PROJECT NO.: TCS/00512/09

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

YUNG SHUE WAN PORTION AREA
MONTHLY ENVIRONMENTAL MONITORING AND AUDIT (EM&A) REPORT (NO.24) – AUGUST 2012

PREPARED FOR
LEADER CIVIL ENGINEERING CORPORATION LIMITED

Quality Index

Date	Reference No.	Prepared By	Approved By
13 September 2012	TCS00512/09/600/R0543v2	Nicola Hon Environmental Consultant	T.W. Tam Environmental Team Leader

Version	Date	Description
1	10 September 2012	First Submission
2	13 September 2012	Amended against IEC's comments on 11 September 2012

Scott Wilson CDM Joint Venture

Chief Engineer/Harbour Area Treatment Scheme
Drainage Services Department
5/F Western Magistracy
2A Pok Fu Lam Road
Hong Kong

Attention: Mr. Kenley C K Kwok

Your reference:

Our reference: 05117/6/16/392441

Date: 13 September 2012

BY FAX AND EMAIL

Dear Sirs,

Contract No. DC/2009/13
Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan
Yung Shue Wan Portion Area
Monthly Environmental Monitoring and Audit (EM&A) Report No. 24 (August 2012)

We refer to the Monthly EM&A Monitoring Report No. 24 for August 2012 received under cover of the email from the Environmental Team, Action-United Environmental Services and Consulting (AUES), dated on 13 September 2012. We have no comment and have verified the captioned report.

Yours faithfully
SCOTT WILSON CDM JOINT VENTURE

Rodney Ip
Independent Environmental Checker

ICWR/SYSL/ecwc

cc Leader Civil Engineering (Attn: Mr Vincent Chan)
AUES (Attn: Mr T.W. Tam)
ER/LAMMA (Attn: Mr Neil Wong)
CDM (Attn: Mr Mark Sin)

EXECUTIVE SUMMARY

ES.01. This is the **24th** monthly Environmental Monitoring and Audit (EM&A) for Yung Shue Wan (hereinafter 'this Report') for the designated works under Environmental Permit [EP-282/2007], covering a period from **26 July to 25 August 2012** (hereinafter 'the Reporting Period').

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

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

Issues	Environmental Monitoring Parameters / Inspection	Occasions
Air Quality	1-hour TSP	30
	24-hour TSP	10
Construction Noise	Leq (30min) Daytime	4
Water Quality	Marine Water Sampling	13
Ecology	Coral Monitoring	1
Inspection / Audit	ET Regular Environmental Site Inspection	4

ES.03. According to the construction information provided by the Contractor, the marine works in Yung Shue Wan has been ceased since 19 January 2012. As agreed by the IEC and RE, the marine water quality and ecology monitoring was suspended from 6 February 2012 until further notice of the commencement of dredging works. The relevant letter ref.: TCS00512/10/300/L0425 has been submitted to EPD on 3 February 2012.

ES.04. It is noticed that the remaining dredging work in Yung Shuen Wan will be commenced in late September 2012. As instructed by the Contractor, the marine water quality has been resumed since 11 June 2012 while an advance ecology monitoring was conducted on 22 August 2012. Since the marine work has not yet started, those monitoring data would be served as reference background data for the upcoming impact monitoring event.

ES.05. In this Reporting Period, **13** days of water quality monitoring were carried out at the designated locations. Nevertheless, monitoring at mid-ebb tides of 10 August was only carried out at impact station (WY1 – WY3) as the working boat unable to travel far from the coast of Yung Shue Wan due to high tides. Also, monitoring at mid-flood tide of 16 August was cancelled due to the influence of Tropical Cyclone Warning No.3.

BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES.06. No exceedance in air quality and construction noise monitoring was recorded in this Reporting Period. The statistics of environmental exceedance, NOE issued and investigation of exceedance are summarized in the following table.

Environmental Issues	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
Air Quality	1-hour TSP	0	0	0	--	--
	24-hour TSP	0	0	0	--	--
Construction Noise	$L_{eq(30min)}$ Daytime	0	0	0	--	--
Water Quality	DO	0	0	0	--	--
	Turbidity	0	0	0	--	--
	SS	0	0	0	--	--
Ecology (Coral)	Sediment Cover (%)	0	0	0	--	--
	Bleaching (%)	0	0	0	--	--
	Mortality (%)	0	0	0	--	--

Note: NOE – Notification of Exceedance

ENVIRONMENTAL COMPLAINT, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.07. No written or verbal complaint, environmental summons or successful prosecutions were recorded in this Reporting Period.

REPORTING CHANGE

ES.08. No reporting change is made in this Reporting Period.

SITE INSPECTION BY EXTERNAL PARTIES

ES.09. No site inspection was undertaken by external parties i.e. Environmental Protection Department (EPD) or Agriculture, Fisheries and Conservation Department (AFCD) within the Reporting Period.

FUTURE KEY ISSUES

ES.10. During wet season, the Contractor shall pay attention on the potential water impact as the construction site is adjacent to the coastline. Muddy water and other water quality pollutants via site surface water runoff into the coral zones of Yung Shue Wan seawall, Shek Kok Tsui and O Tsai should be avoided. Mitigation measures for water quality should be fully implemented.

ES.11. Moreover, the construction dust mitigation measures identified at the EM&A Manuel such as watering at haul road and covering of dusty material should also be implemented and properly maintained during wet season.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

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 Kwu 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 (EP) 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 Kwu Wan and Yung Shue Wan with a capacity of 1,430m^3/day and 2,850m^3/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 (ET) to implement the environmental monitoring and auditing works to fulfill the requirements as stipulated in the EM&A Manual. This EM&A Manual is referred to the Appendix D of the Review Report on EIA Study – Yung Shue 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 programme. 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 This is the **24th** monthly EM&A Report for Yung Shue Wan Portion Area which presenting the monitoring results and inspection findings in the Reporting Period from **26 July to 25 August 2012**.

REPORT STRUCTURE

1.06 The Monthly Environmental Monitoring and Audit (EM&A) Report – Yung Shue Wan is structured into the following sections:-

SECTION 1 **INTRODUCTION**
SECTION 2 **PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS**
SECTION 3 **SUMMARY OF MONITORING REQUIREMENTS**
SECTION 4 **AIR QUALITY MONITORING RESULTS**
SECTION 5 **CONSTRUCTION NOISE MONITORING RESULTS**
SECTION 6 **WATER QUALITY MONITORING RESULTS**
SECTION 7 **ECOLOGY MONITORING RESULTS**
SECTION 8 **WASTE MANAGEMENT**
SECTION 9 **SITE INSPECTIONS**
SECTION 10 **ENVIRONMENTAL COMPLAINTS AND NON-COMPLIANCE**
SECTION 11 **IMPLEMENTATION STATUES OF MITIGATION MEASURES**
SECTION 12 **IMPACT FORECAST**
SECTION 13 **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 programme are enclosed in ***Appendix C*** and the major construction activities undertaken in this Reporting Period are listed below:-

- Construction of YSWSTW: excavation, soil compaction, concreting, steel fixing, formwork erection, formwork removal, backfilling, scaffolding erection, dismantling scaffolding, plastering, painting and E&M works installation.

SUMMARY OF ENVIRONMENTAL SUBMISSIONS

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

Table 2-1 Status of Environmental Licenses and Permits

Item	Description	License/Permit Status
1	Air Pollution Control (Construction Dust) Regulation	Notified 19/5/2010 Case No: 317486
2	Chemical Waste Producer Registration	Issued on 8/6/2010 WPN 5213-912-L2720-01
3	Water Pollution Control Ordinance	Issued on 22/9/2010 WT00007566-2010
4	Billing Account for Disposal of Construction Waste	Issued on 26 May 2010 A/C No: 7010815
5#	Construction Noise Permit (no. GW-RS0772-12)	Issued on 30 July 2012 Valid from 30 July 2012 until 19 January 2013

 # Application for renewal of CNP has been submitted to EPD on 13 July 2012, no construction work was conducted at restricted hour during the period of 26 to 29 July 2012.

2.04 Summary of the report submission for EM&A Programme is presented in ***Table 2-2***.

Table 2-2 Status of EM&A Programme Submission

Item	EM&A Programme Submission	Status
1	Proposed EM&A Programme for Baseline / Impact Monitoring – Yung Shue Wan (TCS00512/09/600/R0011Ver.5)	Verified by IEC and submitted to EPD on 8 July 2010
2	Method Statement for Coral Monitoring – Yung Shue Wan (TCS00512/09/600/R0071Ver.3)	Verified by IEC and submitted to EPD on 25 November 2010
3	Baseline Air and Noise Monitoring Report - Volume 1 (TCS00512/09/600/R0061Ver.3)	Verified by IEC and submitted to EPD on 31 August 2010
4	Baseline Monitoring Report Volume 2 - Water Quality (TCS00512/09/600/R0158Ver.2)	Verified by IEC and submitted to EPD on 10 March 2011
5	Baseline Survey for Coral Monitoring – Yung Shue Wan (TCS00512/09/600/R0132Ver.3)	Verified by IEC and submitted to EPD on 17 February 2011
6	Methodology of Coral Tagging for Impact Monitoring – Yung Shue Wan	Verified by IEC and submitted to EPD on 28 March 2011
7	Coral Tagging Report (TCS00512/09/600/R0214Ver.4)	Verified by IEC and submitted to EPD on 3 August 2011

3 SUMMARY OF BASELINE MONITORING REQUIREMENTS

ENVIRONMENTAL ASPECT

3.01 The EM&A baseline monitoring programme cover the following environmental issues:

- Air quality;
- Construction noise;
- Marine water quality; and
- Ecology monitoring

3.02 The ET implements the EM&A programme in accordance with the aforementioned requirements. Detailed air quality, construction noise, water quality and ecology of the EM&A programme are presented in the following sub-sections.

3.03 A summary of the air, noise, marine water and ecology monitoring parameters is presented in ***Table 3-1***:

Table 3-1 Summary of the EM&A Requirements

Environmental Issue	Parameters
Air Quality	• 1-hour TSP Monitoring by Real-Time Portable Dust Meter; and • 24-hour TSP Monitoring by High Volume Air Sampler.
Noise	• Leq (30min) during normal working hours; and • Leq (15min) during Restricted Hours.
Marine Water Quality	***In-situ Measurements*** • Dissolved Oxygen Concentration (DO) (mg/L); • Dissolved Oxygen Saturation (%); • Turbidity (NTU); • pH unit; • Salinity (ppt); • Water depth (m); and • Temperature (^{o}C). ***Laboratory Analysis*** • Suspended Solids (SS) (mg/L)
Ecology	• Coral Monitoring

MONITORING LOCATIONS

Air Quality

3.04 Two designated monitoring stations, AC02a located at Yung Shue Wan Refuse Transfer Station and AC04 located at residential area nearby Yung Shue Wan football pitch, were recommended in the *EM&A Manual Section 2.5*. In order to identify and seek for the access of the air monitoring locations designated in the EM&A Manual, site visit was conducted by Leader and ET.

3.05 At the site visit, all designated monitoring locations were identified however the premises for high volume sampler installation were objected by the owner or the residents of nearby. So, alternative air monitoring locations were proposed in accordance with the criteria set out in *EM&A manual Section 2.5.2 and 2.5.3*. The proposed alternative air monitoring stations were accepted by the Engineer Representative (ER) and Independent Environmental Checker (IEC) and EPD for endorsement. Details of renewed air monitoring stations are described in ***Table 3-2***. The graphical of air monitoring stations is shown in ***Appendix D*.**

Table 3-2 Location of Air Quality Monitoring Station

Sensitive Receiver	Location
AC02b	The entrance of RE's site office
AC04c	Next to a power transformer station TP208 Yung Shue Wan and adjacent to the road direct to the construction site

Construction Noise

3.06 According to *EM&A Manual Section 3.4*, one noise sensitive receivers (NC05) designated for the construction noise monitoring was recommended at Yung Shue Wan Portion Area of the Project. The designated monitoring station is identified and successfully granted the premises. The detailed construction noise monitoring station is described in ***Table 3-3*** and graphical is shown in ***Appendix D***.

Table 3-3 Location of Construction Noise Monitoring Station

Sensitive Receiver	Location
NC05	Roof of North Lamma Clinic

Marine Water Quality

3.07 Two control stations (CY1 and CY2) and three impact stations (WY1-WY3) were recommended in the *EM&A Manual Section 4.5*. Impact stations WY1-WY3 were identified close to the sensitive receivers (the coral colonies in the vicinity of Yung Shue Wan, and secondary contact recreation subzone). It is proposed to monitor the impacts from the construction of the submarine outfall as well as the effluent discharge from the proposed STW on water quality. Two control stations: CY1 and CY2 were recommended at locations representative of the project site in its undisturbed condition and located at upstream and downstream of the works area. The marine water quality monitoring stations to be performed under the Project is described in ***Table 3-4*** and shown in ***Appendix D***.

Table 3-4 Location of Marine Water Quality Monitoring Station

Station	Description	Coordinates	
		Easting	Northing
WY1	Coral colonies on seawall at STW site	829 170	809 550
WY2	Coral colonies at Shek kok Tsui	829 000	810 400
WY3	Coral colonies at O Tsai (headland N at SW ferry pier)	829 200	809 850
CY1 (flood)	Control Station	828 400	810 800
CY2 (ebb)	Control Station	828 000	808 800

Coral Monitoring

3.08 The coral monitoring stations to be performed under the Project is show in ***Appendix D***. The details of the monitoring location could be referred to ***Impact Coral Monitoring Report*** which enclosed in ***Appendix M.***

MONITORING FREQUENCY AND PERIOD

3.09 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, 4.8, 7.3 and 7.4*. 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: $L_{eq\ 30min)}$ & $L_{eq(5min)}$, L_{10} and L_{90}.

$L_{eq(15min)}$ & $L_{eq(5min)}$, L_{10} and L_{90} 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

Parameters:	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 sets of monitoring will be more than 36 hours
Sampling 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

Coral Monitoring

Parameters:	Presence and coverage of hard and soft corals such as diversity, abundance and health status of the corals in the general area, plus other physical and biological condition at the underwater environment
Frequency:	One per week for the first three months of the marine works. If no exceedances are reported during the first three months, the frequency may be reduced to twice every month
Duration:	During the course of marine works

Post-Construction Monitoring – Marine Water

3.10 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.

Post-Construction Monitoring – Ecology Monitoring

3.11 Following completion of the marine works, post project monitoring should be carried out within two weeks of completion of the marine works (HDD and dredging), and should comprise the same two-tier Rapid Assessment Ecological Assessment (REA) method adopted for the baseline survey.

