

PROJECT NO.: TCS/00512/09

## DSD CONTRACT NO. DC/2009/13 CONSTRUCTION OF SEWAGE TREATMENT WORKS AT YUNG SHUE WAN AND SOK KWU WAN

SOK KWU WAN PORTION AREA MONTHLY ENVIRONMENTAL MONITORING AND AUDIT (EM&A) REPORT (NO.11) – JUNE 2011

PREPARED FOR LEADER CIVIL ENGINEERING CORPORATION LIMITED

Quality Index			
Date	<b>Reference No.</b>	<b>Prepared By</b>	<b>Approved By</b>
18 July 2011	TCS00512/09/600/R0274v2	Anh	Am
		Nicola Hon Environmental Consultant	T.W. Tam Environmental Team Leader

Version	Date	Description
1	13 July 2011	First Submission
2	18 July 2011	Amended against IEC's comments on 15 July 2011

# **Scott Wilson CDM Joint Venture**

Chief Engineer/Harbour Area Treatment Scheme Your reference: Drainage Services Department 05117/6/16/378632 Our reference: 5/F Western Magistracy 2A Pok Fu Lam Road 21 July 2011 Date: Hong Kong BY FAX ONLY

Attention: Mr. C K Au

Dear Sirs.

Contract No. DC/2009/13 Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan Sok Kwu Wan Portion Area Monthly Environmental Monitoring and Audit (EM&A) Report No. 11 (Jun 2011)

We refer to the Monthly EM&A Monitoring Report No. 11 for June 2011 received under cover of the email from the Environmental Team, Action-United Environmental Services and Consulting (AUES), dated 21 July 2011. We do not have further comment and have verified the captioned report.

Yours faithfully SCOTT WILSON CDM JOINT VENTURE

Rodney Ip

ICWR/STKW/ecwc

Leader Civil Engineering CC AUES **ER/LAMMA** CDM

(Attn: Mr Vincent Chan) (Attn: Mr T.W. Tam) (Attn: Mr Neil Wong) (Attn: Mr Mark Sin)



## EXECUTIVE SUMMARY

ES.01. This is the 11<sup>th</sup> monthly EM&A Report for Sok Kwu Wan (hereinafter 'this Report') for the designated works under Environmental Permit No.EP-281/2007/A, covering a period from 1 to 30 June 2011 (hereinafter 'the Reporting Period') during the construction of relevant land works commencement on 27 July 2010.

#### **ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES**

ES.02. Environmental monitoring activities under the EM&A program in this Reporting Month are summarized in the following table.

Issues	Issues Environmental Monitoring Parameters / Inspection	
Air Quality	1-hour TSP	45
All Quality	24-hour TSP	10
Construction Noise	Leq (30min) Daytime	20
Water Quality	Marine Water Sampling	0
Inspection / Audit ET Regular Environmental Site Inspection		4

ES.03. According to the EM&A Manual of Sok Kwu Wan, water quality monitoring should be carried out during the marine work commencement. Since the marine work of outfall construction has not yet commenced, no impact water quality monitoring was undertaken in this reporting month.

#### **BREACH OF ACTION AND LIMIT (A/L) LEVELS**

ES.04. No exceedance of air quality and construction noise monitoring were recorded in this Reporting Month. No Notification of Exceedance (NOE) was, therefore, issued. The statistics of environmental exceedance, NOE issued and investigation of exceedance are summarized in the following table.

Environmental	Monitoring	Action	etion Limit evel Level	Event & Action		
Issues	Parameters	Level		NOE Issued	Investigation	Corrective Actions
Air Quality	1-hour TSP	0	0	0		
All Quality 24-hour TSP		0	0	0		
Construction Noise	Leq <sub>30min</sub> Daytime	0	0	0		
	DO	NA	NA	NA	NA	NA
Water Quality	Turbidity	NA	NA	NA	NA	NA
	SS	NA	NA	NA	NA	NA

*Note: NOE* – *Notification of Exceedance* 

## **ENVIRONMENTAL COMPLAINT**

ES.05. No written or verbal complaint was recorded in this Reporting Month. The statistics of environmental complaint are summarized in the following table.

Departing Deviad	<b>Environmental Complaint Statistics</b>			
Reporting Ferrod	Frequency	Cumulative	<b>Complaint Nature</b>	
27 July 2010 – 31 May 2011	0	0	NA	
1 – 30 June 2011	0	0	NA	

## NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.06. No environmental summons or successful prosecutions were recorded in this Reporting Month. The statistics of environmental complaint are summarized in the following tables.



Departing Daried	Environmental Summons Statistics			
Reporting Period	Frequency	Cumulative	<b>Complaint Nature</b>	
27 July 2010 – 31 May 2011	0	0	NA	
1 – 30 June 2011	0	0	NA	

Departing Deviad	Environmental Prosecution Statistics			
Reporting reriou	Frequency	Cumulative	<b>Complaint Nature</b>	
27 July 2010 – 31 May 2011	0	0	NA	
1 – 30 June 2011	0	0	NA	

#### **REPORTING CHANGE**

ES.07. There is no reporting change in this reporting month.

#### SITE INSPECTION BY EXTERNAL PARTIES

ES.08. No site inspection was undertaken by external parties i.e. EPD or AFCD within the Reporting Period.

#### **FUTURE KEY ISSUES**

- ES.09. During wet season, muddy water and other water quality pollutants via site surface water runoff into the sea body within Fish culture zone at Picnic Bay and the Secondary recreation contact subzone at Mo Tat Wan is the key issue of the Project. Mitigation measures for water quality should be properly maintained to prevent any muddy or sandy runoff from the loose soil surface overflow on the site boundary.
- ES.10. Moreover, special attention should be also paid on the dust mitigation measures to avoid fugitive dust emissions from loose soil surface or haul road. Mitigation measures implemented for control the surface runoff including wheel wash facilities, covering of the loose soil surface or stockpile with tarpaulin sheet, etc., should fully implement.
- ES.11. Baseline Water Quality Monitoring Report Volume 2 for Sok Kwu Wan (TCS00512/09/600/R0182v5) was revised against AFCD comments and re-submitted to EPD on 7 July 2011. In view of the work progress, the construction of marine outfall works is tentatively began in mid-July, therefore, the marine water quality monitoring will be carried out and reported in the coming month accordingly.



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## **1** INTRODUCTION

#### **PROJECT BACKGROUND**

- 1.01 The Leader Civil Engineering Corporation Limited (Leader) has been awarded the Contract DC/2009/13 Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwn Wan (the Project) by the Drainage Services Department (DSD) on 4 May 2010. The Project is part of an overall plan approved under a statutory EIA for Outlying Islands Sewerage Stage 1 Phase 2 Package J Sok Kwu Wan Sewage Collection and Treatment (Register No. AEIAR-075/2003) and Disposal Facilities and Outlying Islands Sewerage Stage 1 Phase 1 Package C Yung Shue Wan Sewage Treatment Works and Outfall (Register No. EIA-124/BC). The Environmental Permit No. EP-281/2007 and EP-282/2007 for the Project have been obtained by the DSD on 29 June 2007 for the relevant works. After July 2009, EP-281/2007/A stead EP-281/2007 is EP for Sok Kwu Wan relevant Works.
- 1.02 The Project involves construction of sewage treatment works at Sok Kwn Wan and Yung She Wan with a capacity of 1,430m<sup>3</sup>/day and 2,850m<sup>3</sup>/day respectively to provide secondary treatment, construction of 2 pumping stations at Sok Kwu Wan and 1 pumping station at Yung Shue Wan, construction of submarine outfall from the coastline and lying of underground sewerage pipeline. The site layout plan for the captioned work under the Project is showing in *Appendix A*
- 1.03 According to the Particular Specification (PS) and *Appendix 25* of the Project, Leader should establish an Environmental Team to implement the environmental monitoring and auditing works to fulfill the requirements as stipulated in the Environmental Monitoring and Audit (EM&A) Manual. This EM&A Manual is referred to the Appendix B of the Review Report on EIA Study Sok Kwu Wan (Final) in January 2007 (Agreement No. CE 20/2005(DS))."
- 1.04 Action-United Environmental Services and Consulting (AUES) has been commissioned by Leader as the ET to implement the relevant EM&A program. Organization chart of the Environmental Team for the Project is shown in *Appendix B*. For ease of reporting, the proposed EM&A programme for baseline and impact monitoring is spilt to following two stand-alone parts:
  - (a) Proposed EM&A Programme for Baseline and Impact Monitoring Sok Kwu Wan (under EP No. 281/2007/A varied on 23 September 2009)
  - (b) Proposed EM&A Programme for Baseline and Impact Monitoring Yung Shue Wan (under EP No. 282/2007)
- 1.05 According to the EM&A Manuals of Sok Kwu Wan and Yung Shue Wan, baseline water quality monitoring should be carried out for consecutive six months before the marine work commencement. Therefore, the baseline reports of Sok Kwu Wan and Yung Shue Wan are divided to two volumes i.e. the Volume 1 for air quality and noise monitoring; and the Volume II for water quality monitoring for separate submission.
- 1.06 There is a concurrent DSD contract "*DC*/2007/18 Yung Shue Wan and Sok Kwu Wan Village Sewerage, Stage 1 Works" undertaking at Sok Kwu Wan since April 2008 and the works are ongoing.
- 1.07 Consider that the construction works of DC/2007/18 and DC/2009/13 at Sok Kwu Wan is under the same Environmental Permit and EM&A Manual, so the performance criteria of air quality and construction noise at Sok Kwu Wan under the Project is recommended to adopt the Action/Limit Levels established by contract DC/2007/18. The Baseline Monitoring Report Volume 1 under the Project for air quality and noise at Sok Kwu Wan was submitted on 9 July 2010 and verified by IEC and for EPD endorsement before the relevant land works commencement on 27 July 2010.
- 1.08 This is the 11<sup>th</sup> monthly EM&A report Sok Kwu Wan Portion Area presenting the monitoring results and inspection findings for the reporting period from 1 to 30 June 2011.



#### **REPORT STRUCTURE**

- 1.09 The Monthly Environmental Monitoring and Audit (EM&A) Report Sok Kwu Wan is structured into the following sections:-
  - INTRODUCTION **SECTION 1 SECTION 2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS SECTION 3** SUMMARY OF MONITORING REQUIREMENTS **SECTION 4 AIR QUALITY MONITORING RESULTS CONSTRUCTION NOISE MONITORING RESULTS SECTION 5 SECTION 6** WATER QUALITY MONITORING RESULTS WASTE MANAGEMENT **SECTION 7** SITE INSPECTIONS **SECTION 8 SECTION 9 ENVIRONMENTAL COMPLAINTS AND NON-COMPLIANCE SECTION 10 IMPLEMENTATION STATUES OF MITIGATION MEASURES SECTION 11** IMPACT FORECAST **SECTION 12 CONCLUSIONS AND RECOMMENDATION**

#### 2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

#### **PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE**

2.01 Organization structure and contact details of relevant parties with respect to on-site environmental management are shown in *Appendix B*.

#### **CONSTRUCTION PROGRESS**

- 2.02 The master and three month rolling construction programs are enclosed in *Appendix C* and the major construction activities undertaken in this Reporting Month are listed below:-
  - Footpath Diversion adjacent to SKW Sewage Treatment Works
  - Construction for pumping station no.1 & 2
  - Construction of the rising main
  - Rock slope cutting works

#### SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.03 Summary of the relevant permits, licences, and/or notifications on environmental protection for this Project in this Reporting Month is presented in *Table 2-1*.

Table 2-1	<b>Status of Environmental Licenses and Permits</b>

Item	Description	License/Permit Status
1	Air pollution Control (Construction Dust)	Notified EPD on 19 May 2010
		Ref.: 317486
2	Chemical Waste Producer Registration	Issued on 8/6/2010
		WPN 5213-912-L2720-01
3	Water Pollution Control Ordinance	Approved on 29/9/2010
		Valid to: 30/09/2015
		Licence no.: WT00007567-2010
4	Billing Account for Disposal of Construction Waste	Issued on 26 May 2010
		A/C No: 7010815
5	Construction Noise Permit	Permit no. GW-RS044-11
		Valid from: 7 Feb 2011
		Until: 6 Aug 2011

- 2.04 The "Baseline/Impact Monitoring Methodology (TCS00512/09/600/R0010Ver.4)" was set out in accordance with the Sok Kwu Wan Environmental Monitoring and Audit Manual. It was approved by the ER and agreed with the Independent Environmental Checker (IEC) and submitted to the EPD on 8 July 2010.
- 2.05 Baseline Monitoring Report Volume 1 for Sok Kwu Wan (TCS00512/09/600/R0020Ver.3) was issued by the ETL and verified by the IEC on 12 July 2010. The report was also submitted to EPD on 12 July 2010.
- 2.06 Baseline Water Quality Monitoring Report Volume 2 for Sok Kwu Wan (TCS00512/09/600/R0182v5) was revised against AFCD comments and re-submitted to EPD on 7 July 2011.

#### **3** SUMMARY OF BASELINE MONITORING REQUIREMENTS

#### **ENVIRONMENTAL ASPECT**

- 3.01 The EM&A baseline monitoring program cover the following environmental issues:
  - Air quality;
  - Construction noise; and
  - Marine Water quality;
- 3.02 The ET implements the EM&A programme in accordance with the aforementioned requirements. Detailed air quality, construction noise and water quality of the EM&A program are presented in the following sub-sections.
- 3.03 A summary of the Air, Noise and Marine Water monitoring parameters is presented in *Table 3-1*:

# Table 3-1 Summary of the Air and Noise monitoring parameters of EM&A Requirements Requirements

<b>Environmental Issue</b>	Parameters
Air Quality	• 1-hour TSP Monitoring by Real-Time Portable Dust Meter; and
Air Quality	• 24-hour TSP Monitoring by High Volume Air Sampler.
Noice	• Leq (30min) during normal working hours; and
Noise	• Leq (15min) during Restricted Hours.
	In-situ Measurements
	• Dissolved Oxygen Concentration (mg/L);
	• Dissolved Oxygen Saturation (%);
	• Turbidity (NTU);
Morino Wotor Ovolity	• pH unit;
Marine water Quanty	• Salinity (ppt);
	• Water depth (m); and
	• Temperature (°C).
	Laboratory Analysis
	• Suspended Solids (mg/L)

#### MONITORING LOCATIONS

#### **Air Quality**

3.04 Three air monitoring stations: AM1, AM2 and AM3 were designated in the *EM&A Manual Section* 2.5. The detailed air monitoring stations is described in *Table 3-2* and graphical is shown in *Appendix D*.

Table 3-2Location of Air Quality Monitoring Station

Sensitive Receiver	Location
AM1	Squatter house in Chung Mei Village
AM2	Squatter house in Chung Mei Village
AM3	Football court

#### **Construction Noise**

3.05 According to *EM&A Manual Section 3.4* stipulations, there were four noise sensitive receivers (NM1-NM4) designated for the construction noise monitoring. NM1, NM2 and NM4 of the three designated monitoring stations were identified and are monitored by the current DSD contract DC/2007/18. However, the premises monitoring station NM3 was rejected by the owner of 1B Sok Kwu Wan and an alternative noise monitoring station RNM3 replacement was proposed by the contract DC/2007/18 ET and accepted by the IEC and EPD before the baseline monitoring commencement in April 2008. The location RNM3 is located at Sok Kwu Wan Sitting-out area which just 3m width footpath away from the original location house 1B. The detailed construction noise monitoring stations to also under the Project is described in *Table 3-3* and graphical is shown in *Appendix D*.



Table 3-3         Location of Construction Noise Monitoring Station	on
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Sensitive Receiver	Location
NM1	1, Chung Mei Village
NM2	20, Sok Kwu Wan
RNM3	Sok Kwu Wan Sitting-out Area
NM4	2-storey village house at Ta Shui Wan

#### **Water Quality**

3.06 Three control stations (C1-C3) and three impact stations (W1-W3) were recommended in the *EM&A Manual Section 4.5*. Impact stations W1-W3 identified at the sensitive receivers (FCZ and secondary contact recreation subzone) to monitor the impacts from the construction of the submarine outfall as well as the effluent discharge from the proposed STW on water quality. Three control stations: C1, C2 & C3 were specified at locations representative of the project site in its undisturbed condition and located at upstream and downstream of the works area. Detailed and co-ordnance of marine water quality monitoring stations is described in *Table 3-4* and the graphical is shown in *Appendix D* and would be performed for EM&A programme.

Station	Description	Co-ordnance		
Station	Description	Easting	Northing	
W1	Secondary recreation contact subzone at Mo Tat Wan	832 968	807 732	
W2	Fish culture zone at Picnic Bay	832 607	807 985	
W3	Fish culture zone at Picnic Bay	832 045	807 893	
C1 (flood)	Control Station	833 703	808 172	
C2	Control Station	831 467	807 747	
C3 (ebb)	Control Station	832 220	808 862	

Table 3-4Location of Marine Water Quality Monitoring Station

## MONITORING FREQUENCY AND PERIOD

3.07 The Impact monitoring carried out in the EM&A programme is basically in accordance with the requirements in *EM&A Manual Sections* 2.7, 3.6, 4.7 and 4.8. The monitoring requirements are listed as follows:

#### Air Quality Monitoring

Parameters:	1-hour TSP and 24-hour TSP.
Frequency:	Once in every six days for 24-hour TSP and three times in every six days for 1-hour TSP.
Duration:	Throughout the construction period.

#### Noise Monitoring

Parameters:	Leq (30min) & Leq (5min), L10 and L90.
	Leq (15min) & Leq (5min), L10 and L90 during the construction undertaken during Restricted Hours (19:00 to 07:00 hours next of normal working day and full day of public holiday and Sunday)
Frequency:	Once per week during 0700-1900 hours on normal weekdays. Restricted Hour monitoring should depend on conditions stipulated in Construction Noise Permit.
Duration:	Throughout the construction period.

## Marine Water Quality Monitoring

<u>Parameters</u>: Duplicate in-situ measurements: water depth, temperature, Dissolved Oxygen, pH, turbidity and salinity;

HOKLAS-accredited laboratory analysis: Suspended Solids

Frequency:	Three days a week, at mid ebb and mid flood tides. The interval between 2 set of monitoring will be more than 36 hours.				
<u>Sampling</u> Depth	(i.) Three depths: 1m below water surface, 1m above sea bottom and at mid-depth when the water depth exceeds 6m.				
	(ii.) If the water depth is between 3m and 6m, two depths: 1m below water surface and 1m above sea bottom.				
	(iii.) If the water depth is less than 3m, 1 sample at mid-depth is taken				
Duration:	During the course of marine works				

#### **Post-Construction Monitoring – Marine Water**

3.08 Upon the marine works (dredging and HDD pipe installation) completion, 4 weeks of post-construction monitoring would be undertaken in accordance with the *Section 4.8 of EM&A Manual*. The requirements of post-construction monitoring such as the parameter, frequency, location and sampling depth is same as the impact monitoring.

#### MONITORING EQUIPMENT

#### Air Quality Monitoring

3.09 The 24-hour and 1-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the *Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B.* If the ET proposes to use a direct reading dust meter to measure 1-hour TSP levels, it shall submit sufficient information to the IEC to approve. The filter paper of 24-hour TSP measurement shall be determined by HOKLAS accredited laboratory.

#### Noise Monitoring

3.10 Sound level meter in compliance with the *International Electrotechnical Commission Publications* 651: 1979 (*Type 1*) and 804: 1985 (*Type 1*) specifications shall be used for carrying out the noise monitoring. The sound level meter shall be checked using an acoustic calibrator. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m s-1.

## Water Quality Monitoring

- 3.11 **Dissolved Oxygen and Temperature Measuring Equipment** The instrument should be a portable and weatherproof dissolved oxygen (DO) measuring instrument complete with cable and sensor, and use a DC power source. The equipment should be capable of measuring as included a DO level in the range of 0 20mg L-1 and 0 200% saturation; and a temperature of 0 45 degree Celsius.
- 3.12 *pH Meter* The instrument shall consist of a potentiometer, a glass electrode, a reference electrode and a temperature-compensating device. It shall be readable to 0.1 pH in arrange of 0 to 14.
- 3.13 **Turbidity (NTU)** Measuring Equipment The instrument should be a portable and weatherproof turbidity measuring instrument using a DC power source. It should have a photoelectric sensor capable of measuring turbidity between 0 1000 NTU.
- 3.14 *Water Sampling Equipment* A water sampler should comprise a transparent PVC cylinder, with a capacity of not less than 2 litres, which can be effectively sealed with latex cups at both ends. The sampler should have a positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler is at the selected water depth.
- 3.15 *Water Depth Detector* A portable, battery-operated echo sounder should be used for the determination of water depth at each designated monitoring station. This unit can either be hand held or affixed to the bottom of the work boat.
- 3.16 *Salinity Measuring Equipment* A portable salinometer capable of measuring salinity in the range of 0 40 parts per thousand (ppt) should be provided for measuring salinity of the water at each

monitoring location.

- 3.17 *Sample Containers and Storage* Water samples for SS should be stored in high density polythene bottles with no preservative added, packed in ice (cooled to 4°C without being frozen).
- 3.18 *Monitoring Position Equipment* A hand-held or boat-fixed type digital Differential Global Positioning System (DGPS) with way point bearing indication and Radio Technical Commission for maritime (RTCM) Type 16 error message 'screen pop-up' facilities (for real-time auto-display of error messages and DGPS corrections from the Hong Kong Hydrographic Office), or other equipment instrument of similar accuracy, should be provided and used during marine water monitoring to ensure the monitoring vessel is at the correct location before taking measurements.
- 3.19 **Suspended Solids Analysis** Analysis of suspended solids shall be carried out in a HOKLAS or other international accredited laboratory.

## **EQUIPMENT CALIBRATION**

- 3.20 Calibration of the HVS is performed upon installation in accordance with the manufacturer's instruction using the NIST-certified standard calibrator (Tisch Calibration Kit Model TE-5025A). The calibration data are properly documented and the records are maintained by ET for future reference.
- 3.21 The 1-hour TSP meter was calibrated by the supplier prior to purchase. Zero response of the equipment was checked before and after each monitoring event. In-house calibration with the High Volume Sampler (HVS) in same condition was undertaken in yearly basis.
- 3.22 The sound level meter and calibrator are calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme at yearly basis.
- 3.23 The Water Quality Monitoring equipments such as Dissolved Oxygen meter, pH Meter, Turbidity Measuring Instrument and Salinometer, are calibrated by HOKLAS accredited laboratory of three month intervals.
- 3.24 All updated calibration certificates of the monitoring equipment used for the impact monitoring program in the Reporting Month would be attached in *Appendix E*.

#### METEOROLOGICAL INFORMATION

3.25 The meteorological information during the construction phase is obtained from the Wong Chuk Hang Station of the Hong Kong Observatory (HKO) due to it nearly the Project site.

#### DATA MANAGEMENT AND DATA QA/QC CONTROL

- 3.26 The impact monitoring data are handled by the ET's systematic data recording and management, which complies with in-house Quality Management System. Standard Field Data Sheets (FDS) are used in the impact monitoring program.
- 3.27 The monitoring data recorded in the equipment e.g. 1-hour TSP meter, noise meter and Multi-parameter Water Quality Monitoring System, are downloaded directly from the equipments at the end of each monitoring day. The downloaded monitoring data are input into a computerized database properly maintained by the ET. The laboratory results are input directly into the computerized database and QA/QC checked by personnel other than those who input the data. For monitoring activities require laboratory analysis, the local laboratory follows the QA/QC requirements as set out under the HOKLAS scheme for all laboratory testing.

#### DETERMINATION OF ACTION/LIMIT (A/L) LEVELS

3.28 According to the Sok Kwu Wan Environmental Monitoring and Audit Manual, the air quality, construction noise and marine water quality were set up, namely Action and Limit levels are listed in *Tables 3-5*, *3-6 and 3-7* as below.



#### Table 3-5Action and Limit Levels for Air Quality Monitoring

Monitoring Station	Action Lev	vel (µg/m <sup>3</sup> )	Limit Level (µg/m <sup>3</sup> )	
Monitol ing Station	1-hour	24-hour	1-hour	24-hour
AM1	343	173	500	260
AM2	331	175	500	260
AM3	353	191	500	260

## Action and Limit Levels for Construction Noise

Monitoring	Action Level	Limit Level		
Location	0700-1900 hours on normal weekdays			
NM1 NM2 RNM3 NM4	When one or more documented complaints are received	75 dB(A) of Leq(30min) during normal hours from 0700 to 1900 hours on normal weekdays, reduced to 70 dB(A) of Leq(30min) for schools and 65 dB(A) during school examination periods		

Table 3-7	Action and Limit Levels for Marine Water Quality Monito	ring
Iunice	Tetron und Emine Levels for murme muter Quanty monto	

Devemotor	Performance	Impact Station		
rarameter	Criteria	W1	W2	W3
DO Concentration (Surface and Middle)	Action Level	5.39	4.64	4.71
(mg/L)	Limit Level	5.29	4.56	4.54
DO Concentration (Bottom)	Action Level	N/A	3.60	3.37
(mg/L)	Limit Level	N/A	3.06	3.18
Turbidity (Depth-Average)	Action Level	4.39	4.84	6.48
(NTU)	Limit Level	6.06	5.99	6.71
Suspended Solids (Depth-Average)	Action Level	12.41	9.24	10.79
(mg/L)	Limit Level	12.68	11.28	12.25

3.29 Should non-compliance of the environmental quality criteria occurs, remedial actions will be triggered according to the Event and Action Plan enclosed in *Appendix F*.



## 4 IMPACT MONITORING RESULTS - AIR QUALITY

4.01 As informed by the Contractor, the construction of relevant land works at Sok Kwu Wan was commenced on 27 July 2010, therefore, the impact EM&A program was started as compliance with the contract Particular Specification, Sok Kwu Wan the EM&A Manual, and the EP. The air quality monitoring results shared with Contract DC/2007/18 are presented in the following sub-sections.

#### **Results of Air Quality Monitoring**

4.02 In this reporting period, **45 and 10** monitoring events were performed for 1-hour TSP and 24-hour TSP monitoring at the designated locations AM1, AM2 and AM3. The results for 24-hour and 1-hour TSP at AM1, AM2 and AM3 are summarized in *Tables 4-1, 4-2* and *4-3* respectively. The 24-hour TSP data are shown in *Appendix G*. Also, the graphical plots of 24-hour and 1-hour TSP are shown in *Appendix H*.

Table 4-1Summary of 24-hour and 1-hour TSP Monitoring Results – AM1

	24-hour			1-hour TSP	$(\mu g/m^3)$	
Date	TSP (µg/m <sup>3</sup> )	Date	Start Time	1 <sup>st</sup> hour measured	2 <sup>nd</sup> hour measured	3 <sup>rd</sup> hour measured
4-Jun-11	*	4-Jun-11	14:01	86	73	79
9-Jun-11	*	9-Jun-11	15:17	83	87	82
16-Jun-11	22	15-Jun-11	13:48	68	62	64
22-Jun-11	17	21-Jun-11	14:10	111	108	121
28-Jun-11	28	27-Jun-11	13:26	77	82	75
Average	22	Avera	ge	84		
(Range)	(17 – 28)	(Rang	(e)	(62 – 121)		

\*Sampling was unsuccessful due to power failure of HVS, details information could be referred to Section 4.04.

Table 4-2	Summary of 24-hour and 1-hour TSP Monitoring Results – AM	[2
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	24-hour			1-hour TSP	$(\mu g/m^3)$		
Date	TSP (µg/m <sup>3</sup> )	Date	Start Time	1 <sup>st</sup> hour measured	2 <sup>nd</sup> hour measured	3 <sup>rd</sup> hour measured	
4-Jun-11	*	4-Jun-11	14:14	77	85	81	
9-Jun-11	*	9-Jun-11	15:22	94	88	86	
16-Jun-11	50	15-Jun-11	13:53	72	66	61	
22-Jun-11	36	21-Jun-11	14:14	129	131	122	
28-Jun-11	27	27-Jun-11	13:30	86	92	88	
Average	38	Avera	ge	91			
(Range)	(27 –50)	(Rang	(e)	(61 – 131)			

\*Sampling was unsuccessful due to power failure of HVS, details information could be referred to Section 4.04.

Table 4-3	Summary of 24-hour and 1-hour T	<b>CSP Monitoring Results – AM3</b>
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	24-hour			1-hour TSP	$(\mu g/m^3)$		
Date	Date TSP (µg/m <sup>3</sup> )		Start Time	1 <sup>st</sup> hour measured	2 <sup>nd</sup> hour measured	3 <sup>rd</sup> hour measured	
4-Jun-11	*	4-Jun-11	14:39	91	84	85	
9-Jun-11	57	9-Jun-11	15:33	83	91	81	
16-Jun-11	44	15-Jun-11	14:08	86	99	78	
22-Jun-11	30	21-Jun-11	14:26	124	118	99	
28-Jun-11	58	27-Jun-11	13:45	78	80	87	
Average	47	Avera	ge		91		
(Range)	(30 - 58)	(Rang	(e)	(78–124)			

\*Sampling was unsuccessful due to power failure of HVS, details information could be referred to Section 4.04.

4.03 As shown in *Tables 4-1, 4-2* and *4-3*, 24-hour and 1-hour TSP results fluctuated well below the Action Level during the Reporting Period. No Notification of Exceedance (NOE) of 24-hour and



1-hour TSP air quality criteria or corrective action was therefore required.

