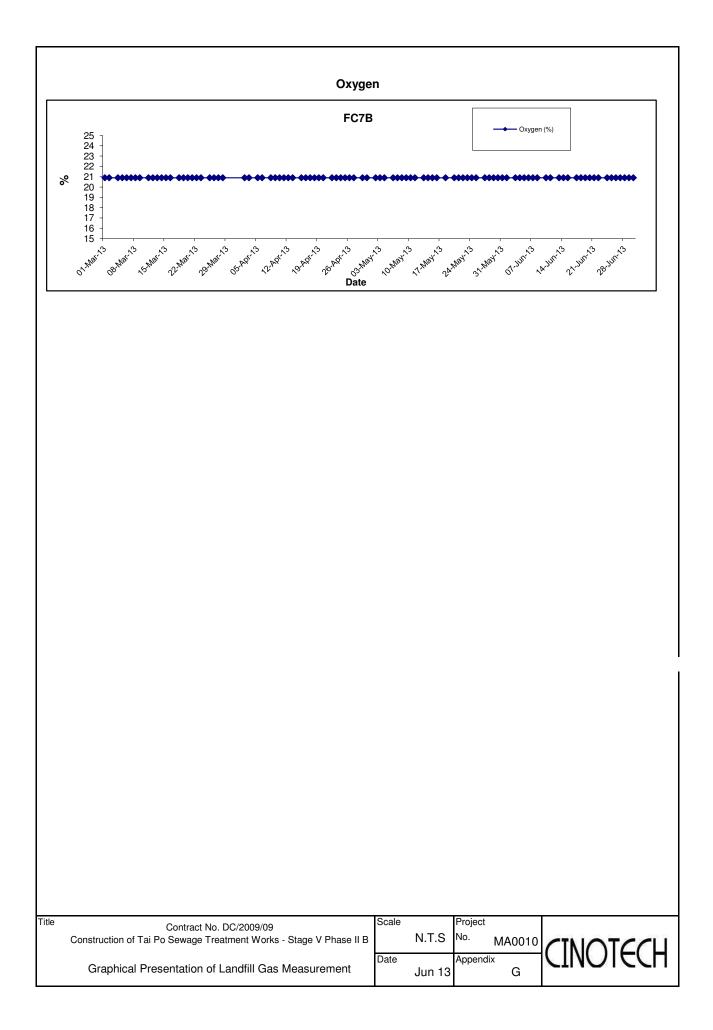


APPENDIX G GRAPHICAL PRESENTATION OF LANDFILL GAS MEASUREMENT BY THE CONTRACTOR









APPENDIX H UPDATED ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

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	V					
Noise	Use of quiet PME						
	 Good Site Practice 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.	V					
	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.	√					

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

Type of Impact	Recommended Mitigation Measures					
	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.	V				
	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.	V				
	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.	V				
	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.	V				
	 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: 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. 	V				
	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	 Good site practices during the construction activities include: □ 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. 	1
	 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: 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 	~
	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.	V
	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.	1

Type of Impact	Recommended Mitigation Measures					
	Bentonite Slurry 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.					
Landfill Gas Hazard	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.	V				
	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.	V				
	 Precautionary measures to minimize landfill gas hazard during excavation: 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 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 					
	 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: 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 	V				

Note: $\sqrt{-}$ Compliance of mitigation measures X - Non-compliance of mitigation measures N/A - Not applicable

APPENDIX I SUMMARY OF ENVIRONMENTAL LICENSING AND PERMIT STATUS

APPENDIX I – Summary of Environmental Licensing and Permit Status

Downit / Liconco No	Valid	Period	Details	Status	
Permit / License No.	From To		Details	Status	
Environmental Permi	it (EP)				
EP-265/2007	22/3/2007	N/A	 Expansion and upgrading of existing <u>Tai Po Sewage Treatment Works from</u> <u>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	
Consruction Noise Pe	· · · · · ·		1		
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.	Expired	
GW-RN0376-13	01/07/13	31/12/13	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: Water Control Zone: Tolo Harbour and Channel Discharge Points: Communal drain for the carriage of surface drainage water	Valid	
Waste Disposal (Cher	nical Waste)				
WPN : 5213-727-C2397-16	09/7/10	End of Project	Disposal of Chemical Waste including spent oil, lubricating oil, diesel oil and methanol, surplus paint, thinner	Valid	

APPENDIX J WASTE GENERATION IN THE REPORTING QUARTER 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)

	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
Month	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	0	0	0	0	0	0	0	0	0	0	0.02
June	0	0	0	0	0	0	0	0	0	0	0.01
Sub-total	4.910	0	0	0	4.910	0	0.8	0	0	0	0.07
July											
Aug											
Sept											
Oct											
Nov											
Dec											
Total											

Waste Flow Table

Notes: (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.

(2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

(3) Broken concrete for recycling into aggregates.

APPENDIX K SUMMARY OF EXCEEDANCE

APPENIDX K – SUMMARY OF EXCEEDANCE

- Reporting Period: April to June 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 L COMPLAINT LOG

APPENDIX L – COMPLAINT LOG

Reporting Period: April to June 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 period.