MONITORING EQUIPMENT

Air Quality Monitoring

3.12 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

3.13 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.

Water Quality Monitoring

3.14 ***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.

3.15 ***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.

3.16 ***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.

3.17 ***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.

3.18 ***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.

3.19 ***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.

3.20 ***Sample Containers and Storage*** – Water samples for suspended solids should be stored in high density polythene bottles with no preservative added, packed in ice (cooled to 4°C without being frozen).

3.21 ***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.

3.22 **Suspended Solids Analysis** – Analysis of suspended solids shall be carried out in a HOKLAS or other international accredited laboratory.

Coral Monitoring

3.23 The monitoring equipments used for the coral monitoring could be referred to ***Impact Coral Monitoring report*** which enclosed in ***Appendix M.***

EQUIPMENT CALIBRATION

3.24 Calibration of the High Volume Sampler (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.

3.25 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.

3.26 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.

3.27 The water quality monitoring equipments such as DO meter, pH Meter, turbidity measuring instrument and salinometer, are calibrated by HOKLAS accredited laboratory of three month intervals.

3.28 All updated calibration certificates of the monitoring equipment used for the impact monitoring programme in the Reporting Period would be attached in ***Appendix E***.

METEOROLOGICAL INFORMATION

3.29 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

3.30 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 programme.

3.31 The monitoring data recorded in the equipment e.g. 1-hour TSP meter, sound level 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.

REPORTING

3.32 It was agreed among the ER, IEC, Contractor and ET that, in order to streamline the EM&A report submission and to cater for the occasional delay in obtaining laboratory analysis results, the cutoff day for each month is the 25th i.e. the first day of each report is the 26th of the last month and the end day, the 25th of that month.

DETERMINATION OF ACTION/LIMIT (A/L) LEVELS

3.33 According to the Yung Shue Wan Environmental Monitoring and Audit Manual, the air quality, construction noise, marine water quality and coral monitoring were established, namely Action and Limit levels are listed in ***Tables 3-5*** to ***3-8*** as below.

Table 3-5 Action and Limit Levels for Air Quality

Monitoring Station	Action Level (μg /m^3)		Limit Level (μg/m^3)	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
AC02b	288	161	500	260
AC04c	290	176	500	260

Table 3-6 Action and Limit Levels for Construction Noise

Recommended Action & Limit Levels of Construction Noise		
Monitoring Location	Action Level	Limit Level
	0700-1900 hours on normal weekdays	
NC05	When one or more documented complaints are received	75 dB(A) *

*Note: * Reduces to 70dB(A) for schools and 65dB(A) during the school examination periods.*

Table 3-7 Action and Limit Levels for Marine Water Quality

Parameter	Performance Criteria	Impact Station		
		WY1	WY2	WY3
DO Concentration (Surface and Middle) (mg/L)	Action Level	3.63	3.53	3.61
	Limit Level	3.32	3.47	3.42
DO Concentration (Bottom) (mg/L)	Action Level	3.33	2.92	3.36
	Limit Level	3.23	2.63	3.14
Turbidity (Depth-Average) (NTU)	Action Level	10.94	14.16	14.99
	Limit Level	17.35	15.20	16.21
Suspended Solids (Depth-Average) (mg/L)	Action Level	17.52	14.04	14.52
	Limit Level	25.62	16.51	16.88

Table 3-8 Action and Limit Levels for Coral Monitoring

Step	Action
1	Commence tagged coral monitoring at the impact site. If no increase in sedimentation cover/bleaching/partial mortality is observed on the hard corals or partial mortality no the soft/black corals, no action is required. If an increase in sedimentation cover/bleaching/partial mortality is observed on the hard corals or partial mortality on the soft/black corals at one or more impact monitoring stations Step 3 should be enacted, if not, Step 2.
2	If non actions are triggered a formal report should be issued along with evidentiary photographs following completion of the survey. Meanwhile monitoring work and construction works should continue uninterrupted.
3	If during the impact monitoring a 15% increase in the percentage of sedimentation on the hard corals occurs at more than 20% of the tagged coral colonies at the Impact Monitoring Station that is not reported at the Control Monitoring Station, then the Action Level is exceeded (Step 4).
4	If the Action Level is exceeded the IC(E) should inform all parties. The data from the water quality monitoring should also be reviewed. If the water quality monitoring shows no attributable effects of the installation works, then the Action Level is not triggered. If the water quality data indicate exceedances (for SS and/or turbidity) the IC(E) should discus with the Contractor the most appropriate method of reducing suspended solids during construction (e.g. reduce rate of dredging). The water quality data reviewed should then be enacted on the next working day.
5	Monitoring should proceed the following day as per Step 1. If during the Impact Monitoring a 25% increase in the percentage of sedimentation on the hard corals at more than 20% of the tagged coral colonies at the Impact Monitoring Station that is not reported at the Control Monitoring Station, then the Limit Level is exceeded (Step 6). If the Limit Level is not exceeded Step 2 is enacted and work continues according to the mitigated method.
6	If the Limit Level is exceeded the Inspector Officer should inform all parties immediately. Should the Limit Level be exceeded, the Contractor should stop works immediately and work out a solution to the satisfaction of the IC(E), EPD and AFCD. The IC(E) should inform the Contractor to suspend marine construction works until an effective solution is identified. Once the solution has identified and agreed with all parties, backfilling works may re-commence.

3.34 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 Leader, the construction of relevant land works at Yung Shue Wan was commenced on 14 September 2010, therefore, the impact EM&A programme was begun as compliance with the contract Particular Specification, Yung Shue Wan EM&A Manual and the EP.

Result

4.02 In this Reporting Period, the results for 24-hour and 1-hour TSP monitoring are tabulated in ***Tables 4-1 and 4-2***. The 24-hour TSP monitoring data are shown in ***Appendix G*** and the graphical plots are shown in ***Appendix H***.

Table 4-1 Summary of 24-hour and 1-hour TSP Monitoring Results at AC02b

Date	24-hour TSP ($\mu g/m^3$)	1-hour TSP ($\mu g/m^3$)				
		Date	Start Time	1st hour measured	2nd hour measured	3rd hour measured
30-Jul-12	100	27-Jul-12	8:00	137	143	132
4-Aug-12	107	4-Aug-12	13:00	186	194	202
9-Aug-12	64	10-Aug-12	9:00	145	152	141
15-Aug-12	53	16-Aug-12	14:30	124	137	127
21-Aug-12	93	22-Aug-12	10:30	142	149	146
Average (Range)	**83 (53 – 107)**	Average (Range)		**150 (124 – 202)**		

Table 4-2 Summary of 24-hour and 1-hour TSP Monitoring Results at AC04c

Date	24-hour TSP ($\mu g/m^3$)	1-hour TSP ($\mu g/m^3$)				
		Date	Start Time	1st hour measured	2nd hour measured	3rd hour measured
30-Jul-12	117	27-Jul-12	10:30	151	157	148
4-Aug-12	102	4-Aug-12	15:00	197	211	205
9-Aug-12	46	10-Aug-12	12:00	159	168	161
15-Aug-12	43	16-Aug-12	12:00	121	139	117
21-Aug-12	131	22-Aug-12	8:00	146	159	152
Average (Range)	**88 (43 – 131)**	Average (Range)		**159 (117 – 211)**		

4.03 As shown in ***Tables 4-1 and 4-2***, the 1-hour and 24-hour TSP monitoring results fluctuated below the Action Level during this Reporting Period. No Notification of Exceedance (NOE) of air quality criteria or corrective action was therefore required.

4.04 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 are presented in the following sub-sections.

Result

5.02 In this report period, **4** construction noise monitoring events were undertaken at designated location NC05. The results for $L_{eq(30min)}$ are tabulated in ***Tables 5-1*** and the graphical plots are shown in ***Appendix H***.

Table 5-1 Summarized of Construction Noise Monitoring Results at NC05

Date	Start Time	End Time	1st set L_{eq5}	2nd set L_{eq5}	3rd set L_{eq5}	4th set L_{eq5}	5th set L_{eq5}	6th set L_{eq5}	L_{eq30}	Corrected L_{eq30}*
31-Jul-12	13:48	14:18	61.5	62.6	59.4	58.7	60.2	61.0	60.8	63.8
10-Aug-12	11:00	11:30	61.0	64.2	56.7	55.7	55.3	65.1	61.4	64.4
16-Aug-12	13:30	14:00	53.8	56.4	60.0	61.5	62.0	73.2	66.3	69.3
22-Aug-12	10:30	11:00	61.2	67.5	60.3	56.1	58.4	59.8	62.2	65.2
Limit Level			**-**							**75 dB(A)**

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

5.03 It was noted that no noise complaint (which is an Action Level exceedance) was received. In view of the results shown in ***Table 5-1,*** all the values are well below 75dB(A), therefore, no Action or Limit Level exceedance was triggered during this Reporting Period.

6 IMPACT MONITORING RESULTS – WATER QULAITY

6.01 As informed by the Contractor, the marine works in Yung Shue Wan was ceased since 19 January 2012 due to completion of the HDD work. As agreed by the IEC and RE, the marine water quality monitoring was suspended from 6 February 2012 until further notice of the commencement of dredging works. The relevant letter ref.: TCS00512/10/300/L0425 has been submitted to EPD on 3 February 2012.

6.02 It is noticed that the remaining dredging work in Yung Shuen Wan will be commenced in late September 2012. As advised by the Contractor, the marine water quality has been resumed on 11 June 2012. Since the marine work has not yet started, those monitoring data would be served as reference background data to for the upcoming impact monitoring event.

6.03 In this Reporting Period, **13** days of water quality monitoring were carried out at the designated locations. Nevertheless, monitoring at mid-ebb tides of 10 August was only carried out at impact station (WY1 – WY3) as the working boat unable to travel far from the coast of Yung Shue Wan due to high tides. Also, monitoring at mid-flood tide of 16 August was cancelled due to the influence of Tropical Cyclone Warning No.3.

6.04 During the Reporting Period, field measurements of both control and impact stations showed that marine water of the depth average of the salinity concentration was within **27.00 to 33.97** ppt, and pH value was within **6.54 to 8.89.** The monitoring results including in-situ measurements and laboratory testing results are presented in ***Appendix G***. The graphical plots are shown in ***Appendix H***.

6.05 Monitoring results of 3 key parameters: dissolved oxygen (DO), turbidity and suspended solids in this Reporting Period, are summarized in ***Tables 6-1, 6-2, 6-3 and 6-4***. A summary of exceedances for the three parameters: dissolved oxygen (DO), turbidity and suspended solids are shown in ***Table 6-5***.

Table 6-1 Summary of Water Quality Results – Mid-ebb Tides (Dissolved Oxygen)

Sampling date	Dissolved Oxygen conc. of Depth Ave. of Surf. and Mid Layer (mg/L)					Dissolved Oxygen conc. of Depth Ave. of Bottom Layer (mg/L)				
	WY1	WY2	WY3	CY1	CY2	WY1	WY2	WY3	CY1	CY2
27-Jul-12	5.43	5.43	5.61	5.25	5.23	4.31	4.90	5.34	4.38	4.55
31-Jul-12	6.10	5.57	5.87	6.18	6.80	5.12	3.91	4.17	4.50	5.74
2-Aug-12	7.26	7.49	6.52	7.45	8.78	7.22	7.42	6.65	5.71	5.53
4-Aug-12	7.60	7.34	8.04	6.95	7.55	7.10	7.19	6.97	6.65	6.72
6-Aug-12	8.91	7.45	8.55	6.91	6.50	7.23	5.98	6.62	5.05	5.09
8-Aug-12	8.57	7.78	8.64	7.39	8.30	6.42	5.60	7.69	5.13	5.48
10-Aug-12	8.04	7.33	7.35	*	*	7.40	6.25	6.78	*	*
14-Aug-12	5.72	5.73	5.84	7.08	7.41	5.21	3.51	6.02	2.85	3.85
16-Aug-12	8.43	8.12	9.53	9.20	7.16	7.94	5.34	7.58	5.17	3.11
18-Aug-12	5.63	6.73	6.77	6.76	7.08	5.49	6.74	7.20	4.74	4.61
20-Aug-12	5.44	6.85	6.56	7.09	7.64	5.39	6.68	6.64	7.12	6.38
22-Aug-12	7.92	7.09	8.16	7.14	6.76	6.99	5.89	7.64	5.72	4.15
24-Aug-12	8.15	8.34	8.82	7.37	7.95	7.71	5.88	7.54	6.89	5.95

** working boat cannot travel to the monitoring station due to high tide*

Table 6-2 Summary of Water Quality Results – Mid-ebb Tides (Turbidity & Suspended Solids)

Sampling date	Turbidity Depth Ave. (NTU)					Suspended Solids Depth Ave. (mg/L)				
	WY1	WY2	WY3	CY1	CY2	WY1	WY2	WY3	CY1	CY2
27-Jul-12	1.81	1.45	1.70	2.54	4.64	8.60	9.13	9.30	8.23	7.10
31-Jul-12	1.37	1.54	1.48	1.81	2.32	4.55	13.10	4.45	4.20	3.97
2-Aug-12	1.31	1.71	1.66	2.06	2.19	4.70	6.50	5.70	4.03	4.03
4-Aug-12	1.73	1.81	1.49	1.84	2.32	2.45	2.20	2.80	2.20	2.63
6-Aug-12	1.41	2.00	1.50	2.37	2.38	10.70	2.40	4.10	6.13	4.33
8-Aug-12	1.35	1.05	1.30	1.95	2.01	8.20	6.53	6.50	4.23	6.73
10-Aug-12	1.68	2.60	1.89	*	*	5.80	5.83	7.10	*	*
14-Aug-12	1.41	1.50	1.65	1.71	1.80	2.95	3.70	3.10	4.13	4.27
16-Aug-12	1.49	1.38	1.47	1.59	1.81	4.20	5.07	6.30	5.90	7.40
18-Aug-12	1.79	2.21	1.73	2.65	2.47	16.10	8.17	13.15	6.27	6.53
20-Aug-12	2.01	2.29	2.38	2.76	2.68	3.85	4.93	3.80	5.33	4.53
22-Aug-12	1.59	1.61	1.62	1.65	1.64	5.45	5.40	4.50	7.33	6.07

** working boat cannot travel to the monitoring station due to high tide*

Table 6-3 Summary of Water Quality Results – Mid-flood Tides (Dissolved Oxygen)