- 4.04 Power failure of High Volume Sampler (HVS) at Locations AM1, AM2 was occurred on 4 and 9 June 2011 and at Location AM3 on 4 June 2011. As investigated by the Contractor and ET, the power failure was due to short circuit of the power supplier at Chung Mei House No.50. To avoid occurrence of power failure in the future, the Contractor has arranged new power source for the HVS. The monitoring work has resumed following the schedule when the power issue was restored.
- 4.05 The meteorological information during the impact monitoring days are summarized in *Appendix I*.

## 5 IMPACT MONITORING RESULTS – CONSTRUCTION NOISE

5.01 The noise monitoring results extracted from Contract DC/2007/18 are presented in the following sub-sections.

#### **Results of Construction Noise Monitoring**

5.02 In this monthly report period, **5** construction noise monitoring events were undertaken at designated location NM1, NM2, RNM3 and NM4. The results for Leq<sub>30min</sub> at NM1, NM2, RNM3 and NM3 are summarized in *Tables 5-1, 5-2, 5-3* and *5-4* respectively. Also, the graphical plots are shown in *Appendix H*.

 Table 5-1
 Summarized of Construction Noise Monitoring Results at NM1

Date	Start Time	End time	1 <sup>st</sup> Leq5	2 <sup>nd</sup> Leq5	3 <sup>rd</sup> Leq5	4 <sup>th</sup> Leq5	5 <sup>th</sup> Leq5	6 <sup>th</sup> Leq5	Leq30
4-Jun-11	14:09	14:39	42.7	51.2	50.6	52.8	51.7	47.4	50.4
9-Jun-11	14:13	14:43	50.0	49.5	46.1	48.5	51.2	49.5	49.4
15-Jun-11	13:52	14:22	49.8	50.2	52.3	51.8	54.3	54.2	52.4
21-Jun-11	14:18	14:48	51.2	52.9	51.1	53.7	50.7	53.8	52.4
27-Jun-11	13:38	14:08	48.2	49.5	50.2	53.3	47.8	48.2	50.0
Limit Le	evel in dH	B(A)	-					75	

Table 5-2Summarized of Construction Noise Monitoring Results at NM2

Date	Start Time	End time	1 <sup>st</sup> Leq5	2 <sup>nd</sup> Leq5	3 <sup>rd</sup> Leq5	4 <sup>th</sup> Leq5	5 <sup>th</sup> Leq5	6 <sup>th</sup> Leq5	Leq30
4-Jun-11	14:48	15:18	51.3	50.7	60.8	60.9	61.4	58.3	59.0
9-Jun-11	14:48	15:18	58.9	59.6	60.3	60.4	58.9	59.0	59.6
15-Jun-11	14:29	14:59	61.8	63.3	64.8	62.7	64.3	63.2	63.5
21-Jun-11	14:57	15:27	67.3	66.3	68.7	68.1	65.5	63.1	66.9
27-Jun-11	14:18	14:48	62.2	58.3	57.7	59.5	61.6	60.2	60.2
Limit Le	evel in dH	B(A)	-					75	

Table 5-3Summarized of Construction Noise Monitoring Results at RNM3

Date	Start Time	End time	1 <sup>st</sup> Leq5	2 <sup>nd</sup> Leq5	3 <sup>rd</sup> Leq5	4 <sup>th</sup> Leq5	5 <sup>th</sup> Leq5	6 <sup>th</sup> Leq5	Leq30	Corrected* Leq30
4-Jun-11	15:33	16:03	54.4	55.8	56.3	59.2	60.3	61.2	58.6	61.6
9-Jun-11	15:27	15:57	57.4	57.2	57.4	57.1	58.1	57.3	57.4	60.4
15-Jun-11	15:08	15:38	58.2	58.7	59.6	58.5	58.2	57.3	58.5	61.5
21-Jun-11	15:38	16:08	56.5	54.2	55.1	54.8	56.7	57.0	55.8	58.8
27-Jun-11	14:58	15:28	58.2	57.6	60.0	57.8	58.4	56.6	58.2	61.2
Limit Le	evel in dE	B(A)	-					75		

\* A façade correction of +3dB(A) has been added according to acoustical principles and EPD guidelines.

 Table 5-4
 Summarized of Construction Noise Monitoring Results at NM4

Date	Start Time	End time	1 <sup>st</sup> Leq5	2 <sup>nd</sup> Leq5	3 <sup>rd</sup> Leq5	4 <sup>th</sup> Leq5	5 <sup>th</sup> Leq5	6 <sup>th</sup> Leq5	Leq30
4-Jun-11	16:23	16:53	50.6	56.2	53.7	53.8	53.3	52.4	53.7
9-Jun-11	16:09	16:39	60.7	58.9	58.3	61.2	62.3	59.5	60.4
15-Jun-11	15:48	16:18	53.9	53.6	52.8	52.8	52.7	53.4	53.2
21-Jun-11	16:18	16:48	53.7	52.3	58.4	54.7	52.8	51.2	54.6
27-Jun-11	15:38	16:08	50.2	48.2	51.0	50.2	52.1	53.3	51.1
Limit Le	evel in dH	B(A)	-				75		

5.03 It was noted that no noise complaint (which is an Action Level exceedance) was received. In view of the results shown in *Tables 5-1, 5-2, 5-3 and 5-4* which were all below 75dB(A), no Action or Limit Level exceedance was triggered during this month.

## 6 IMPACT MONITORING RESULTS – WATER QULAITY

6.01 Since no construction of outfall marine works were carried out in the reporting period, no impact water quality monitoring was undertaken and no results are presented in this section.

## 7 ECOLOGY

- 7.01 According to Clause 3.7 and Figure 4 in the Environmental Permit No. EP-281/2007/A, a total of 12 numbers Celtis Timorensis (uncommon species) in Chung Mei at Sok Kwu Wan, are identified to require labeling, fencing and protection. Out of these, four numbers located in the Pumping Station No.1 area are required to be transplanted in advance of pumping station construction and the transplantation proposal has been submitted to EPD previously.
- 7.02 Regular inspection of the transplanted tree was carried out by the landscaping sub-Contractor (Melofield Nursery and Landscape Contractor Limited) after the transplantation. As informed by the Contractor, the inspection work was suspended in June 2011 after a full review of the uncommon species on 19 May 2011 but it has resumed in July 2011. As a contingency measure in case that CT7 to CT10 can no longer be recovered, additional 7 no. of Celtis Timorensis were planted adjacent to the under-monitoring Celtis Timorensis CT7 to CT10 on 30 April 2011. The full review report of transplanted and compensated trees was presented in *Appendix M of Monthly EM&A Report- May 2011*.

#### 8 WASTE MANAGEMENT

8.01 Waste management was carried out by an on-site Environmental Officer or an Environmental Supervisor from time to time.

#### **Records of Waste Quantities**

- 8.02 All types of waste arising from the construction work are classified into the following:
  - Construction & Demolition (C&D) Material;
  - Chemical Waste;
  - General Refuse; and
  - Excavated Soil.
- 8.03 The quantities of waste for disposal in this Reporting Period are summarized in *Table 7-1* and *7-2* and the Monthly Summary Waste Flow Table is shown in *Appendix J*. Whenever possible, materials were reused on-site as far as practicable.

#### Table 7-1 Summary of Quantities of Inert C&D Materials

Type of Waste	Quantity	Disposal Location
C&D Materials (Inert) ('000m <sup>3</sup> )	0.022	Sok Kwu Wan Transfer Facility
Reused in the Contract (Inert) ( $(000m^3)$ )	0.001	-
Reused in other Projects (Inert) ('000m <sup>3</sup> )	0.954	-
Disposal as Public Fill (Inert) ('000m <sup>3</sup> )	0	Sok Kwu Wan Transfer Facility

#### Table 7-2Summary of Quantities of C&D Wastes

Type of Waste	Quantity	Disposal Location
Metal (kg)	0	-
Paper / Cardboard Packing (kg)	0	-
Plastic (kg)	0	-
Chemical Wastes (kg)	0	-
General Refuses (tonne)	1.510	Sok Kwu Wan Transfer Facility

8.04 There was no site effluent discharged but the estimated volume of surface runoff was less than  $50m^3$  in this monthly period.

## 9 SITE INSPECTION

- 9.01 According to the Environmental Monitoring and Audit Manual, the environmental site inspection should been formulated by ET Leader. Regular environmental site inspections had been carried out by the ET to confirm the environmental performance. In this reporting period, site inspection was carried out on 9, 14, 21 and 29 June 2011 after the relevant land work commencement at Sok Kwu Wan Portion Area on 27 July 2010. Besides, routine joint-site visit by IEC, RE, Leader and ET was carried out on 9 June 2011.
- 9.02 The findings/ deficiencies that observed during the weekly site inspection are listed in *Table 8-1* and the relevant checklists are attached in **Appendix K**.

Date	Findings / Deficiencies	Follow-Up Status
9 June 2011	<ul> <li>The Contractor should clear the stagnant water in the trip tray to avoid mosquito breeding.</li> <li>Mud and soil was accumulated in the U-channel. The Contractor should clear the sediment regularly to maintain the de-silting function of the sand bag.</li> </ul>	The observation has been followed on 10 June 2011. The observation has been followed on 11 June 2011.
14 June 2011	<ul> <li>The Environmental Permit posted at the site entrances/exits was worn after rainstorm.</li> <li>Stagnant water cumulated in the un-used sediment tank shall be drained away to prevent mosquito breeding.</li> </ul>	The observations have been followed on 15 June 2011.
21 June 2011	• No environmental issue was observed during the site inspection.	N.A
29 June 2011	<ul> <li>The geotextile sheets in the sedimentation tanks at PS1 and PS2 should be replaced regularly to ensure the desilting function.</li> <li>Muddy runoff to the marine body was observed after heavy rainstorm, the Contractor is reminded to improve the drainage system to avoid overflow of muddy water especially in wet season.</li> </ul>	The geotextile sheets have been replaced on 5 July 2011. No muddy discharge to the marine body was observed 5 July 2011.

Table 8-1Site Observations

## 10 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

10.01 No environmental complaint, summons and prosecution was received in this reporting period. The statistical summary table of environmental complaint is presented in *Tables 9-1, 9-2* and *9-3*.

 Table 9-1
 Statistical Summary of Environmental Complaints

<b>D</b> oporting <b>D</b> oriod	Envir	Environmental Complaint Statistics					
Reporting Period	Frequency	Cumulative	<b>Complaint Nature</b>				
27 July 2010 – 31 May 2011	0	0	NA				
1 – 30 June 2011	0	0	NA				

#### Table 9-2 Statistical Summary of Environmental Summons

Departing Devied	<b>Environmental Summons Statistics</b>											
Reporting reriou	Frequency	Cumulative	<b>Complaint Nature</b>									
27 July 2010 – 31 May 2011	0	0	NA									
1 – 30 June 2011	0	0	NA									

#### Table 9-3 Statistical Summary of Environmental Prosecution

Departing Devied	<b>Environmental Prosecution Statistics</b>											
Reporting Period	Frequency	Cumulative	<b>Complaint Nature</b>									
27 July 2010 – 31 May 2011	0	0	NA									
1 – 30 June 2011	0	0	NA									

## 11 IMPLEMENTATION STATUS OF MITIGATION MEASURES

11.01 The environmental mitigation measures that recommended in the Sok Kwu Wan Environmental Monitoring and Audit Manual covered the issues of dust, noise, water and waste and they are summarized as following:

#### **Dust Mitigation Measure**

- 11.02 Installation of 2m high solid fences around the construction site of Pumping Station P2 is recommended. Implementation of the requirements stipulated in the Air Pollution Control (Construction Dust) Regulation and the following good site practices are recommended to control dust emission from the site:
  - (a) Stockpiles of imported material kept on site should be contained within hoardings, dampened and / or covered during dry and windy weather;
  - (b) Material stockpiled alongside trenches should be covered with tarpaulins whenever works are close to village houses;
  - (c) Water sprays should be used during the delivery and handling of cement, sands, aggregates and the like.
  - (d) Any vehicle used for moving sands, aggregates and construction waste shall have properly fitting side and tail boards. Materials should not be loaded to a level higher than the side and tail boards, and should be covered by a clean tarpaulin.

#### **Noise Mitigation Measure**

- 11.03 As detailed in the EIA report, concreting work of the Pumping Station P1a and sewer alignment construction activities would likely cause adverse noise impacts on some of the noise sensitive receivers. Appropriate mitigation measures have therefore been recommended. The mitigation measures recommended in the EIA report are summarised below:
  - (a) Use of quiet equipment for the construction activities of the Pumping Stations and sewer alignment;
  - (b) Use of temporary noise barrier around the site boundary of Pumping Station P1a;
  - (c) Use of kick ripper (saw and lift) method to replace the breaker for pavement removal during sewer alignment construction;
  - (d) Restriction on the number of plant during sewer alignment construction;
  - (e) Use of noise screening structures in the form of acoustic shed or movable barrier wherever practicable and feasible in areas with sufficient clearance and headroom during the construction of sewer alignment;
  - (f) Adoption of manual working method wherever practicable and feasible in areas where the worksites of the proposed sewer alignment are located less than 20m from the residential noise sensitive receivers and less than 30m from the temple and the public library; and
  - (g) Implementation of the following good site practices:
    - Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program.
    - Mobile plant, if any, should be sited as far away 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.
    - Material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities.

## Water Quality Mitigation Measure

11.04 No-dig method using Horizontal Directional Drilling (HDD) would be used for the installation of outfall pipe of about 480 m from shore to minimize the potential water quality impacts arising from the dredging works required for the submarine outfall construction. For the remaining outfall pipe of about 240m and the diffuser section, open trench dredging would still be required.

- 11.05 During the dredging works, the Contractor should be responsible for the design and implementation of the following mitigation measures.
  - Dredging should be undertaken using closed grab dredgers with a total production rate of 55m<sup>3</sup>/hr;
  - Deployment of 2-layer silt curtains with first layer enclosing the grab and the second layer at around 50, from the dredging area while dredging works are in progress;
  - all vessels should be sized such that adequate clearance (i.e. minimum clearance of 0.6m) is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash;
  - all pipe leakages should be repaired promptly and plant shall not be operated with leaking pipes;
  - excess material should be cleaned from the decks and exposed fittings of barges before the vessel is moved;
  - adequate freeboard (i.e. minimum of 200m) should be maintained on barges to ensure that decks are not washed by wave action;
  - all barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; and
  - loading of barges and hoppers should be controlled to prevent splashing of dredged material to the surrounding water, and barges and hoppers should not be filled to a level which would cause the overflow of materials or sediment laden water during loading or transportation; and
  - the decks of all vessels should be kept tidy and free of oil or other substances that might be accidentally or otherwise washed overboard.

## Construction Run-off and Drainage

- 11.06 The Contractor should observe and comply with the Water Pollution Control Ordinance and the subsidiary regulations. The Contractor should follow the practices, and be responsible for the design, construction, operation and maintenance of all the mitigation measures as specified in ProPECC PN 1/94 "Construction Site Drainage". The design of the mitigation measures should be submitted by the Contractor to the Engineer for approval. These mitigation measures should include the following practices to minimise site surface runoff and the chance of erosion, and also to retain and reduce any suspended solids prior to discharge:
  - Provision of perimeter channels to intercept storm-runoff from outside the site. These should be constructed in advance of site formation works and earthworks.
  - Works programmes should be designed to minimize works areas at any one time, thus minimising exposed soil areas and reducing the potential for increased siltation and runoff.
  - Sand/silt removal facilities such as sand traps, silt traps and sediment basins should be provided to remove the sand/silt particles from run-off. These facilities should be properly and regularly maintained. These facilities shall be carefully planned to ensure that they would be installed at appropriate locations to capture all surface water generated on site.
  - Careful programming of the works to minimise soil excavation works during rainy seasons.
  - Exposed soil surface should be protected by paving or hydroseeding as soon as possible to reduce the potential of soil erosion.
  - Trench excavation should be avoided in the wet season, and if necessary, these should be excavated and backfilled in short sections.
  - Open stockpiles of construction materials on site should be covered with tarpaulin or similar fabric.

## General Construction Activities

11.07 Debris and rubbish generated on-site should be collected, handled and disposed of properly to avoid entering the nearby coastal waters and stormwater drains. All fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. Open drainage channels and culverts near the works areas should be covered to block the entrance of large debris and refuse.

## Wastewater Arising from Workforce

11.08 Portable toilets shall be provided by the Contractors, where necessary, to handle sewage from the workforce. The Contractor shall also be responsible for waste disposal and maintenance practices

#### **Sediment Contamination Mitigation Measure**

- 11.09 The basic requirements and procedures for dredged mud disposal are specified under the WBTC No. 34/2002. The management of the dredging, use and disposal of marine mud is monitored by the MFC, while the licensing of marine dumping is the responsibility of the Director of Environmental Protection (DEP).
- 11.10 The uncontaminated dredged sediment will be loaded onto barges and transported to the designated marine disposal site. Appropriate dredging methods have been incorporated into the recommended water quality mitigation measures including the use of closed-grab dredgers and silt curtains. Category L sediment would be suitable for disposal at a gazetted open sea disposal ground.
- 11.11 During transportation and disposal of the dredged marine sediments, the following measures should be taken to minimize potential impacts on water quality:
  - Bottom opening of barges should be fitted with tight fitting seals to prevent leakage of material. Excess material should be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved.
  - Monitoring of the barge loading should be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels should be equipped with automatic self-monitoring devices as specified by the DEP.

#### **Construction Waste Mitigation Measure**

#### Good Site Practices and Waste Reduction Measures

- 11.12 It is not anticipated that adverse waste management related impacts would arise, provided that good site practices are strictly followed. Recommendations for good site practices for the construction waste arising include:
  - Nomination of an approved person, such as a site manager, to be responsible for the implementation of good site practices, arranging for collection and effective disposal to an appropriate facility, of all wastes generated at the site.
  - Training of site personnel in proper waste management and chemical handling procedures.
  - Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers.
  - Provision of sufficient waste disposal points and regular collection for disposal.
  - 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.
  - Maintain records of the quantities of wastes generated, recycled and disposed.
- 11.13 In order to monitor the disposal of C&D waste at landfills and to control fly tipping, a trip-ticket system should be included as one of the contractual requirements and implemented by an Environmental Team undertaking the Environmental Monitoring and Audit work. An Independent Environmental Checker should be responsible for auditing the results of the system.
- 11.14 Good management and control can prevent the generation of significant amount of waste. 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 aluminium cans by individual collectors, separate labelled bins should be provided to segregate this waste from other general refuse generated by the work force;
- any unused chemicals or those with remaining functional capacity should be recycled;
- use of reusable non-timber 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 should be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill;
- proper storage and site practices to minimise the potential for damage or contamination of construction materials; and
- plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.

## General Site Wastes

11.15 A collection area should be provided where waste can be stored prior to removal from site. An enclosed and covered area is preferred for the collection of the waste to reduce 'wind blow' of light material.

## Chemical Wastes

- 11.16 After use, chemical waste (eg. cleaning fluids, solvents, lubrication oil and fuel) should be handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Any unused chemicals or those with remaining functional capacity should be recycled. Spent chemicals should be properly stored on site within suitably designed containers, and should be collected by an approved operator for disposal at the Chemical Waste Treatment Facility or other licenced facility in accordance with the Waste Disposal (Chemical Waste) (General) Regulation under the Waste Disposal Ordinance.
- 11.17 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 leakages and spillage should only be undertaken with the areas appropriately equipped to control these discharges.

## Construction and Demolition Material

- 11.18 The C&D material should be separated on-site into three categories: (i) public fill, the inert portion of the C&D material (e.g. concrete and rubble), which should be re-used on-site or disposed of at a public filling area; (ii) C&D waste for re-use and/or recycling, the non-inert portion of the C&D material, (e.g. steel and other metals, wood, glass and plastic); (iii) C&D waste which cannot be re-used and/or recycled. The waste producers are responsible for its disposal at strategic landfills.
- 11.19 In order to minimise the impact resulting from collection and transportation of material for off-site disposal, it was recommended that inert material should be re-used on-site where possible. Prior to disposal of C&D material, it was also recommended that steel and other metals should be separated for re-use and/or recycling where practicable to minimise the quantity of waste to be disposed of to landfill.

## **Ecology Mitigation Measure**

## <u>Terrestrial Ecology</u>

- 11.20 The uncommon tree species should be labelled and probably fenced to avoid direct or indirect disturbance during construction. Works areas should avoid woodland habitats, in particular where these trees are located.
- 11.21 Construction and maintenance of site runoff control measures would be required at all work sites during construction. These should include barriers to direct runoff to sand/silt removal facilities (sand/silt/traps and/or sediment basins); minimisation of earthworks during rainy season (May to September); and coverage of sand/fill piles and exposed earth during storms.



11.22 Special attention should be paid during the breeding season of Romer's Tree Frog (March to September) to ensure their habitat landward to Pumping Station P2 site is well protected from site runoff. Barriers should be deployed completely along the landward side of the pumping station site boundary to prevent any site runoff from entering the tree frog habitat. Intactness of the barriers should be frequently inspected.

## Intertidal and Subtidal Ecology

- 11.23 Construction and maintenance of site runoff control measures would be required at all work sites during construction. These should include barriers to direct runoff to sand/silt removal facilities (sand/silt/traps and/or sediment basins); use of silt curtains along coastline; minimisation of earthworks during rainy season (May to September); and coverage of sand/fill piles and exposed earth during storms.
- 11.24 To reduce impacts of sediment resuspension upon nearby habitats and organisms during dredging, all dredging should be done using a closed-grab dredger, and silt curtains should be deployed around the dredger during all dredging activity

## **Fisheries Mitigation Measure**

11.25 Closed grab dredger, deployment of silt curtains around the immediate dredging area and low dredging rate have been recommended in Water Quality of the EIA report in order to minimise sediment release into the water column.

## Landscape & Visual Mitigation Measure

- 11.26 Mitigation measures recommended in the EIA Report for landscape and visual impacts during the construction stage are summarised below.
  - Screening of site construction works by use of hoarding that is appropriate to its site context;
  - Retaining existing trees and minimising damage to vegetation where possible by close co-ordination and on site alignment adjusted of rising main and gravity sewer pipelines. Tree protective measures should be implemented to ensure trees identified as to be retained are satisfactorily protected during the construction phase;
  - Careful and efficient transplanting of affected trees (1 no.) to temporary or final transplant location (the proposed tree to be transported is a semi-mature *Macaranga tanarius* and is located at the proposed Pumping Station P2 location);
  - Short excavation and immediate backfilling of sections upon completion of works to reduce active site area;
  - Conservation of top-soil for reuse.
  - Night-time light source from marine fleets should be directed away from the residential units
- 11.27 The implementation schedule of mitigation measures is presented in *Appendix L*.
- 11.28 Leader had been implementing the required environmental mitigation measures according to the Sok Kwu Wan Environmental Monitoring and Audit Manual subject to the site condition. Environmental mitigation measures generally implemented by Leader in this Reporting Month are summarized in *Table 10-1*.

Issues	Environmental Mitigation Measures
Water	• Drainage channels were provided to convey run-off into the treatment facilities;
Ouality	and
Zumity	<ul> <li>Drainage systems were regularly and adequately maintained.</li> </ul>
Air Quality	· Cover all excavated or stockpile of dusty material by impervious sheeting or
	sprayed with water to maintain the entire surface wet;
	<ul> <li>Public roads around the site entrance/exit had been kept clean and free from dust; and</li> </ul>
	<ul> <li>Tarpaulin covering of any dusty materials on a vehicle leaving the site.</li> </ul>

 Table 10-1
 Environmental Mitigation Measures



Issues	Environmental Mitigation Measures
Noise	<ul> <li>Good site practices to limit noise emissions at the sources;</li> </ul>
	• Use of quite plant and working methods;
	• Use of site hoarding or other mass materials as noise barrier to screen noise at
	ground level of NSRs; and
	• To minimize plant number use at the worksite.
Waste and	• Excavated material should be reused on site as far as possible to minimize off-site
Chemical	disposal. Scrap metals or abandoned equipment should be recycled if possible;
Management	• Waste arising should be kept to a minimum and be handled, transported and
Wanagement	disposed of in a suitable manner;
	• The Contractor should adopt a trip ticket system for the disposal of C&D
	materials to any designed public filling facility and/or landfill; and
	• Chemical waste shall be handled in accordance with the Code of Practice on the
	Packaging, Handling and Storage of Chemical Wastes.
General	The site was generally kept tidy and clean.



## **12 IMPACT FORECAST**

12.01 Key issues to be considered in the coming month include:

#### Water Quality

- Erect of sand bag in proper area to avoid any muddy surface runoff from the loose soil surface or haul road during the rainy days; and
- The accumulated stagnant water should be drained away.

#### Air Quality

- Vehicles shall be cleaned of mud and debris before leaving the site;
- Stockpile and loose soil surface shall be covered with tarpaulin sheet or other means to eliminate the fugitive dust;
- Water spaying on the dry haul road and exit/entrance of the site in regular basis is reminded; and
- Public roads around the site entrance/exit had been kept clean and free from dust.

#### Noise

- Works and equipment should be located to minimize noise nuisance from the nearest sensitive receiver; and
- Idle equipments should be either turned off or throttled down;

#### Waste and Chemical Management

- Housekeeping on site shall be improved;
- The Contractor is advised to fence off the construction waste at a designated area in order to maintain the tidiness of the site;
- Drip tray and proper label should be provided for all chemical containers.
- C&D waste should be disposed in regular basis.

#### **13 CONCLUSIONS AND RECOMMENDATIONS**

#### CONCLUSIONS

- 13.01 This is the 11<sup>th</sup> Monthly EM&A Report covering the construction period from 1 to 30 June 2011 (the Reporting Period).
- 13.02 No 1-hour TSP or 24-hr TSP monitoring results was found to be triggered the Action or Limit Level in this Reporting Period.
- 13.03 No noise complaint (an Action Level exceedance) was received and no construction noise measurement results that exceeded the Limit Level were recorded in this reporting month.
- 13.04 No impact water quality monitoring was undertaken in this reporting month.
- 13.05 No documented complaint, notification of summons or successful prosecution was received.
- 13.06 In this reporting period, site inspection was carried out on **9**, **14**, **21** and **29** June 2011 after the relevant land work commencement at Sok Kwu Wan Portion Area on 27 July 2010. Besides, routine joint-site visit by IEC, RE, Leader and ET was carried out on **9** June 2011. All the observation has been rectified during the next week site inspection. The environmental performance of the Project was therefore considered as satisfactory.

#### RECOMMENDATIONS

- 13.07 During wet season, muddy water and other water quality pollutants via site surface water runoff into the sea body within Fish culture zone at Picnic Bay and the Secondary recreation contact subzone at Mo Tat Wan is the key issue of the Project. Mitigation measures for water quality should be properly maintained to prevent any muddy or sandy runoff from the loose soil surface overflow on the site boundary.
- 13.08 Moreover, special attention should be also paid on the dust mitigation measures to avoid fugitive dust emissions from loose soil surface or haul road. Mitigation measures implemented for control the surface runoff including wheel wash facilities, covering of the loose soil surface or stockpile with tarpaulin sheet, etc., should fully implement.
- 13.09 Baseline Water Quality Monitoring Volume Sok Kwu Wan Report -2 for (TCS00512/09/600/R0182v5) was revised against AFCD comments and re-submitted to EPD on 7 July 2011. In view of the work progress, the construction of marine outfall works is tentatively began in mid-July, therefore, the marine water quality monitoring will be carried out and reported in the coming month accordingly.