Sampling date	Dissolved Oxygen conc. of Depth Ave. of Surf. and Mid Layer (mg/L)					Dissolved Oxygen conc. of Depth Ave. of Bottom Layer (mg/L)				
	WY1	WY2	WY3	CY1	CY2	WY1	WY2	WY3	CY1	CY2
27-Jul-12	5.09	4.84	5.31	5.26	5.73	4.57	4.06	4.57	4.87	5.29
31-Jul-12	6.57	6.49	6.14	5.24	4.91	5.66	6.20	5.20	4.59	4.42
2-Aug-12	7.74	8.38	9.48	5.99	6.77	7.83	6.23	8.00	5.68	5.39
4-Aug-12	5.65	6.56	7.15	5.77	6.04	7.29	6.07	6.59	5.73	5.58
6-Aug-12	6.93	5.93	7.34	6.53	6.33	6.73	5.36	7.69	5.35	4.16
8-Aug-12	7.16	7.76	7.89	6.52	6.93	7.52	6.06	7.69	4.80	4.94
10-Aug-12	8.44	7.78	8.27	8.83	7.93	7.69	5.95	7.16	5.15	3.91
14-Aug-12	7.56	5.47	7.14	6.92	5.41	7.10	4.90	6.96	4.71	3.61
16-Aug-12	#	#	#	#	#	#	#	#	#	#
18-Aug-12	5.96	5.94	5.62	4.89	5.34	5.38	5.93	4.99	5.11	4.26
20-Aug-12	5.10	7.51	7.10	8.94	9.20	5.94	6.98	6.10	7.89	7.23
22-Aug-12	6.95	7.09	7.47	6.96	4.94	6.06	6.10	7.08	5.19	4.30
24-Aug-12	7.87	7.54	7.28	7.05	7.64	6.84	6.04	7.03	5.65	5.20

 # Monitoring was cancelled due to the influence Tropical Cyclone Warning Signal No.3

Table 6-4 Summary of Water Quality Results – Mid-flood Tides (Turbidity & Suspended Solids)

Sampling date	Turbidity Depth Ave. (NTU)					Suspended Solids Depth Ave. (mg/L)				
	WY1	WY2	WY3	CY1	CY2	WY1	WY2	WY3	CY1	CY2
27-Jul-12	1.72	1.56	1.72	2.44	4.67	8.30	10.73	9.15	9.73	8.90
31-Jul-12	1.81	1.81	1.94	2.12	2.12	9.90	6.30	8.90	7.77	6.97
2-Aug-12	1.43	1.50	1.55	1.80	2.29	10.45	8.67	11.65	8.10	8.93
4-Aug-12	1.52	1.69	1.94	2.91	1.98	2.65	4.70	6.10	6.97	6.30
6-Aug-12	1.35	1.30	1.13	1.72	2.07	3.60	3.30	2.85	3.83	2.27
8-Aug-12	1.30	1.67	1.55	1.78	1.71	7.60	5.53	4.70	6.97	6.83
10-Aug-12	1.90	1.88	2.20	2.92	2.85	17.45	8.90	12.65	15.90	8.90
14-Aug-12	1.26	1.58	1.41	1.43	1.61	5.75	3.90	4.60	4.57	4.70
16-Aug-12	#	#	#	#	#	#	#	#	#	#
18-Aug-12	1.76	2.35	1.76	2.38	2.42	16.05	13.23	14.35	7.27	13.70
20-Aug-12	1.76	2.01	1.72	2.81	2.28	6.75	7.27	6.85	7.83	4.50
22-Aug-12	1.58	1.79	1.53	1.64	1.64	8.35	6.10	6.05	12.90	11.73
24-Aug-12	1.23	1.35	1.39	1.65	1.50	12.60	9.27	9.65	7.63	5.90

 # Monitoring was cancelled due to the influence Tropical Cyclone Warning Signal No.3

Table 6-5 Summarized Exceedances of Marine Water Quality

Station	DO (Ave of Surf. & mid-depth)		DO (Ave. of Bottom Layer)		Turbidity (Depth Ave.)		SS (Depth Ave)		Total Exceedance	
	Action	Limit	Action	Limit	Action	Limit	Action	Limit	Action	Limit
Mid-Ebb										
WY1	0	0	0	0	0	0	0	0	0	0
WY2	0	0	0	0	0	0	0	0	0	0
WY3	0	0	0	0	0	0	0	0	0	0
Mid-Flood										
WY1	0	0	0	0	0	0	0	0	0	0
WY2	0	0	0	0	0	0	0	0	0	0
WY3	0	0	0	0	0	0	0	0	0	0
No of Exceedance	0	0	0	0	0	0	0	0	0	0

6.06 For marine water monitoring, no exceedance of Action/Limit level was recorded in this Reporting Period. Therefore, no associated corrective actions were then required.

7 IMPACT MONITORING RESULTS – ECOLOGY MONITORING

7.01 Impact monitoring for coral shall be conducted initially at a frequency of once per week for the first three months of the marine works (HDD and dredging). If no exceedances are reported during this period, then the frequency may be reduced to twice every month for the reminder of the marine works.

7.02 According to the construction information provided by the Contractor, the marine works in Yung Shue Wan has been ceased since 19 January 2012. As agreed by the IEC and RE, the ecology monitoring was suspended from 6 February 2012 until further notice of the commencement of dredging works.

7.03 It is noticed that the remaining dredging work in Yung Shuen Wan will be commenced in late September 2012, as advised by IEC, coral monitoring has been carried out before the resumption of dredging to oversee the background condition of the tagged corals for the upcoming impact monitoring events. As instructed by the Contractor, an advance coral monitoring have been conducted on **22 August 2012** by the marine ecologist. Since the marine work has not yet started, the monitoring result would be served as reference background data to for the upcoming impact monitoring event.

7.04 The impact coral monitoring report for **August 2012** for this Reporting Period is presented in ***Appendix M.***

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 ***Tables 8-1*** and ***8-2*** and the Monthly Summary Waste Flow Table is shown in ***Appendix J***. Whenever possible, materials were reused on-site as far as practicable.

Table 8-1 Summary of Quantities of Inert C&D Materials

Type of Waste	Quantity	Disposal Location
C&D Materials (Inert) ('000m^3)	0	-
Reused in this Contract (Inert) ('000m^3)	0	-
Reused in other Projects (Inert) ('000m^3)	0	-
Disposal as Public Fill (Inert) ('000m^3)	0.144	Tuen Mun Area 38

Table 8-2 Summary of Quantities of C&D Wastes

Type of Waste	Quantity	Disposal Location
Metals (kg)	0	-
Paper / Cardboard Packing (kg)	0	-
Plastics (kg)	0	-
Chemical Wastes (kg)	0	-
General Refuses (tonne)	19.73	Yung Shue Wan RTS

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 formulation by ET Leader. Regular environmental site inspections had been carried out by the ET to confirm the environmental performance. In this reporting period, weekly joint-site visit by RE, the Contractor and ET was carried out on **31 July, 7, 14 and 21 August 2012**.

9.02 The findings/ deficiencies that observed during the weekly site inspection are listed in ***Table 9-1*** and the relevant checklists are attached in ***Appendix K***.

Table 9-1 Site Observations

Date	Findings / Deficiencies	Follow-Up Status
31 July 2012	• No environmental issue was observed during the site inspection.	N.A
7 August 2012	• Larvicidal should be placed to sedimentation tanks which are not in use and cleaning up the sediment inside is also recommended. • Stagnant water near wall Bay B should be removed.	Rectified on 14 August 2012.
14 August 2012	• No environmental issue was observed during the site inspection. However, full implementation of the required mitigation measures is reminded.	N.A
21 August 2012	• No environmental issue was observed during the site inspection.	N.A

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 10-1, 10-2*** and ***10-3***.

Table 10-1 Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
14 Sep – 30 September 2011	0	0	NA
October – December 2011	0	0	NA
January –July 2012	0	0	NA
August 2012	0	0	NA

Table 10-2 Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
14 Sep – 30 September 2011	0	0	NA
October – December 2011	0	0	NA
January –July 2012	0	0	NA
August 2012	0	0	NA

Table 10-3 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
14 Sep – 30 September 2011	0	0	NA
October – December 2011	0	0	NA
January –July 2012	0	0	NA
August 2012	0	0	NA

11 IMPLEMENTATION STATUS OF MITIGATION MEASURES

11.01 The environmental mitigation measures that recommended in the Yung Shue 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:

- Stockpiles of imported material kept on site should be contained within hoardings, dampened and / or covered during dry and windy weather;
- Material stockpiled alongside trenches should be covered with tarpaulins whenever works are close to village houses;
- Water sprays should be used during the delivery and handling of cement, sands, aggregates and the like.
- 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 programme.
    - 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^3/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;
- 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

11.20 The following general good practice measures should be adopted to mitigate ecological impacts during marine works (including dredging and HOD);

- Excess material from vessel loading should be cleaned from the decks and exposed fittings before vessels are moved to the backfilling location;
- Dredging should cause no foam, oil, grease, scum, litter or other objectionable matter to be present on the water;
- Adequate freeboard should be maintained to ensure that decks are not washed by wave action;
- All pie leakages should be repaired promptly and plant Should not be operated with leaking pipes; and

- All banges and other vessels should maintain adequate clearance between vessels and the seabed at all stats of the tide and reduce operational speeds to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash.

11.21 In the event of exceedances of ecological action or limit level, the Contractor will be required to revise his operations as a further mitigation measure. Revisions to the operation method may include (but not be limited to):

- Reduction in dredging rate'
- Restriction of dredging in particular areas to specific periods in the tidal cycle

11.22 Should repeated non-compliances with limit level(s) occur the Contractor shall modify his working method until he is able to achieve the required compliances with the limit levels to the satisfaction of the IC(E)

Fisheries Mitigation Measure

11.23 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

11.24 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

11.25 The implementation schedule of mitigation measures is presented in ***Appendix L***.

11.26 Leader had been implementing the required environmental mitigation measures according to the Yung Shue Wan Environmental Monitoring and Audit Manual subject to the site condition. Environmental mitigation measures generally implemented by Leader in this Reporting Period are summarized in ***Table 11-1***.

Table 11-1 Environmental Mitigation Measures

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

Issues	Environmental Mitigation Measures
Noise	• Good site practices to limit noise emissions at the sources; • 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 Chemical Management	• Excavated material should be reused on site as far as possible to minimize off-site disposal. Scrap metals or abandoned equipment should be recycled if possible; • Waste arising should be kept to a minimum and be handled, transported and 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 **24th** Monthly EM&A Report covering the construction period from **26 July to 25 August 2012**.

13.02 It is noticed that the remaining dredging work in Yung Shue Wan will be commenced in late September 2012. As advised by the Contractor, the marine water quality has been resumed since 11 June 2012 while an ecology monitoring was conducted on 22 August 2012.

13.03 No 1-hour and 24-hour TSP result was found to be triggered the Action or Limit Level in this Reporting Period.

13.04 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 Period.

13.05 In this Reporting Period, **13** days of water quality monitoring were carried out at the designated locations. Nevertheless, monitoring at mid-ebb tides of 10 August was only carried out at impact station (WY1 – WY3) as the working boat unable to travel far from the coast of Yung Shue Wan due to high tides. Also, monitoring at mid-flood tide of 16 August was cancelled due to the influence of Tropical Cyclone Warning No.3. Besides, no marine water monitoring exceedance was recorded in this Reporting Period.

13.06 Coral monitoring was carried out on **22 August 2012** and no exceedance was recorded.

13.07 No documented complaint, notification of summons or successful prosecution was received.

13.08 In this reporting period, joint-site visit by RE, the Contractor and ET was carried out on **31 July, 7, 14 and 21 August 2012**. The environmental performance of the Project was therefore considered as satisfactory.

13.09 No site inspection was undertaken by external parties i.e. Environmental Protection Department (EPD) or Agriculture, Fisheries and Conservation Department (AFCD) within the Reporting Period.

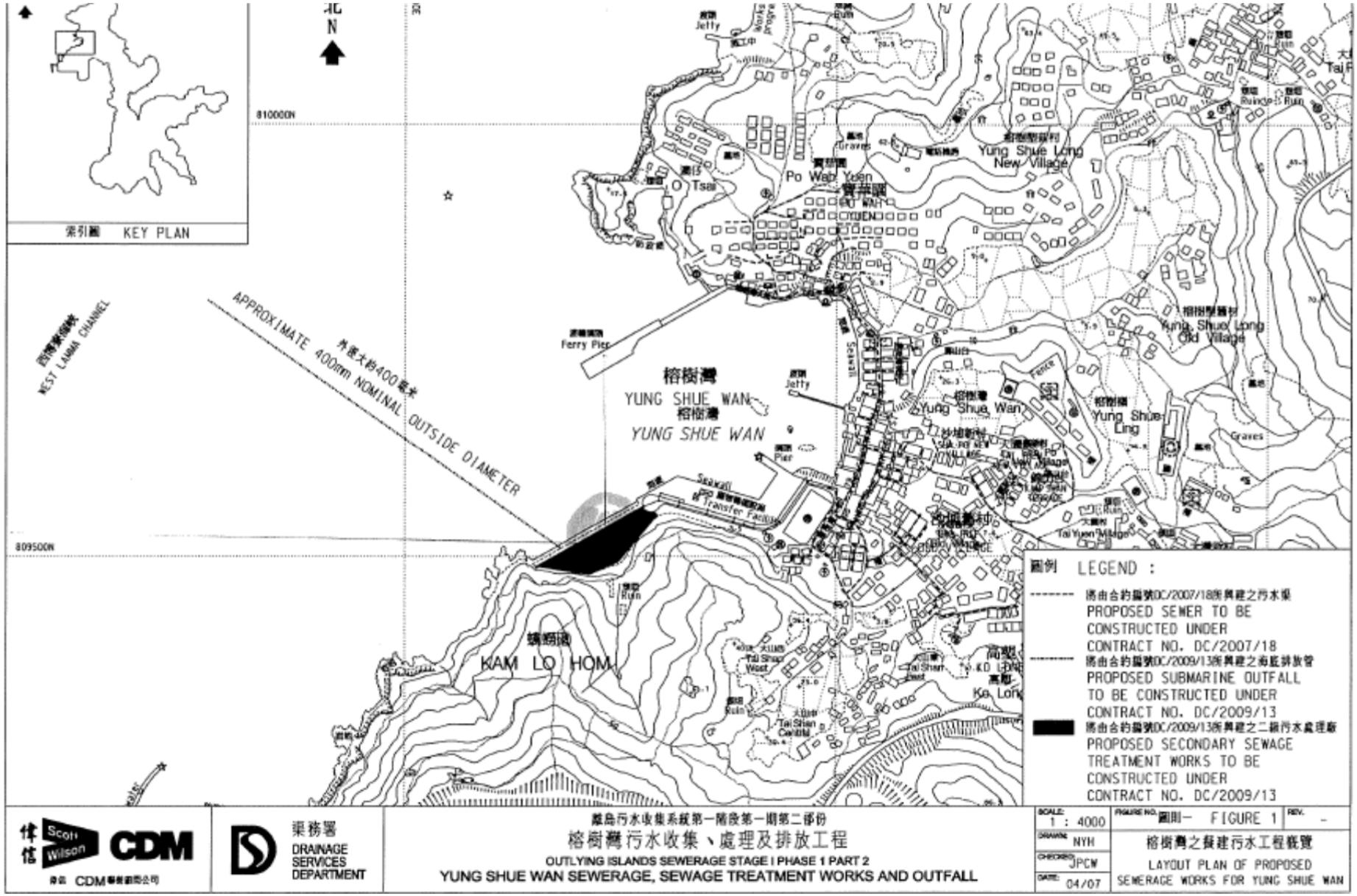
RECOMMENDATIONS

13.10 During wet season, the Contractor shall pay attention on the potential water impact as the construction site is adjacent to the coastline. Muddy water and other water quality pollutants via site surface water runoff into the coral zones of Yung Shue Wan seawall, Shek Kok Tsui and O Tsai should be avoided. Mitigation measures for water quality should be fully implemented.