## Appendix A

## Site Layout Plan – Sok Kwu Wan Portion Area







## Appendix B

## **Organization Structure and Contact Details of Relevant Parties**

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.			
DSD	Employer	Mr. AU Chi Kwong	-	-			
SCJV	Engineer's Representative	Mr. Neil Wong	2982 0240	2982 4129			
SCJV	Resident Engineer	Mr. Alfred Cheung	2982 0240	2982 4129			
Scott Wilson	Independent Environmental Checker	Mr. Rodney Ip	2410 3750	2428 9922			
Leader	Project Manager	Project Manager Mr. Wilfred So					
Leader	Site Agent/ Environmental Officer	Mr. Vincent Chan	2982 1750	2982 1163			
Leader	Section Engineer	Mr. Burgess Yip	2982 1750	2982 1163			
Leader	Safety Officer	Mr. Edwin Leung	2982 1750	2982 1163			
AUES	Environmental Team Leader	Mr. T. W. Tam	2959 6059	2959 6079			
AUES	Environmental Consultant	Ms. Nicola Hon	2959 6059	2959 6079			
AUES	Assistance Environmental Consultant	Mr. Ray Cheung	2959 6059	2959 6079			
AUES	Team Supervisor	Mr. Ben Tam	2959 6059	2959 6079			

## Contact Details of Key Personnel

**AUES** 

## Legend:

DSD (Employer) – Drainage Services Department

CDM (Engineer) – Scott Wilson CDM Joint Venture

Leader (Main Contractor) – Leader Civil Engineering Corporation Limited

Scott Wilson (IEC) – Scott Wilson Limited

AUES (ET) – Action-United Environmental Services & Consulting



# Appendix C

## A Master and Three Months Rolling Construction Programs

Activity	Description	Original F Duration C	Percent Ea omplete St	ly Early n Finish	Late Start	Late Finish	Total Float	Predecessors	Successors		MAY 20	ii ann i a	R I AUG	SEP OCT
Project Key D	ala	of Proceedings and				1								
KD0010	Receive Letter of Acceptance	0	100	05/05/10		05/05/10 A	1		KD0125		/			
KD0020	Project Commencement Date	0	100	17/05/10	1	17/05/10 A	1		EaM0010, EaM0070, EaM1001,	-				
KD0050	Section W3 - Ecoloath Diversion in Plo G (273d)	0	0	10/06/11		19/02/11*	-117d*	SKW0551	1020125			0-1		
Preliminary (0	Sivil)	1 9	91	Turuuri	-	Turber 1	1			6				
PRE0020	Pre-condition Survey	60	100 17/05/1	A 15/07/10	17/05/10 A	15/07/10 A	1	KD0020	1					
PRE0040	Erection of Engineer's Site Accommodation at YSW	60	100 17/05/1	A 15/07/10	17/05/10 A	15/07/10 A		KD0020						
PRE0050	Taking over the Secondary Engineer's Site Accomm	75	100 17/05/1	A 30/07/10	17/05/10 A	30/07/10 A		KI10020						
PRE0060	Application of Consent from Marine Department	60	100 17/05/1	A 15/07/10	17/05/10 A	15/07/10 A		KD0020						
PRE0090	Working Group Meeting for Outfall Construction	120	100 17/05/1	A 23/11/10	A 17/05/10 A	23/11/10 A		KE0020	SKW1151		-			
PRE0100	Application & Consent of XP from HyD (Mo Tat Rd)	120	100 17/05/1	A 13/10/10	17/05/10 A	13/10/10 A		KD0020	SKW1491, SKW1501					
PRE0130	Setup Web-site for EM&A Reporting	90	100 17/05/1	A 31/08/10	17/05/10 A	31/08/10 A	1	KD0020						
Preliminary (8	E&(M)			-	1000	1. A. A.	1.00	· ····································	and the second second					
Technical Subm	ission													
Process Design	nor SKWSTW& YSWSTW	1	and success	. Lassan	Louise a	Testerin A	1	Krann	ERMOND FRAMMIN FRAMMIN					
E&M0010	Stomission	38	100 17/05/1	A 23/06/10	17/05/10 A	23/06/10 A	-	EAMODIA	Estavit Estavit					
E8M0020	Vetting and Comment by ER	21	100 24/06/1	A 14/07/10	15/05/10 A	14/0//10 A	104	EAM0020	EAMOOR					
ESMORRO	Anarounal from the Englisher	125	0 06/06/1	19/06/11	13/07/10/1	30/06/11	120	E&M0030	E&M0205		1 6			
Hydraulic Desic	In Polyage includes and the second	1 141	0105/06/1	110/00/11	11/100/11	[ au/uo/11	I neu		1			1		
E8M0040	Submission	21	100 15/07/1	A 16/09/10	15/07/10 A	16/09/10 A	1	E&M0010, E&M0020	E&M0050, E&M0101, E&M0240,				1	
E&M0050	Vetting and Comment by ER	14	100 17/09/1	A 09/11/10	17/09/10 A	09/11/10 A		E61/0040	E&M0000				1	
E&M0050	Revision and Resubmission	97	90 19/08/1	A 09/05/11	19/08/10 A	27/06/11	18d	E&M00E0	E&M0430	1	11		i.	
E8M0430	Approval from the Engineer	7	50 29/03/1	A 13/06/11	29/03/11 A	30/06/11	18d	E&M0060	E&M0295				1	
Equipment Subr	nission & Approvel													
E&M0070	Submission of Membrane Module	50	100 17/05/1	A 05/07/10	17/05/10 A	05/07/10 A		KD0020	E&M0090				11	
E8M0090	Vetting and Comment by ER	14	100 06/07/1	A 19/07/10	06/07/10 A	19/07/10 A		E&M0070	E&M0100				11	
E8M0100	Revision and Resubmission	14	100 20/07/1	A 24/02/11	20/07/10 A	24/02/11 A	-	E8/10090	E8M0160				11	
E8M0101	Submission of Equipment	90	95 04/08/1	A 04/06/11	04/08/10 A	06/02/11	-118d	ESM0040	E5M0102			1	11	
E8M0102	Vetting and Comment by ER	60	90 18/11/1	A 10/06/11	18/11/10 A	12/02/11	-118d	Estiloren	ESMONS ESMAND ESMAND		11 - 1	the last	ii ii	
E8M0103	Revision and Resubmission	60	70 01/02/1	A 28/06/11	01/02/11 A	02/03/11	-118d	Estions	FAMORO		1		11	
E8M0110	Approval on Coarse Screens	30	50 25/05/1	A 13/07/11	25/05/11 A	01/04/11	-1030	Ea Mortos	E&M0400, E&M3060				- 11	
E8M0120	Approval on Filme Screens	30	0 28/06/1	28/07/11	03/02/11	28/03/11	-610	E&M0103	E&M0410, E&M3070			r - Interior	<b>—</b> 11	
E8M0140	Approval on Schmereible Mixere	30	100 23/03/1	A 23/03/11	23/03/11 A	23/03/11 A	-1100	E&M0108	EAM0420, EAM3080				- 11	
E8M0150	Approval on Grit Removal Equipment	30	0 28/06/1	28/07/11	29/04/11	28/05/11	-61d	E&M0103	E8M0360, E8M3030		1		<b></b> !!	
E8M0160	Approval on MBR Membrane Modules (M.M.)	105	100 02/08/1	A 24/02/11	02/08/10 A	24/02/11 A		E&M0100	E&M0350, E&M0370, E&M3010					
E8M0170	Approval on Sludge Dewatering Equipment	30	0 28/06/1	28/07/11	03/03/11	01/04/11	-118d	E&M0103	E&M0440, E&M3090		Th			
E&M0180	Approval on Valves, Pipes & Fitting s	30	0 28/06/1	28/07/11	28/06/11	27/07/11	- 1d	E&M0103	EAM0450, EAM3100			11	- 11	
E&M0190	Approval on Penstocks	30	0 28/06/1	28/07/11	11/06/11	10/07/11	-18d	EaMote	E8M0460, E8M3110			DIT II.		
E8M0200	Approval on Instrumentation	30	0 28/08/1	28/07/11	09/10/11	07/11/11	103d	E&M0103	E&M0470, E&M3130			1 THE	3 !!	
E8M0210	Approval on MCC & LVSB	30	0 28/06/1	28/07/11	03/03/11	01/04/11	-118d	ESM0103	EAMONED, EAMONED			1 LIU		
E&M0220	Approval on BS Equipment	30	0 30/06/1	29/07/11	31/07/11	29/08/11	31d	EAMOTOS, EAMORO	EAMONS EAMOND FAMOSON					(1
E&M0230	Approval on FS Equipment	30	0 30/07/1	28/08/11	01/06/11	30/05/11	-590	Easibility Comicou	Company administration					
Drawings Subm	Ission & Approval	I not	100 04000	A 100/00/10	LOUDGIAD A	00/00/10 4	1	E&M0010	T				1 11	
E8M0235	Sub, P&ID Drawings	100	100 24/05/1	A 22/08/10	04/09/10 A	22/08/10 A	.7d	E&M0040	EAM0250, EAM0280, EAM0290		111			
E8M0290	Sub, Plant GA Drawings	45	85 04/08/1	A 17/06/11	04/00/10 A	01/05/11	-154	E&M0240, E&M0260, EMM0270	E&M0260, E&M0290					
E8M0250	Sub Machanics Installation Drawings	60	75 27/09/1	A 14/06/11	27/09/10 A	30/05/11	-16d	E&M0040	E&M0250	1 million and the second se			i li li	
E&M0270	Sub Electrical Installation Drawings	60	75 27/09/1	A 14/06/11	27/09/10 A	30/05/11	-15d	E&M0010	EAM0250, ERM0280					
E&M0280	Sub, BS Installation Drawings	120	75 27/09/1	A 29/06/11	27/09/10 A	30/07/11	31d	E&M0240, E&M0250, E&M0270	E&M0220		111			
E&M0290	Sub. FS Installation Drawings	120	50 13/11/1	A 29/07/11	13/11/10 A	31/05/11	-59d	E6M0340, E8M0250	EAM0230		111	101-11-1		
Statutory Submit	selon					1000000			1					
E&M0295	Preparation of Submission to HEG	39	0 29/08/1	06/10/11	01/07/11	08/09/11	-59d	E6M0060, E8M0230, E6M0430	ESM0300					
E&M0300	Application & Approval from HEC	150	0 07/10/1	04/03/12	09/08/11	05/01/12	-59d	E&40295	E&M0035		Щ			and American
Starl date 05/0 Finish date 18/1 Data date 31/0 Run date 16/0 Page number 1A	5/10 Esrly bar 2/14 Propress bar 5/11 Critical bar 5/11 Progress bar 6/11 Progress point Critical point Critical point Summary point Summary point Summary point		C	Lea nstruction o 3-month Ro	der Civil E Contract f Sewage ling Progra	ngineering No. DC/200 Treatment <sup>v</sup> umme (Jun	Corp. 09/13 Works - 2011 -	Ltd. at YSW & SKW Aug 2011)	(Ma	Date 31/05/11	Re	Hausion Vision 0	StL	VC

	Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors		B I MAR	I APH	MAY 2	UII JUN	1		1G 5	IP III	рат
	E&M0320	Form 314 Submission to FSD	14	0	29/08/11	11/09/11	15/04/12	28/04/12	230d	E6M0230	E&M0325, E&M0070				TIT				-		-
1	E8M0325	Submission to WSD	14	0	12/09/11	25/09/11	29/04/12	12/05/12	230d	E8M0320	E&M0570. E&M0500								Lat		
	E&M0350	Form 501 Submission to FSD (PS1 & PS2)	28	0	09/10/11	05/11/11	18/01/14	14/02/14	832d	E8M2016								· · · · ·		12	-
Y	ung Shue W	an	-	-		Contraction of								-							
	Preliminary		-						-			1									
	YSW0020	Approval of Environmental Team	16	100	17/05/10 A	01/06/10 A	17/05/10 A	01/06/10 A		HC00020	YSW0030, YSW0010										
	YSW0030	Baseline monitoring (Air & Nolse)	14	100	31/07/10 A	07/09/10 A	31/07/10 A	07/09/10 A		YSW0020	YSW0120, YSW0152, YSW0500,										
	YSW0040	Baseline monitoring (Water)	213	100	30/07/10 A	31/12/10 A	30/07/10 A	31/12/10 A		Y5W0020	YSW 0050			******					17		- 1
	YSW0050	Erect Hoarding and Fencing	60	100	17/05/10 A	15/07/10 A	17/05/10 A	15/07/10 A											11		
	Section W1 - Sk	ppe Works in Portion A & C							-								TT		1-		
1	YSW0075	Mobilization	30	100	17/05/10 A	15/06/10 A	17/05/10 A	15/06/10 A		KD0020	YSW6100								1		
	YSW0080	Site Clearance	30	100	17/05/10 A	15/06/10 A	17/05/10 A	15/06/10 A	1221		YSW0065, YSW0120	1							1		
	YSW0085	Initial Survey	14	100	02/05/10 A	15/06/10 A	02/06/10 A	15/06/10 A		A2M0080	YSW0120								1		
	YSW0090	Verify the Rock Boulder required Stablization Wk	30	100	19/07/10 A	21/03/11 A	19/07/10 A	21/03/11 A			YSW0100, YSW0110	1	-	C				1	2		
	YSW0100	Removal of RockBoulder	280	85	20/09/10 A	31/07/11	20/09/10 A	15/08/11	15d	YSW0075, YSW0090	YSW0150									1.1	
	YSW0110	Stablizing work for rockboulder	280	0	20/06/11	25/03/12	09/11/10	15/08/11	-223d	YSW0090	VSW0150									-	
	YSW0120	Cut the slope to design prolile	100	100	13/09/10 A	14/09/10 A	13/09/10 A	14/09/10 A		YSW0030, YSW0060, YSW0085	YSW0131, YSW0165								i.		
	YSW0131	Mobilization of Plant and Material of Soll Nalls	20	100	01/09/10 A	14/09/10 A	01/09/10 A	14/09/10 A		YSW0120	YSW0132								2		
	Y5W0132	Erect Scattold and Working Platform	20	100	15/09/10 A	16/09/10 A	15/09/10 A	16/09/10 A		YSW0131	YSW0133								i		
	YSW0133	Setting out and Verify Locations of Soil Nails	10	100	14/09/10 A	31/10/10 A	14/09/10 A	31/10/10 A		A2M0135	Y5W0134								82		
	YSW0134	Drilling and Soll Nalls Installation	20	100	08/10/10 A	19/11/10 A	09/10/10 A	19/11/10 A		YSW0133	YSW0135								1 i		
	YSW0135	Construction of Nail Heads	10	100	24/11/10 A	01/12/10 A	24/11/10 A	01/12/10 A	1000	YSW0134	YSW013E								1		
	YSW0136	Mesh installation on Cut Slope	10	100	04/12/10 A	04/12/10 A	04/12/10 A	04/12/10 A		Y5W0135	YSW0137								i		
	YSW0137	Hydroseeding	30	0	31/05/11	29/06/11	10/04/11	09/05/11	-51d	Y5W0136	YSW0140				TTL				1		
	YSW0140	Construction of U-channels, Catch Pit on slope	120	90	02/04/11 A	11/07/11	02/04/11 A	21/05/11	-51d	YSW0137	YEW0150				111	1.0			ji -		
	YSW0165	Construction of Barrier Wall (below Ground Lev)	240	92	10/09/10 A	19/06/11	10/09/10 A	21/05/11	-28d	A2M0150	YSW0150, YSW0154, YSW0158								1	_	-
	Section W2 - YS	W STW & Submarine Outfall																	i.		
1	Civil & Structura	il Work																	1		
	YSW0412	Mobilization	30	100	17/05/10 A	15/06/10 A	17/05/10 A	15/06/10 A		KD0020	YSW0422								1		
	YSW0422	Site Clearance	30	100	17/05/10 A	15/06/10 A	17/05/10 A	15/06/10 A	1000	KD0020 YSW0412	YSW0432, YSW0600, YSW0610,			1					1		
	YSW0432	Initial Survey	14	100	02/06/10 A	15/06/10 A	02/06/10 A	15/06/10 A		Y8W9422	YSW0910				112				1	_	
	YSW STP - G	LH-T																	51		
	YSW0500	ELS & Excavation for Inlet Pumping Station	62	100	17/09/10 A	16/12/10 A	17/09/10 A	16/12/10 A		YSW0030, YSW0422	Y8W0510								11		
	YSW0510	Sub-structure construction (Inlet Pumping Stn)	30	100	17/12/10 A	04/04/11 A	17/12/10 A	04/04/11 A	1.011	YSW0432, YSW0500	YSW0520								111		
	YSW0520	Backfill & Remove ELS (Inlet Pumping Stn)	.30	100	03/01/11 A	05/05/11 A	03/01/11 A	05/05/11 A		YSW0510	YSW0530, YSW0610		I						2.1		
	YSW0530	ELS & Excavation for Equalization Tank	40	100	11/01/11 A	08/06/11 A	11/01/11 A	08/06/11 A		YSW0520	YSW0640								11		
	YSW0540	Sub-structure construction (Equalization Tank)	40	0	31/05/11	09/07/11	25/11/10	03/01/11	-187d	Y5W0530	YSW0550				114	-11	11		11		
	YSW0550	Backfilling & Remove ELS (Equalization Tank)	40	0	10/07/11	18/08/11	04/01/11	12/02/11	-187d	YSW0540	YSW(05/0						1 TH	d	111		
	YSW0570	Excavate to formation by open cut	30	0	19/08/11	17/09/11	13/02/11	14/03/11	-187d	YSW0560	YSWUSED				111 1				Li E		- 1
	YSW0580	Base slab construction	30	0	18/09/11	17/10/11	15/03/11	13/04/11	-187d	Y5W0670	Y5W0500									1	-
	YSW STP-G	LT-X	-		-	1				Walliama Walliama Kaupana	Lycial April 1								14		
H	YSW0610	Excavate to formation	50	100	08/09/10 A	17/09/10 A	08/09/10 A	17/09/10 A		YSW0030, YSW0422, YSW0520	Y8W0520								1.1		
	YSW0520	Base slab construction	60	100	18/09/10 A	23/05/11 A	18/09/10 A	23/05/11 A		10/0510	Velucin		1		III.				11		
	YSW0530	G/F to 1/F construction	95	85	27/12/10 A	14/06/11	27/12/10 A	08/05/11	-36d	TSW050	VSW00ID VSW0040		1		111	-			Li.		
	YSW0540	1/F to Roof Construction	91	0	14/06/11	13/09/11	09/05/11	07/08/11	-36d	131/030	CENTRE CANADA							- 1	1		_
	YSW0810	ABWF Installation	100	0	24/07/11	01/11/11	18/06/11	25/09/11	-36d	15170540	Condition Company Existing							1	1:11	1	-
	YSWSTP- G	LF - H & DN Tanks	-			1				Velucion Velucion	Livewood								11		
	YSW0550	ELS & Excavation for DN Tanks	72	100	21/08/10 A	14/10/10 A	21/08/10 A	14/10/10 A		Velución	VSW0570								11		
	YSW0560	Sub-struction construction (DN Tanks)	44	100	15/10/10 A	31/12/10 A	15/10/10 A	31/12/10 A		1500000	VSW0000	I IIII							1.1		
	YSW0670	Backfill & Remove ELS (DN Tanks)	32	100	08/01/11 A	15/03/11 A	08/01/11 A	15/03/11 A	_	734/000 VCIU2220	VSW0000		4						1.1		
	YSW0580	Base slab construction	30	100	28/03/11 A	28/03/11 A	28/03/11 A	28/03/11 A		Vewagea	VSW0700 VSW0020		E	1					15		
	YSW0590	Superstructure construction upto + 10.5mPD	ED	80	30/03/11 A	11/06/11	30/03/11 A	16/01/11	-146d	VEWACOD	VSW07ID								1.1		
	YSW0700	Apply protective paint	35	0	12/06/11	16/07/11	17/01/11	20/02/11	-1460	YSW0700	EAMOSTO, EAMOSTO, EAMOSTO								iii		
	YSW0710	Water test	30	0	17/07/11	15/08/11	21/02/11	22/03/11	-146d	Y5W000	ESMOSIO ESMOSOL ESMOSO								11		
	YSW0820	ABWF Installation	65	0	12/06/11	15/08/11	1//01/11	22/03/11	-1460	10.0000	the second second in					10	CIRCU.		1		_
Sta Fin Da Ru Par	rt date 05/0 ish date 18/1 la date 31/0 n date 16/0 ge number 2A Primavera Switer	5/10 Early tax 2/14 Programs tax 5/11 Critical tax Scrimacy bax Programs point Citical point Summary point Summary point Summary point			Consti 3-m	Leade ruction of t onth Rollin	er Civil En Contract N Sewage Ti ng Program	gineering lo. DC/200 reatment V nme (Jun	Corp. 9/13 Vorks : 2011 -	Ltd. at YSW & SKW Aug 2011)	(Ma	ked on 31 May 2	31/0	Date 5/11	Re	P evision 0	evision		Checke StL	d App VC	oved
		Elect marries paid																			
	Activity ID	Description	Original P Duration Co	ercent omplete	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors	JAN L T		B   M	y 2011	UN T DU		I BEP	007		
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	Fire Hose Re	el / Sprinkler Pump Rm																11			
	YSW0840	ELS & excavate to formation (+0 mPD approx)	30	0	13/09/11	13/10/11	01/09/11	30/09/11	-12d	YSW0030, YSW0422, YSW0840	Y5W0890			_111				11 -1			
	Road, Drain.	Gable Draw Pits & Duoling																			
	YSW0152	Temporary Diversion of Drainage	92	100	02/12/10 A	09/05/11 A	02/12/10 A	09/05/11 A	-	Y5W0030	YSW0163, YSW0154	15 million									
11	YSW0153	Removal of ExU-Channel where clash with B. Wall	50	100	20/11/10 A	20/04/11 A	20/11/10 A	20/04/11 A		YSW0152	YSW0154			1	TT						
	YSW0154	Construction of Subsoil Drain	90	0	19/06/11	17/09/11	08/10/11	05/01/12	111d	YSW0152, YSW0153, YSW0166	YSW0166			1-1-1			11				
	Suomarina Cutt		1 1			1	1	1	-		Lonuese			1111							
	YSW0180	Coordination of HEC	53	100	17/05/10 A	08/07/10 A	17/05/10 A	08/07/10 A			YSW0350			1111							
	YSW0200	Submission and Approval of Ecologist	60	100	17/05/10 A	15/07/10 A	17/05/10 A	15/07/10 A	-	CONTRACTOR OF CO	YSW0210			1111							
	YSW0210	Ecology Survey	90	100	16/07/10 A	11/02/11 A	16/07/10 A	11/02/11 A		73990200	VSW000										
	YSW0220	Submission and Approval of In. Hydro Survey	90	100	17/05/10 A	27/08/10 A	17/05/10 A	27/08/10 A	-	VSWazan	VSW050			1111							
	YSW0230	Motorial Schwiedler, American of UDDE size	45	100	17/08/10 A	31/01/11 A	31/08/10 A	31/01/11 A		Townso	VSW0250	- 1 - 1 -		- 111			( II				
	VSW0250	Submit and Ammand of Method Statement for LIDD	120	100	24/00/10 A	31/03/11 A	DAIDOTID A	ar/us/11 A		YSW0240	VSW0260, VSW0270, VSW0340	-	T GP								
110	YSW0260	Schmission of HDD Mathod Statement to HEC	14	100	26/01/11 A	24/02/11 0	24/05/10 A	20/03/11 A		YSW0250	YSW0320, YSW0340	1	LL				( II				
	YSW0270	Additional G.I. Boreboles (YSW)	62	100	05/11/10 A	19/01/11 A	05/11/10 A	19/01/11 A		Y5W0250	YSW0290, YSW0320										
	YSW0280	Submission of propose alignment to the Eng	14	100	02/02/11 A	04/03/11 A	02/02/11 A	04/03/11 A		Y5W0270	YSW0290, YSW0310, YSW0340	-		1111							
	YSW0290	Submission of Marine Notice	60	100	31/01/11 A	29/03/11 A	31/01/11 A	29/03/11 A		Y5W0260	YSW0350	196		111							
	YSW0310	Construction of Entry Pit and Preparation Work	39	100	15/03/11 A	31/03/11 A	15/03/11 A	31/03/11 A	1	YSW02E0	YSW0320, YSW0300										
	YSW0320	Prepare of HDD Drill Rig Set-up (YSW)	39	100	02/04/11 A	28/04/11 A	02/04/11 A	28/04/11 A		YSW0260, YSW0270, YSW0310	YSW0330, YSW0360		Luc						1		
	YSW0330	Establishment of HDD plant & equipment	14	100	09/04/11 A	14/04/11 A	09/04/11 A	14/04/11 A		YSW0310, YSW0320	YSW0340			at							
	YSW0340	Setting up at drillhole location	7	100	19/04/11 A	28/04/11 A	19/04/11 A	28/04/11 A	1	YSW0250, YSW0260, YSW0290,	Y\$W0350		1.		_						
	YSW0350	Drill pilot hole and rearning hole - NS400 - 530m	123	33	29/04/11 A	21/08/11	29/04/11 A	16/05/11	-65d	YSW0040, YSW0160, YSW0210,	YSW0360				-	1-1-1-1-11-1					
	E&M Works - Y	SWSTP																			
	E&M0360	Delivery of MBR Memb. Mod. (MBR Tk4)	150	0	31/05/11	27/10/11	24/10/10	22/03/11	-219d	E&M0163	E&M0510						11	1			
	E&M0370	Delivery of MBR Membrane Modules - 2nd Shipment	150	0	31/05/11	27/10/11	29/09/11	25/02/12	121d	E&M0160	EXM0320		1		-	1111111	-11	T			
	E&M0380	Delivery of Grit Removal Equipment	180	0	28/07/11	24/01/12	29/05/11	24/11/11	-61d	ESMOLO	E6M030			1111			- 11	1			
	E8M0390	Delivery of Coarse Screens	162	0	13/07/11	22/12/11	02/04/11	10/09/11	-103d	ESMOTO	Eshioso			1111				1			
	E8M0400	Delivery of Fine Screens	180	0	28/07/11	24/01/12	29/05/11	24/11/11	-610	EaMOISO	FAMOSTO	1-1-		-111			11	1			
	E8M0410	Delivery of Pumps	162	0	28/07/11	05/01/12	01/07/11	10/09/11	-1180	ESM0140	E&M0570			1111				1	_		
	E8M0440	Delivery of Studies and Englished Fouriers	150	0	28/07/11	24/01/12	02/04/11	08/12/11	30	E&M0170	E&M0560					THH	-9		-		
	E8M0450	Delivery of Values, Pipes & Fittings	180	0	28/07/11	24/01/12	28/07/11	23/01/12	-10	E8M0180	EXM0520 EXM0505			1111					-		
	E8M0450	Delivery of Penstocks	180	0	28/07/11	24/01/12	11/07/11	06/01/12	-18d	E&M0190	EAMORO			1111			-				
	E8M0470	Delivery of Instruments	180	0	28/07/11	24/01/12	08/11/11	05/05/12	103d	E5M0200	E&M0610			1111			-				
	E&M0480	Dalivery of MCC LVSB	177	0	28/07/11	21/01/12	02/04/11	25/09/11	-118d	E51/0210	E&M0020	1		1111			-1		-		
	E&M0490	Delivery of BS Equipment	180	0	30/07/11	25/01/12	30/08/11	25/02/12	31d	E8140230	E&M0830		0.0	1111							
	E&M0500	Delivery FS Equipment	180	0	29/08/11	24/02/12	27/09/11	24/03/12	29d	E8//0230	E6M0330. E6M0640						1	-1			
So	k Kwu Wan																				
P	eliminary											1		1111							
S	SKW0250	Approval of Environmental Team	16	100	17/05/10 A	01/06/10 A	17/05/10 A	01/06/10 A		KD0050	SKW0260			1111							
S	SKW0260	Baseline monitoring (Air & Noise)	14	100 (	02/06/10 A	15/06/10 A	02/05/10 A	15/06/10 A		SKW0250	SKW0242, SKW0582, SKW0681,	-									
Se	ection W3 - For	atpath Diversion in Portion G																			
	Civil & Geotechr	ilaal Warks																			
	SKW0240	Site Clearance	21	100	17/05/10 A	06/06/10 A	17/05/10 A	06/06/10 A			SKW0241			1111							
	SKW0241	Initial Survey	9	100 (	07/06/10 A	15/06/10 A	07/05/10 A	15/06/10 A		SKW0240	SKW(042			1111							
	SKW0242	Excavation to formation for Bay 1 to 5	57	100	16/06/10 A	11/08/10 A	16/06/10 A	11/08/10 A		Skyvuzen, Skyvuzeu	SNW (20)			1111							
	SKW0251	Drill & Install Dowel Bar for Bay 0 & 4	21	100 0	02/08/10 A	01/09/10 A	02/08/10 A	01/09/10 A		SIGWARST	Skiwali			1111							
	SKW0301	Erect Formwork, mesh & Weephole for Bay 0 & 2	14	100 0	12/09/10 A	15/09/10 A	102/09/10 A	15/09/10 A	-	SKW0001	SKW0021										
	SKW0311	Delition & install Dated Bay (or Dated & C	14	100	A 01/20/10	25/05/10 A	10/09/10 A	DS(ID(ID A		SK(W0311	SKW0031		1								
	SKOW0321	Freet Formund, much & waarhole for Bayd & F	7	100 0	07/10/10 A	13/10/10 A	07/10/10 A	13/10/10 A		SKW0321	SKW0041										
	SKW0341	Concreting for Bay 4 & 6	7	100	14/10/10 A	20/10/10 4	14/10/10 A	20/10/10 A		SK(¥0331	SKW0051										
	SKW0351	Excavation to formation for Bay 7 to 9	21	100	21/10/10 A	10/11/10 A	21/10/10 A	10/11/10 A		SKW0341	SKW0061	1									
	SKW0361	Erect Formwork mesh weephole for Bay 1, 3 & 5	6	100	11/11/10 A	16/11/10 A	11/11/10 A	16/11/10 A		SKW0351	SKW0871								_		
			-1										1			P. I.		and the			
Start	date 05/05	5/10 Early bar				No. D		6	-	6.0			Date		Bodeley	Hevision		SH V	paroved C		
TINS	date 18/12	Critical hay				Leade	er Civil Er	ngineering	Corp. 1	_td.			STUGET		1104(810)	1.9		with V	-		

Finish date 18/12/14 Data date 31/05/11	Critical bar	Leader Civil Engineering Corp. Ltd.	31/05/11	Hevision 0	SIL	VC
Run date 16/06/11 Page number 3A	A Prograss poid Ortical point	Construction of Sewage Treatment Works at YSW & SKW				
c Primavera Systems, Inc.	Summary point	3-month Rolling Programme (Jun 2011 - Aug 2011) (Marked on 31 May 2011)				

Non-the second set		Activity ID	Description	Original	Percent	Early Start	Early	Late	Late Finish	Total Float	Predecessors	Successors				2011		10 1 00	
		SKW0371	Concreting for Bay1, 3 & 5	7	100	17/11/10 A	23/11/10 A	17/11/10 A	23/11/10 A		5KW0361	SKW0301	- JAN   PO		TT DIAT				
		SKW0381	Replace of soft soct by rock fill for Bay 7 to 9	7	100	24/11/10 A	30/11/10 A	24/11/10 A	30/11/10 A	1	SKW0371	5KW0391						É.	
		SKW0391	Erect formwork, mesh & weephole for Bay 7 to 9	3	100	01/12/10 A	03/12/10 A	01/12/10 A	03/12/10 A		SKWaaa	SKW0401						R I	
		SKW0401	Concreting for Bay7 to 9	7	100	04/12/10 A	24/12/10 A	04/12/10 A	24/12/10 A		SKW(039)	SKW0461						í.	
Biological Academic Society Soc		SKW0461	Excavation for no fine concrete Bay (1-9)	7	100	25/12/10 A	31/12/10 A	25/12/10 A	31/12/10 A		5KW0401	SKW0471			1111			l.	
By 2000       Bucklindov Mille kave being       of       Bit		SKW0471	Concreting for no-fine concrete	7	100	01/02/11 A	07/02/11 A	01/02/11 A	07/02/11 A		SKW0461	SKW0481	6					í.	
		SKW0481	Installation of Wall tie & stone facing	14	100	08/02/11 A	21/02/11 A	08/02/11 A	21/02/11 A		SKW0471	SKW0/81	4					1	
Biological Participanti and Participante Partine Participanti and Participanti and Participanti and Pa		SKW0491	Construction of Gabion Wall	7	100	08/02/11 A	14/02/11 A	08/02/11 A	14/02/11 A		SKW0481	SKW0501						1	
Note:       Production:		SKW0501	Place Geotextile	3	100	08/01/11 A	28/02/11 A	08/01/11 A	28/02/11 A		SKW0491	SKW0511	-11					Ê. I	
Biologia       Biologia <td< td=""><td></td><td>SKW0511</td><td>Backfill behide the retaining wall to approx +4</td><td>7</td><td>100</td><td>11/01/11 A</td><td>28/02/11 A</td><td>11/01/11 A</td><td>28/02/11 A</td><td></td><td>SKW0501</td><td>SKW0001</td><td>-</td><td></td><td></td><td></td><td>111 1</td><td>1</td><td></td></td<>		SKW0511	Backfill behide the retaining wall to approx +4	7	100	11/01/11 A	28/02/11 A	11/01/11 A	28/02/11 A		SKW0501	SKW0001	-				111 1	1	
19.100000000000000000000000000000000000		SKW0521	Watermain Laying and Diversion	14	100	01/04/11 A	10/05/11 A	01/04/11 A	10/05/11 A		SKW0511	SKW0531		1				1	
1         0.00001         0.00		SKW0531	Concreting for Pavement	7	60	11/05/11 A	02/06/11	11/05/11 A	05/02/11	-117d	SKW0521	SRW0541					AL 1		1 1
Line Line Line Line Line Line Line Line		SKW0541	Installation of Flower Pot	7	0	02/06/11	09/06/11	06/02/11	12/02/11	-117d	5KW0531	SKW0551			-		AL 1	1	
Description         Description <thdescription< th=""> <thdescription< th=""></thdescription<></thdescription<>		SKW0551	Permanent Footpath Diversion	1	0	09/06/11	10/06/11	13/02/11	13/02/11	-117d	SKW0511	KU0050, SKW1251, SKW1311							_
Normality         Normality         Normality         Normality         Normality           0000000         Entry to find Revery to Rev         00         100         500010         Normality         Normality           000000         Entry to find Revery to Rev         00         100         200010         Normality         Normality           000000         Entry to find Revery to Rev         00         100         200010         Normality         <		Containded M	ope Works in Portions H & I															1	
Normal         100<		SKINDERR	Construct coeffection extense	1 10	1 100	AEINEINA	14407/10 4	Laganana	LANDINA		KDR020	SKW05PD					ill I	1	
Normal         Normal<		SKWU388	Construct scattoring access	30	100	15/05/10 A	14/07/10 A	15/05/10 A	14/07/10 A		SKW099	SKW/(Set					(III - I	1	
Normal         Discussion         Image of the second of th		SK1M0590	Initial Superview Steps	100	100	15/07/10 A	10/10 A	10/07/10/4	122/10/10 A		SKW0590	SRW0692					(H. 1	6	
Number 10         Description         00		SKW0591	Transversi Beridell (and star Eastanth	40	100	21/09/10 A	18/10/10 A	21/09/10 A	DC/DU/UA A		SKW0260, SKW0591	SKW0EA31							
No.2002         Opsitudior Unit         Opsitudior Unit <td></td> <td>SKIM05021</td> <td>Construction of Hand Road / To + 21mPD/</td> <td>43</td> <td>100</td> <td>19/10/10/A</td> <td>DE/UT/TT A</td> <td>20/11/10 A</td> <td>21/05/01/11 A</td> <td></td> <td>SKW0592</td> <td>SKW(6832</td> <td></td> <td>a second particular</td> <td>1111</td> <td></td> <td></td> <td></td> <td></td>		SKIM05021	Construction of Hand Road / To + 21mPD/	43	100	19/10/10/A	DE/UT/TT A	20/11/10 A	21/05/01/11 A		SKW0592	SKW(6832		a second particular	1111				
Number         Section of December (John December (John December )         Sol (John December )		Sk1M05032	Construction of Haul Road (To +211FD)	60	100	15/19/10 A	31/03/11	15/12/10 A	21/01/11 0		SKW05931	SKW06833			111				
Normal         Second         Second<		SK1M05032	Eventition of Rock Recents 50mPD to (2.5mPD)	20	100	01/02/11 A	03/05/11 6	01/02/11 A	02/05/11 A		\$KW06932	SKW06834		La II			ill 1	Ê.	
Normal         Section of the Section (Section 12 2001)         Section (Section 12 2001)         Section 2001         Section 300000           Section 2001		SkW05034	Excavation of Rock Bern (+42 5mPD to +35mPD)	30	100	04/05/11 A	31/05/11 A	04/05/11 A	31/05/11 A		SKW05933	SKW05835			Call		ill 1		
Normality         Normality         Normality         Normality         Normality           SW000000         Leadeduct (Mode Munc) (20/m10)         30         000/011         100001         100001         100001         100001         100001         10000000         10000000         10000000         10		SKOM05035	Excavation of Rock Barm (+12.5mPD to +25mPD)	30	100	31/05/11	20/06/11	20/02/11	21/03/11	-1004	\$KW05834	SKW(05836			Lp				
Security		SKW05936	Excavation of Book Berry (+27 5mPD to +20mPD)	30	0	30/08/11	29/07/11	22/03/11	20/04/11	-1004	SKW05835	SKW05837							
Second         Construction         State         Display		SKW05937	Excavation of Bock Berm (+20mPD to +125mPD)	30	0	30/07/11	28/08/11	21/04/11	20/05/11	-1004	SKW05835	SKW05938			111-1		Gime		
Several         Description         280         B 30.001         14.0012         201100         15.058         Protein           Several         No.01         Protein         15.050         100         1705/16.0         20000/16.0         2005/16.0         2005/16.0 <td></td> <td>SKW0594</td> <td>Read &amp; Drains Works</td> <td>248</td> <td>0</td> <td>31/05/11</td> <td>02/02/12</td> <td>11/12/10</td> <td>15/08/11</td> <td>-171d</td> <td>SKW05838</td> <td>KD0060</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>		SKW0594	Read & Drains Works	248	0	31/05/11	02/02/12	11/12/10	15/08/11	-171d	SKW05838	KD0060							
Section Wite PE-Bs No. 1h Portion D           GRUE Generative Wivels           SW0050         Bite Oleannes         7         100         200/01A         <		SKW0595	Bock Meshing & Bockal) Fence	250	0	31/05/11	14/02/12	29/11/10	15/08/11	-183d	SKW05838	KD0060							
Circle Conversion	S	ection W 5 - P.S	. No. 1 in Portion D				1		1										
SW00561       Sile Clearance       7       1001       100514.0       100540.0       200510.0       100540.0       200510.0       100540.0       200510.0       100540.0       200511.0       20051.0       20051.		CIVII & Geotechr	nical Works																
SV0052       Initial Sarvey       7       toto 2,00570.0       200570.0		SKW0651	Site Clearance	7	100	17/05/10 A	23/05/10 A	17/05/10 A	23/05/10 A		KD0020	SKW0652							
SVM0261       Transplantator for uncommon updation       30       100 310,071.0       200,071.1       200,071.1		SKW0652	Initial Survey	7	100	24/05/10 A	30/05/10 A	24/05/10 A	30/05/10 A		SKW0651	SKW0681, SKW0681							
SW0001       Exacute to lower the working gatterm is 13mPD       48       100       100010.4       170010.4       100010.4       170010.4       100010.4       170010.4       1000011.4       100010.4 <t< td=""><td></td><td>SKW0661</td><td>Transplantation for uncommon veg atation</td><td>30</td><td>100</td><td>31/05/10 A</td><td>29/06/10 A</td><td>31/05/10 A</td><td>29/06/10 A</td><td></td><td>SKW0652</td><td>SKW0681</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>		SKW0661	Transplantation for uncommon veg atation	30	100	31/05/10 A	29/06/10 A	31/05/10 A	29/06/10 A		SKW0652	SKW0681							
SW0061       ELS to 2.2 mPD       40       100       1808/10.4       2000/10.4       2000/10.4       2000/10.4       2000/10.4       2000/10.4       2000/10.4       2000/10.4       2000/10.4       2000/10.4       2000/10.4       2000/10.4       2000/10.4       2000/10.4       2000/10.4       2000/11.4       1		SKW0681	Excavate to lower the working platform to +3mPD	49	100	30/06/10 A	17/08/10 A	30/06/10 A	17/08/10 A		SKW0260, SKW0652, SKW0681	SKW0EET							
SM0021         Excusted to fermation         Q2         1001/1700/10A         S1000/11A         DATABLE         DATABLE           SM0021         Base Slab (SSD2 & BSD3)         15         20204/11A         1100/11         -161d         SM0021         <		SKW0691	ELS to + 2.2mPD	40	100	18/08/10 A	26/09/10 A	18/08/10 A	26/09/10 A		SKW0681	EKW0/21					1 I		
Structure wone         Structure wone         Structure wone         Structure wone         Structure wone           Structure wone		SKW0721	Excavate to formation	92	100	17/09/10 A	31/03/11 A	17/09/10 A	31/03/11 A		BRWUBBI	SKW0/41		- Long					
SNV0741         Base Stable (Sb2 2 BS03)         15         20         200411.1         100/011         -1610         Exercision           SNV0751         Base Stable (Sb2 2 BS03)         15         20         200411.1         200/011         -1610         Exercision		Structural Works		1			Lunau		Laura III	1041	SKW6231	L SKW0751							
SN00251       Wall & Column (CA1-3; CD1-3; QD1-3; QD2-3; QD1-2; QD2-1; QD2		SKW0741	Base Slab (BSD2 & BSD3)	15	20	20/04/11 A	11/06/11	20/04/11 A	01/01/11	-161d	SION0241	SKW0781		-	1111				
Str.W0261         Hate Statu (SSU1) for 338         14         0         240/211         -1610         Str.W1271         Str		SKW0751	Wall & Column (CA1-3,CB1-3,CC1-3, CD1-2) Approx.	14	0	11/06/11	24/06/11	01/01/11	14/01/11	-161d	SKWIM	SKW0771				III			
SMW071         Walk a Column (CAR-3001-300-13)         Initial Column (CAR-3001-300-13)		SKW0/61	Base Stab (BSU1) to +3.98	14	0	24/06/11	07/07/11	14/01/11	27/01/11	-1610	SKW0751	SKW0781				4			
Bit         Strikurgen         Hi         Coupling         Coupling         Strikurgen         Strikurgen           SKW0701         Base Sald (2501-30501-76)         14         0         Coupling         1616         SkW0711         <		SKW0771	Wall & Column (CA1-3,CB1-3,CC1-3, CD1-2) to +6.3	14	0	07/07/11	20/07/11	27/01/11	09/02/11	-1610	SKW0771	SKW0/91							
Bit With 2         Desk Volume		SKW0/81	Dase Stab (GSD1-3,GSG1-0,GSD1-2)	14	0	02/08/11	15/08/11	22/02/11	07/03/11	-1614	SKW0781	SKWoeat					-	1	
Network         Network         Network         Network         Network         Network           SkW0081         Goud Bears & Parapet         14         0         2508/11         040/11         1/16/16         SkW081         SkW081 <t< td=""><td></td><td>SKW0201</td><td>Wall &amp; Column (CE1.3, CE1.3)</td><td>14</td><td>0</td><td>15/08/11</td><td>28/08/11</td><td>07/03/11</td><td>20/03/11</td><td>-1610</td><td>5KW0791</td><td>SKW0811</td><td></td><td></td><td></td><td></td><td>5</td><td></td><td></td></t<>		SKW0201	Wall & Column (CE1.3, CE1.3)	14	0	15/08/11	28/08/11	07/03/11	20/03/11	-1610	5KW0791	SKW0811					5		
Skv00art         Bolt data         Deskt data		SKW0811	Ground Beam (GB1-12 GB2-12 GB2-1 GBA-1 GBB1-4	14	0	29/08/11	11/09/11	21/03/11	03/04/11	-161d	SKWpem	SKW0821							
SKW0331         Roo Beams & Paraget         14         0         2800911         091011         1804/11         0100711         -1610         SKW021         EMM102, EMM102, EMM102,           SKW0331         Roo Beams & Paraget         14         0         280911         091011         1804/11         0100711         -1610         SKW021         EMM102, EMM102, EMM102,           SKW0331         Roo Beams & Paraget         168         0         26/0911         091011         1804/11         0100711         -1610         SKW021         EMM102, EMM102, EMM102,           SKW0331         Roo Beams & Paraget         168         0         26/0911         1010111         25/0912         0100111         1010711         -1610         SKW031         K00071         K000711         K000711         K000711 <td></td> <td>SKW0821</td> <td>Wall &amp; Column (CA1-3 CB1-3 CC1-3 CD1-2) to+10</td> <td>14</td> <td>0</td> <td>12/09/11</td> <td>25/09/11</td> <td>04/04/11</td> <td>17/04/11</td> <td>-161d</td> <td>SKW0811</td> <td>SKW0631</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>		SKW0821	Wall & Column (CA1-3 CB1-3 CC1-3 CD1-2) to+10	14	0	12/09/11	25/09/11	04/04/11	17/04/11	-161d	SKW0811	SKW0631							
SKW0841         ABWF installation         45         D         26/09/11         09/11/11         180/11         01/00/11         -161d         MW0831         EAM1002         EAM1003         EAM1001         EAM1001         Skmmstep channel         55         D         01/00/11         25/03/12         01/00/11         15/11/11         -131d         Skmmstep channel         EAM1001         Skmmstep channel         55         7/05/10         09/05/11         15/11/11         -131d         Skmmstep channel         EAM1002         EAM1002         Skmmstep channel         55         7/05/10         09/05/11         17/05/10         02/12/10         -188d         EAM1002         EAM1003         EAM103         EAM103 <td></td> <td>SKW0831</td> <td>Bool Beams &amp; Paranet</td> <td>14</td> <td>0</td> <td>26/09/11</td> <td>09/10/11</td> <td>18/04/11</td> <td>01/05/11</td> <td>-161d</td> <td>SKW0821</td> <td>ESM1101, ESM1102; ESM1103.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td>		SKW0831	Bool Beams & Paranet	14	0	26/09/11	09/10/11	18/04/11	01/05/11	-161d	SKW0821	ESM1101, ESM1102; ESM1103.						-	
SKW0831         300mmU-dhamel & 675mm Step Chamel         168         0         10/10/11         250/212         01/06/11         15/11/11         -131d         91/09331. SkU0(est)           EAM Works (PS1)         EAM Works (PS1)         EAM 1001         Submission of Pumps         188         95         17/05/10 A         09/05/11         17/05/10 A         02/12/10         -188d         EAM 1001         EAM 1001         Submission of Den System         188         95         17/05/10 A         09/05/11         17/05/10 A         02/12/10         -188d         EAM 1002         EAM 1001         EAM 1002         Submission of Den System         188         95         17/05/10 A         09/06/11         17/05/10 A         02/12/10         -188d         EAM 1002         EAM 1002         EAM 1003         EAM 1003         EAM 1003         EAM 1004         Submission of LV SB & MCC         100         95         17/05/10 A         02/12/10         -188d         EAM 1003         EAM 1004         EAM 1003         100		SKW0841	ABWF installation	45	0	26/09/11	09/11/11	18/04/11	01/06/11	-161d	SHW0831	ESM1101, ESM1102, E8M1103,						14	
EaM Works (PS1)         Submission of Delivery.         EaM 1001         Submission of Pumps:         1188         95         17/05/10 A         09/05/11         17/05/10 A         02/12/10         188d         EaM 1001         Submission of Ben-Set         1198         95         17/05/10 A         09/05/11         17/05/10 A         02/12/10         188d         EaM 1001         EaM 1001         Submission of Liv S8         MCC         111		SKW0861	300mm U-channel & 675mm Step Channel	168	0	10/10/11	25/03/12	01/05/11	15/11/11	-131d	SKW0831, SKW0841	KD0070						- I	la jest
Submission 8/Delivery         Submission 9/Delivery           E&M 1001         Submission of Cen-Set         198         95         17/05/10 A         09/05/11         17/05/10 A         02/12/10         -188d         E&M1001         EM10012         1 <td></td> <td>E8M Works (PS</td> <td>1)</td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td>-</td> <td></td>		E8M Works (PS	1)				-		-										
E8M 1001         Submission of Pumps         198         95         17/05/10 A         09/05/11         17/05/10 A         02/12/10         -188d         E6M 1001         EAM 1001         Fill         Fill <t< td=""><td></td><td>Submission &amp;</td><td>Delivery.</td><td></td><td></td><td></td><td></td><td></td><td>in the second</td><td></td><td>Turting the second</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>		Submission &	Delivery.						in the second		Turting the second								
E&M1002         Submission of Gen-Set         198         95         17/05/10 A         09/06/11         17/05/10 A         02/12/10         -188d         EAM1092           E&M1003         Submission of DeO System         198         95         17/05/10 A         09/06/11         17/05/10 A         02/12/10         -188d         EAM1013         EAM1013         11111         11111         1111         1111		E&M1001	Submission of Pumps	198	95	17/05/10 A	09/06/11	17/05/10 A	02/12/10	-189d	KD0050	E5M1011			THE				
E&M1003         Submission of DeO System         198         95         17/05/10 A         09/06/11         17/05/10 A         02/12/10         -188d         EMM013           Start date         05/05/10         Ea/l tool         95         17/05/10 A         09/06/11         17/05/10 A         02/12/10         -188d         EMM013         EMM013         EMM014         <		E&M1002	Submission of Gen-Set	198	95	17/05/10 A	09/06/11	17/05/10 A	02/12/10	-189d		E5M1012	1 1		1111				
LEAM1004         Submission of LV S8 & MCC         180         95         17/05/10 A         08/05/11         17/05/10 A         02/12/10         -18/d         EMM10H		E&M1003	Submission of DeO System	198	95	17/05/10 A	09/06/11	17/05/10 A	02/12/10	+1.89d		ESM1013	1		1111				
Uate     Howston     Checked     Howston     Checked     Howston       Start date     05/05/10     Explore     Start of a date     18/12/14     Program for     Start of a date     31/05/11     Revision 0     Start of a date     VC       Data date     31/05/11     Stimmary for     Construction of Sewage Treatment Works at YSW & SKW     31/05/11     Revision 0     Start of a date		E&M1004	Submission of LV SB & MCC	180	95	17/05/10 A	08/06/11	17/05/10 A	02/12/10	-188d		1:30/1014	1 1	0	. unit	Periot	0	Charler	Approved
Instruction     Instruction     Instruction       Otacide     3105/11       Rundate     1600011       Rundate     1600011       Page number     4A       Page number     Construction of Sewage Treatment Works at YSW & SKW       Page number     3-month Rolling Programme (Jun 2011 - Aug 2011)       (Marked or 31 May 2011)     (Marked or 31 May 2011)	Star	date 05/05	5/10 Early be 0/14 Program bar					01-11-5	and the second second	Com	1.1			31/05/11	B	evision 0	AL	StL	VC
Rundate     1600/11     Programs point       Page number     4A       Page number     4A       Page number     5 starmage point       OF Direct No.     5 starmage point       OF Direct No.     5 starmage point	Data	date 31/04	0 i cal ber				Lead	Canton of C	igineering	Corp.	L10.								
Page number 4A Distribution of Sew age freatment works at rSW a SKW  Page number 4A  Distribution of Sew age freatment works at rSW a SKW  Distribution of Sew age freatment works at rSW a SKW  Distribution of Sew age freatment works at rSW a SKW  Distribution of Sew age freatment works at rSW a SKW  O Statement works at rSW a SKW  (Marked or 31 May 2011)  (Marked or 31 May 2011)	Run	date 16/06	S/11 A Progress point			0	auntien of	Contract	10. DG/200	Worker -	VOW & CKIM							1000	
Dimages States [or ]     States port     States port	Page	e number 4A	Dritical point			Const	opth Ballin	sewage I	reament V	2011	Aug 2011)								+
		Jimawa Sustan	se Inc. Start missione port			3-M	onui noili	ig Program	inne (oun	2011.	aug 2011)	(Mark	ed on 31 May 2	011)				-	

	Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors	2011
	E&M1005	Submission of Instrumentation	243	95	17/05/10 A	12/06/11	17/05/10 A	31/01/11	-131d	1	E&M1015	
	E&M1006	Submission of FS System	243	95	17/05/10 A	12/06/11	17/05/10 A	14/01/11	-148d	1	E&M1016	
	E&M1007	Submission of BS System	243	95	17/05/10 A	12/05/11	17/05/10 A	14/01/11	-148d		E&M1017	
	E&M1011	Delivery of Pumps	150	0	09/06/11	06/11/11	03/12/10	01/05/11	-189d	E8M1001	E&M1101	
	E&M1012	Delivery of Gen-Set	150	0	09/06/11	06/11/11	03/12/10	01/05/11	-189d	E8M1002	E&M1102	
	E8M1013	Delivery of DeO System	150	0	09/06/11	06/11/11	03/12/10	01/05/11	-189d	E&M1003	E&M1103	
	E&M1014	Delivery of LV SB & MCC	150	0	09/06/11	05/11/11	03/12/10	01/05/11	-188d	E&M1004	E&M1104	
	E&M1015	Delivery of Instrumentation	90	0	12/06/11	10/09/11	01/02/11	01/05/11	-131d	E&M1005	E&M1105	
	E8M1016	Delivery of FS Equipment	107	0	12/06/11	27/09/11	15/01/11	01/05/11	-1485	E&M1006	E8M1108	
	E8M1017	Delivery of BS Equipment	107	0	12/06/11	27/09/11	15/01/11	01/05/11	-148d	E&M1007	E&M1107	
	Installation, 14	NG	1			Langer	1			Patient different Philippi	Leanus	
	ESMIIOS	Install Instrumentation	55	0	10/10/11	03/12/11	02/05/11	25/06/11	-161d	E&M1015, SKW0831, SKW0841	E&M1140	
	ESM1105	Install PS Equipment	55	0	10/10/11	03/12/11	02/05/11	25/06/11	-161d	Eanhold, Skwoldt, Skwoldt	E6M1130, E6M1140	
S	ection W 6 - Set	APPENDIC CONTRACT OF THE PROVIDENCE OF THE PROVI	55	0	10/10/11	03/12/11	02/05/11	25/06/11	-161d	Eani IUTA an Wubat an Wubat	Edialitio, Edialitio	
Ĩ	Civil & Geotech	Ical Works					-					
	SKW0881	Site Glearance	7	100	17/05/10 A	22/05/10 A	17/05/10 A	22/05/10 4		HCD0020	SKW0891	
	SKW0891	Plant mobilization	7	100	17/05/10 A	23/05/10 A	17/05/10 A	23/05/10 A		SKW0881	SKW0892	
	SKW0892	Initial Survey	30	100	24/05/10 A	22/06/10 A	24/05/10 A	22/05/10 A		SKW0891	SKW0901	
	SKW0901	Tree Transplantation	30	100	23/06/10 A	22/07/10 A	23/06/10 A	22/07/10 A		SKW0892	SKW0921	
	SKW0921	Cut Slope & U-Channel	14	100	23/07/10 A	31/01/11 A	23/07/10 A	31/01/11 A		SKW0260, SKW0001	SKW0031, SKW0051	
	SKW0931	Hoarding & Fencing	14	100	15/09/10 A	07/10/10 A	15/09/10 A	07/10/10 A		SKW0921	SKW0951	
	SKW0951	Excavate to formation	106	95	04/10/10 A	05/06/11	04/10/10 A	05/12/10	-182d	SKW0921, SKW0931	SKW0961, SKW0971	
	SKW0961	Mass Conc. Retaining Wall	257	0	05/06/11	17/02/12	04/03/11	15/11/11	-93d	SKW0951	KD0080	
	SKW1491	Concrete Trough (ChA0+45 - ChA1+75)	180	96	01/03/11 A	07/06/11	01/03/11 A	30/03/11	-68d	PRE0100	5KW1511	
	SKW1511	Twin DN150 DI Rising Main (ChA0+00 - ChA5+79)	180	10	16/05/11 A	16/11/11	16/05/11 A	08/09/11	-68d	SKW1491	SKW 1531	
	Structural Works											
	SKW0971	Base Slab to -3.2mPD	14	10	02/05/11 A	17/06/11	02/05/11 A	17/12/10	-182d	SKW0951	SKW0061	
	SKW0981	Basement Beam (BBB-1,BBC-1,BBD-1)	14	0	17/06/11	01/07/11	18/12/10	31/12/10	-182d	SKW0971	SIGW 0991	
	SKW0991	Wall & Column to +1.5mPD	14	0	01/07/11	15/07/11	01/01/11	14/01/11	-182d	SKW0981	SIGV9 1001.	
	SKW1001	Base Slab (BSC-4) to +3mPD	14	0	15/07/11	29/07/11	15/01/11	28/01/11	-182d	SKW0991	5KW 1011	
	SKW1011	Wall & Column to +5,35mPD	14	0	29/07/11	12/08/11	29/01/11	11/02/11	-182d	SKW1001	SPOV 1021	
	SKW1021	Ground Stab	20	0	12/08/11	01/09/11	12/02/11	03/03/11	-182d	SAW 1011	SIGN 1001	
	ESM Marke (PS	on beam	14	0	01/09/11	15/09/11	04/03/11	17/03/11	-1820	GRW IDET	30000	
11	Balomission &	oj Deliveru										
	E8M2001	Submission of Pumos	100	00	17/05/10 4	10/06/11	17/05/10 4	02/02/11	1374	KD0020	E&M2011	
	E8M2002	Submission of Gen-Set	198	90	17/05/10 A	19/06/11	17/05/10 A	02/02/11	-137d		E&M2012	
	E&M2003	Submission of DeO System	198	90	17/05/10 A	19/06/11	17/05/10 A	02/02/11	-137d		E&M2013	
	E8M2004	Submission of LV SB & MCC	271	90	17/05/10 A	27/06/11	17/05/10 A	13/02/11	-133d		E&M2014	
	E8M2005	Submission of Instrumentation	243	90	17/05/10 A	24/06/11	17/05/10 A	31/01/11	-143d		E&M2015	
	E&M2006	Submission of FS System	243	90	17/05/10 A	24/06/11	17/05/10 A	14/01/11	-160d		E&M2016	
	E&M2007	Submission of BS System	243	90	17/05/10 A	24/06/11	17/05/10 A	14/01/11	-160d		E8M2017	
	E&M2011	Delivery of Pumps	150	0	19/06/11	16/11/11	03/02/11	02/07/11	-137d	E&M2001	E&M2101	
	E&M2012	Delivery of Gen-Set	150	0	19/06/11	16/11/11	03/02/11	02/07/11	-137d	E8M2002	E8M2102	
	E&M2013	Delivery of DeO System	150	0	19/06/11	16/11/11	03/02/11	02/07/11	-137d	E&M2003	E8M2103	
	E&M2014	Delivery of LV SB & MCC	150	0	31/05/11	27/10/11	03/12/10	01/05/11	-179d	E&M3004	E&M2104	
	E&M2015	Delivery of Instrumentation	90	0	24/06/11	22/09/11	01/02/11	01/05/11	-143d	E&M2005	E&M2105	
	E&M2016	Delivery of FS Equipment	107	0	24/06/11	09/10/11	15/01/11	01/05/11	-160d	E&M2005	E8M0350, E8M2105	
	E&M2017	Delivery of BS Equipment	107	0]	24/06/11	09/10/11	15/01/11	01/05/11	-160d	Eamony	COMCIU/	
50	Schutzeles (Val-	in or wysever and submarine Outrall						_				
	SKIMI I 20	Annual of IUS Consultant	1 1001	Inni	17/05/10 4	17/10/10 4	1705110.4	177/00/10 A	- 1		SKW1131	4
	SKW1130	Hudrographical Support SKW	100	100	01/02/11 A	27/08/10 A	01/02/11 A	27/08/10 A		KD0020, \$KW1130	SKW1231	
	SKW1141	Water Ouality Baseline Monitoring under EP / SRM	212	100	27/07/10 A	31/01/11 A	27/07/10 A	31/01/11 6		SKW0260	SKW1151	
	SKW1151	Set up Temporary Working Platform	185	00	31/05/11	01/12/11	01/03/11	01/09/11	-914	PRE0090, SKW 1141	SKW1171	
Stert	date 05/05	/10 Early ber	100/	01	and and a state of the	STORE T	e mear ti	SHOFTI	- 210			Date Revision Checked Approved
Finis	h date 18/12	V14 Progress bar				Leade	er Civil En	gineering	Corp. L	.td.		31/05/11 Revision 0 StL VC
Dala	date 31/05	711 Summary bar					Contract N	lo. DC/200	9/13			
Page	number 5A	Critical point			Constr	uction of s	Sewage T	reatment V	/orks a	t YSW & SKW		
	and the state	Summary point			3-m	onth Rollin	ng Program	nme (Jun :	2011 -	Aug 2011)	144-01	lost on 91 May 2011)
o P	rimavera System	S. Inc. V oran massione pore									11/1 211	Text sit of mity soft []