13.11 Moreover, the construction dust mitigation measures identified at the EM&A Manuel such as watering at haul road and covering of dusty material should also be implemented and properly maintained during wet season.

Appendix A

Site Layout Plan – Yung Shue Wan Portion Area


索引圖 KEY PLAN
北 N
810000N
809500N
APPROXIMATE 400mm NOMINAL OUTSIDE DIAMETER
外徑大約400毫米
WEST LAMMA CHANNEL
榕樹灣
YUNG SHUE WAN
榕樹灣
YUNG SHUE WAN
Yung Shue Long New Village
Yung Shue Long Old Village
Yung Shue Wan
Yung Shue Ling
Po Wah Yuen
O Tsai
Ferry Pier
Jetty
Pier
Seawall Transfer Facility
KAM LO HOM
Graves
Tai Yuen Village
圖例 LEGEND :
PROPOSED SEWER TO BE CONSTRUCTED UNDER CONTRACT NO. DC/2007/18
PROPOSED SUBMARINE OUTFALL TO BE CONSTRUCTED UNDER CONTRACT NO. DC/2009/13
PROPOSED SECONDARY SEWAGE TREATMENT WORKS TO BE CONSTRUCTED UNDER CONTRACT NO. DC/2009/13
Scott Wilson
CDM
DRAINAGE SERVICES DEPARTMENT
離島污水收集系統第一階段第一期第二部份
榕樹灣污水收集、處理及排放工程
OUTLYING ISLANDS SEWERAGE STAGE I PHASE 1 PART 2
YUNG SHUE WAN SEWERAGE, SEWAGE TREATMENT WORKS AND OUTFALL
SCALE: 1 : 4000
DRAWING NYH
CHECKED JPCW
DATE 04/07
FIGURE NO. 圖則– FIGURE 1
REV. –
榕樹灣之擬建污水工程概覽
LAYOUT PLAN OF PROPOSED SEWERAGE WORKS FOR YUNG SHUE WAN

Appendix B

Organization Structure and Contact Details of Relevant Parties

Contact Details of Key Personnel

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
DSD	Employer	Mr Kenley C K Kwok	-	-
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	Mr. Vincent Chan	2982 1750	2982 1163
Leader	Construction Manager	Mr. K. Y. So	2982 1750	2982 1163
Leader	Assistant Construction Manager	Mr. Ron Hung	2982 1750	2982 1163
Leader	Environmental Officer	Mr. William Wong	2982 8652	2982 8650
Leader	Sub-Agent	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	Team Supervisor	Mr. Ben Tam	2959 6059	2959 6079
AUES	Coral Specialist	Mr. Keith Kei	2959 6059	2959 6079

Legend:

DSD (Employer) – Drainage Services Department

CDM (Engineer) – Scott Wilson CDM Joint Venture

Leader (Main Contractor) – Leader Civil Engineering Corporation Limited

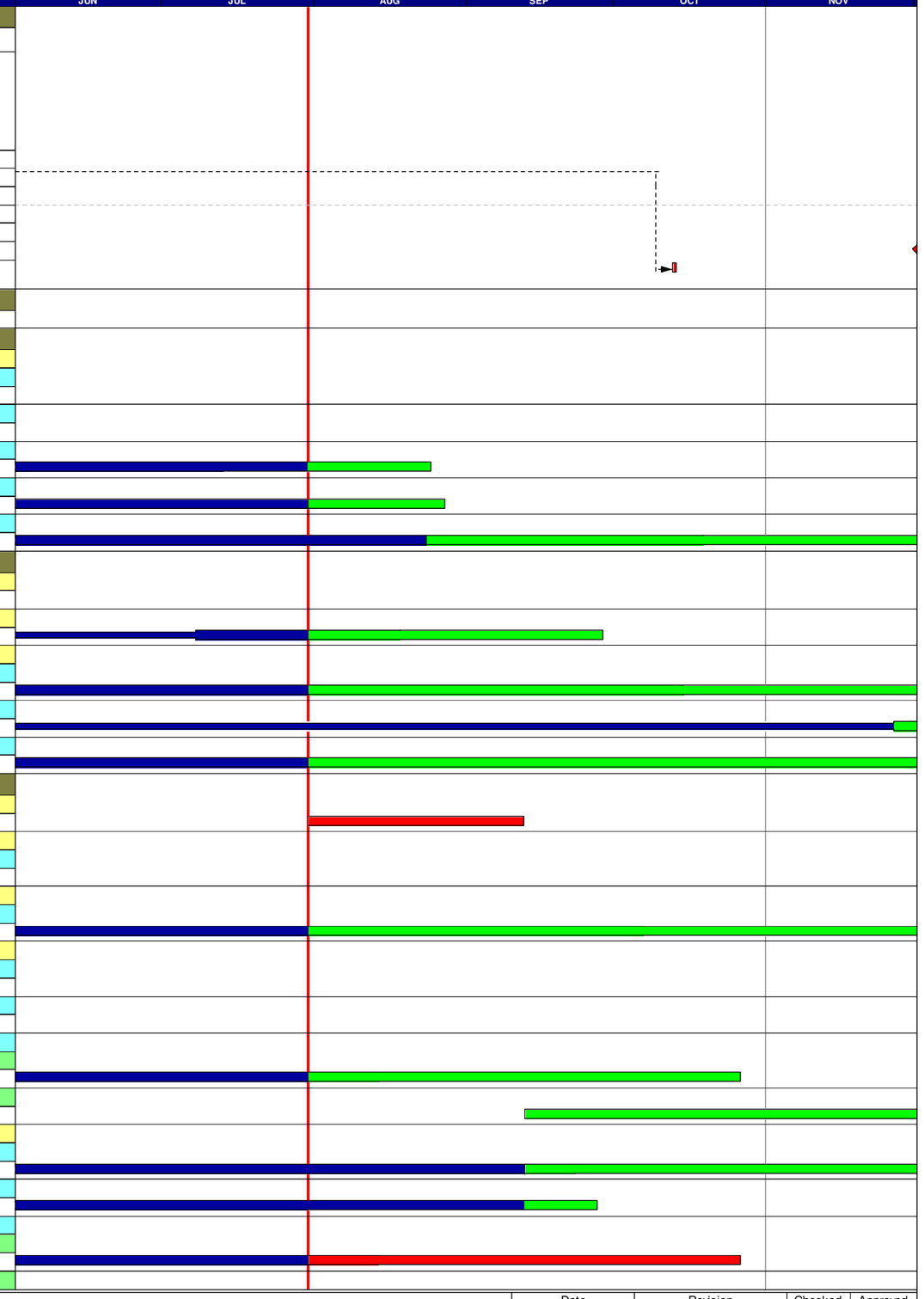
Scott Wilson (IEC) – Scott Wilson Limited

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

Appendix C

Master and Three Months Rolling Construction Programme

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors
Project Key Date										
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, E&M2001, KD0125, PRE0020, PRE0040, PRE0050, PRE0060, PRE0090, PRE0100, PRE0130, SKW0250, SKW0588, SKW0651, SKW0881, SKW1131, SKW1481, SKW1591, SKW1611, YSW0020,
KD0030	Section W1 - Slope Works in Portion A & C	0	100		14/10/11 A		14/10/11 A		YSW0100, YSW0110, YSW0140,	KD0125, KD0130
KD0050	Section W3 - Footpath Diversion in Ptn G	0	100		24/03/11 A		24/03/11 A		SKW0481	KD0125
KD0060	Section W4 - Slope Works in Portios H & I	0	100		27/03/12 A		27/03/12 A		SKW05938, SKW059416	KD0125, KD0135, SKW05941
KD0070	Section W5 - P.S. No. 1 in Portion D	0	100		10/02/12 A		10/02/12 A		SKW0741	KD0125
KD0080	Section W6 - Sew er & PS No2 in Ptn. E & F	0	100		10/02/12 A		10/02/12 A		SKW0971	KD0125
KD0115	Start Operate Temp Sew age Treatment in Port. A&H	0	0		01/12/12		01/12/12	0 *	E&M0510	KD0125
KD0130	Completion of Maintenance Period of W1	1	0	13/10/12	13/10/12 *	13/10/12	13/10/12 *	0	KD0030, YSW01755, YSW01805,	
+Preliminary (Civil)										
		120	100	17/05/10 A	13/09/10 A	17/05/10 A	13/09/10 A		KD0020	
Preliminary (E&M)										
Technical Submission										
+Process Design of SKWSTW & YSWSTW										
		198	100	17/05/10 A	30/11/10 A	17/05/10 A	30/11/10 A			
+Hydraulic Design										
		139	100	15/07/10 A	30/11/10 A	15/07/10 A	30/11/10 A			
+Equipment Submission & Approval										
		831	97	17/05/10 A	24/08/12	17/05/10 A	15/04/13	234d		
+Drawings Submission & Approval										
		795	81	24/06/10 A	27/08/12	24/06/10 A	11/03/13	196d		
+Statutory Submission										
		468	44	01/11/11 A	07/03/13	01/11/11 A	12/10/13	219d		
Yung Shue Wan										
+Preliminary										
		229	100	17/05/10 A	31/12/10 A	17/05/10 A	31/12/10 A			
+Section W1 - Slope Works in Portion A & C										
		866	94	17/05/10 A	28/09/12	17/05/10 A	13/10/12	15d		
Section W2 - YSW STW & Submarine Outfall										
+Civil & Structural Work										
		1017	72	17/05/10 A	27/02/13	17/05/10 A	14/08/13	169d		
+Submarine Outfall										
		836	98	17/05/10 A	26/12/12	17/05/10 A	31/07/13	217d		
+E&M Works - YSW STW										
		958	63	24/02/11 A	09/10/13	24/02/11 A	13/10/13	5d		
Sok Kwu Wan										
+Preliminary										
		44	0	31/07/12	12/09/12	21/05/12	04/07/12	-71d		
Section W3 - Footpath Diversion in Portion G										
+Civil & Geotechnical Works										
		603	100	17/05/10 A	09/01/12 A	17/05/10 A	09/01/12 A			
Section W4 - Slope Works in Portions H & I										
+Geotechnical Works										
		973	81	15/06/10 A	11/02/13	15/06/10 A	14/04/15	792d		
Section W5 - P.S. No. 1 in Portion D										
+Civil & Geotechnical Works										
		393	100	17/05/10 A	13/06/11 A	17/05/10 A	13/06/11 A			
+Structural Works										
		300	100	14/06/11 A	08/04/12 A	14/06/11 A	08/04/12 A			
E&M Works (PS1)										
+Submission & Delivery										
		894	94	17/05/10 A	26/10/12	17/05/10 A	23/07/13	270d		
+Installation, T&C										
		123	0	13/09/12	14/01/13	23/07/13	01/12/13	322d		
Section W6 - Sewer and PS No.2 in Portions E&H										
+Civil & Geotechnical Works										
		930	73	17/05/10 A	14/01/13	17/05/10 A	20/02/13	37d		
+Structural Works										
		431	96	11/06/11 A	27/09/12	11/06/11 A	11/11/12	45d		
E&M Works (PS2)										
+Submission & Delivery										
		894	94	17/05/10 A	26/10/12	17/05/10 A	31/07/12	-92d		
+Installation, T&C										



Start date	05/05/10
Finish date	22/11/15
Data date	31/07/12
Run date	22/08/12
Page number	1A
c Primavera Systems, Inc.	

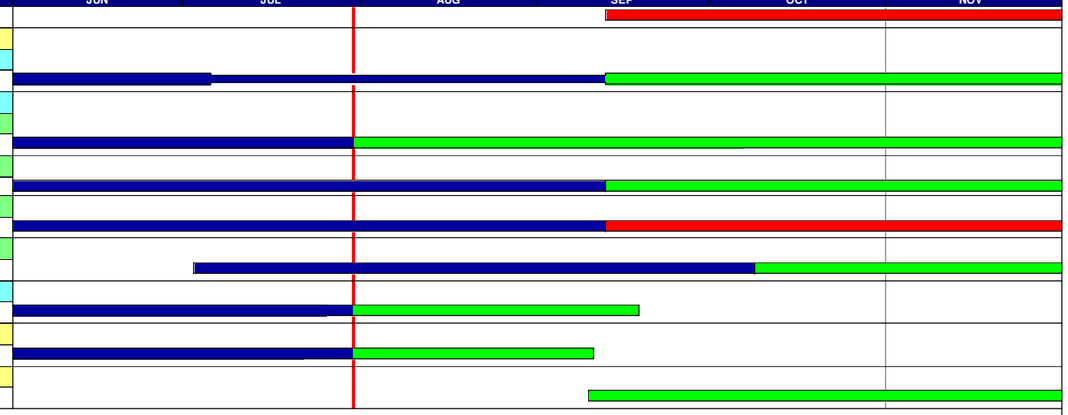
Early bar
Progress bar
Critical bar
Summary bar
Progress point
Critical point
Summary point
Start milestone point
Finish milestone poir

Leader Civil Engineering Corp. Ltd.
Contract No. DC/2009/13
Construction of Sewage Treatment Works at YSW & SKW
3-month Rolling Programme (Aug 2012 - Oct 2012)

(Marked on 31 July 2012)

Date	Revision	Checked	Approved
31/07/12	Revision 0	RH	VC

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors
		123	0	13/09/12	14/01/13	27/07/12	05/01/13	-8d		
Section W7 - SKW STW,Sewer and Submarine Outfall										
+Submarine Outfall										
		971	88	17/05/10 A	24/02/13	17/05/10 A	24/10/13	242d		
SKW STW										
+Submission & Delivery (E&M)										
		719	65	24/02/11 A	11/02/13	24/02/11 A	27/11/13	289d		
+Construction of Grid A-G										
		281	60	28/03/12 A	16/02/13	28/03/12 A	27/05/13	101d		
+Construction of Grid G-N										
		229	49	28/03/12 A	25/12/12	28/03/12 A	15/10/12	-71d		
+Construction of Grid N-T										
		131	27	03/07/12 A	20/01/13	03/07/12 A	27/01/13	8d		
+Rising Main										
		856	93	17/05/10 A	18/09/12	17/05/10 A	12/09/14	724d		
+Section W8 - Landscape Softworks in All Portions										
		847	96	17/05/10 A	10/09/12	17/05/10 A	08/03/13	180d		
+Section W9 - Establishment Works in All Portions										
		365	0	10/09/12	10/09/13	12/03/13	11/03/14	183d		



Start date	05/05/10
Finish date	22/11/15
Data date	31/07/12
Run date	22/08/12
Page number	2A
c Primavera Systems, Inc.	