	Activity ID	Description	Original Percent Duration Complet	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors	
SH	WSTW				-	-					
	Submission 8	Delivery (E&M)									
	E&M3010	Delivery of MBR M.M 1st shipment for Temp STP	150	0 31/05/11	27/10/11	24/04/13	20/09/13	694d	E&M0160	E&M3170	
	E&M3030	Delivery of Grit Removal Equipment	180	0 28/07/11	24/01/12	31/08/11	26/02/12	34d	E&M0150	EAM3190	
	E&M3060	Delivery of Fine Screens	136	0 28/07/11	11/12/11	15/08/11	28/12/11	18d	E8M0120	E&M3210	
	E&M3070	Delivery of Pumps	136	0 28/07/11	11/12/11	15/08/11	28/12/11	18d	E&M0130	EAM3220	
	E&M3080	Delivery of Submersible Mixers	180	0 28/06/11	25/12/11	15/09/11	12/03/12	79d	E&M0140	E&M3230	
	E&M3090	Delivery of Sludge Dewatering Equipment	210	0 28/07/11	23/02/12	18/07/11	12/02/12	-11d	E&M0170	E#M3240	
	E&M3100	Delivery of Valves, Pipes & Fittings	180	0 28/07/11	24/01/12	05/02/13	03/08/13	558d	E&M0180	E&M3250	
	E&M3110	Delivery of Penstocks	180	0 28/07/11	24/01/12	18/02/13	16/08/13	571d	E&M0190	E&M3260	
	E&M3130	Delivery of instruments	180	0 28/07/11	24/01/12	04/05/13	30/10/13	646d	E8M0200	E&M3270	
	E&M3140	Delivery of MCC LVSB	180	0 28/07/11	24/01/12	09/05/11	04/11/11	-81d	E&M0210	E&M3261	
	E&M3150	Delivery of BS Equipment	180	0 30/07/11	25/01/12	20/02/13	18/08/13	571d	EAM0220	E&M3291	
	E8M3160	Delivery of FS Equipment	180	0 29/08/11	24/02/12	14/01/12	11/07/12	138d	E&M0230	E&M0340, E&M3300	
	Construction	of Grid A+G		LOBACC "	1 - miles	Ville I and	-	-	de la composition	New York Contraction of the second se	
	SKW1261	Excavate for SKW STW Structure (Grid A - G)	164	0 10/06/11	21/11/11	14/02/11	27/07/11	-117d	SKW0551	SKW 1271, SKW 1371	
Bi	sing Main										
S	KW1481	Subm, Approval & Delivery of DI pipes	120 10	0 17/05/10 A	28/02/11 A	17/05/10 A	28/02/11 A		1(D0020	SKW 1501	
S	KW1501	Concrete Trough (ChB0+00 - ChB1+20)	300	0 31/05/11	25/03/12	14/09/10	10/07/11	-259d	PRE0100, SKW1461	SKW 1521	
Sect	ion W8 - La	ndscape Softworks in All Portions									
SKI	N1591	Tree Survey	21 10	0 17/05/10 A	06/06/10 A	17/05/10 A	06/06/10 A		KD0020	SKW1621	
SKV	V1611	Preservation & Protection of Trees	822 4	6 17/05/10 A	16/08/12	17/05/10 A	15/08/12	-1d	KD0020	K00100, SKW1531	
SKV	V1621	Transplantation at SKW	60 10	0 07/06/10 A	05/10/10 A	07/06/10 A	05/10/10 A		SKW (59)		

Start date 05/05/10 Eady by		Date	Revision	Checked	Approved
Finish date 18/12/14 Proyress ba	Leader Civil Engineering Corp. Ltd.	31/05/11	Revision 0	StL	VC
Data date 31/05/11 Summary b.	Contract No. DC/2009/13				
Page number 6A Critical point	Construction of Sew age Treatment Works at YSW & SKW				
c Primavera Systems, Inc.	(Marked on 31 May 2011)				

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors	JAN FEB	MAR APR	MAY 2		AUG	SEP OCT
Project Key D	ate		A CONTRACT			1			and the second second	and the second sec						
KD0010	Receive Letter of Acceptance	0	100		05/05/10 A		05/05/10 A			KD0125						
KD0020	Project Commencement Date	0	100		17/05/10 A		17/05/10 A			E&M0010, E&M0070, E&M1001,						
KD 0050	Section W3 - Footpath Diversion in Ptn G (273d)	0	0		10/06/11		13/02/11 *	-117d*	SKW0551	KD0125						
+Preliminary (	GIVII)	I will		All role			Landard	-	KOOMIO	and the second second						
Preliminary (F	8M)	191	100	17/05/10 A	23/11/10 A	17/05/10 A	23/11/10 A	-	Rower							
Technical Submi	ssion			1.000												
+Process Desig	In of SKWSTW & YSWSTW				-	-		-								
- Harraulia Das	in the second	398	90	17/05/10 A	18/06/11	17/05/10 A	30/06/11	12d			-					
Triyuradire Dea	gn	333	91	15/07/10 A	13/06/11	15/07/10 A	30/06/11	18d				-				
+Equipment Sul	omission & Approval	1														
Distance	and the state of the	469	54	17/05/10 A	28/08/11	17/05/10 A	07/11/11	71d			1					
+Drawings Sub	mission e Approva	401	75	24/06/10 A	29/07/11	24/06/10 A	30/07/11	1 1d								
+Statutory Subm	ission	101														
		189	0	29/08/11	04/03/12	01/07/11	14/02/14	712d								
Yung Shue Wa	in															
+Preniminary		220	100	17/05/10 A	31/12/10 A	17/05/10 A	31/12/10 A				-	-				
+Section W1-S	ope Works in Portion A & C		100	110021011	- and a lott	maartart										
		679	69	17/05/10 A	25/03/12	17/05/10 A	15/08/11	-223d						1		
Section W 2 - YS	W STW & Submarine Outfall										-					
+ GIMT & STRUCTUR	er work	533	57	17/05/10 A	01/11/11	17/05/10 A	05/01/12	66d			1		× - 0			
+Sulomarine Out	tall	1 0001	0/1	moonon	Tantinti	THUR INTO I	- Columna									
		461	91	17/05/10 A	21/08/11	17/05/10 A	16/06/11	-65d				4.00				
+E&M Works - 1	/SW STP	070	-	10544	0.000/10	0440/10	Lot Iot II O	74.4			-					
Sok Kwu Wan		270	01	31/05/11	24/02/12	24/10/10	05/05/12	1 /10	1	11						
+Preliminary				-												
		30	100	17/05/10 A	15/06/10 A	17/05/10 A	15/06/10 A									
Section W 3 - For	otpath Diversion in Portion G										-					
+ Onin a cleated	iningan wikunga	390	96	17/05/10 A	10/06/11	17/05/10 A	10/05/11	-117d			The Local Data		-			
Section W 4 - Slo	pe Works in Portions H & I	1														
+Geotechnical V	Vorks	1		Paraliza A	Lumaua	un maila a	Lationita						-			
Section W5 - P.S	No. 1 in Portion D	610	38	15/06/10 A	14/02/12	15/06/10 A	15/08/11	-1830								
+Civil & Geotech	nnical Warks				1.2.2											
		319	100	17/05/10 A	31/03/11 A	17/05/10 A	31/03/11 A				L.					
+Structural Wor	6	244	4	0/04/11 A	25/03/12	01/01/11 6	15/11/11	-1314			-		-		_	
E&M Works (PS	1)	041	1	LUCHTIN .	Tentorie	MANUTA	List 1/1	1 (010]								
+Submission 8	& Delivery			The s	-	100								_	_	
( leaded at least		539	59	17/05/10 A	06/11/11	17/05/10 A	01/05/11	-1890						-		
+instetuetton,	au.	55	lo	10/10/11	03/12/11	02/05/11	25/06/11	-161d								1
Section W 6 - Sev	ver and PS No.2 in Portions E&H	1	ΨI,		1											
+Civil & Geotech	mical Works	1					Lanua				-		-	ST-		
Structural Mart		641	48	17/05/10 A	17/02/12	17/05/10 A	15/11/11	-93d	-		1					
+ or dorural syon	N	132	11	02/05/11 A	15/09/11	18/12/10 A	17/03/11	-182d		1				1		
Start data 05/05	500 East by											Date	T	Revision	Chec	ked Approved
Finish date 18/12 Data date 18/12 Data date 31/05 Run date 16/06 Page number 1A c Primavera System	VIU     Lefty for       2/14     Tercginss bar       VI11     Critics ther       VI11     Programs point       VI11     Critics ther       VI11     Critics ther       VI11     Critics ther       VI11     Summary bar       VI11     Critics ther       VI11     Summary bar       VI11     Critics ther       VI11     Critics ther			Constr 3-m	Leade uction of s onth Rollin	er Civil Er Contract I Sewage T ng Program	ngineering No. DC/200 reatment mme (Jun	Corp. 1 09/13 Works a 2011 -	-td. ht YSW & SKW Aug 2011)	Aline (P. 1 of 2 YMar	ked on 31 May 2011;	31/05/11	R	avision 0	SIL	VĊ

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors	JAN   FEB   MAR   APR	2011 MAY JUN JUL AUG SEP OCT
E&M Works (P	SZ)											
+Submission	1 & Delivery	Sector P										
		549	57	17/05/10 A	16/11/11	17/05/10 A	02/07/11	-137d		1	hanne	
Section W7 - S	KW STW, Sewar and Submarine Outfall											
+Submarine O	utfall											
		564	79	17/05/10 A	01/12/11	17/05/10 A	01/09/11	-91d				
SKWSTW		-						1				
+Submission	i & Delhery (E&M)				ale and							
		270	0	31/05/11	24/02/12	09/05/11	30/10/13	614d				
+Construotio	in of Grid A-G				I a many				and the second s			
		164	0	10/06/11	21/11/11	14/02/11	27/07/11	-117d				U
+Rising Main												
		679	29	17/05/10 A	25/03/12	17/05/10 A	10/07/11	-259d				
+Section W8-1	Landscape Softworks in All Portions					2						
		823	51	17/05/10 A	16/08/12	17/05/10 A	15/08/12	-10				

		Date	Bevision	Checked	Approved
Einish date 18/12/14 Progress bar	Londor Cluit Engineering Com Ltd	31/05/11	Revision 0	SIL	VC
Data date 31/05/11 Grical be	Contract No. DC/2000/13				
Run date 16/06/11 A Progress port	Construction of Sawage Treatment Works at YSW & SKW				-
Page number 2A V Critical point	3-month Rolling Programme (Jun 2011 - Aug 2011)		-		
o Primavera Systems, Inc. Stat missione point	attine (21 fr Marked on 31 May 2011)				



## Appendix D

## Location of Monitoring Stations (Air Quality / Construction Noise / Water Quality)





Contract No. DC/2009/13 – Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan Sok Kwu Wan – EM&A Monthly Report –June 2011





Contract No. DC/2009/13 – Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan Sok Kwu Wan – EM&A Monthly Report –June 2011





# **AUES**





# Appendix E

## **Monitoring Equipments Calibration Certificate**



TISCH ENVIROMENTAL, INC. 145 SOUTH MIAMI AVE. VILLAGE OF CLEVES, OH 45002 513.467.9000 877.263.7610 TOLL FREE 513.467.9009 FAX WWW.TISCH-ENV.COM

#### AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Ju	ın 02, 2010	) Rootsmeter	S/N 9	833620	Ta (K) -	297
Operator	Tisch	Orifice I.I	D	1483	Pa (mm) -	746.76
PLATE	VOLUME	VOLUME	DIFF	======================================	======================================	ORFICE DIFF
OR	START	STOP	VOLUME	TIME	Hg	H2O
Run #	(m3)	(m3)	(m3)	(min)	(mm)	(in.)
1	NA	NA	1.00	1.3990	3.2	2.00
2	NA	NA	1.00	0.9820	6.4	4.00
3	NA	NA	1.00	0.8770	7.9	5.00
4	NA	NA	1.00	0.8350	8.8	5.50
5	NA	NA	1.00	0.6910	12.8	8.00

#### DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
0.9816	0.7017	1.4042		0.9957	0.7117	0.8919
0.9775	0.9954	1.9858		0.9914	1.0096	1.2613
0.9754	1.1122	2.2202		0.9893	1.1281	1.4102
0.9742	1.1668	2.3286		0.9882	1.1835	1.4790
0.9689	1.4023	2.8084		0.9828	1.4223	1.7837
Qstd slop	pe (m) =	2.00279		Qa slope	e (m) =	1.25411
intercept	t (b) =	-0.00494		intercept	t (b) =	-0.00314
coefficie	ent (r) =	0.99994		coefficie	ent (r) =	0.99994
y axis =	SQRT [H20 (1	2a/760) (298/1	Га)]	y axis =	SQRT [H2O (7	[a/Pa)]

#### CALCULATIONS

Vstd = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta) Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa] Qa = Va/Time

For subsequent flow rate calculations:

Qstd =  $1/m\{[SQRT(H2O(Pa/760)(298/Ta))] - b\}$ Qa =  $1/m\{[SQRT H2O(Ta/Pa)] - b\}$ 



TISCH ENVIROMENTAL, INC. 145 SOUTH MIAMI AVE. VILLAGE OF CLEVES, OH 45002 513.467.9000 877.263.7610 TOLL FREE 513.467.9009 FAX WWW.TISCH-ENV.COM



AIR POLLUTION MONITORING EQUIPMENT

\* y-axis equations: Qstd series:

Qstd series: 
$$\sqrt{\Delta H \left(\frac{P a}{P s t d}\right) \left(\frac{T s t d}{T a}\right)}$$
  
Qa series:  $\sqrt{(\Delta H (T a / P a))}$ 

#1483



# CERTIFICATE OF CALIBRATION AND TESTING TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

Temperature	· · · · · · · · · · · · · · · · · · ·	·······	Model		ΔM	1510
	74.8 (23.8)	°F (°C)				
Relative Humidity		%RH	Serial Number		110	08017
Barometric Pressure	28.96 (980.7)	inHg (hPa)				
⊠As Left □As Found			In Tolerance Out of Tolerance			
		Concentratio	on Linearity Plot			1
	001 01 01 Device Kesponse (mg/m3) 1.0 10.0	01 0.1 Aerosol Conce	• • • • • • • • • • • • • • • • • • •	In Tolerance Out of Tolerance olerance : ±10%	e	D. DTU01-
TSI Incorporated does he strict accordance with th	reby certify that all me e applicable specifica ace tests required under mass measurements. C	zterials, component tions agreed upon this contract were alibration of this in ISO 12103-1, A1 (c	ts, and workmanship used in by TSI and the customer successfully conducted acco istrument performed by TSI f est dust (Arizona dust). Our c	n the manufactur and with all pur rding to required has been done us alibration ratio	re of this eq iblished spe l specification ing emery of is greater th	uipment are ecifications. A ons. There is t oil and has be oan 1 2 1
NIST standard for optical sominally adusted to respi Measurement Variable Photometer DC Voltage(Keithley) Barometric Pressure Humidity	system ID         Last C           E003433         05-17           E002859         01-05           E003733         12-26           E002873         02-23	Cal.         Cal.         Due           -10         11-17-10           -10         01-05-11           -09         12-26-10           -10         02-23-11	Measurement Variable Flow and temperature Microbalance Temperature Pressure	<u>System ID</u> E003434 E003403 E002873 E003440	Last Cal. 04-21-10 01-07-10 02-23-10 08-26-09	<u>Cal. Due</u> 04-21-11 01-07-11 02-23-11 08-26-10

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GOES 34



# **CERTIFICATE OF CALIBRATION AND TESTING** TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

Litho. in U.S./

Alass -

Environment Condition	<u> </u>		· · · · · · · · · · · · · · · · · · ·								
Temperature	73.2 (22.9)	°F (°C)	Model	AM510							
Relative Humidity	38	%RH	Seciel New L	44000000							
Barometric Pressure	29.08 (984.8)	inHg (hPa)	Serial Number	11008060							
As Left			n Tolerance Dut of Tolerance								
	Concentration Linearity Plot										
	- 00 - 01 - 0.0 - 1.0 - 1.0 - 1.0 - 0.0 - 0.0	0, 0 0, 0 0, 1 1 Aerosol Concen	$\circ$ = In Tolerance $\bullet$ = Out of Tole Tolerance : $\pm 1$ 10 100 tration (mg/m3)	Strance 10% System ID: DT1101-01							
TSI Incorporated does hereby cu strict accordance with the appr performance and acceptance test NIST standard for optical mass n nominally adusted to respirable n	ertify that all ma licable specificat s required under neasurements. Co nass of standard	terials, components, ions agreed upon b this contract were su tlibration of this inst ISO 12103-1, A1 test	and workmanship used in the manufa my TSI and the customer and with au- iccessfully conducted according to requ- rument performed by TSI has been don dust (Arizona dust). Our calibration ra	acture of this equipment are in Il published specifications, All tired specifications, There is no e using emery oil and has been ttio is greater than 1.2:1							
Measurement Variable PhotometerSystemPhotometerE003DC Voltage(Keithley)E003Barometric PressureE003HumidityE003	em ID Last C 1433 05-17- 1859 01-05- 1733 12-26- 1873 02-23-	al. <u>Cal. Due</u> 10 11-17-10 10 01-05-11 09 12-26-10 10 02-23-11	Measurement VariableSystem IDFlow and temperatureE003434MicrobalanceE003403TemperatureE002873PressureE003440	Last Cal.Cal. Due04-21-1004-21-1101-07-1001-07-1102-23-1002-23-1108-26-0908-26-10							
Roe Vane	3		Function Augus	st 17, 2010							
Calibratéd	V	•		Date							
			<u>ANGERENTY NA VER</u>								



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# CERTIFICATE OF CALIBRATION AND TESTING TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

Environment Condition			Madal	<b>A B</b>		
Temperature	74.8 (23.8)	°F (°C)			A	UDIU
Relative Humidity	38	%RH	Seriel Number		110	00040
Barometric Pressure	28.96 (980.7)	inHg (hPa)	Serial Nulliper			00010
⊠As Left □As Found		C	In Tolerance Out of Tolerance			
	· · · · · · · · · · · · · · · · · · ·	Concentratio	on Linearity Plot			
	- 001 - 01 Bevice (mg/m3) - 1.0 Device Kesbourse (mg/m3) - 1.0 0.0	0 0 0 0 1 0.1 Aerosol Conc	0 0 0 0 0 0 0 0 0 0 0 0 0 0	In Tolerance Out of Toleran olerance : ±109	ce % Systen	1D: DT1101-01
TSI Incorporated does here strict accordance with the performance and acceptance NIST standard for optical in nominally adusted to respire <u>Measurement Variable</u> Photometer DC Voltage(Keithley) Barometric Pressure Humidity	by certify that all mo applicable specifica, e tests required under ass measurements. Cl able mass of standard System ID Last C E003433 05-17 E002859 01-05 E003733 12-26 E002873 02-23	terials, componentions agreed upor this contract were alibration of this in ISO 12103-1, A1 t Cal. <u>Cal. Due</u> 10 11-17-10 10 01-05-11 09 12-26-10 10 02-23-11	nts, and workmanship used in n by TSI and the customer e successfully conducted acco nstrument performed by TSI I lest dust (Arizona dust). Our co Measurement Variable Flow and temperature Microbalance Temperature Pressure	n the manufact; and with all p rding to requiri- tas been done t calibration ratio System ID E003434 E002873 E003440	ure of this ea oublished spi ed specificati using emery of o is greater th <u>Last Cal.</u> 04-21-10 01-07-10 02-23-10 08-26-09	puipment are in accifications. All ons. There is no bil and has been han 1.2:1 Cal. Due 04-21-11 01-07-11 02-23-11 08-26-10
502	aH.	X Fii	nal Function Check	August	6, 2010	
Calib	orated	、		Da	ate	

itho, in U.S

## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

	1										
Location :	Squatter	r house in	n Chung	Mei Village	<b>,</b>	]	Date of Ca	alibration: 28-	Apr-11		
Location 1	D :	AM2				Ne	xt Calibra	tion Date: 28-	Jun-11		
					COND			echnician: Mr.	Ben Tam		
					COND						
	Se	a Level I	Pressure	(hPa)	101	0		Corrected	Pressure (m	m Hg)	757.5
		Temp	erature	(°C)	25.	.1		Tem	perature (K)	)	298
				CA	LIBRATI	ION	ORIFICE				
				Make->	ГISCH			Qstd	Slope ->	2.002	279
				Model->	5025A			Qstd Inte	ercept ->	-0.00	494
				Serial # ->	1483						
					CALIB	RAT	ION				
Plate	H20 (L)	H2O (R)	H20	Qstd	Ι		IC		LINEAR		
No.	(in)	(in)	(in)	(m3/min)	(chart)	С	orrected	]	REGRESSIC	ON	
18	6	6	12	1.729	58	58 57.89			Slope = $25$	.3965	
13	4.3	4.3	8.6	1.464	51	51 50.90 Intercept = $13.85'$				.8571	
10	3	3	6	1.223	45		44.91	Corr.	$\operatorname{coeff.} = 1$	.0000	
5	1.8	1.8	3.6	0.948	38		37.92				
	0.7	0.7	1.4	0.392	29		28.94				
Calculatio	ons :							FLOW RA	TE CHART		
Qstd = 1/n	n[Sqrt(H	20(Pa/Ps	td)(Tstd	/Ta))-b]	70	0.00					
IC = I[Squ	rt(Pa/Psto	d)(Tstd/T	a)]								
0.11	1 1 0				60	0.00				•	
Qstd = sta	indard flo	ow rate	20								
I = actual	chart res	nonse	55		<u>ତ</u> 50	0.00				~	
m = calibr	ator Ost	d slope			) se						
b = calibra	ator Qstd	intercep	t			0.00					
Ta = actua	al temper	ature dur	ing calib	oration ( deg	KE						
Pstd = act	ual press	ure durin	g calibra	ation ( mm H	e گاھ اع	0.00		•			
For subs	equent c	alculatio	n of san	npler flow:	Actu	0 00					
1/m(( I )[S	Sqrt(298/	Tav)(Pav	r/760)] <b>-</b> t	))		0.00					
		·			1(	0.00					_
m = samp	ler slope										
b = samp	ler interc	ept			(	0.00					
I = chart r	esponse		otuu-			0.0	000	0.500 1	.000 1	1.500	2.000
1av = dat Pav = dat	ly averag	e lemper	alure					Standard FIOV	v Rate (m3/min	)	
i av – uall	iy averag	e pressur	C								

## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

r											
Location	Squatter	r house in	n Chung	Mei Village	2		Date of C	alibration: 28-A	vpr-11		
Location 2	ID:	AM1				Ν	lext Calibra	tion Date: 28-J	un-11		
							T	echnician: Mr.	Ben Tam		
					CON	IDITI	IONS				
	Sa	o Loval I	Juana	(hDa)	10	10		Corrected	)		157 5
	36	Temr	aratura	$(\Pi Pa)$	2	5 1		Corrected P	ressure (IIIII Verature (K)	1 ng) – I	208
		Temp	cialuic	()	Δ.						290
				CA	LIBRA	τιοι					
				Make->	TISCH	[		Qstd S	lope ->	2.002	79
				Model->	5025A			Qstd Inter	cept ->	-0.004	194
				Serial # ->	1483						
					CALI	BRA					
Plate H20 (L)H2O (R) H20 Qstd							IC	5	LINEAR	N T	
NO.	(in)	(in)	(11) 10.2	(m3/min)	(chart	t)	corrected	R	EGRESSIO	N 1167	
18	5.1	5.2	0.5	1.002	59 52		52.00	Slope = 55.1107			
15	$\frac{4}{20}$	4 20	0 5 0	1.412	33 46	$16 \qquad 45.91 \qquad Corr coeff = 0.000000000000000000000000000000000$				0008	
10	2.9	2.9	3.0 3.1	0.021	40		45.91	C011. (		9990	
5	0.9	0.9	1.8	0.921	28		27.94				
	0.7	0.7	1.0	0.071	20		21.91				
Calculatio	ons :							FLOW RAT	E CHART		
Qstd = 1/1	n[Sqrt(H	20(Pa/Ps	td)(Tstd	/Ta))-b]		70.00	) <u> </u>				
IC = I[Squ	rt(Pa/Psto	d)(Tstd/T	a)]								
						60.00	D			/	_
Qstd = sta	indard flo	ow rate									
IC = correction	ected cha	rt respon	es			50.00	o				_
I = actual	chart res	ponse			e (IC				*		
m = calibr	rator Qsto	d slope			ous	40.00	o ———— o				_
b = calibr	ator Qstd	Intercep	t 		Les I			<b>x</b>			
1a = actual Data	al temper		ing calit	oration ( deg	y M	30.00	о —				
Pstd = act	ual press	ure durin	g canora	ation ( mm )	ng o		-	*			
For subs	equent c	alculatio	n of san	pler flow:	Act	20.00	o ———				
1/m((I)[	- Sqrt(298/	Tav)(Pav	r/760)] <b>-</b> t	)			-				
	·					10.00	o 🗕 🚽				
m = samp	ler slope						-				
b = samp	a = sampler intercept										
I = chart 1	response					0.00	0.000	0.500 1.0	, 000 1.5	500 2	2.000
Tav = dai	ly averag	e temper	ature					Standard Flow	Rate (m3/min)		
Pav = dai	ly averag	e pressur	e		L						

## **TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET**





Certificate No. : C112202

Certificate of Calibration

This is to certify that the equipment

Description : Integrating Sound Level Meter (EQ010) Manufacturer : Bruel & Kjaer Model No. : 2238 Serial No. : 2285721

## has been calibrated for the specific items and ranges. The results are shown in the Calibration Report No. C112202.

The equipment is supplied by

Co. Name : Action-United Environmental Services and Consulting

Address : Unit A, 20/F., Gold King Industrial Building, 35-41 Tai Lin Pai Road, Kwai Chung, N.T.

Date of Issue : 19 April 2011

Certified by : K ¢/Lee

The test equipment used for calibration are traceable to the National Standards as specified in this report. This report shall not be reproduced except in full and with prior written approval from this laboratory.

Calibration and Testing Laboratory of Sun Creation Engineering Limited

c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com



Sun Creation Engineering Limited Calibration and Testing Laboratory

Report No. : C112202

Calibration Report

### ITEM TESTED

DESCRIPTION	:	Integrating Sound Level Meter (EQ010)
MANUFACTURER	:	Bruel & Kjaer
MODEL NO.	:	2238
SERIAL NO.	:	2285721

#### **TEST CONDITIONS**

AMBIENT TEMPERATURE :  $(23 \pm 2)^{\circ}C$ LINE VOLTAGE : ---

#### TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 18 April 2011

JOB NO. : IC11-0947

RELATIVE HUMIDITY :  $(55 \pm 20)\%$ 

#### **TEST RESULTS**

The results apply to the particular unit-under-test only. All results are within manufacturer's specification. The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory

- The Bruel & Kjaer Calibration Laboratory, Denmark
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested by :

L L Cheung

Date : 19 April 2011

The test equipment used for calibration are traceable to the National Standards as specified in this report. This report shall not be reproduced except in full and with prior written approval from this laboratory.



Sun Creation Engineering Limited Calibration and Testing Laboratory

Report No. : C112202

Calibration Report

- 1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- 2. Self-calibration using the B & K Acoustic Calibrator 4231, S/N : 2713428 was performed before the test.
- 3. The results presented are the mean of 3 measurements at each calibration point.
- 4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C110018
CL281	Multifunction Acoustic Calibrator	C1006860

- 5. Test procedure : MA101N.
- 6. Results :
- 6.1 Sound Pressure Level
- 6.1.1 Reference Sound Pressure Level

	UUT		Applied	l Value	UUT	IEC 60651	
Range	Parameter	Frequency	Time	Level	Freq.	Reading	Type 1 Spec.
(dB)		Weighting	Weighting	(dB)	(kHz)	(dB)	(dB)
50 - 130	L <sub>AFP</sub>	Α	F	94.00	1	94.0	± 0.7

#### 6.1.2 Linearity

	UUT Setting				d Value	UUT
Range	Parameter	Frequency	Time	Level	Freq.	Reading
(dB)		Weighting	Weighting	(dB)	(kHz)	(dB)
50 - 130	L <sub>AFP</sub>	А	F	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		114.0

IEC 60651 Type 1 Spec. :  $\pm$  0.4 dB per 10 dB step and  $\pm$  0.7 dB for overall different.

The test equipment used for calibration are traceable to the National Standards as specified in this report. This report shall not be reproduced except in full and with prior written approval from this laboratory.



Sun Creation Engineering Limited Calibration and Testing Laboratory

Report No. : C112202

# Calibration Report

## 6.2 Time Weighting

## 6.2.1 Continuous Signal

	UUT	Setting		Applied	l Value	UUT	IEC 60651
Range	Parameter	Frequency	Time	Level Freq.		Reading	Type 1 Spec.
(dB)		Weighting	Weighting	(dB)	(kHz)	(dB)	(dB)
50 - 130	L <sub>AFP</sub>	A	F	94.00	1	94.0	Ref.
	L <sub>ASP</sub>		S			94.0	± 0.1
	$L_{AIP}$		Ι			94.1	± 0.1

## 6.2.2 Tone Burst Signal (2 kHz)

	UUT Setting				lied Value	UUT	IEC 60651
Range	Parameter	Frequency	Time	Level	Burst	Reading	Type 1 Spec.
(dB)		Weighting	Weighting	(dB)	Duration	(dB)	(dB)
30 - 110	L <sub>AFP</sub>	A	F	106.0	Continuous	106.0	Ref.
	L <sub>AFMax</sub>				200 ms	105.0	$-1.0 \pm 1.0$
	L <sub>ASP</sub>		S		Continuous	106.0	Ref.
	L <sub>ASMax</sub>				500 ms	101.9	$-4.1 \pm 1.0$

#### 6.3 Frequency Weighting

### 6.3.1 A-Weighting

	UUT	Setting		Applie	ed Value	UUT	IEC 60651
Range	Parameter	Frequency	Time	Level	Freq.	Reading	Type 1 Spec.
(dB)		Weighting	Weighting	(dB)		(dB)	(dB)
50 - 130	$L_{AFP}$	А	F	94.00	31.5 Hz	54.6	-39.4 ± 1.5
					63 Hz	67.7	$-26.2 \pm 1.5$
					125 Hz	77.7	$-16.1 \pm 1.0$
					250 Hz	85.2	-8.6 ± 1.0
					500 Hz	90.7	$-3.2 \pm 1.0$
					l kHz	94.0	Ref.
					2 kHz	95.2	$+1.2 \pm 1.0$
					4 kHz	95.0	$+1.0 \pm 1.0$
					8 kHz	92.8	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.7	-4.3 (+3.0 ; -6.0)

The test equipment used for calibration are traceable to the National Standards as specified in this report. This report shall not be reproduced except in full and with prior written approval from this laboratory.



Sun Creation Engineering Limited Calibration and Testing Laboratory

Report No. : C112202

# Calibration Report

## 6.3.2 C-Weighting

	UUT	Setting		Applie	ed Value	UUT	IEC 60651
Range	Parameter	Frequency	Time	Level	Freq.	Reading	Type 1 Spec.
(dB)		Weighting	Weighting	(dB)	-	(dB)	(dB)
50 - 130	L <sub>CFP</sub>	С	F	94.00	31.5 Hz	91.1	$-3.0 \pm 1.5$
					63 Hz	93.2	$-0.8 \pm 1.5$
					125 Hz	93.8	$-0.2 \pm 1.0$
					250 Hz	94.0	$0.0 \pm 1.0$
					500 Hz	94.0	$0.0 \pm 1.0$
					1 kHz	94.0	Ref.
					2 kHz	93.8	$-0.2 \pm 1.0$
					4 kHz	93.2	$-0.8 \pm 1.0$
					8 kHz	90.9	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.8	-6.2(+3.0:-6.0)

#### 6.4 Time Averaging

UUT Setting				Applied Value					UUT	IEC 60804
Range	Parameter	Frequency	Time	Frequency	Frequency Burst Burst Equivalent				Reading	Type 1
(dB)		Weighting	Weighting	(kHz)	Duration	Duty	Level	Level	(dB)	Spec.
					(ms)	Factor	(dB)	(dB)		(dB)
30 - 110	L <sub>Aeq</sub>	A	10 sec.	4	1	1/10	110.0	100	99.9	± 0.5
						1/10 <sup>2</sup>		90	89.6	± 0.5
			60 sec.			1/103		80	79.3	± 1.0
			5 min.			1/104		70	69.9	± 1.0

Remarks : - Mfr's Spec. : IEC 60651 Type 1 & IEC 60804 Type 1

Uncertainties of Applied Value :	94 dB :	31.5 Hz - 125 Hz	:	$\pm 0.40 \text{ dB}$
		250 Hz - 500 Hz	:	± 0.30 dB
		l kHz	:	± 0.20 dB
		2 kHz	:	± 0.40 dB
		4 kHz	:	± 0.50 dB
		8 kHz	:	± 0.70 dB
		12.5 kHz	:	± 1.20 dB
	104 dB :	1 kHz	:	± 0.10 dB (Ref. 94 dB)
	114 dB :	l kHz	:	$\pm 0.10 \text{ dB}$ (Ref. 94 dB)
	Burst equ	ivalent level	:	$\pm 0.2 \text{ dB}$ (Ref. 110 dB
	1			continuous sound level)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :

The values given in this Calibration Report only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to the National Standards as specified in this report. This report shall not be reproduced except in full and with prior written approval from this laboratory.



Certificate No. : C112201

Certificate of Calibration

## This is to certify that the equipment

Description : Acoustical Calibrator (EQ082) Manufacturer : Bruel & Kjaer Model No. : 4231 Serial No. : 2713428

## has been calibrated for the specific items and ranges. The results are shown in the Calibration Report No. C112201.

The equipment is supplied by

Co. Name : Action-United Environmental Services and Consulting

Address : Unit A, 20/F., Gold King Industrial Building, 35-41 Tai Lin Pai Road, Kwai Chung, N.T.

Date of Issue : 19 April 2011

Certified by : K Ċ/Lee

The test equipment used for calibration are traceable to the National Standards as specified in this report. This report shall not be reproduced except in full and with prior written approval from this laboratory.



Sun Creation Engineering Limited Calibration and Testing Laboratory

Report No. : C112201

RELATIVE HUMIDITY :  $(55 \pm 20)\%$ 

JOB NO. : IC11-0947

Calibration Report

### ITEM TESTED

DESCRIPTION	:	Acoustical Calibrator (EQ082)
MANUFACTURER	:	Bruel & Kjaer
MODEL NO.	:	4231
SERIAL NO.	:	2713428

#### **TEST CONDITIONS**

AMBIENT TEMPERATURE:  $(23 \pm 2)^{\circ}C$ LINE VOLTAGE: ---

#### TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 18 April 2011

TEST RESULTS

The results apply to the particular unit-under-test only. All results are within manufacturer's specification. The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- The Bruel & Kjaer Calibration Laboratory, Denmark
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested by :

Date : 19 April 2011

The test equipment used for calibration are traceable to the National Standards as specified in this report. This report shall not be reproduced except in full and with prior written approval from this laboratory.



Sun Creation Engineering Limited Calibration and Testing Laboratory

Report No.: C112201

Calibration Report

- 1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours before the commencement of the test.
- 2. The results presented are the mean of 3 measurements at each calibration point.
- 3. Test equipment :

Equipment ID CL130 CL281 TST150A Description Universal Counter Multifunction Acoustic Calibrator Measuring Amplifier <u>Certificate No.</u> C103289 C1006860 C101008

- 4. Test procedure : MA100N.
- 5. Results :
- 5.1 Sound Level Accuracy

UUT	Measured Value	Mfr's Spec.	Uncertainty of Measured Value
Nominal Value	(dB)	(dB)	(dB)
94 dB, 1 kHz	94.0	± 0.2	± 0.2
114 dB, 1 kHz	114.0		

#### 5.2 Frequency Accuracy

UUT Nominal Value	Measured Value	Mfr's	Uncertainty of Measured Value			
(kHz)	(kHz)	Spec.	(Hz)			
1	1.000 0	1 kHz ± 0.1 %	± 0.1			

Remark : - The uncertainties are for a confidence probability of not less than 95 %.

Note :

The values given in this Calibration Report only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to the National Standards as specified in this report. This report shall not be reproduced except in full and with prior written approval from this laboratory.



# Appendix F

## **Event/Action Plan**



Air Quality

EVENT	ACTION			
	ET	IC(E)	ER	CONTRACTOR
ACTION LEVEL		-		
1. Exceedance for one sample	<ol> <li>Identify source, investigate the causes of exceedance and propose remedial measures;</li> <li>Inform IC(E) and ER;</li> <li>Repeat measurement to confirm finding;</li> <li>Increase monitoring frequency to daily.</li> </ol>	<ol> <li>Check monitoring data submitted by ET;</li> <li>Check Contractor's working method.</li> </ol>	1. Notify Contractor.	<ol> <li>Rectify any unacceptable practice;</li> <li>Amend working methods if appropriate.</li> </ol>
2. Exceedance for two or more consecutive samples	<ol> <li>Identify source;</li> <li>Inform IC(E) and ER;</li> <li>Advise the ER on the effectiveness of the proposed remedial measures;</li> <li>Repeat measurements to confirm findings;</li> <li>Increase monitoring frequency to daily;</li> <li>Discuss with IC(E) and Contractor on remedial actions required;</li> <li>If exceedance continues, arrange meeting with IC(E) and ER;</li> <li>If exceedance stops, cease additional monitoring.</li> </ol>	<ol> <li>Check monitoring data submitted by ET;</li> <li>Check Contractor's working method;</li> <li>Discuss with ET and Contractor on possible remedial measures;</li> <li>Advise the ET on the effectiveness of the proposed remedial measures;</li> <li>Supervise Implementation of remedial measures.</li> </ol>	<ol> <li>Confirm receipt of notification of failure in writing;</li> <li>Notify Contractor;</li> <li>Ensure remedial measures properly implemented.</li> </ol>	<ol> <li>Submit proposals for remedial to ER within 3 working days of notification;</li> <li>Implement the agreed proposals;</li> <li>Amend proposal if appropriate.</li> </ol>
		LIMIT LEVEL		
1. Exceedance for one sample	<ol> <li>Identify source, investigate the causes of exceedance and propose remedial measures;</li> <li>Inform ER, Contractor and EPD;</li> <li>Repeat measurement to confirm finding;</li> <li>Increase monitoring frequency to daily;</li> <li>Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results.</li> </ol>	<ol> <li>Check monitoring data submitted by ET;</li> <li>Check Contractor's working method;</li> <li>Discuss with ET and Contractor on possible remedial measures;</li> <li>Advise the ER on the effectiveness of the proposed remedial measures;</li> <li>Supervise implementation of remedial measures.</li> </ol>	<ol> <li>Confirm receipt of notification of failure in writing;</li> <li>Notify Contractor;</li> <li>Ensure remedial measures properly implemented.</li> </ol>	<ol> <li>Take immediate action to avoid further exceedance;</li> <li>Submit proposals for remedial actions to IC(E) within 3 working days of notification;</li> <li>Implement the agreed proposals;</li> <li>Amend proposal if appropriate.</li> </ol>
2. Exceedance for two or more consecutive samples	<ol> <li>Notify IC(E), ER, Contractor and EPD;</li> <li>Identify source;</li> <li>Repeat measurement to confirm findings;</li> <li>Increase monitoring frequency to daily;</li> <li>Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</li> <li>Arrange meeting with IC(E) and ER to discuss the remedial actions to be taken;</li> <li>Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results;</li> <li>If exceedance stops, cease additional monitoring.</li> </ol>	<ol> <li>Discuss amongst ER, ET, and Contractor on the potential remedial actions;</li> <li>Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;</li> <li>Supervise the implementation of remedial measures.</li> </ol>	<ol> <li>Confirm receipt of notification of failure in writing;</li> <li>Notify Contractor;</li> <li>In consolidation with the IC(E), agree with the Contractor on the remedial measures to be implemented;</li> <li>Ensure remedial measures properly implemented;</li> <li>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.</li> </ol>	<ol> <li>Take immediate action to avoid further exceedance;</li> <li>Submit proposals for remedial actions to IC(E) within 3 working days of notification;</li> <li>Implement the agreed proposals;</li> <li>Resubmit proposals if problem still not under control;</li> <li>Stop the relevant portion of works as determined by the ER until the exceedance is abated.</li> </ol>



**Construction Noise** 

EVENT	ACTION				
	ET	IC(E)	ER	CONTRACTOR	
Action Level	<ol> <li>Notify IC(E) and Contractor;</li> <li>Carry out investigation;</li> <li>Report the results of investigation to the IC(E), ER and Contractor;</li> <li>Discuss with the Contractor and formulate remedial measures;</li> <li>Increase monitoring frequency to check mitigation effectiveness</li> </ol>	<ol> <li>Review the analysed results submitted by the ET;</li> <li>Review the proposed remedial measures by the Contractor and advise the ER accordingly;</li> <li>Supervise the implementation of remedial measures.</li> </ol>	<ol> <li>Confirm receipt of notification of failure in writing;</li> <li>Notify Contractor;</li> <li>Require Contractor to propose remedial measures for the analysed noise problem;</li> <li>Ensure remedial measures are properly implemented.</li> </ol>	<ol> <li>Submit noise mitigation proposals to IC(E);</li> <li>Implement noise mitigation proposals.</li> </ol>	
Limit Level	<ol> <li>Identify source;</li> <li>Inform IC(E), ER, EPD and Contractor;</li> <li>Repeat measurements to confirm findings;</li> <li>Increase monitoring frequency;</li> <li>Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</li> <li>Inform IC(E), ER and EPD the causes and actions taken for the exceedances;</li> <li>Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results;</li> <li>If exceedance stops, cease additional monitoring.</li> </ol>	<ol> <li>Discuss amongst ER, ET, and Contractor on the potential remedial actions;</li> <li>Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;</li> <li>Supervise the implementation of remedial measures.</li> </ol>	<ol> <li>Confirm receipt of notification of failure in writing;</li> <li>Notify Contractor;</li> <li>Require Contractor to propose remedial measures for the analysed noise problem;</li> <li>Ensure remedial measures properly implemented;</li> <li>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.</li> </ol>	<ol> <li>Take immediate action to avoid further exceedance;</li> <li>Submit proposals for remedial actions to IC(E) within 3 working days of notification;</li> <li>Implement the agreed proposals;</li> <li>Resubmit proposals if problem still not under control;</li> <li>Stop the relevant portion of works as determined by the ER until the exceedance is abated.</li> </ol>	

Water Quality

EVENT			ACTI	ON			
	ET		IC(E)		ER		CONTRACTOR
ACTION LEVEL							
1. Exceedance for one sampling day	<ol> <li>Repeat in-situ measurement on the next day of exceedance to confirm findings;</li> <li>Identify source(s) of impact;</li> <li>Inform ICE, Contractor, ER, EPD and AFCD; and</li> <li>Check monitoring data, all plant, equipment and Contractor's working methods.</li> </ol>	1.	Check monitoring data submitted by ET and Contractor's working methods	1. 2.	Confirm receipt of notification of non-compliance in writing; and Notify Contractor	1. 2. 3.	Information the ER and confirm notification of the non-compliance in writing; Rectify unacceptable practice; and Amend working methods if appropriate
2. Exceedance for two or more consecutive sampling days	<ol> <li>Same as the above;</li> <li>Inform ICE, Contractor, ER, EPD and AFCD;</li> <li>Discuss mitigation measures with IC(E), RE and Contractor;</li> <li>Ensure well implementation of mitigation measures; and</li> <li>Increase the monitoring frequency to daily until no exceedance of Action Level</li> </ol>	1. 2. 3.	Same as the above; Discuss with ET and Contractor on possible remedial actions; Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; and Supervise the implementation of mitigation measures.	1. 2. 3.	Discuss with IC(E) on the proposed mitigation measures; Ensure well implementation of mitigation measures; and Assess the effectiveness of the implemented mitigation measures	1. 2. 3.	Same as the above; Check all plant and equipment and consider changes of working methods; Submit proposal of additional mitigation measures to ER within 3 working days of notification and discuss with ET, IC(E), and ER; and Implement the agreed mitigation measures
			LIMIT LEVEL			-	
1. Exceedance for one sampling day	<ol> <li>Repeat in-situ measurement on the next day of exceedance to confirm findings;</li> <li>Identify source(s) of impact;</li> <li>Inform ICE, Contractor, ER, EPD and AFCD;</li> <li>Check monitoring data, all plant, equipment and Contractor's working methods; and</li> <li>Discuss mitigation measures with IC(E), RE and Contractor</li> </ol>	1.       2.       3.	Check monitoring data submitted by ET and Contractor's working method Discuss with ER and Contractor on possible remedial actions; and Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly	1. 2. 3. 4.	Confirm receipt of notification failure in writing; and Discuss with IC(E), ET and Contractor on the proposed mitigation measures; and Request Contractor to review the working methods	1. 2. 3. 4.	Inform the ER and confirm notification of the failure in writing; Rectify unacceptable practice; Check all plant and equipment and consider changes of working methods; and Submit proposal of mitigation measures to ER within 3 working days of notification and discuss with ET and ER
2. Exceedance for two or more consecutive sampling days	<ol> <li>Same as the above;</li> <li>Ensure mitigation measures are implemented; and</li> <li>Increase the monitoring frequency to daily until no exceedance of Limit Level for two consecutive days</li> </ol>	1. 2.	Same as the above; and Supervise the Implementation of mitigation measures	1. 2. 3. 4.	Same as the above; Ensure well implementation of mitigation measures Make agreement on the mitigation measures to be implemented; and Consider and instruct, if necessary, the Contractor to stow down or to stop all or part of the construction activities until no exceedance of limit level	1. 2. 3. 4. 5.	Same as the above; Take immediate action to avoid further exceedance; Implement the agreed mitigation measures; Resubmit proposals of mitigation measures if problem still not under control; and As directed by the Engineer, to slow down or to stop all or part of the construction activities until to no exceedance of Limit Level.

# Appendix G

## **Monitoring Data Sheet**
#### 24-hour TSP Monitoring Results - AM1

Date of Calibration: 28-Apr-11 Slope = 33.1167

Next Calibration Date: 28-Jun-11 Intercept =

											Next Calibi	ration Date:	28-Jun-11	Intercept =	6.0332
		EI	ELAPSED TIME CHART READING						STANDARD	)	INITIAL	FINAL	WEIGHT	DUST	
DATE	SAMPLE							AVG	AVG	FLOW	AIR	FILTER	FILTER	DUST	24-hour TSP
	NUMBER	INITIAL	FINAL	ACTUAL	MIN	MAX	AVG	TEMP	PRESS	RATE	VOLUME	WEIGHT	WEIGHT	COLLECTED	IN AIR
				(min)				(oC)	(hPa)	(m3/min)	(std m3)	(g)	(g)	(g)	$(ug/m^3)$
4-Jun-11	power failure														
9-Jun-11	power failure														
16-Jun-11	23722	10644.01	10667.89	1432.80	30	32	31.0	26.6	1005.1	0.75	1071	2.7438	2.7677	0.0239	22
22-Jun-11	23768	10667.89	10691.45	1413.60	28	33	30.5	26.6	997.8	0.73	1031	2.7994	2.8166	0.0172	17
28-Jun-11	23818	10691.45	10715.35	1434.00	34	36	35.0	26.4	1004.5	0.87	1244	2.7663	2.8017	0.0354	28

#### 24-hour TSP Monitoring Results - AM2

Date of Calibration: 28-Apr-11 Slope = 25.3965

Next Calibration Date: 28-Jun-11 Intercept = 13.8571

											Tterr Gunor	ution Dute.	20-Jun-11	intercept	15.0571
		EI	LAPSED T	IME	CHART READING					STANDARD	)	INITIAL	FINAL	WEIGHT	DUST
DATE	SAMPLE							AVG	AVG	FLOW	AIR	FILTER	FILTER	DUST	24-hour TSP
	NUMBER	INITIAL	FINAL	ACTUAL	MIN	MAX	AVG	TEMP	PRESS	RATE	VOLUME	WEIGHT	WEIGHT	COLLECTED	IN AIR
				(min)				(oC)	(hPa)	(m3/min)	(std m3)	(g)	(g)	(g)	$(ug/m^3)$
4-Jun-11	power failure														
9-Jun-11	power failure														
16-Jun-11	23770	9173.95	9197.54	1415.40	30	32	31.0	26.6	1005.1	0.67	944	2.8016	2.8484	0.0468	50
22-Jun-11	23804	9197.54	9222.19	1479.00	32	34	33.0	26.6	997.8	0.74	1095	2.7564	2.796	0.0396	36
28-Jun-11	23859	9222.19	9246.5	1458.60	32	34	33.0	26.4	1004.5	0.75	1087	2.7492	2.7785	0.0293	27

24-hour TSP	Monitoring R	lesults - AM	13						Date of Calibration: 28-Apr-1					Slope =	23.8359
											Next Calib	ration Date:	28-Jun-11	Intercept =	11.9864
	ELAPSED TIME CHART READING								STANDARD		INITIAL	FINAL	WEIGHT	DUST	
DATE	SAMPLE							AVG	AVG	FLOW	AIR	FILTER	FILTER	DUST	24-hour TSP
	NUMBER	INITIAL	FINAL	ACTUAL	MIN	MAX	AVG	TEMP	PRESS	RATE	VOLUME	WEIGHT	WEIGHT	COLLECTED	IN AIR
				(min)				(oC)	(hPa)	(m3/min)	(std m3)	(g)	(g)	(g)	$(ug/m^3)$
4-Jun-11	power failure														
9-Jun-11	23802	4685.50	4709.48	1438.80	28	30	29.0	28.8	1008.8	0.70	1012	2.7747	2.8328	0.0581	57
16-Jun-11	23805	4709.48	4733.36	1432.80	30	32	31.0	30	1006.2	0.78	1121	2.7577	2.8071	0.0494	44
22-Jun-11	23857	4733.36	4757.33	1438.20	30	32	31.0	26.6	997.8	0.78	1128	2.7526	2.786	0.0334	30
28-Jun-11	23858	4757.33	4781.23	1434.00	34	36	35.0	26.4	1004.5	0.96	1370	2.7538	2.8339	0.0801	58

# Appendix H

## **Graphical Plots of Monitoring Results**

Contract No. DC/2009/13 – Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan Sok Kwu Wan – EM&A Monthly Report- June 2011



Contract No. DC/2009/13 – Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan Sok Kwu Wan – EM&A Monthly Report- June 2011



Contract No. DC/2009/13 – Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan Sok Kwu Wan – EM&A Monthly Report- June 2011







# Appendix I

# **Meteorological Information**

### Meteorological Data Extracted from HKO during the Reporting Period

Date		Weather							
1-Jun-11	Wed	Moderate south to southeasterly winds							
2-Jun-11	Thu	squally thunderstorms							
3-Jun-11	Fri	Moderate to fresh southeasterly winds.							
4-Jun-11	Sat	Mainly cloudy with a few showers.							
5-Jun-11	Sun	Hot with a few showers.							
6-Jun-11	Mon	Moderate south to southwesterly winds.							
7-Jun-11	Tue	A few showers with isolated thunderstorms.							
8-Jun-11	Wed	Hot with sunny periods.							
9-Jun-11	Thu	Moderate southerly winds.							
10-Jun-11	Fri	Sunny periods tomorrow							
11-Jun-11	Sat	Cloudy with occasional showers and squally thunderstorms							
12-Jun-11	Sun	Mainly cloudy with a few showers.							
13-Jun-11	Mon	Moderate southerly winds.							
14-Jun-11	Tue	Mainly cloudy with a few showers.							
15-Jun-11	Wed	Cloudy with a few showers.							
16-Jun-11	Thu	Cloudy with rain							
17-Jun-11	Fri	Hot with sunny periods							
18-Jun-11	Sat	Sunny periods.							
19-Jun-11	Sun	Moderate west to southwesterly winds.							
20-Jun-11	Mon	Fresh east to northeasterly winds							
21-Jun-11	Tue	Cloudy with squally showers and a few thunderstorms.							
22-Jun-11	Wed	Mainly cloudy with squally showers							
23-Jun-11	Thu	Moderate to fresh east to southeasterly winds.							
24-Jun-11	Fri	Sunny periods.							
25-Jun-11	Sat	Mainly fine apart from one or two showers							
26-Jun-11	Sun	Sunny intervals with one or two showers.							
27-Jun-11	Mon	Moderate west to southwesterly winds.							
28-Jun-11	Tue	Cloudy with occasional rain and a few squally thunderstorms							
29-Jun-11	Wed	Very hot							
30-Jun-11	Thu Moderate south to southwesterly winds								

# Appendix J

## Monthly Summary Waste Flow Table

## Monthly Summary Waste Flow Table for June 2011

			Actu	ial Quant	ities of Ir	nert C&D	Material	s Genera	ted Mont	hly			Actual Quantities of C&D Wastes Generated Monthly									
Month	Total Quantity Generated (a) = (c)+(d)+(e)		Hard Rock and Large Broken Concrete (b)		Reused in the Contract (c)		Reused in other Projects (d)		Disposed as Public Fill (e)		Imported Fill (f)		Metals		Paper/ cardboard packaging		Plastics		Chemical Waste		Others, e.g. rubbish	
	(in '00	$00m^{3})$	(in '00	(in '000m <sup>3</sup> )		(in '000m <sup>3</sup> )		(in '000m <sup>3</sup> )		00m <sup>3</sup> )	(in '0	$00m^{3})$	(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in tonne)	
	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW
2010	4.522	0.030	0.068	0.104	0.488	0.000	0.000	0.000	4.033	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	18.460
Jan	0.985	3.110	0.003	0.013	0.120	0.484	0.000	2.626	0.865	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.240
Feb	0.377	0.000	0.000	0.043	0.000	0.000	0.000	0.000	0.377	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350
Mar	0.758	1.430	0.002	0.106	0.006	0.255	0.000	1.175	0.752	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.360
Apr	1.135	1.249	0.017	0.025	0.112	0.090	0.000	1.159	1.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.830	5.160
May	0.614	1.862	0.030	0.036	0.014	0.900	0.000	0.962	0.600	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.150	0.860
Jun	0.505	0.955	0.000	0.022	0.000	0.001	0.000	0.954	0.505	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.610	1.510
<mark>Sub-total</mark>	8.8954	8.6359	0.1184	0.3497	0.7397	1.7296	0.0000	6.8760	8.1558	0.0303	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	<mark>15.5900</mark>	<mark>28.9400</mark>
Jul																						
Aug																						
Sep																						
Oct																						
Nov																						
Dec																						
Total	8.8954	8.6359	0.1184	0.3497	0.740	1.730	0.000	6.876	8.1558	0.0303	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.59	28.94
Total	17.	531	0.4	·68	2.4	69	6.8	76	8.1	86	0.0	00	0.0	00	0.0	00	0.0	00	0.0	00	44.	53

*Remark:* Assume 1.0  $m^3$  vehicle dump load = 1.6 tonnes C&D materials

YSW: Yung Shue Wan SKW: Sok Kwu Wan

# Appendix K

## Weekly Site Inspection Checklist

Project Date: PAR Wea Temp Hum Winc Area 1	TCS/00512/09         Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan         9 June 2011         TA:       GENERAL INFORMATION         ther:       Sunny       ✓         9 June 2011       ✓         TA:       GENERAL INFORMATION         ther:       Sunny       ✓         idity:       High       ✓         berature:       30.0       °C         idity:       High       ✓         Strong       Breeze       ✓         Inspected       Sok Kwu Wan	Inspecto ETL/ ET RE's Re Contrac IEC's Ro Time: Rainy	ed by 's Repres presentat tor's Repr epresenta	entative: ive: resentative tive:	Cha _Ray _Jos : Edv 	cklist No. / Cheung eph Ng vin Leung 00 ronmental 81/2007A	Permit No.
PART	B: SITE AUDIT						
Note:	Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance; Follow Up: Observations requiring follow-Up actions N/A: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
Sectio	on 1: Water Quality					_	
1.01	Is an effluent discharge license obtained for the Project?		$\checkmark$				
1.02	Is the effluent discharged in accordance with the discharge licence?	?	$\checkmark$				
1.03	Is the discharge of turbid water avoided?		$\checkmark$				
1.04	Are there proper desilting facilities in the drainage systems to reduce SS levels in effluent?	° 🗌			$\checkmark$		Remark 2
1.05	Are there channels, sandbags or bunds to direct surface run-off to sedimentation tanks?	° 🗌	$\checkmark$				
1.06	Are there any perimeter channels provided at site boundaries to intercept storm runoff from crossing the site?	° 🗌	$\checkmark$				
1.07	Is drainage system well maintained?		$\checkmark$				
1.08	As excavation proceeds, are temporary access roads protected by crushed stone or gravel?	y 🗌	$\checkmark$				
1.09	Are temporary exposed slopes properly covered?		$\checkmark$				
1.10	Are earthworks final surfaces well compacted or protected?		$\checkmark$				
1.11	Are manholes adequately covered or temporarily sealed?		$\checkmark$				
1.12	Are there any procedures and equipment for rainstorm protection?		$\checkmark$				
1.13	Are wheel washing facilities well maintained?	$\checkmark$					
1.14	Is runoff from wheel washing facilities avoided?	$\checkmark$					
1.15	Are there toilets provided on site?		$\checkmark$				
1.16	Are toilets properly maintained?		$\checkmark$				
1.17	Are the vehicle and plant servicing areas paved and located within roofed areas?	n 🗹					
1.18	Is the oil leakage or spillage avoided?		$\checkmark$				
1.19	Are there any measures to prevent leaked oil from entering the drainage system?	e	$\checkmark$				
1.20	Are there any measures to collect spilt cement and concrete washings during concreting works?	•				$\checkmark$	
1.21	Are there any oil interceptors/grease traps in the drainage systems for vehicle and plant servicing areas, canteen kitchen, etc?	s 🗹					
1.22	Are the oil interceptors/grease traps maintained properly?		$\checkmark$				