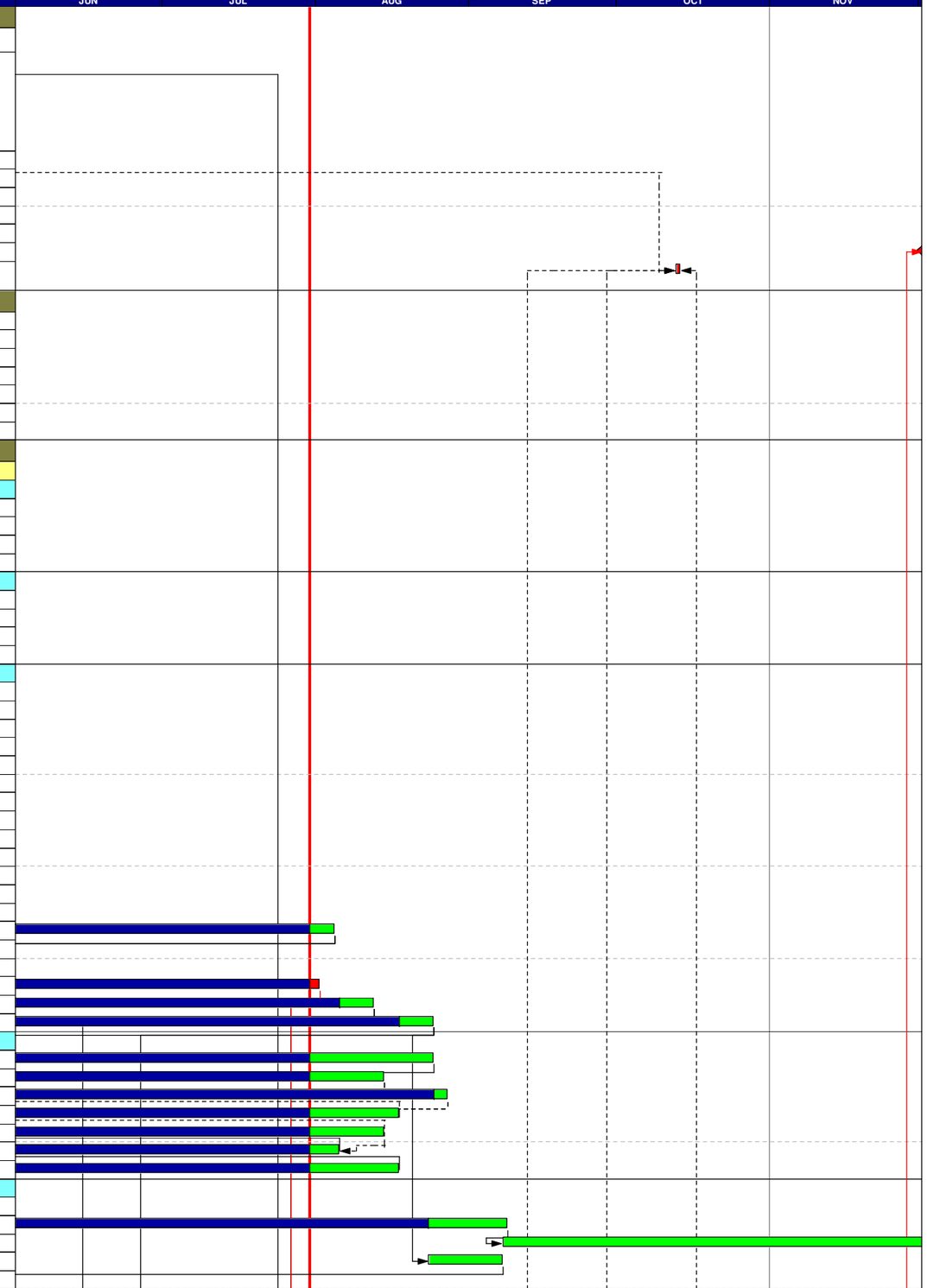
Early bar
Progress bar
Critical bar
Summary bar
Progress point
Critical point
Summary point
Start milestone point
Finish milestone poir

Leader Civil Engineering Corp. Ltd.
Contract No. DC/2009/13
Construction of Sewage Treatment Works at YSW & SKW
3-month Rolling Programme (Aug 2012 - Oct 2012)

(Marked on 31 July 2012)

Date	Revision	Checked	Approved
31/07/12	Revision 0	RH	VC

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors
Project Key Date										
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, E&M2001, KD0125, PRE0020, PRE0040, PRE0050, PRE0060, PRE0090, PRE0100, PRE0130, SKW0250, SKW0588, SKW0651, SKW0881, SKW1131, SKW1481, SKW1591, SKW1611, YSW0020,
KD0030	Section W1 - Slope Works in Portion A & C	0	100		14/10/11 A		14/10/11 A		YSW0100, YSW0110, YSW0140,	KD0125, KD0130
KD0050	Section W3 - Footpath Diversion in Ptn G	0	100		24/03/11 A		24/03/11 A		SKW0481	KD0125
KD0060	Section W4 - Slope Works in Portios H & I	0	100		27/03/12 A		27/03/12 A		SKW05938, SKW059416	KD0125, KD0135, SKW05941
KD0070	Section W5 - P.S. No. 1 in Portion D	0	100		10/02/12 A		10/02/12 A		SKW0741	KD0125
KD0080	Section W6 - Sew er & PS No2 in Ptn. E & F	0	100		10/02/12 A		10/02/12 A		SKW0971	KD0125
KD0115	Start Operate Temp Sew age Treatment in Port. A&H	0	0		01/12/12		01/12/12	0 *	E&M0510	KD0125
KD0130	Completion of Maintenance Period of W1	1	0	13/10/12	13/10/12 *	13/10/12	13/10/12 *	0	KD0030, YSW01755, YSW01805,	
Preliminary (Civil)										
PRE0020	Pre-condition Survey	60	100	17/05/10 A	15/07/10 A	17/05/10 A	15/07/10 A		KD0020	
PRE0040	Erection of Engineer's Site Accommodation at YSW	60	100	17/05/10 A	15/07/10 A	17/05/10 A	15/07/10 A		KD0020	
PRE0050	Taking over the Secondary Engineer's Site Accomm	75	100	17/05/10 A	30/07/10 A	17/05/10 A	30/07/10 A		KD0020	
PRE0060	Application of Consent from Marine Department	60	100	17/05/10 A	15/07/10 A	17/05/10 A	15/07/10 A		KD0020	
PRE0090	Working Group Meeting for Outfall Construction	120	100	17/05/10 A	13/09/10 A	17/05/10 A	13/09/10 A		KD0020	SKW1151
PRE0100	Application & Consent of XP from HyD (Mo Tat Rd)	120	100	17/05/10 A	13/09/10 A	17/05/10 A	13/09/10 A		KD0020	SKW1491, SKW1501
PRE0130	Setup Web-site for EM&A Reporting	90	100	17/05/10 A	14/08/10 A	17/05/10 A	14/08/10 A		KD0020	
Preliminary (E&M)										
Technical Submission										
Process Design of SKWSTW & YSWSTW										
E&M0010	Submission	38	100	17/05/10 A	23/06/10 A	17/05/10 A	23/06/10 A		KD0020	E&M0020, E&M0040, E&M0235
E&M0020	Vetting and Comment by ER	21	100	24/06/10 A	14/07/10 A	24/06/10 A	14/07/10 A		E&M0010	E&M0030, E&M0040
E&M0030	Revision and Resubmission	125	100	15/07/10 A	16/11/10 A	15/07/10 A	16/11/10 A		E&M0020	E&M0080
E&M0080	Approval from the Engineer	14	100	17/11/10 A	30/11/10 A	17/11/10 A	30/11/10 A		E&M0030	E&M0295
Hydraulic Design										
E&M0040	Submission	21	100	15/07/10 A	04/08/10 A	15/07/10 A	04/08/10 A		E&M0010, E&M0020	E&M0050, E&M0101, E&M0240,
E&M0050	Vetting and Comment by ER	14	100	05/08/10 A	18/08/10 A	05/08/10 A	18/08/10 A		E&M0040	E&M0060
E&M0060	Revision and Resubmission	97	100	19/08/10 A	10/11/10 A	19/08/10 A	10/11/10 A		E&M0050	E&M0430
E&M0430	Approval from the Engineer	7	100	24/11/10 A	30/11/10 A	24/11/10 A	30/11/10 A		E&M0060	E&M0295
Equipment Submission & Approval										
E&M0070	Submission of Membrane Module	50	100	17/05/10 A	05/07/10 A	17/05/10 A	05/07/10 A		KD0020	E&M0090
E&M0090	Vetting and Comment by ER	14	100	06/07/10 A	19/07/10 A	06/07/10 A	19/07/10 A		E&M0070	E&M0100
E&M0100	Revision and Resubmission	14	100	20/07/10 A	24/02/11 A	20/07/10 A	24/02/11 A		E&M0090	E&M0160
E&M0101	Submission of Equipment	90	100	05/08/10 A	30/11/11 A	05/08/10 A	30/11/11 A		E&M0040	E&M0102
E&M0102	Vetting and Comment by ER	60	100	03/11/10 A	30/11/11 A	03/11/10 A	30/11/11 A		E&M0101	E&M0103
E&M0103	Revision and Resubmission	60	100	01/02/11 A	30/11/11 A	01/02/11 A	30/11/11 A		E&M0102	E&M0110, E&M0120, E&M0130,
E&M0110	Approval on Coarse Screens	30	100	25/05/11 A	25/05/11 A	25/05/11 A	25/05/11 A		E&M0103	E&M0390
E&M0120	Approval on Fine Screens	30	100	12/09/11 A	12/09/11 A	12/09/11 A	12/09/11 A		E&M0103	E&M0400, E&M3060
E&M0130	Approval on Pumps	30	100	23/06/11 A	23/06/11 A	23/06/11 A	23/06/11 A		E&M0103	E&M0410, E&M3070
E&M0140	Approval on Submersible Mixers	30	100	23/03/11 A	23/03/11 A	23/03/11 A	23/03/11 A		E&M0103	E&M0420, E&M3080
E&M0150	Approval on Grit Removal Equipment	30	100	10/10/11 A	10/10/11 A	10/10/11 A	10/10/11 A		E&M0103	E&M0380, E&M3030
E&M0160	Approval on MBR Membrane Modules (M.M.)	105	100	03/08/10 A	24/02/11 A	03/08/10 A	24/02/11 A		E&M0100	E&M0360, E&M0370, E&M3010
E&M0170	Approval on Sludge Dew atering Equipment	30	100	01/09/11 A	01/09/11 A	01/09/11 A	01/09/11 A		E&M0103	E&M0440, E&M3090
E&M0180	Approval on Valves, Pipes & Fittings	30	85	19/11/11 A	04/08/12	19/11/11 A	15/04/13	255d	E&M0103	E&M0450, E&M3100
E&M0190	Approval on Penstocks	30	100	15/11/11 A	15/11/11 A	15/11/11 A	15/11/11 A		E&M0103	E&M0460, E&M3110
E&M0200	Approval on Instrumentation	30	100	21/06/11 A	08/03/12 A	21/06/11 A	08/03/12 A		E&M0103	E&M0470, E&M3130
E&M0210	Approval on MCC & LVSB	30	95	19/11/11 A	01/08/12	19/11/11 A	10/07/12	-22d	E&M0103	E&M0480, E&M3140
E&M0220	Approval on BS Equipment	30	78	30/11/11 A	12/08/12	30/11/11 A	21/01/13	162d	E&M0103, E&M0280	E&M0490, E&M3150
E&M0230	Approval on FS Equipment	30	78	30/11/11 A	24/08/12	30/11/11 A	18/02/13	178d	E&M0103, E&M0290	E&M0295, E&M0320, E&M0500,
Drawings Submission & Approval										
E&M0235	Sub. P&ID Drawings	100	75	24/06/10 A	24/08/12	24/06/10 A	09/03/13	196d	E&M0010	E&M0250
E&M0240	Sub. Plant GA Drawings	45	68	04/08/10 A	14/08/12	04/08/10 A	09/03/13	207d	E&M0040	E&M0250, E&M0280, E&M0290
E&M0250	Sub. Builder's Works Requirements Drawings	15	85	04/08/10 A	27/08/12	04/08/10 A	11/03/13	196d	E&M0235, E&M0240, E&M0260,	E&M0280, E&M0290
E&M0260	Sub. Mechanical Installation Drawings	60	70	27/09/10 A	17/08/12	27/09/10 A	09/03/13	203d	E&M0040	E&M0250
E&M0270	Sub. Electrical Installation Drawings	60	75	27/09/10 A	14/08/12	27/09/10 A	09/03/13	206d	E&M0040	E&M0250, E&M0280
E&M0280	Sub. BS Installation Drawings	120	95	27/09/10 A	05/08/12	27/09/10 A	15/01/13	162d	E&M0240, E&M0250, E&M0270	E&M0220
E&M0290	Sub. FS Installation Drawings	120	85	13/11/10 A	17/08/12	13/11/10 A	12/02/13	178d	E&M0240, E&M0250	E&M0230
Statutory Submission										
E&M0295	Preparation of Submission to HEC	39	100	01/11/11 A	30/11/11 A	01/11/11 A	30/11/11 A		E&M0080, E&M0230, E&M0430	E&M0300
E&M0300	Application & Approval from HEC	150	90	01/11/11 A	08/09/12	01/11/11 A	15/04/13	219d	E&M0295	E&M0305
E&M0305	Provision of Cables to the STWs	180	0	08/09/12	07/03/13	16/04/13	12/10/13	219d	E&M0300	E&M0680
E&M0320	Form 314 Submission to FSD	14	0	24/08/12	07/09/12	08/08/13	21/08/13	348d	E&M0230	E&M0325, E&M0670
E&M0325	Submission to WSD	14	100	01/11/11 A	29/02/12 A	01/11/11 A	29/02/12 A		E&M0320	E&M0670, E&M0680



Start date	05/05/10
Finish date	22/11/15
Data date	31/07/12
Run date	22/08/12
Page number	1A
c Primavera Systems, Inc.	

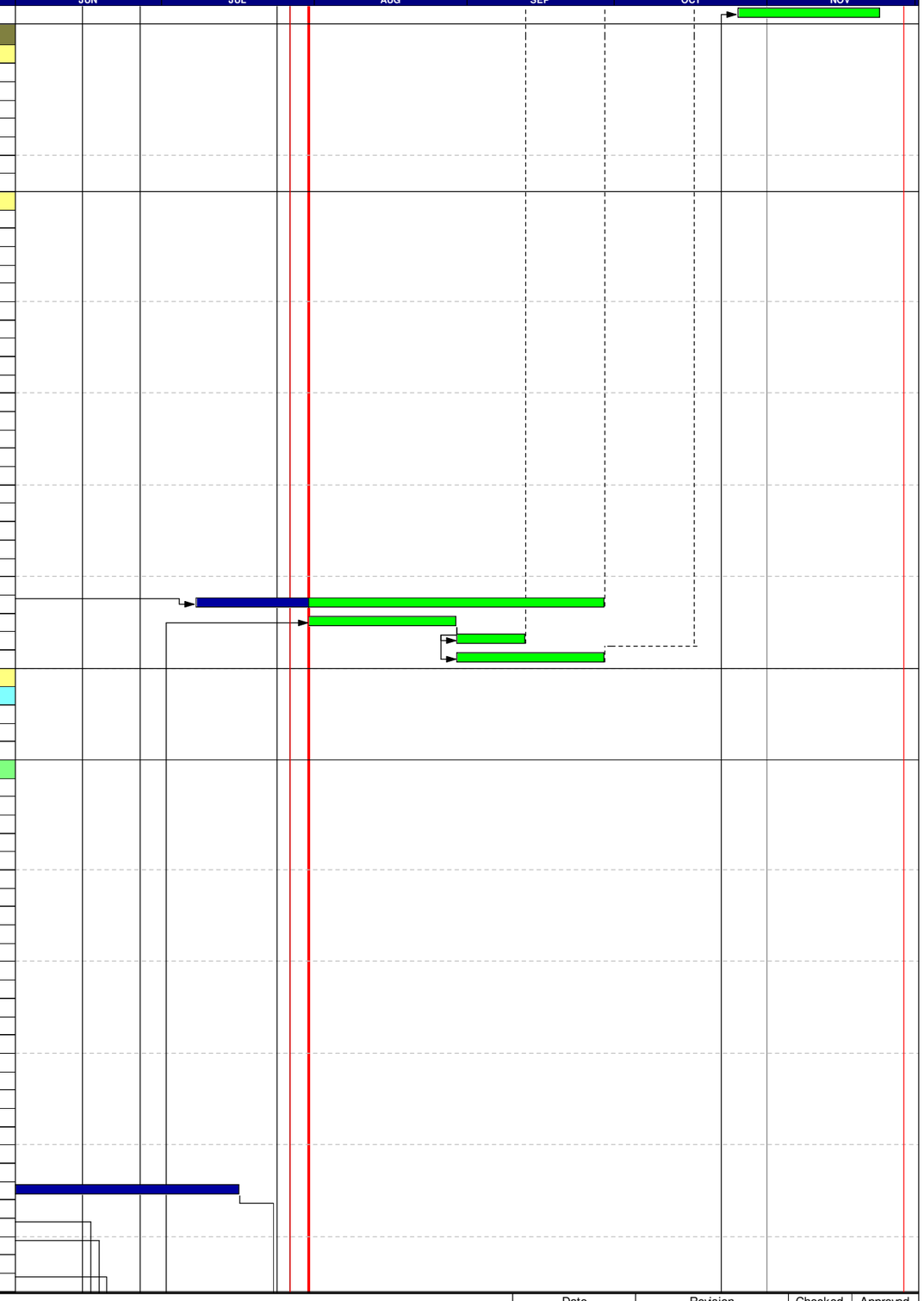
Early bar
Progress bar
Critical bar
Summary bar
Progress point
Critical point
Summary point
Start milestone point
Finish milestone poir

Leader Civil Engineering Corp. Ltd.
Contract No. DC/2009/13
Construction of Sewage Treatment Works at YSW & SKW
3-month Rolling Programme (Aug 2012 - Oct 2012)

(Marked on 31 July 2012)

Date	Revision	Checked	Approved
31/07/12	Revision 0	RH	VC

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors
E&M0350	Form 501 Submission to FSD (PS1 & PS2)	28	0	26/10/12	23/11/12	14/11/12	11/12/12	19d	E&M2016	E&M11800, E&M2180
Yung Shue Wan										
Preliminary										
YSW0020	Approval of Environmental Team	16	100	17/05/10 A	01/06/10 A	17/05/10 A	01/06/10 A		KD0020	YSW00201, YSW0030, YSW00351,
YSW00201	Change Baseline Monitoring Location (Air&Noise)	59	100	02/06/10 A	30/07/10 A	02/06/10 A	30/07/10 A		YSW0020	YSW0030
YSW0030	Baseline monitoring (Air & Noise)	23	100	31/07/10 A	22/08/10 A	31/07/10 A	22/08/10 A		YSW0020, YSW00201	YSW0035
YSW0035	Baseline Monitoring Report Submission (A & N)	16	100	23/08/10 A	07/09/10 A	23/08/10 A	07/09/10 A		YSW0030	YSW0120, YSW01545, YSW0500,
YSW00351	Submission & Approval for Monitoring Method (W)	58	100	02/06/10 A	29/07/10 A	02/06/10 A	29/07/10 A		YSW0020	YSW0040
YSW0040	Baseline monitoring (Water)	155	100	30/07/10 A	31/12/10 A	30/07/10 A	31/12/10 A		YSW0020, YSW00351	YSW0350
YSW0050	Erect Hoarding and Fencing	60	100	19/05/10 A	17/07/10 A	19/05/10 A	17/07/10 A		KD0020	YSW0155
Section W1 - Slope Works in Portion A & C										
YSW0075	Mobilization	30	100	17/05/10 A	15/06/10 A	17/05/10 A	15/06/10 A		KD0020	YSW0080, YSW0100
YSW0080	Site Clearance	30	100	16/06/10 A	15/07/10 A	16/06/10 A	15/07/10 A		YSW0075	YSW0085, YSW0090, YSW0120
YSW0085	Initial Survey	14	100	02/07/10 A	15/07/10 A	02/07/10 A	15/07/10 A		YSW0080	YSW0120
YSW0090	Verify the Rock Boulder required Stablization Wk	249	100	16/07/10 A	21/03/11 A	16/07/10 A	21/03/11 A		YSW0080	YSW0100, YSW0110
YSW0100	Removal of Rock Boulder	257	100	20/09/10 A	03/06/11 A	20/09/10 A	03/06/11 A		YSW0075, YSW0090	KD0030
YSW0110	Stablizing w ork for rock boulder	35	100	16/07/11 A	19/08/11 A	16/07/11 A	19/08/11 A		YSW0090	KD0030
YSW0120	Cut the slope to design profile	2	100	24/09/10 A	25/09/10 A	24/09/10 A	25/09/10 A		YSW0035, YSW0080, YSW0085	YSW0131, YSW0155, YSW0170
YSW0131	Mobilization of Plant and Material of Soil Nails	14	100	12/09/10 A	25/09/10 A	12/09/10 A	25/09/10 A		YSW0120	YSW0132
YSW0132	Erect Scaffold and Working Platform	2	100	26/09/10 A	27/09/10 A	26/09/10 A	27/09/10 A		YSW0131	YSW0133
YSW0133	Setting out and Verify Locations of Soil Nails	45	100	28/09/10 A	11/11/10 A	28/09/10 A	11/11/10 A		YSW0132	YSW0134
YSW0134	Drilling and Soil Nails Installation	43	100	19/10/10 A	30/11/10 A	19/10/10 A	30/11/10 A		YSW0133	YSW0135
YSW0135	Construction of Nail Heads	12	100	01/12/10 A	12/12/10 A	01/12/10 A	12/12/10 A		YSW0134	YSW0136
YSW0136	Mesh Installation on Cut Slope	3	100	13/12/10 A	15/12/10 A	13/12/10 A	15/12/10 A		YSW0135	YSW01361
YSW01361	Verify alignment of access & channels on slope	118	100	16/12/10 A	12/04/11 A	16/12/10 A	12/04/11 A		YSW0136	YSW0140
YSW0140	Construct U-channels & Step Channel on Cut Slope	182	100	13/04/11 A	11/10/11 A	13/04/11 A	11/10/11 A		YSW01361	KD0030
YSW0153	Removal of Ex U-Channel w here clash w ith B. Wall	151	100	10/05/11 A	07/10/11 A	10/05/11 A	07/10/11 A		YSW01545	YSW01750
YSW01545	Temporary Diversion of Drainage	244	100	08/09/10 A	09/05/11 A	08/09/10 A	09/05/11 A		YSW0035	YSW0153
YSW0155	RC Barrier Wall Bay 1-13 (below Ground Level)	256	100	26/09/10 A	08/06/11 A	26/09/10 A	08/06/11 A		YSW0050, YSW0120	KD0030, YSW0170, YSW0175
YSW0170	RC Barrier Wall Bay 1-13 (above Ground Level)	125	100	09/06/11 A	11/10/11 A	09/06/11 A	11/10/11 A		YSW0120, YSW0155	KD0030, YSW01750
YSW0175	Construct U-channels and Catchpits (Phase 1)	76	100	09/06/11 A	23/08/11 A	09/06/11 A	23/08/11 A		YSW0155	KD0030
YSW01750	Construction of subsoil drain (phase 1)	120	100	12/10/11 A	08/02/12 A	12/10/11 A	08/02/12 A		YSW0153, YSW0170	YSW01755
YSW01755	Construct subsoil drain (phase 2)	60	0	08/07/12 A	28/09/12	08/07/12 A	12/10/12	14d	YSW01750	KD0130
YSW01800	RC Barrier Wall Bay 14 (below & above Ground)	30	0	31/07/12	29/08/12	15/08/12	13/09/12	15d	YSW0760	YSW01805, YSW01810
YSW01805	Hydroseeding	14	0	30/08/12	12/09/12	29/09/12	12/10/12	30d	YSW01800	KD0130
YSW01810	Construct U-channels and Catchpits (Phase 2)	30	0	30/08/12	28/09/12	14/09/12	13/10/12	15d	YSW01800	KD0130
Section W2 - YSW STW & Submarine Outfall										
Civil & Structural Work										
YSW0412	Mobilization	30	100	17/05/10 A	15/06/10 A	17/05/10 A	15/06/10 A		KD0020	YSW0422
YSW0422	Site Clearance	30	100	17/05/10 A	15/06/10 A	17/05/10 A	15/06/10 A		KD0020, YSW0412	YSW0432, YSW0500, YSW0610,
YSW0432	Initial Survey	14	100	02/06/10 A	15/06/10 A	02/06/10 A	15/06/10 A		YSW0422	YSW0510
YSW STW - GL H - T										
YSW0500	ELS & Excavation for Inlet Pumping Station	105	100	08/09/10 A	21/12/10 A	08/09/10 A	21/12/10 A		YSW0035, YSW0422	YSW0510
YSW0510	Sub-structure construction (Inlet Pumping Stn)	129	100	22/12/10 A	29/04/11 A	22/12/10 A	29/04/11 A		YSW0432, YSW0500	YSW0520
YSW0520	Backfill & Remove ELS (Inlet Pumping Stn)	40	100	30/04/11 A	08/06/11 A	30/04/11 A	08/06/11 A		YSW0510	YSW05701
YSW0530	ELS & Excavation for Equalization Tank	159	100	01/01/11 A	08/06/11 A	01/01/11 A	08/06/11 A		YSW0660	YSW0540, YSW05701
YSW0540	Sub-structure construction (Equalization Tank)	112	100	09/06/11 A	28/09/11 A	09/06/11 A	28/09/11 A		YSW0530	YSW0550, YSW05901
YSW0550	Backfilling & Remove ELS (Equalization Tank)	20	100	29/09/11 A	18/10/11 A	29/09/11 A	18/10/11 A		YSW0540	YSW05901
YSW05701	ELS & Excavation for Grit Chambers	28	100	09/06/11 A	06/07/11 A	09/06/11 A	06/07/11 A		YSW0520, YSW0530	YSW05711, YSW05731
YSW05711	Construct sub-structure for Grit Chambers	106	100	07/07/11 A	20/10/11 A	07/07/11 A	20/10/11 A		YSW05701	YSW05721, YSW05911
YSW05721	Backfill & Remove ELS for Grit Chambers	12	100	21/10/11 A	01/11/11 A	21/10/11 A	01/11/11 A		YSW05711	YSW05911
YSW05731	ELS & Excavation for Grease Separators (GS)	34	100	07/07/11 A	09/08/11 A	07/07/11 A	09/08/11 A		YSW05701	YSW05741
YSW05741	Construct sub-structure for Grease Separators	52	100	10/08/11 A	30/09/11 A	10/08/11 A	30/09/11 A		YSW05731	YSW05751
YSW05751	Install Dia.400 Puddles in Grease Separators	27	100	01/10/11 A	27/10/11 A	01/10/11 A	27/10/11 A		YSW05741	YSW05752
YSW05752	Construct sub-structure for GS (above puddles)	48	100	28/10/11 A	14/12/11 A	28/10/11 A	14/12/11 A		YSW05751	YSW05761
YSW05761	Backfill & remove ELS for Grease Separators	10	100	15/12/11 A	24/12/11 A	15/12/11 A	24/12/11 A		YSW05752	YSW0580, YSW05921
YSW0580	Excavate to Formation for Deodorizer Room	10	100	25/12/11 A	03/01/12 A	25/12/11 A	03/01/12 A		YSW05761	YSW05801, YSW05922
YSW05801	Excavate to formation - Grid J-N/5-7	40	100	04/01/12 A	12/02/12 A	04/01/12 A	12/02/12 A		YSW0580	YSW05802, YSW05923
YSW05802	Excavate to formation - Grid GA-H/5-7	10	100	13/02/12 A	22/02/12 A	13/02/12 A	22/02/12 A		YSW05801	YSW05924
YSW05901	G/F to 1/F Construction Grid GA-K/1-5	90	100	29/09/11 A	27/12/11 A	29/09/11 A	27/12/11 A		YSW0540, YSW0550	YSW06001
YSW05911	G/F to 1/F Construction Grid N-S/1-5	80	100	21/10/11 A	08/01/12 A	21/10/11 A	08/01/12 A		YSW05711, YSW05721	YSW06011, YSW06035
YSW05921	G/F to 1/F Construction Grid K-N/1-5	45	100	25/12/11 A	07/02/12 A	25/12/11 A	07/02/12 A		YSW05761	YSW06021
YSW05922	G/F to 1/F Construction for Deodorizer Room	80	100	04/01/12 A	23/03/12 A	04/01/12 A	23/03/12 A		YSW0580	YSW06022
YSW05923	G/F to 1/F Construction for Grid J-N/5-7	60	100	13/02/12 A	12/04/12 A	13/02/12 A	12/04/12 A		YSW05801	YSW06023
YSW05924	G/F to 1/F Construction for Grid GA-H/5-7	60	100	28/05/12 A	16/07/12 A	28/05/12 A	16/07/12 A		YSW05802, YSW06023	YSW06034
YSW06001	1/F to Roof Constuction for Grid GA-K/1-5	87	100	28/12/11 A	23/03/12 A	28/12/11 A	23/03/12 A		YSW05901	YSW0800
YSW06011	1/F to Roof Constuction for Grid N-S/1-5	75	100	09/01/12 A	23/03/12 A	09/01/12 A	23/03/12 A		YSW05911	YSW0800
YSW06021	1/F to Roof Constuction for Grid K-N/1-5	44	100	08/02/12 A	22/03/12 A	08/02/12 A	22/03/12 A		YSW05921	YSW07201
YSW06022	1/F to Roof Constuction for Deodorizer Room	60	100	24/03/12 A	22/05/12 A	24/03/12 A	22/05/12 A		YSW05922	YSW0800
YSW06023	1/F to Roof Constuction for Grid J-N/5-7	45	100	13/04/12 A	27/05/12 A	13/04/12 A	27/05/12 A		YSW05923	YSW05924