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Note:	Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance; Follow Up: Observations requiring follow-Up actions N/A: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
1.23	Is used bentonite recycled where appropriate?	$\checkmark$					
1.24	Designated settlement area for runoff/wheel wash waste is provide and located at the streambed with 1-2m deep, 12m long and around 50m <sup>3</sup> capacities for sedimentation.	$\checkmark$					
1.25	No excavation is undertaken in the settlement area.		$\checkmark$				
1.26	Concreting wastes water should be neutralized below the pH Action Levels before discharge.	$\checkmark$					
1.27	Mobile toilets should provide on site and located away the stream course.	$\checkmark$					
1.28	License collector should be employed for handling the sewage of mobile toilet.	$\checkmark$					
1.29	Is ponding /stand water avoided?				$\checkmark$		Remark 1
1.30	Is open stockpiles well covered by impermeable sheet?		$\checkmark$				
Sectio	n 2: Air Quality						
2.01	Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?	$\checkmark$					
2.02	Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?		$\checkmark$				
2.03	Are the excavated materials sprayed with water during handling?		$\checkmark$				
2.04	Are stockpiles of dusty materials sprayed with water, covered or placed in sheltered areas?						
2.05	Is the exposed earth properly treated within six months after the last construction activities?	$\checkmark$					
2.06	Are the access roads sprayed with water to maintain the entire road surface wet or paved?		$\checkmark$				
2.07	Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?		$\checkmark$				
2.08	Is the load on vehicles covered entirely by clean impervious sheeting?		$\checkmark$				
2.09	Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?		$\checkmark$				
2.10	Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?		$\checkmark$				
2.11	Is dark smoke emission from plant/equipment avoided?		$\checkmark$				
2.12	Are de-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement?	$\checkmark$					
2.13	Are site vehicles travelling within the speed limit not more than 15km/hour?		$\checkmark$				
2.14	Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?		$\checkmark$				
2.15	Is open burning avoided?		$\checkmark$				
2.16	Excavated materials from the stream must remove form site on the same day. The materials shall be stored in covered impermeable skips awaiting removal from site.		$\checkmark$				
Sectio	n 3: Noise						
3.01	Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?		$\checkmark$				
3.02	Is silenced equipment adopted?		$\checkmark$				
3.03	Is idle equipment turned off or throttled down?		$\checkmark$				
3.04	Are all plant and equipment well maintained and in good condition?		$\checkmark$				
3.05	Are noise barriers or enclosures provided at areas where construction activities cause noise impact on sensitive receivers?	$\checkmark$					
3.06	Are hand held breakers fitted with valid noise emission labels during operation?		$\checkmark$				
3.07	Are air compressors fitted with valid noise emission labels during operation?		$\checkmark$				

Note:	Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance; Follow Up: Observations requiring follow-Up actions N/A: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
3.08	Are flaps and panels of mechanical equipment closed during operation?		$\checkmark$				
3.09	Are Construction Noise Permit(s) applied for percussive piling works?	$\checkmark$					
3.10	Are Construction Noise Permit(s) applied for general construction works during restricted hours?	$\checkmark$					
3.11	Are valid Construction Noise Permit(s) posted at site entrances?	$\checkmark$					
3.12	Use of quiet plant had been used on site to minimise the construction noise impact to the surrounding residences/dwellings (Level 1 mitigation measures).	$\checkmark$					
3.13	Temporary/Moveable noise barrier or site hoarding are provide or erect at the site boundary to minimise the noise impact of the closest NSRs or stationary equipments shield by the noise barrier which cannot visible from NSRs (Level 2 mitigation measure) Temporary/Moveable poise barrier equal to or more than 3m beinth	$\checkmark$					
3.14	with 10kg/m2 are provide for noise mitigation measures (Level 2 mitigation measures).	$\checkmark$					
Sectio	n 4: Waste/Chemical Management						
4.01	Waste Management Plan had been submit to Engineer for approval.		$\checkmark$				
4.02	Are receptacles available for general refuse collection?		$\checkmark$				
4.03	Is general refuse sorting or recycling implemented?		$\checkmark$				
4.04	Is general refuse disposed of properly and regularly?		$\checkmark$				
4.05	Is the Contractor registered as a chemical waste producer?	$\checkmark$					
4.06	Are the chemical waste containers and storage area properly labelled?		$\checkmark$				
4.07	Are the chemical wastes stored in proper storage areas?		$\checkmark$				
4.08	Is the chemical container or equipment provided with drip tray?		$\checkmark$				
4.09	Is the chemical waste storage area used for storage of chemical waste only?		$\checkmark$				
4.10	Are incompatible chemical wastes stored in different areas?		$\checkmark$				
4.11	Are the chemical wastes disposed of by licensed collectors?		$\checkmark$				
4.12	Are trip tickets for chemical wastes disposal available for inspection?		$\checkmark$				
4.13	Are chemical/fuel storage areas bounded?		$\checkmark$				
4.14	Are designated areas identified for storage and sorting of construction wastes?		$\checkmark$				
4.15	Are construction wastes sorted (inert and non-inert) on site?		$\checkmark$				
4.16	Are construction wastes reused?		$\checkmark$				
4.17	Are construction wastes disposed of properly?		$\checkmark$				
4.18	Are site hoardings and signboards made of durable materials instead of timber?		$\checkmark$				
4.19	Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?		$\checkmark$				
4.20	Are appropriate procedures followed if contaminated material exists?		$\checkmark$				
4.21	Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?		$\checkmark$				
4.22	Site cleanliness and appropriate waste management training had provided for the site workers.		$\checkmark$				
4.23	Contaminated sediments will managed according to WBTC No.12/2000 and EWTB TC(W) No. 34/2002.	$\checkmark$					

Note:	Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance; Follow Up: Observations requiring follow-Up actions N/A: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
Sectio	on 5: Landscape & Visual						
5.01	Are retained and transplanted trees in health condition?				$\checkmark$		Refer to Monthly EM&A report – June 2011 - Appendix M
5.02	Are retained and transplanted trees properly protected?		$\checkmark$				Refer to tree photos
5.03	Are surgery works carried out for the damaged trees?	$\checkmark$					
5.04	Is damage to trees outside site boundary due to construction activities avoided?		$\checkmark$				
5.05	Is the night-time lighting controlled to minimize glare to sensitive receivers?	$\checkmark$					
Sectio	on 6: Others						
6.01	Are relevant Environmental Permits posted at all vehicle site entrances/exits?	$\checkmark$					

(Sok Kwu Wan) Remarks: Findings of Site Inspection: (9 June 2011)



The Contractor should clear the stagnant water in the trip The stagnant water was cleared. tray to avoid mosquito breeding.

Follow up:



(Rectified on 10-6-2011)



Mud and soil was accumulated in the U-channel. The Contractor should clear the sediment regularly to maintain the de-silting function of the sand bags.



The sediment in the channel was cleared (Rectified on 11-6-2011)



**Tree Photos:** 



The transplanted and retained uncommon tree species trees were found to be labeled, fenced and protected.

IEC's representative		RE's representative		ET's representative	E	O's representativ	/e	Contractor's rep	resentative
				D					
				Fayer					
				2					
( N/A	)	(	)	( Ray Cheung	)	(	)	(	)

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Projec	:t:	TCS/00512/09	Inspected by		Che	Checklist No. TCS512B-140611			
-	-	Construction of Sewage Treatment Works at	ETL/ ET	's Represe	entative:	Nic	Nicola Hon		
	-	Yung Shue Wan and Sok Kwu Wan	RE's Re	presentati	ve:	Jos	Joseph Ng		
	-		Contrac	tor's Repr	esentative	: Edv	Edwin Leung		
Date:	-	14 June 2011	Time:	epresentat	ive:	14:0	00		
PAR	T A:	GENERAL INFORMATION				Envi	ronmental	Permit No.	
Weat	ther:	Sunny Fine Cloudy I	Rainy			✓ EP- 28	81/2007A		
Temp	erature:	29.6 °C							
Humi	idity:	High Moderate Low							
Wind	l:	Strong Breeze 🖌 Light (	Calm						
Area I 1	Sok ł	ted Kwu Wan							
PART	B:	SITE AUDIT							
Note:	Not O Follov	<ul> <li>bs.: Not Observed; Yes: Compliance; No: Non-Compliance;</li> <li>Up: Observations requiring follow-Up actions N/A: Not Applicable</li> </ul>	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks	
Sectio	on 1: W	ater Quality					-		
1.01	ls an	effluent discharge license obtained for the Project?		$\checkmark$					
1.02	Is the	effluent discharged in accordance with the discharge licence?		$\checkmark$					
1.03	Is the	discharge of turbid water avoided?		$\checkmark$					
1.04	Are t reduc	nere proper desilting facilities in the drainage systems to e SS levels in effluent?		$\checkmark$					
1.05	Are th sedim	ere channels, sandbags or bunds to direct surface run-off to entation tanks?		$\checkmark$					
1.06	Are th interc	here any perimeter channels provided at site boundaries to ept storm runoff from crossing the site?		$\checkmark$					
1.07	ls dra	inage system well maintained?		$\checkmark$					
1.08	As ex crush	cavation proceeds, are temporary access roads protected by ed stone or gravel?		$\checkmark$					
1.09	Are te	mporary exposed slopes properly covered?		$\checkmark$					
1.10	Are e	arthworks final surfaces well compacted or protected?		$\checkmark$					
1.11	Are m	anholes adequately covered or temporarily sealed?		$\checkmark$					
1.12	Are th	ere any procedures and equipment for rainstorm protection?		$\checkmark$					
1.13	Are w	heel washing facilities well maintained?	$\checkmark$						
1.14	ls run	off from wheel washing facilities avoided?	$\checkmark$						
1.15	Are th	ere toilets provided on site?		$\checkmark$					
1.16	Are to	ilets properly maintained?		$\checkmark$					
1.17	Are th roofed	e vehicle and plant servicing areas paved and located within a reas?	$\checkmark$						
1.18	Is the	oil leakage or spillage avoided?		$\checkmark$					
1.19	Are th draina	nere any measures to prevent leaked oil from entering the age system?		$\checkmark$					
1.20	Are t washi	here any measures to collect spilt cement and concrete ngs during concreting works?					$\checkmark$		
1.21	Are th for ve	ere any oil interceptors/grease traps in the drainage systems hicle and plant servicing areas, canteen kitchen, etc?	$\checkmark$						
1.22	Are th	e oil interceptors/grease traps maintained properly?		$\checkmark$					

Note:	Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance; Follow Up: Observations requiring follow-Up actions N/A: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
1.23	Is used bentonite recycled where appropriate?	$\checkmark$					
1.24	Designated settlement area for runoff/wheel wash waste is provide and located at the streambed with 1-2m deep, 12m long and around $50m^3$ capacities for sedimentation.	$\checkmark$					
1.25	No excavation is undertaken in the settlement area.		$\checkmark$				
1.26	Concreting wastes water should be neutralized below the pH Action Levels before discharge.	$\checkmark$					
1.27	Mobile toilets should provide on site and located away the stream course.	$\checkmark$					
1.28	License collector should be employed for handling the sewage of mobile toilet.	$\checkmark$					
1.29	Is ponding /stand water avoided?				$\checkmark$		Remark 2
1.30	Is open stockpiles well covered by impermeable sheet?		$\checkmark$				
Sectio	n 2: Air Quality						
2.01	Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?	$\checkmark$					
2.02	Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?		$\checkmark$				
2.03	Are the excavated materials sprayed with water during handling?		$\checkmark$				
2.04	Are stockpiles of dusty materials sprayed with water, covered or placed in sheltered areas?						
2.05	Is the exposed earth properly treated within six months after the last construction activities?	$\checkmark$					
2.06	Are the access roads sprayed with water to maintain the entire road surface wet or paved?		$\checkmark$				
2.07	Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?		$\checkmark$				
2.08	Is the load on vehicles covered entirely by clean impervious sheeting?		$\checkmark$				
2.09	Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?		$\checkmark$				
2.10	Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?		$\checkmark$				
2.11	Is dark smoke emission from plant/equipment avoided?		$\checkmark$				
2.12	Are de-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement?	$\checkmark$					
2.13	Are site vehicles travelling within the speed limit not more than 15km/hour?		$\checkmark$				
2.14	Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?		$\checkmark$				
2.15	Is open burning avoided?		$\checkmark$				
2.16	Excavated materials from the stream must remove form site on the same day. The materials shall be stored in covered impermeable skips awaiting removal from site.		$\checkmark$				
Sectio	n 3: Noise						
3.01	Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?		$\checkmark$				
3.02	Is silenced equipment adopted?		$\checkmark$				
3.03	Is idle equipment turned off or throttled down?		$\checkmark$				
3.04	Are all plant and equipment well maintained and in good condition?		$\checkmark$				
3.05	Are noise barriers or enclosures provided at areas where construction activities cause noise impact on sensitive receivers?	$\checkmark$					
3.06	Are hand held breakers fitted with valid noise emission labels during operation?		$\checkmark$				
3.07	Are air compressors fitted with valid noise emission labels during operation?		$\checkmark$				

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Note:	Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance; Follow Up: Observations requiring follow-Up actions N/A: Not Applicable	Not Obs	Yes	No	Follow	N/A	Photo/ Remarks
3.08	Are flaps and panels of mechanical equipment closed during operation?		$\checkmark$				
3.09	Are Construction Noise Permit(s) applied for percussive piling works?	$\checkmark$					
3.10	Are Construction Noise Permit(s) applied for general construction works during restricted hours?	$\checkmark$					
3.11	Are valid Construction Noise Permit(s) posted at site entrances?	$\checkmark$					
3.12	Use of quiet plant had been used on site to minimise the construction noise impact to the surrounding residences/dwellings (Level 1 mitigation measures).	$\checkmark$					
3.13	Temporary/Moveable noise barrier or site hoarding are provide or erect at the site boundary to minimise the noise impact of the closest NSRs or stationary equipments shield by the noise barrier which cannot visible from NSRs (Level 2 mitigation measure)	$\checkmark$					
3.14	Temporary/Moveable noise barrier equal to or more than 3m height with 10kg/m2 are provide for noise mitigation measures (Level 2 mitigation measures).	$\checkmark$					
Sectio	on 4: Waste/Chemical Management						
4.01	Waste Management Plan had been submit to Engineer for approval.		$\checkmark$				
4.02	Are receptacles available for general refuse collection?		$\checkmark$				
4.03	Is general refuse sorting or recycling implemented?		$\checkmark$				
4.04	Is general refuse disposed of properly and regularly?		$\checkmark$				
4.05	Is the Contractor registered as a chemical waste producer?	$\checkmark$					
4.06	Are the chemical waste containers and storage area properly labelled?		$\checkmark$				
4.07	Are the chemical wastes stored in proper storage areas?		$\checkmark$				
4.08	Is the chemical container or equipment provided with drip tray?		$\checkmark$				
4.09	Is the chemical waste storage area used for storage of chemical waste only?		$\checkmark$				
4.10	Are incompatible chemical wastes stored in different areas?		$\checkmark$				
4.11	Are the chemical wastes disposed of by licensed collectors?		$\checkmark$				
4.12	Are trip tickets for chemical wastes disposal available for inspection?		$\checkmark$				
4.13	Are chemical/fuel storage areas bounded?		$\checkmark$				
4.14	Are designated areas identified for storage and sorting of construction wastes?		$\checkmark$				
4.15	Are construction wastes sorted (inert and non-inert) on site?		$\checkmark$				
4.16	Are construction wastes reused?		$\checkmark$				
4.17	Are construction wastes disposed of properly?		$\checkmark$				
4.18	Are site hoardings and signboards made of durable materials instead of timber?		$\checkmark$				
4.19	Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?		$\checkmark$				
4.20	Are appropriate procedures followed if contaminated material exists?		$\checkmark$				
4.21	Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?		$\checkmark$				
4.22	Site cleanliness and appropriate waste management training had provided for the site workers.		$\checkmark$				
4.23	Contaminated sediments will managed according to WBTC No.12/2000 and EWTB TC(W) No. 34/2002.	$\checkmark$					

Note:	Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance; Follow Up: Observations requiring follow-Up actions N/A: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
Sectio	on 5: Landscape & Visual						
5.01	Are retained and transplanted trees in health condition?				$\checkmark$		Refer to Monthly EM&A report - June 2011 - Appendix M
5.02	Are retained and transplanted trees properly protected?		$\checkmark$				Refer to tree photos
5.03	Are surgery works carried out for the damaged trees?	$\checkmark$					
5.04	Is damage to trees outside site boundary due to construction activities avoided?		$\checkmark$				
5.05	Is the night-time lighting controlled to minimize glare to sensitive receivers?	$\checkmark$					
Sectio	on 6: Others						
6.01	Are relevant Environmental Permits posted at all vehicle site entrances/exits?				$\checkmark$		Remark 1

#### (Sok Kwu Wan)

#### **Remarks:**

#### Findings of Site Inspection: (14 June 2011)



The Environmental Permit posted at the site entrances/exits was worn after rainstorm,



Stagnant water cumulated in the un-used sediment tank shall be drained away to prevent mosquito breeding.

### Follow up:



AUES

The Environmental Permit was replaced on 15 June 2011.



The stagnant water cumulated in un-used sediment tanks was cleared on 15 June 2011.



Tree Photos:



The transplanted and retained uncommon tree species trees were found to be labeled, fenced and protected.

IEC's representative	RE's representative	ET's representative	EO's representative	Contractor's representative	
		Anh			
( N/A )	( )	( Nicola Hon )	( )	( )	

Project Date: PAR Weat Temp Hum Wind Area I 1	tt: TCS/00512/09 Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan 21 June 2011 TA: GENERAL INFORMATION ther: ♀ Sunny    Fine    Cloudy berature: 29.1    °C idity: ♀ High    Moderate    Low d:    Strong    Breeze    Light Inspected Sok Kwu Wan	Inspected by ETL/ ET's Representative: RE's Representative: Contractor's Representative: IEC's Representative: Time: Rainy			Cha _Ray _Jos 	ecklist No. / Cheung eph Ng vin Leung 00 ronmental 81/2007A	TCS512B-210611
PART	B: SITE AUDIT						
Note:	Not Obs.:         Not Observed;         Yes:         Compliance;         No:         Compliance;         No:         Compliance;         M/A:         Not Applicable         No:         Applicable         No:         Applicable         No:         No:	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
Sectio	on 1: Water Quality			_	_		
1.01	Is an effluent discharge license obtained for the Project?		$\checkmark$				
1.02	Is the effluent discharged in accordance with the discharge licence?	?	$\checkmark$				
1.03	Is the discharge of turbid water avoided?		$\checkmark$				
1.04	Are there proper desilting facilities in the drainage systems to reduce SS levels in effluent?	р П	$\checkmark$				
1.05	Are there channels, sandbags or bunds to direct surface run-off to sedimentation tanks?	р П	$\checkmark$				
1.06	Are there any perimeter channels provided at site boundaries to intercept storm runoff from crossing the site?	р П	$\checkmark$				
1.07	Is drainage system well maintained?		$\checkmark$				
1.08	As excavation proceeds, are temporary access roads protected by crushed stone or gravel?	/	$\checkmark$				
1.09	Are temporary exposed slopes properly covered?		$\checkmark$				
1.10	Are earthworks final surfaces well compacted or protected?		$\checkmark$				
1.11	Are manholes adequately covered or temporarily sealed?		$\checkmark$				
1.12	Are there any procedures and equipment for rainstorm protection?		$\checkmark$				
1.13	Are wheel washing facilities well maintained?	$\checkmark$					
1.14	Is runoff from wheel washing facilities avoided?	$\checkmark$					
1.15	Are there toilets provided on site?		$\checkmark$				
1.16	Are toilets properly maintained?		$\checkmark$				
1.17	Are the vehicle and plant servicing areas paved and located withir roofed areas?						
1.18	Is the oil leakage or spillage avoided?		$\checkmark$				
1.19	Are there any measures to prevent leaked oil from entering the drainage system?	•	$\checkmark$				
1.20	Are there any measures to collect spilt cement and concrete washings during concreting works?					$\checkmark$	
1.21	Are there any oil interceptors/grease traps in the drainage systems for vehicle and plant servicing areas, canteen kitchen, etc?	5					
1.22	Are the oil interceptors/grease traps maintained properly?		$\checkmark$				

AUES



Note:	Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance; Follow Up: Observations requiring follow-Up actions N/A: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
1.23	Is used bentonite recycled where appropriate?	$\checkmark$					
1.24	Designated settlement area for runoff/wheel wash waste is provide and located at the streambed with 1-2m deep, 12m long and around $50m^3$ capacities for sedimentation.	$\checkmark$					
1.25	No excavation is undertaken in the settlement area.		$\checkmark$				
1.26	Concreting wastes water should be neutralized below the pH Action Levels before discharge.	$\checkmark$					
1.27	Mobile toilets should provide on site and located away the stream course.	$\checkmark$					
1.28	License collector should be employed for handling the sewage of mobile toilet.	$\checkmark$					
1.29	Is ponding /stand water avoided?		$\checkmark$				
1.30	Is open stockpiles well covered by impermeable sheet?		$\checkmark$				
Sectio	n 2: Air Quality						
2.01	Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?	$\checkmark$					
2.02	Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?		$\checkmark$				
2.03	Are the excavated materials sprayed with water during handling?		$\checkmark$				
2.04	Are stockpiles of dusty materials sprayed with water, covered or placed in sheltered areas?						
2.05	Is the exposed earth properly treated within six months after the last construction activities?	$\checkmark$					
2.06	Are the access roads sprayed with water to maintain the entire road surface wet or paved?		$\checkmark$				
2.07	Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?		$\checkmark$				
2.08	Is the load on vehicles covered entirely by clean impervious sheeting?		$\checkmark$				
2.09	Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?		$\checkmark$				
2.10	Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?		$\checkmark$				
2.11	Is dark smoke emission from plant/equipment avoided?		$\checkmark$				
2.12	Are de-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement?	$\checkmark$					
2.13	Are site vehicles travelling within the speed limit not more than 15km/hour?		$\checkmark$				
2.14	Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?		$\checkmark$				
2.15	Is open burning avoided?		$\checkmark$				
2.16	Excavated materials from the stream must remove form site on the same day. The materials shall be stored in covered impermeable skips awaiting removal from site.		$\checkmark$				
Sectio	n 3: Noise						
3.01	Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?		$\checkmark$				
3.02	Is silenced equipment adopted?		$\checkmark$				
3.03	Is idle equipment turned off or throttled down?		$\checkmark$				
3.04	Are all plant and equipment well maintained and in good condition?		$\checkmark$				
3.05	Are noise barriers or enclosures provided at areas where construction activities cause noise impact on sensitive receivers?	$\checkmark$					
3.06	Are hand held breakers fitted with valid noise emission labels during operation?		$\checkmark$				
3.07	Are air compressors fitted with valid noise emission labels during operation?		$\checkmark$				

Note:	Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance; Follow Up: Observations requiring follow-Up actions N/A: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
3.08	Are flaps and panels of mechanical equipment closed during operation?		$\checkmark$				
3.09	Are Construction Noise Permit(s) applied for percussive piling works?	$\checkmark$					
3.10	Are Construction Noise Permit(s) applied for general construction works during restricted hours?	$\checkmark$					
3.11	Are valid Construction Noise Permit(s) posted at site entrances?	$\checkmark$					
3.12	Use of quiet plant had been used on site to minimise the construction noise impact to the surrounding residences/dwellings (Level 1 mitigation measures).	$\checkmark$					
3.13	Temporary/Moveable noise barrier or site hoarding are provide or erect at the site boundary to minimise the noise impact of the closest NSRs or stationary equipments shield by the noise barrier which cannot visible from NSRs (Level 2 mitigation measure) Temporary/Moveable poise barrier equal to or more than 3m beinth	$\checkmark$					
3.14	with 10kg/m2 are provide for noise mitigation measures (Level 2 mitigation measures).	$\checkmark$					
Sectio	n 4: Waste/Chemical Management						
4.01	Waste Management Plan had been submit to Engineer for approval.		$\checkmark$				
4.02	Are receptacles available for general refuse collection?		$\checkmark$				
4.03	Is general refuse sorting or recycling implemented?		$\checkmark$				
4.04	Is general refuse disposed of properly and regularly?		$\checkmark$				
4.05	Is the Contractor registered as a chemical waste producer?	$\checkmark$					
4.06	Are the chemical waste containers and storage area properly labelled?		$\checkmark$				
4.07	Are the chemical wastes stored in proper storage areas?		$\checkmark$				
4.08	Is the chemical container or equipment provided with drip tray?		$\checkmark$				
4.09	Is the chemical waste storage area used for storage of chemical waste only?		$\checkmark$				
4.10	Are incompatible chemical wastes stored in different areas?		$\checkmark$				
4.11	Are the chemical wastes disposed of by licensed collectors?		$\checkmark$				
4.12	Are trip tickets for chemical wastes disposal available for inspection?		$\checkmark$				
4.13	Are chemical/fuel storage areas bounded?		$\checkmark$				
4.14	Are designated areas identified for storage and sorting of construction wastes?		$\checkmark$				
4.15	Are construction wastes sorted (inert and non-inert) on site?		$\checkmark$				
4.16	Are construction wastes reused?		$\checkmark$				
4.17	Are construction wastes disposed of properly?		$\checkmark$				
4.18	Are site hoardings and signboards made of durable materials instead of timber?		$\checkmark$				
4.19	Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?		$\checkmark$				
4.20	Are appropriate procedures followed if contaminated material exists?		$\checkmark$				
4.21	Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?		$\checkmark$				
4.22	Site cleanliness and appropriate waste management training had provided for the site workers.		$\checkmark$				
4.23	Contaminated sediments will managed according to WBTC No.12/2000 and EWTB TC(W) No. 34/2002.	$\checkmark$					

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Note:	Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance; Follow Up: Observations requiring follow-Up actions N/A: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
Sectio	on 5: Landscape & Visual						
5.01	Are retained and transplanted trees in health condition?				$\checkmark$		Refer to Monthly EM&A report - June 2011 - Appendix M
5.02	Are retained and transplanted trees properly protected?		$\checkmark$				Refer to tree photos
5.03	Are surgery works carried out for the damaged trees?	$\checkmark$					
5.04	Is damage to trees outside site boundary due to construction activities avoided?		$\checkmark$				
5.05	Is the night-time lighting controlled to minimize glare to sensitive receivers?	$\checkmark$					
Sectio	on 6: Others						
6.01	Are relevant Environmental Permits posted at all vehicle site entrances/exits?		$\checkmark$				

#### (Sok Kwu Wan)

#### **Remarks:**

Follow up:

### Findings of Site Inspection: (21 June 2011)

No environmental issue was observed during the site inspection



**Tree Photos:** 



The transplanted and retained uncommon tree species trees were found to be labeled, fenced and protected.