Start date	05/05/10
Finish date	22/11/15
Data date	31/07/12
Run date	22/08/12
Page number	2A
c Primavera Systems, Inc.	

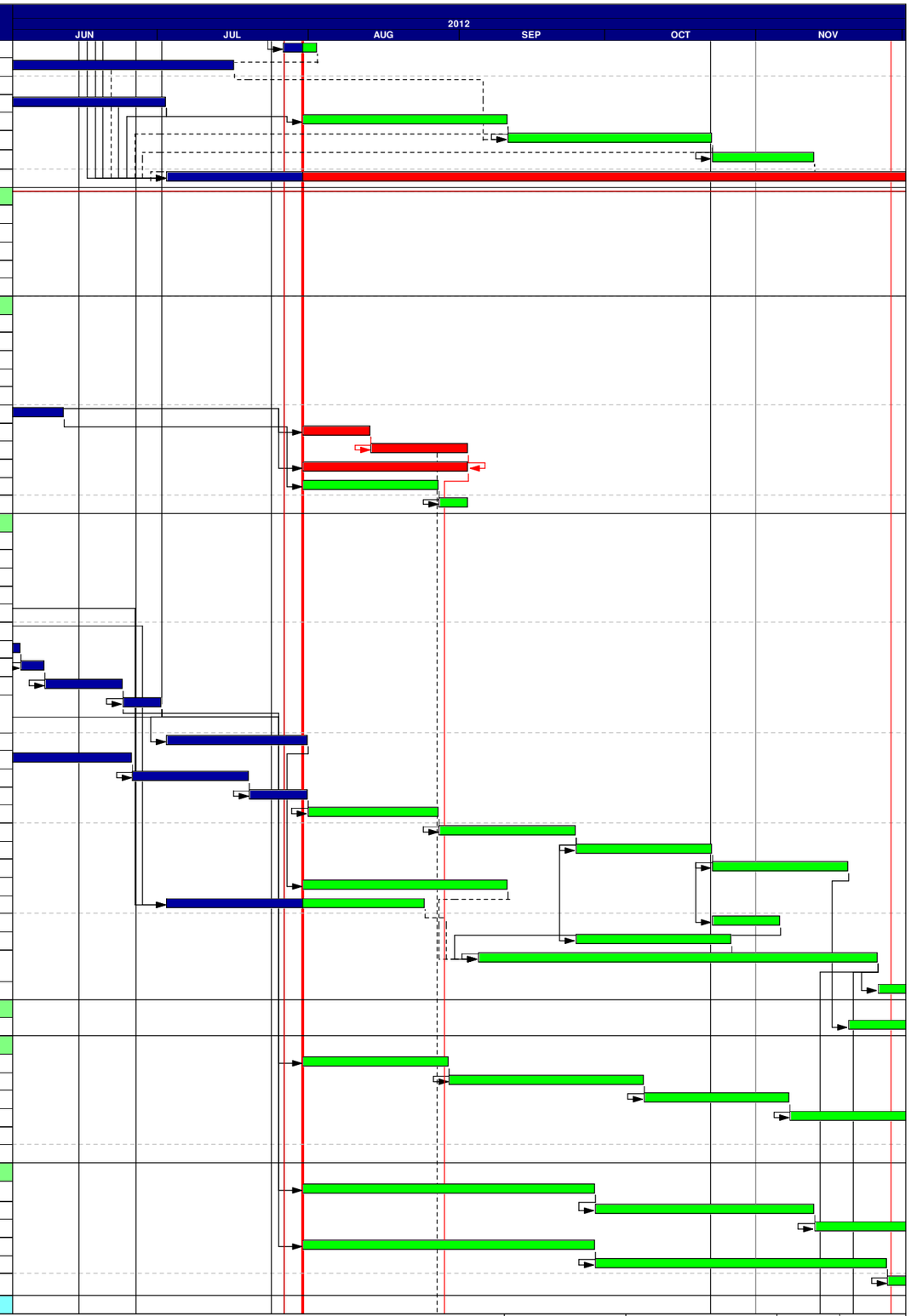
Early bar
Progress bar
Critical bar
Summary bar
Progress point
Critical point
Summary point
Start milestone point
Finish milestone poir

Leader Civil Engineering Corp. Ltd.
Contract No. DC/2009/13
Construction of Sewage Treatment Works at YSW & SKW
3-month Rolling Programme (Aug 2012 - Oct 2012)

(Marked on 31 July 2012)

Date	Revision	Checked	Approved
31/07/12	Revision 0	RH	VC

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors
YSW06034	1/F to Roof Constuction for Grid GA-H/5-7	45	95	27/07/12 A	02/08/12	27/07/12 A	14/12/12	134d	YSW05924	YSW0800
YSW06035	Construct buffle w alls in Grease Separators	118	100	18/04/12 A	16/07/12 A	18/04/12 A	16/07/12 A		YSW05911	YSW07204
YSW07201	Water tightness test for Inlet Pumping Station	60	100	23/03/12 A	21/05/12 A	23/03/12 A	21/05/12 A		YSW06021	YSW07202, YSW0800
YSW07202	Water tightness test for Equalization Tanks	42	100	22/05/12 A	02/07/12 A	22/05/12 A	02/07/12 A		YSW07201	YSW07203, YSW0800
YSW07203	Water tightness test for Grit Chambers	42	0	31/07/12	10/09/12	06/10/12	17/11/12	68d	YSW07202	YSW07204, YSW0800
YSW07204	Water tightness test for Grease Separators	42	0	11/09/12	22/10/12	17/11/12	29/12/12	68d	YSW06035, YSW07203	YSW07205, YSW0800
YSW07205	Water tightness test for w ater channels	21	0	23/10/12	12/11/12	29/12/12	19/01/13	68d	YSW07204	YSW0800
YSW0800	ABWF installation	271	22	03/07/12 A	27/02/13	03/07/12 A	24/01/13	-33d	YSW06001, YSW06011, YSW06022,	E&M0530, E&M0540, E&M0550,
YSW STW - GL T - X										
YSW0610	Excavate to formation	10	100	08/09/10 A	17/09/10 A	08/09/10 A	17/09/10 A		YSW0035, YSW0422	YSW0620
YSW0620	Base slab construction	248	100	18/09/10 A	23/05/11 A	18/09/10 A	23/05/11 A		YSW0610	YSW0630
YSW0630	G/F to 1/F construction	205	100	24/05/11 A	14/12/11 A	24/05/11 A	14/12/11 A		YSW0620	YSW0640
YSW0640	1/F to Roof Construction	64	100	15/12/11 A	16/02/12 A	15/12/11 A	16/02/12 A		YSW0630	YSW0810
YSW0810	ABWF installation	80	100	28/12/11 A	16/03/12 A	28/12/11 A	16/03/12 A		YSW0640	E&M0610, E&M0620, E&M0630,
YSW STW - GL F - H & DN Tanks										
YSW0650	ELS & Excavation for DN Tanks	37	100	08/09/10 A	14/10/10 A	08/09/10 A	14/10/10 A		YSW0035, YSW0422	YSW0660
YSW0660	Sub-struction construction (DN Tanks)	78	100	15/10/10 A	31/12/10 A	15/10/10 A	31/12/10 A		YSW0650	YSW0530, YSW0670
YSW0670	Backfill & Remove ELS (DN Tanks)	70	100	01/01/11 A	11/03/11 A	01/01/11 A	11/03/11 A		YSW0660	YSW0680
YSW0680	Base slab construction (SD1, SD2 & MBR4)	17	100	12/03/11 A	28/03/11 A	12/03/11 A	28/03/11 A		YSW0670	YSW0690
YSW0690	Construct Superstructure SD1, SD2 & MBR4	82	100	29/03/11 A	18/06/11 A	29/03/11 A	18/06/11 A		YSW0680	YSW0705, YSW0820
YSW06901	Construct Superstructure of DN Tanks	28	100	15/05/12 A	11/06/12 A	15/05/12 A	11/06/12 A		YSW0735	YSW0830
YSW0705	Water test for MBR 4, SD 1&2	14	0	31/07/12	13/08/12	31/07/12	13/08/12	0	YSW0690	E&M0510, E&M0630, E&M0640,
YSW0710	Apply protective paint for MBR 4, SD 1&2	20	0	14/08/12	02/09/12	14/08/12	02/09/12	0	YSW0705	YSW0820
YSW0820	ABWF installation	34	0	31/07/12	02/09/12	31/07/12	02/09/12	0	YSW0690, YSW0710	E&M0510, E&M0630, E&M0640
YSW0830	Water test for DN Tanks	28	0	31/07/12	27/08/12	12/07/13	08/08/13	346d	YSW06901	YSW0850
YSW0850	Apply protecitve paint for DN Tanks	6	0	28/08/12	02/09/12	09/08/13	14/08/13	346d	YSW0830	E&M0610
YSW STW - GL A - F										
YSW0730	Completion of HDD	0	100	21/01/12 A		21/01/12 A			YSW03601, YSW03605	YSW0732
YSW0732	Excavate for MBR 2 & 3	20	100	21/01/12 A	09/02/12 A	21/01/12 A	09/02/12 A		YSW0730	YSW0733
YSW0733	Construct basement of MBR 2 & 3	20	100	10/02/12 A	29/02/12 A	10/02/12 A	29/02/12 A		YSW0732	YSW0735, YSW0740
YSW0735	Construct superstructure of MBR 2	75	100	01/03/12 A	14/05/12 A	01/03/12 A	14/05/12 A		YSW0733	YSW06901, YSW0736, YSW08302
YSW0736	Construct superstructure of MBR 3	100	100	15/05/12 A	14/05/12 A	15/05/12 A	14/05/12 A		YSW0735	YSW08302
YSW0740	ELS & excavate for Outfall Shaft	75	100	01/03/12 A	14/05/12 A	01/03/12 A	14/05/12 A		YSW0733	YSW0750
YSW0750	Construct basement of Outfall Shaft	19	100	15/05/12 A	02/06/12 A	15/05/12 A	02/06/12 A		YSW0740	YSW07501
YSW07501	Connect additional flange to HDPE pipe (VO 042)	5	100	03/06/12 A	07/06/12 A	03/06/12 A	07/06/12 A		YSW0750	YSW07502
YSW07502	Construct sub-structure of Outfall Shaft	16	100	08/06/12 A	23/06/12 A	08/06/12 A	23/06/12 A		YSW07501	YSW0760
YSW0760	Backfill & remove ELS (outfall shaft)	8	100	24/06/12 A	01/07/12 A	24/06/12 A	01/07/12 A		YSW07502	YSW01800, YSW07601, YSW07603, YSW1470, YSW16601, YSW16606
YSW07601	Construct superstructure for Outfall Shaft	80	100	03/07/12 A	31/07/12 A	03/07/12 A	31/07/12 A		YSW0760	YSW08301
YSW07603	ELS & excavate for FSH Water Supply Tank	21	100	01/06/12 A	25/06/12 A	01/06/12 A	25/06/12 A		YSW0760	YSW07604
YSW07604	Construct substructure for FSH Water Supply Tank	23	100	26/06/12 A	19/07/12 A	26/06/12 A	19/07/12 A		YSW07603	YSW07605
YSW07605	Backfill & remove ELS for FSH Water Supply Tank	21	100	20/07/12 A	31/07/12 A	20/07/12 A	31/07/12 A		YSW07604	YSW07607
YSW07607	Construct basement of MBR 1 & Workshop	28	0	01/08/12 A	27/08/12	01/08/12 A	02/10/12	36d	YSW07605	YSW07608
YSW07608	Construct superstructure for FSH Water Supply Tk	28	0	28/08/12	24/09/12	03/10/12	30/10/12	36d	YSW07607	YSW07609, YSW08304
YSW07609	Construct superstructure for MBR 1	28	0	25/09/12	22/10/12	31/10/12	27/11/12	36d	YSW07608	YSW07610, YSW08303
YSW07610	Construct Workshop, FSSH Pump Rm, PW Pump Rm	28	0	23/10/12	19/11/12	28/11/12	25/12/12	36d	YSW07609	YSW0840
YSW08301	Water tightness test for Outfall Shaft	42	0	31/07/12	10/09/12	20/09/12	31/10/12	51d	YSW07601	YSW08305
YSW08302	Water tightness test for MBR 2 & 3	49	50	03/07/12 A	24/08/12	03/07/12 A	10/10/12	48d	YSW0735, YSW0736	YSW08305
YSW08303	Water tightness test for MBR 1	14	0	23/10/12	05/11/12	28/11/12	11/12/12	36d	YSW07609	YSW08305
YSW08304	Water tightness test for FSH Water Supply Tank	32	0	25/09/12	26/10/12	31/10/12	01/12/12	36d	YSW07608	YSW08305
YSW08305	Apply protective paint	82	0	05/09/12	25/11/12	11/10/12	31/12/12	36d	YSW08301, YSW08302, YSW08303, YSW08304	E&M0520, E&M0590, E&M0605, YSW0870
YSW0870	ABWF installation	30	0	26/11/12	25/12/12	07/05/13	05/06/13	162d	YSW08305	E&M0630, E&M0640, E&M0650
Fire Hose Reel / Sprinkler Pump Rm										
YSW0840	ELS & excavate to formation (+0 mPD approx.)	30	0	20/11/12	19/12/12	26/12/12	24/01/13	36d	YSW07610	YSW0860
Emergency Storage Tank										
YSW1470	ELS & excavate to formation (-1.5mPD Approx.)	30	0	31/07/12	29/08/12	01/10/12	30/10/12	62d	YSW0760	YSW1480
YSW1480	Sub-structure construction	40	0	30/08/12	08/10/12	31/10/12	09/12/12	62d	YSW1470	YSW1490
YSW1490	Backfill & extract sheetpile	30	0	09/10/12	07/11/12	10/12/12	08/01/13	62d	YSW1480	YSW1500
YSW1500	Superstructure construction upto +10.5mPD	40	0	08/11/12	17/12/12	09/01/13	17/02/13	62d	YSW1490	YSW1530, YSW1536
YSW1530	Underground pipeline w orks	40	0	18/12/12	26/01/13	18/02/13	29/03/13	62d	YSW1500	E&M0690, YSW1680
YSW1536	Water tightness test	40	0	18/12/12	26/01/13	26/06/13	04/08/13	190d	YSW1500	YSW1538
Road, Drain, Cable Draw Pits & Ducting										
YSW16601	Construct 6m deep sew er YFMH5-YFMH6 (Grid Q-X)	60	0	31/07/12	28/09/12	16/10/12	14/12/12	77d	YSW0760	YSW16602
YSW16602	Connect 6m deep sew er to existing manhole FM1	45	0	29/09/12	12/11/12	15/12/12	28/01/13	77d	YSW16601	YSW16603
YSW16603	Construct UU & pipes along sea side (Grid Q-X)	60	0	13/11/12	11/01/13	29/01/13	29/03/13	77d	YSW16602	YSW16604, YSW16703
YSW16606	Construct UU & pipes along hill side (Grid D-Q)	60	0	31/07/12	28/09/12	29/01/13	29/03/13	182d	YSW0760	YSW16607
YSW16607	Construct UU & pipes along hill side (Grid Q-X)	60	0	29/09/12	27/11/12	30/03/13	28/05/13	182d	YSW16606	YSW16608
YSW16608	Construct UU & pipes along hill side (Grid XA-D)	60	0	28/11/12	26/01/13	29/05/13	27/07/13	182d	YSW16607	YSW1690
Submarine Outfall										