IEC's representative		RE's rep	resentative	ET's	s representative		EO's r	epresentative	9	Contr	actor's rep	resentativ	/e	
					1	Payer								
(	N/A	)	(	)	(	Ray Cheung	)	(		)	(			)

Projec Date:		TCS/00512/09         Construction of Sewage Treatment Works at         Yung Shue Wan and Sok Kwu Wan         29 June 2011         GENERAL INFORMATION	Inspected by       Checklist No.       TCS512B-29061         ETL/ ET's Representative:       Nicola Hon         RE's Representative:       Joseph Ng         Contractor's Representative:       Edwin Leung         IEC's Representative:       14:00         Environmental Permit No.						
Weather:       Sunny       Fine       Cloudy       ✓ Rainy         Temperature:       26.5       °C         Humidity:       ✓ High       Moderate       Low         Wind:       ✓ Strong       Breeze       Light       Calm         Area Inspected       1       Sok Kwu Wan							31/2007A		
Nata	Not Ol	bs.: Not Observed; Yes: Compliance; No: Non-Compliance;	Not			Follow		Photo/	
Note:	Follow	Up: Observations requiring follow-Up actions N/A: Not Applicable	Obs.	Yes	No	Up	N/A	Remarks	
1.01	ls an (	effluent discharge license obtained for the Project?		$\overline{\mathbf{A}}$			— —		
1.02	ls the	effluent discharged in accordance with the discharge licence?		$\overline{\mathbf{A}}$					
1.03	Is the	discharge of turbid water avoided?		$\overline{\mathbf{A}}$					
1.04	Are th	here proper desilting facilities in the drainage systems to e SS levels in effluent?				$\overline{\checkmark}$		Photo 1	
1.05	Are th	ere channels, sandbags or bunds to direct surface run-off to entation tanks?				$\checkmark$		Photo 2	
1.06	Are th	here any perimeter channels provided at site boundaries to epit storm runoff from crossing the site?		$\checkmark$					
1.07	ls dra	inage system well maintained?		$\checkmark$					
1.08	As ex	cavation proceeds, are temporary access roads protected by		$\checkmark$					
1.09	Are te	mporary exposed slopes properly covered?		$\checkmark$					
1.10	Are ea	arthworks final surfaces well compacted or protected?		$\checkmark$					
1.11	Are m	anholes adequately covered or temporarily sealed?		$\checkmark$					
1.12	Are th	ere any procedures and equipment for rainstorm protection?		$\checkmark$					
1.13	Are w	heel washing facilities well maintained?	$\checkmark$						
1.14	ls run	off from wheel washing facilities avoided?	$\checkmark$						
1.15	Are th	ere toilets provided on site?		$\checkmark$					
1.16	Are to	ilets properly maintained?		$\checkmark$					
1.17	Are th roofed	e vehicle and plant servicing areas paved and located within dareas?	$\checkmark$						
1.18	Is the	oil leakage or spillage avoided?		$\checkmark$					
1.19	Are th draina	nere any measures to prevent leaked oil from entering the uge system?		$\checkmark$					
1.20	Are ti washi	here any measures to collect spilt cement and concrete ngs during concreting works?					$\checkmark$		
1.21	Are th for ve	ere any oil interceptors/grease traps in the drainage systems hicle and plant servicing areas, canteen kitchen, etc?	$\checkmark$						
1.22	Are th	e oil interceptors/grease traps maintained properly?		$\checkmark$					

AUES



Note:	Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance; Follow Up: Observations requiring follow-Up actions N/A: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
1.23	Is used bentonite recycled where appropriate?	$\checkmark$					
1.24	Designated settlement area for runoff/wheel wash waste is provide and located at the streambed with 1-2m deep, 12m long and around 50m <sup>3</sup> capacities for sedimentation.	$\checkmark$					
1.25	No excavation is undertaken in the settlement area.		$\checkmark$				
1.26	Concreting wastes water should be neutralized below the pH Action Levels before discharge.	$\checkmark$					
1.27	Mobile toilets should provide on site and located away the stream course.	$\checkmark$					
1.28	License collector should be employed for handling the sewage of mobile toilet.	$\checkmark$					
1.29	Is ponding /stand water avoided?		$\checkmark$				
1.30	Is open stockpiles well covered by impermeable sheet?		$\checkmark$				
Sectio	n 2: Air Quality						
2.01	Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?	$\checkmark$					
2.02	Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?		$\checkmark$				
2.03	Are the excavated materials sprayed with water during handling?		$\checkmark$				
2.04	Are stockpiles of dusty materials sprayed with water, covered or placed in sheltered areas?						
2.05	Is the exposed earth properly treated within six months after the last construction activities?	$\checkmark$					
2.06	Are the access roads sprayed with water to maintain the entire road surface wet or paved?		$\checkmark$				
2.07	Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?		$\checkmark$				
2.08	Is the load on vehicles covered entirely by clean impervious sheeting?		$\checkmark$				
2.09	Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?		$\checkmark$				
2.10	Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?		$\checkmark$				
2.11	Is dark smoke emission from plant/equipment avoided?		$\checkmark$				
2.12	Are de-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement?	$\checkmark$					
2.13	Are site vehicles travelling within the speed limit not more than 15km/hour?		$\checkmark$				
2.14	Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?		$\checkmark$				
2.15	Is open burning avoided?		$\checkmark$				
2.16	Excavated materials from the stream must remove form site on the same day. The materials shall be stored in covered impermeable skips awaiting removal from site.		$\checkmark$				
Sectio	n 3: Noise						
3.01	Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?		$\checkmark$				
3.02	Is silenced equipment adopted?		$\checkmark$				
3.03	Is idle equipment turned off or throttled down?		$\checkmark$				
3.04	Are all plant and equipment well maintained and in good condition?		$\checkmark$				
3.05	Are noise barriers or enclosures provided at areas where construction activities cause noise impact on sensitive receivers?	$\checkmark$					
3.06	Are hand held breakers fitted with valid noise emission labels during operation?		$\checkmark$				
3.07	Are air compressors fitted with valid noise emission labels during operation?		$\checkmark$				

Note:	Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance; Follow Up: Observations requiring follow-Up actions N/A: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
3.08	Are flaps and panels of mechanical equipment closed during operation?		$\checkmark$				
3.09	Are Construction Noise Permit(s) applied for percussive piling works?	$\checkmark$					
3.10	Are Construction Noise Permit(s) applied for general construction works during restricted hours?	$\checkmark$					
3.11	Are valid Construction Noise Permit(s) posted at site entrances?	$\checkmark$					
3.12	Use of quiet plant had been used on site to minimise the construction noise impact to the surrounding residences/dwellings (Level 1 mitigation measures).	$\checkmark$					
3.13	Temporary/Moveable noise barrier or site hoarding are provide or erect at the site boundary to minimise the noise impact of the closest NSRs or stationary equipments shield by the noise barrier which cannot visible from NSRs (Level 2 mitigation measure) Temporary/Moveable noise barrier equal to or more than 3m beinth	$\checkmark$					
3.14	with 10kg/m2 are provide for noise mitigation measures (Level 2 mitigation measures).	$\checkmark$					
Sectio	n 4: Waste/Chemical Management						
4.01	Waste Management Plan had been submit to Engineer for approval.		$\checkmark$				
4.02	Are receptacles available for general refuse collection?		$\checkmark$				
4.03	Is general refuse sorting or recycling implemented?		$\checkmark$				
4.04	Is general refuse disposed of properly and regularly?		$\checkmark$				
4.05	Is the Contractor registered as a chemical waste producer?	$\checkmark$					
4.06	Are the chemical waste containers and storage area properly labelled?		$\checkmark$				
4.07	Are the chemical wastes stored in proper storage areas?		$\checkmark$				
4.08	Is the chemical container or equipment provided with drip tray?		$\checkmark$				
4.09	Is the chemical waste storage area used for storage of chemical waste only?		$\checkmark$				
4.10	Are incompatible chemical wastes stored in different areas?		$\checkmark$				
4.11	Are the chemical wastes disposed of by licensed collectors?		$\checkmark$				
4.12	Are trip tickets for chemical wastes disposal available for inspection?		$\checkmark$				
4.13	Are chemical/fuel storage areas bounded?		$\checkmark$				
4.14	Are designated areas identified for storage and sorting of construction wastes?		$\checkmark$				
4.15	Are construction wastes sorted (inert and non-inert) on site?		$\checkmark$				
4.16	Are construction wastes reused?		$\checkmark$				
4.17	Are construction wastes disposed of properly?		$\checkmark$				
4.18	Are site hoardings and signboards made of durable materials instead of timber?		$\checkmark$				
4.19	Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?		$\checkmark$				
4.20	Are appropriate procedures followed if contaminated material exists?		$\checkmark$				
4.21	Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?		$\checkmark$				
4.22	Site cleanliness and appropriate waste management training had provided for the site workers.		$\checkmark$				
4.23	Contaminated sediments will managed according to WBTC No.12/2000 and EWTB TC(W) No. 34/2002.	$\checkmark$					

Note:	Not Obs.: Not Observed; Yes: Compliance; No: Non-Compliance; Follow Up: Observations requiring follow-Up actions N/A: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
Sectio	on 5: Landscape & Visual						
5.01	Are retained and transplanted trees in health condition?				$\checkmark$		Refer to Monthly EM&A report - June 2011 - Appendix M
5.02	Are retained and transplanted trees properly protected?		$\checkmark$				Refer to tree photos
5.03	Are surgery works carried out for the damaged trees?	$\checkmark$					
5.04	Is damage to trees outside site boundary due to construction activities avoided?		$\checkmark$				
5.05	Is the night-time lighting controlled to minimize glare to sensitive receivers?	$\checkmark$					
Sectio	on 6: Others						
6.01	Are relevant Environmental Permits posted at all vehicle site entrances/exits?		$\checkmark$				



The geotextile sheets were found to be replaced on 5 July 2011.

05.07 2011







Muddy runoff to the marine body was observed after heavy rainstorm, the Contractor is reminded to improve the drainage system to avoid overflow of muddy water especially in wet season.



No muddy discharge to the marine body was observed 5 July 2011.

#### **Tree Photos:**



 The transplanted and retained uncommon tree species trees were found to be labeled, fenced and protected.

 IEC's representative
 ET's representative
 EO's representative
 Contractor's representative

N/A

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**v** 

Nicola Hon )

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# Appendix L

## **Implementation Schedule of Mitigation Measures**
#### **Implementation Schedule of Air Quality Measures**

EIA EM&A		Environmental Protection Measures*	Location /	Implementation	Imp	olementa Stages**	tion *	Relevant Legislation
Ref	Ref	Environmental Protection Measures*	Timing	Agent	D	C	0	& Guidelines
Constr	uction Phase							
3.32	2.34	Installation of 2m high solid fences around the construction site of Pumping Station P2.	Work site / during construction	Contractor		$\checkmark$		
3.34	2.34	<ul> <li>Adopting the following good site practices and follow the dust control requirements of the Air Pollution Control (Construction Dust) Regulation:</li> <li>Stockpiles of imported material kept on site should be contained within hoardings, dampened and / or covered during dry and windy weather;</li> <li>Material stockpiled alongside trenches should be covered with tarpaulins whenever works are close to village houses;</li> <li>Water sprays should be used during the delivery and handling of cement, sands, aggregates and the like.</li> <li>Any vehicle used for moving sands, aggregates and construction waste should have properly fitting side and tail boards. Materials should not be loaded to a level higher than the side and tail boards, and should be covered by a clean tarpaulin.</li> </ul>	Work site / during construction	All contractors		V		EIAO-TM, APCO, Air Pollution Control (Construction Dust) Regulation
3.36	Section 2	1 hour and 24 hour dust monitoring and site audit	Designated air monitoring locations / throughout construction period	Contractor/ Environmental Team		V		EM&A Manual

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

\*\* D=Design, C=Construction, O=Operation

### Implementation Schedule of Noise Measures

EIA Ref	EM&A	Environmental Protection Measures*	Location/Timing	Implementation	Imp	olementa Stages *:	ntion *	Relevant Legislation &
Ref	Ref			Agent	D	С	0	Guidelines
Construct	tion Phase							
4.41-4.43	3.19	<ul> <li>Use of quiet PME for the construction of the pumping stations</li> <li>Use of temporary noise barrier during the construction of Pumping Station P1a</li> </ul>	Work site /during the construction of Pumping Stations	Contractor		V		EIAO-TM, NCO
4.44 – 4.49	3.19	<ul> <li>Implementation of following measures during the sewer construction:</li> <li>Use of quiet PME or method;</li> <li>Restriction on the number plant (1 item for each type of plant); and</li> <li>Good Site Practices</li> <li>Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program.</li> <li>Mobile plant, if any, should be sited as far away from NSRs as possible.</li> <li>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.</li> <li>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.</li> <li>Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.</li> </ul>	Work site /during the construction of Sewer.	Contractor				

### **AUES**

EIA	EM&A Ref	Environmental Protection Measures*	Location/Timing	Implementation	Imp	lementa Stages **	tion *	Relevant Legislation &
Ref	Ref			Agent	D	С	0	Guidelines
4.50 – 4.53	3.19	<ul> <li>Use of noise screening structures such as acoustic shed and barrier wherever practicable and feasible in areas with sufficient clearance and headroom.</li> <li>Adoption of manual working method wherever practicable and feasible in areas where the worksites of the proposed sewer alignment are located less than 20 m from the residential NSRs and less than 30 m from the temple (THT) and the public library.</li> <li>Use of PME for the construction of the section of sewer between the NSR and the Pumping Station P1a should not be allowed during the excavation work of Pumping Station P1a.</li> </ul>	Work site /during the construction of Sewer.	Contractor		V		
4.60	Section 35	Noise monitoring	Designated noise monitoring locations / throughout construction period	Contractor/ Environmental Team		V		EM&A Manual

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

\*\* D=Design, C=Construction, O=Operation

### **Implementation Schedule of Water Quality Control Measures**

EIA EM&A		Environmental Protection Measures*	Location (duration	Implementation	Imp	lement Stages*	ation **	Relevant Legislation
Ref	Ref	Environmental r rotection weasures	measures)	Agent	D	С	0	and Guidelines
Constr	uction Phase	e						
5.77	4.35	No-dig method using Horizontal Directional Drilling (HDD) would be used for the installation of outfall pipe of about 480 m from shore to minimize the potential water quality impacts arising from the dredging works required for the submarine outfall construction. Silt curtains will be installed around the exit area of the pilot drill.	Marine works site / During construction of submarine outfall	Contractor		$\checkmark$		
5.73 - 5.78	4.36	<ul> <li>Dredging Works</li> <li>Implementation of following measures during the dredging works:</li> <li>dredging should be undertaken using closed grab dredgers with a maximum total production rate of 55m<sup>3</sup>/hr;</li> <li>deployment of 2-layer silt curtains with the first layer enclosing the grab and the second layer at around 50m from the dredging area while dredging works are in progress;</li> <li>dredging operation should be undertaken during ebb tide only;</li> <li>all vessels should be sized such that adequate clearance (i.e. minimum clearance of 0.6m) is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash;</li> <li>all pipe leakages should be cleaned from the decks and exposed fittings of barges before the vessel is moved;</li> <li>adequate freeboard (i.e. minimum of 200mm) should be maintained on barges to ensure that decks are not washed by wave action;</li> <li>all barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material;</li> <li>loading of barges should be controlled to prevent splashing of dredged material to the surrounding water, and barges should not be filled to a level which will cause the overflow of materials or polluted water during loading or transportation; and</li> </ul>	Marine works site and at the identified water sensitive receivers/ During construction	Contractor		V		

# **AUES**

EIA	EM&A	Environmental Protection Magguros*	Location (duration	Implementation	Imp	lement Stages*	ation **	Relevant Legislation
Ref	Ref	Environmental Protection Measures <sup>1</sup>	measures)	Agent	D	С	0	and Guidelines
		• the decks of all vessels should be kept tidy and free of oil or other substances that might be accidentally or otherwise washed overboard.						
5.79	4.37	<ul> <li><u>Construction Run-off and Drainage</u></li> <li>Implementation of the following site practices outlined in ProPECC</li> <li>PN 1/94 for "Construction Site Drainage"</li> <li>Provision of perimeter channels to intercept storm-runoff from outside the site. These should be constructed in advance of site formation works and earthworks.</li> <li>Works programmes should be designed to minimize works areas at any one time, thus minimizing exposed soil areas and reducing the potential for increased siltation and runoff.</li> <li>Sand / silt removal facilities such as sand traps, silt traps and sediment basins should be provided to remove the sand / silt particles from run-off. These facilities should be carefully planned to ensure that they would be installed at appropriate locations to capture all surface water generated on site.</li> <li>Careful programming of the works to minimise soil excavation works during rainy seasons.</li> <li>Exposed soil surface should be protected by paving or hydroseeding as soon as possible to reduce the potential of soil erosion.</li> <li>Trench excavation should be avoided in the wet season, and if necessary, these should be excavated and backfilled in short sections.</li> <li>Open stockpiles of construction materials on site should be covered with tarpaulin or similar fabric</li> </ul>	Construction works sites	Contractor				ProPECC PN 1/94
5.80	4.38	<u>General Construction Activities</u> Debris and rubbish generated on-site should be collected, handled and disposed of properly to avoid entering the nearby coastal waters and stormwater drains. All fuel tanks and storage areas should be provided	Construction works sites	Contractor		$\checkmark$		

## **AUES**

EIA	EM&A	Environmental Dustastion Magnuss*	Location (duration	Implementation	Imp	lement Stages*	ation *	ion Relevant Legislation	
Ref	Ref	Environmental Protection Measures <sup>1</sup>	measures)	Agent	D	С	0	and Guidelines	
		with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. Open drainage channels and culverts near the works areas should be covered to block the entrance of large debris and refuse.							
5.81	4.39	<u>Wastewater Arising from Workforce</u> Portable toilets should be provided by the Contractors, where necessary, to handle sewage from the workforce. The Contractor should also be responsible for waste disposal and maintenance practices.	Construction works sites	Contractor		$\checkmark$			
5.96	Section 4	Water quality monitoring	Designated water monitoring locations/ throughout construction period	Contractor		$\checkmark$		EM&A Manual	

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

\*\* D=Design, C=Construction, O=Operation

### **Implementation Schedule of Sediment Contamination Mitigation Measures**

EIA	EM&A Rof	Environmental Protection Measures*	Location / Timing	Implementation	Im	plementat Stages**	tion	Relevant Legislation &
Ref	Ref		Location / Thining	Agent	D	С	0	Guidelines
6.17	5.3	Follow the requirement and procedures for dredged mud disposal specified under the WBTC No. 34/2002.	Marine works site / during dredging works	Contractor		V		WBTC No. 34/2002
6.18	5.4	Implement appropriate dredging methods which have been incorporated into the recommended water quality mitigation measures.	Marine works site, during dredging works	Contractor		V		
6.19	5.5	<ul> <li>During the transportation and disposal of the dredged sediment, the following measures should be taken:</li> <li>Bottom opening of barges should be fitted with tight fitting seals to prevent leakage of material. Excess material should be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved.</li> <li>Monitoring of the barge loading should be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels should be equipped with automatic self monitoring devices as specified by the DEP.</li> </ul>	Marine works site and at the identified sensitive receivers	Contractor		V		

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\*\* D=Design, C=Construction, O=Operation

### Implementation Schedule of Solid Waste Management Measures

EIA	EM&A Ref Environmental Protection Measures*	Location /	Implementation	Imp	olementa Stages **	tion *	Relevant Legislation &	
Ref	Ref	Environmental Protection Measures*	Timing	Agent	D	С	0	Guidelines
Construct	ion Phase					•	•	•
7.14	6.4	<ul> <li><u>Good site practices</u></li> <li>Nomination of an approved person, such as a site manager, to be responsible for implementation of good site practices, arranging for collection and effective disposal to an appropriate facility, of all wastes generated at the site</li> <li>Training (proper waste management and chemical handling procedure) should be provided for site staffs</li> <li>Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers.</li> <li>Provision of sufficient waste disposal points and regular collection for disposal.</li> <li>Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Facility.</li> <li>Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.</li> <li>Maintain records of the quantities of wastes generated,</li> </ul>	Work sites/During construction	Contractor		~		Waste Disposal Ordinance (Cap.54)
7.15	6.5	To monitor the disposal of C&D waste at landfills and to control fly tipping, a trip-ticket system should be included as one of the contractual requirements and implemented by an Environmental Team undertaking the Environmental Monitoring and Audit work. An Independent Environmental Checker should be responsible for auditing the results of the system.	Work sites/During construction	Contractor		V		WBTC No. 21/2002
7.16	6.6	<ul> <li>Recommendations to achieve waste reduction include:</li> <li>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;</li> <li>to encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to segregate this waste from other general refuse generated</li> </ul>	Work sites/During construction	Contractor		V		WBTC No. 4/98, 5/98

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### **AUES**

EM&A Environmental Protection Measures*	Location /	Implementation	Imp	olementa Stages **	tion *	Relevant Legislation &
Environmental Protection Measures*	Timing	Agent	D	С	0	Guidelines
<ul> <li>by the work force;</li> <li>any unused chemicals or those with remaining functional capacity should be recycled;</li> <li>use of reveable non-timber formwork to reduce the amount.</li> </ul>						
<ul> <li>dise of redsable hon-timber formwork to reduce the amount of C&amp;D material;</li> <li>prior to disposal of C&amp;D waste, it is recommended that wood, steel and other metals should be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill;</li> <li>proper storage and site practices to minimise the potential for damage or contamination of construction materials; and</li> <li>plan and stock construction materials carefully to</li> </ul>						
minimise amount of waste generated and avoid unnecessary generation of waste.						
<ul> <li><u>General Site Wastes</u></li> <li>A collection area for construction site waste should be provided where waste can be stored prior to removal from site</li> </ul>	Work sites/During construction	Contractor		V		Public Health and Municipal Services Ordinance (Cap. 132)
• An enclosed and covered area for the collection of the waste is recommended to reduce 'wind blow' of light material						
<ul> <li><u>Chemical Wastes</u></li> <li>After use, chemical waste should be handled according to the Code of Practice on the Package, Labelling and Storage of Chemical Wastes</li> <li>Any unused chemicals or those with remaining functional capacity should be recycled</li> <li>Waste should be properly stored on site within suitably designed containers and should be collected by an approved licensed waste collectors for disposal at the Chemical Waste Treatment Facility or other licenced facility in accordance with the Waste Disposal (Chemical Waste) (General) Regulation under the Waste Disposal Ordance.</li> </ul>	Work sites/During construction	Contractor		V		Waste Disposal (Chemical Waste) (General) Regulation, Code of Practice on the Packaging Labelling and Storage of Chemical Wastes
A .9	A         Environmental Protection Measures*           by the work force;         any unused chemicals or those with remaining functional capacity should be recycled;           use of reusable non-timber 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 should be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill;           proper storage and site practices to minimise the potential for damage or contamination of construction materials; and         plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.           General Site Wastes         A collection area for construction site waste should be provided where waste can be stored prior to removal from site           •         A fter use, chemical waste should be handled according to the Code of Practice on the Package, Labelling and Storage of Chemical Wastes           •         Any unused chemicals or those with remaining functional capacity should be recycled           •         Waste should be properly stored on site within suitably designed containers and should be collected by an approved licensed waste collectors for disposal at the Chemical Waste Treatment Facility or other licenced facility in accordance with the Waste Disposal (Chemical Waste) (General) Regulation under the Waste Disposal Ordance.	A         Environmental Protection Measures*         Location / Timing           by the work force;         any unused chemicals or those with remaining functional capacity should be recycled;         use of reusable non-timber 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 should be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill;         proper storage and site practices to minimise the potential for damage or contamination of construction materials; and         Work           •         plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.         Work sites/During construction           •         A collection area for construction site waste should be provided where waste can be stored prior to removal from site         Work sites/During construction           •         A neclosed and covered area for the collection of the waste is recommended to reduce 'wind blow' of light material         Work sites/During construction           •         After use, chemical waste should be handled according to the Code of Practice on the Package, Labelling and Storage of Chemical Wastes         Work sites/During construction           •         Any unused chemicals or those with remaining functional capacity should be recycled         Work sites/During construction           •         May unused chemicals or those with remaining functional capacity should be properly stored on site within suitably designed containers and should be collected by	A         Environmental Protection Measures*         Location / Timing         Implementation Agent           by the work force;         • any unused chemicals or those with remaining functional capacity should be recycled;         • use of reusable non-timber 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 should be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill;         • proper storage and site practices to minimise the potential for damage or contamination of construction materials; and         Work         Contractor <u>General Site Wastes</u> • An enclosed and covered area for the collection of the waste is recommended to reduce 'wind blow' of light material         Work sites/During construction         Contractor           9         Chemical Wastes         • An unclosed and covered area for the collection of the waste is recommended to reduce 'wind blow' of light material         Work sites/During construction         Contractor           9         Chemical Wastes         • Any unused chemicals or those with remaining functional capacity should be recycled         Work sites/During construction         Contractor           9         Waste should be property stored on site within suitably designed containers and should be collected by an approved licensed waste collectors for disposal at the Chemical Waste Treatment Facility or other licenced facility in accordance with the Waste Disposal Ordance.         Work licensed waste Disposal Ordance.	A       Location / Timing       Implementation Agent       Implementation Agent         by the work force;       any unused chemicals or those with remaining functional capacity should be recycled;       by the work force;       b)         •       use of reusable non-timber formwork to reduce the amount of C&D material;       c)       c)         •       prior to disposal of C&D waste, it is recommended that wood, steel and other metals should be separated for re-euse and /or recycling to minimise the quantity of waste to be disposed of to landfill;       work       c)         •       prior to disposal of C&D waste, it is recommended that wood, steel and other metals should be separated for re-euse and /or recycling to minimise the quantity of waste to be disposed of to landfill;       work       c)         •       plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.       Work       Contractor         General Site Wastes       •       A collection area for construction site waste should be provided where waste can be stored prior to removal from site       Work stes/During construction       Contractor         9       Chemical Wastes       •       After use, chemical waste should be handled according to the Code of Practice on the Package, Labelling and Storage of Chemical Wastes       Work sites/During construction       Contractor         •       Agent Wastes       •       Any unused chemicals or those with remaining functional capacit	A       Environmental Protection Measures*       Location / Timing       Implementation Agent       Implementation Stages ** D         by the work force;       • any unused chemicals or those with remaining functional capacity should be recycled;       • use of reusable non-timber 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 should be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill;       • proper storage and site practices to minimise the potential for damage or contamination of construction materials; and       Work       Contractor       ✓ <u>Ceneral Site Wastes</u> • A collection area for construction site waste should be provided where waste can be stored prior to removal from site nectosend to reduce 'wind blow' of light material       Work sites/During construction       Contractor       ✓         9       Chemical Wastes • Any unused chemicals vaste should be handled according to the Code of Practice on the Package, Labelling and Storage of Chemical Wastes       Work sites/During construction       Contractor       ✓         • 9       Chemical Wastes • Any unused chemicals or those with remaining functional capacity should be recycled       Work sites/During construction       Contractor       ✓         • 9       Chemical Wastes • Any unused chemicals or those with remaining functional capacity should be recycled       Elevel to the Waste Disposal (Chemical Waste, (General) Regulation under the Waste Disposal Ordance.       Contractor       ✓	A     Location / Timing     Implementation Agent     Implementation Stages **       •     by the work force;     •     any unused chemicals or those with remaining functional capacity should be recycled;     •     Implementation Agent     D     C     O       •     use of reusable non-timber 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 should be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill;     •     work     Contractor     ✓       •     plan and stock construction materials; and     •     A collection area for construction site waste should be provided where waste can be stored prior to removal from site     Work     Contractor     ✓       •     A collection area for construction site waste should be provided where waste can be stored prior to removal from site     Work sites/During construction     Contractor     ✓       •     A neclosed and covered area for the callection of the waste is recommended to reduce 'wind blow' of light material     Work sites/During construction     Contractor     ✓       •     A nu unused chemicals or those with remaining functional capacity should be recycled     Sorage of Chemical wastes     Mork sites/During construction     Contractor     ✓       •     •     Any unused chemicals or thoes with remaining functional capacity should be recycled     •     ✓       • <td< td=""></td<>

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## **AUES**

EIA	EM&A	EM&A Bof	EM&A Ref Environmental Protection Measures*	Location /	Implementation	Implementation Stages **			Relevant Legislation &
Ref	Ref	Environmental Protection Measures*	Timing	Agent	D	С	0	Guidelines	
		• Any service shop and minor maintenance facilities should be located on hard standing 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 be undertaken within the designated areas equipped control these discharges							
7.21-7.22	6.10 – 6.11	<ul> <li>Construction and Demolition Material</li> <li>The C&amp;D waste should be separated on-site into three categories:         <ul> <li>public fill, the inert portion of the C&amp;D material (e.g. concrete and rubble), which should be re-used on-site or disposed of at a public filling area;</li> <li>C&amp;D waste for re-use and / or recycling, the non-inert portion of the C&amp;D material, (e.g. steel and other metals, woods, glass and plastic);</li> <li>C&amp;D waste which cannot be re-used and / or recycled (e.g. wood, glass and plastic)</li> </ul> </li> <li>Where possible, inert material should be re-used on-site</li> <li>Where practicable, steel and other metals should be separated for re-use and/or recycling prior to disposal of</li> </ul>	During all construction phases	Contractors		V		WBTC No. 4/98, 5/98, 21/2002, 25/99, 12/2000	

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

\*\* D=Design, C=Construction, O=Operation

#### **Implementation Schedule of Ecological Impact Measures**

EIA Ref	EM&A	Environmental Protection Measures*	al Protection Measures* Location / Implementa Timing Agent	Implementation	Imp	lementa Stages	ntion	Relevant Legislation &	
	Kei		Tinning	Agent	D	С	0	Guidennes	
Construc	tion Phase						1		
8.157	7.2	<ul> <li><u>Terrestrial Ecology</u></li> <li>Labeling and fencing of the uncommon tree species</li> <li>Avoidance of use of woodland habitats as Works Area, in particular where trees are located</li> </ul>	Work sites / during construction phase	Contractor		$\checkmark$			
8.159 – 8.160	7.3	Subtidal Ecology         Use of HDD technique         Dredging         • Use of closed-grab dredger         • Deploy silt curtains during dredging.	Marine works site / during dredging works	Contractor		V			
8.161	7.4	<ul> <li>Site runoff</li> <li>Construction and maintenance of sand / silt removal facilities</li> <li>Silt curtains</li> <li>Timing of earthworks</li> <li>Coverage of sand / fill piles during storms.</li> <li>Barriers along the landward side of Pumping Station P2 site boundary (to prevent site runoff from entering area with Romer's Tree Frog)</li> </ul>	All work sites / during construction phase	Contractor		V			

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

\*\* D=Design, C=Construction, O=Operation

#### **Implementation Schedule of Fisheries Impact Measures**

EIA	EIA EM&A Environmental Protection Measures* Location / Implementation	Imp S	lement: Stages*	ation *	Relevant Legislation			
Ref	Ref		Timing	Agent	D	С	0	& Guidelines
9.29	8.3	Use of closed grab dredging and silt curtains around the immediate dredging area and low dredging rates as recommended in Water Quality of the EIA report	Marine works site, during dredging works	Contractor		$\checkmark$		TM on EIA Process
9.32	Section 8	Water quality monitoring (see Implementation Schedule for Water Quality Control Measures)	Designated monitoring locations / throughout construction period and 1 year following operation of the STW	Contractor and Environmental Team		$\checkmark$	$\checkmark$	EM&A Manual

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

\*\* D=Design, C=Construction, O=Operation

### **Implementation Schedule of Landscape and Visual Impact Measures**

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages **		ation *	Relevant Legislation &
					D	C	0	Guidelines
Construction Phase								
10.74	9.10	Retaining existing trees and minimizing damage to vegetation by close coordination and on site alignment adjusted of rising main and gravity sewer pipelines.	All sites	Contractor		$\checkmark$		WBTC No. 14/2002
		Careful and efficient transplanting of affected trees to temporary or final transplant location (the proposed tree to be transplanted is a semi-mature <i>Macaranga tanarius</i> and is located at the proposed Pumping Station P2 location).	All sites	Contractor		$\checkmark$		WBTC No. 14/2002
		Short excavation and immediate backfilling sections upon completion of works to reduce active site area.	All sites	Contractor		$\checkmark$		
		Screening of site construction works by use of hoarding that is appropriate to its site.	All sites	Contractor		$\checkmark$		WBTC No. 19/2001
		Conservation of topsoil for reuse.	All sites	Contractor		$\checkmark$		
		Night-time light source from marine fleets should be directed away from the residential units.	Outfall area.	Contractor		$\checkmark$		

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

\*\* D=Design, C=Construction, O=Operation

### Appendix M

### Tree Inspection Report (Not Used)