Start date	05/05/10
Finish date	22/11/15
Data date	31/07/12
Run date	22/08/12
Page number	3A
c Primavera Systems, Inc.	

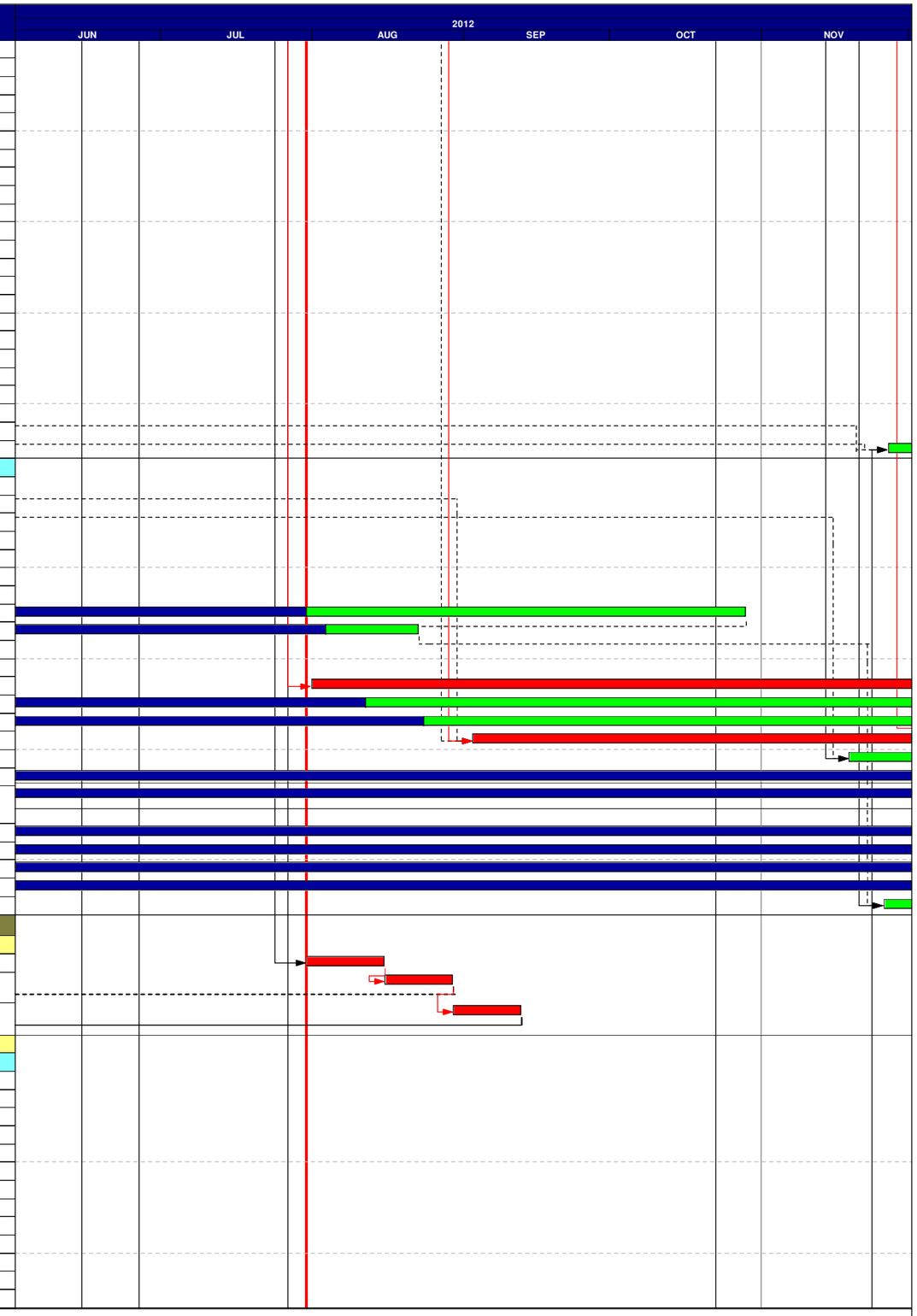
Early bar
Progress bar
Critical bar
Summary bar
Progress point
Critical point
Summary point
Start milestone point
Finish milestone poir

Leader Civil Engineering Corp. Ltd.
Contract No. DC/2009/13
Construction of Sewage Treatment Works at YSW & SKW
3-month Rolling Programme (Aug 2012 - Oct 2012)

(Marked on 31 July 2012)

Date	Revision	Checked	Approved
31/07/12	Revision 0	RH	VC

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors
YSW0180	Coordination of HEC	53	100	17/05/10 A	08/07/10 A	17/05/10 A	08/07/10 A		KD0020	YSW0350
YSW0200	Submission and Approval of Ecologist	60	100	17/05/10 A	15/07/10 A	17/05/10 A	15/07/10 A		KD0020	YSW0210
YSW0210	Ecology Survey	211	100	16/07/10 A	11/02/11 A	16/07/10 A	11/02/11 A		YSW0200	YSW0350
YSW0220	Submission and Approval of In. Hydro Survey	103	100	17/05/10 A	27/08/10 A	17/05/10 A	27/08/10 A		KD0020	YSW0230
YSW0230	Hydrographical Survey (YSW)	157	100	28/08/10 A	31/01/11 A	28/08/10 A	31/01/11 A		YSW0220	YSW0350
YSW0240	Material Submission, Approval of HDPE pipe	319	100	17/05/10 A	31/03/11 A	17/05/10 A	31/03/11 A		KD0020	YSW0360
YSW02401	Clarify Coordinate of Point Y (Reply of RFI 010)	83	100	28/06/10 A	18/09/10 A	28/06/10 A	18/09/10 A		KD0020	YSW0250
YSW0250	Submit and Approval of Method Statement for HDD	188	100	19/09/10 A	25/03/11 A	19/09/10 A	25/03/11 A		YSW02401	YSW0260, YSW0270, YSW0340
YSW0260	Submission of HDD Method Statement to HEC	14	100	26/03/11 A	08/04/11 A	26/03/11 A	08/04/11 A		YSW0250	YSW0340
YSW0270	Additional G.I. Boreholes (YSW)	123	100	19/09/10 A	19/01/11 A	19/09/10 A	19/01/11 A		YSW0250	YSW0280, YSW0290
YSW0280	Submission of propose alignment	44	100	20/01/11 A	04/03/11 A	20/01/11 A	04/03/11 A		YSW0270	YSW0310, YSW0340
YSW0290	Submission of Marine Notice	69	100	20/01/11 A	29/03/11 A	20/01/11 A	29/03/11 A		YSW0270	YSW0350
YSW0310	Construction of Entry Pit and Preparation Work	27	100	05/03/11 A	31/03/11 A	05/03/11 A	31/03/11 A		YSW0280	YSW0320
YSW0320	Prepare of HDD Drill Rig Set-up (YSW)	28	100	01/04/11 A	28/04/11 A	01/04/11 A	28/04/11 A		YSW0310	YSW0330, YSW0350
YSW0330	Establishment of HDD plant & equipment	6	100	09/04/11 A	14/04/11 A	09/04/11 A	14/04/11 A		YSW0320	YSW0340
YSW0340	Setting up at drillhole location	14	100	15/04/11 A	28/04/11 A	15/04/11 A	28/04/11 A		YSW0250, YSW0260, YSW0280,	YSW0350
YSW0350	Drill pilot hole and reaming hole - NS400 - 530m	229	100	29/04/11 A	13/12/11 A	29/04/11 A	13/12/11 A		YSW0040, YSW0180, YSW0210,	YSW0360
YSW0360	Installation of NS400 HDPE 530m	17	100	14/12/11 A	30/12/11 A	14/12/11 A	30/12/11 A		YSW0240, YSW0350	SKW1181, YSW03601, YSW03620,
YSW03601	Demobilization of HDD plant & equipment	7	100	31/12/11 A	06/01/12 A	31/12/11 A	06/01/12 A		YSW0360	YSW03605, YSW03641, YSW0730
YSW03605	Remove Entry pit of HDD	14	100	07/01/12 A	20/01/12 A	07/01/12 A	20/01/12 A		YSW03601	YSW0730
YSW03620	Removal of Receiving Pit	14	100	31/12/11 A	13/01/12 A	31/12/11 A	13/01/12 A		YSW0360	YSW0365
YSW03641	Prepare backfilling material under VO 046A	120	100	07/01/12 A	05/05/12 A	07/01/12 A	05/05/12 A		YSW03601	YSW0365
YSW0365	Set up of Silt Curtain as per EP	30	0	27/11/12	26/12/12	02/07/13	31/07/13	217d	SKW1431, YSW03620, YSW03641	YSW0370
E&M Works - YSW STW										
E&M0360	Delivery of MBR Memb. Mod. (MBR Tk 4)	137	100	24/02/11 A	21/06/11 A	24/02/11 A	21/06/11 A		E&M0160	E&M0510
E&M0370	Delivery of MBR Membrane Modules - 2nd Shipment	150	100	24/02/11 A	17/10/11 A	24/02/11 A	17/10/11 A		E&M0160	E&M0520
E&M0380	Delivery of Grit Removal Equipment	180	100	10/10/11 A	29/12/11 A	10/10/11 A	29/12/11 A		E&M0150	E&M0530
E&M0390	Delivery of Coarse Screens	162	100	06/09/11 A	12/01/12 A	06/09/11 A	12/01/12 A		E&M0110	E&M0540
E&M0400	Delivery of Fine Screens	180	100	12/09/11 A	30/11/11 A	12/09/11 A	30/11/11 A		E&M0120	E&M0550
E&M0410	Delivery of Pumps	162	100	23/06/11 A	05/09/11 A	23/06/11 A	05/09/11 A		E&M0130	E&M0560
E&M0420	Delivery of Submersible Mixers	162	100	26/02/11 A	17/11/11 A	26/02/11 A	17/11/11 A		E&M0140	E&M0570
E&M0440	Delivery of Sludge Dewatering Equipment	180	50	01/09/11 A	28/10/12	01/09/11 A	03/03/13	126d	E&M0170	E&M0580
E&M0450	Delivery of Valves, Pipes & Fittings	180	90	30/08/11 A	22/08/12	30/08/11 A	03/05/13	255d	E&M0180	E&M0590, E&M0605
E&M0460	Delivery of Penstocks	180	100	12/08/11 A	24/12/11 A	12/08/11 A	24/12/11 A		E&M0190	E&M0600
E&M0470	Delivery of Instruments	180	100	03/11/11 A	21/06/11 A	03/11/11 A	21/06/11 A		E&M0200	E&M0610
E&M0480	Delivery of MCC LVSB	177	0	01/08/12	25/01/13	11/07/12	03/01/13	-22d	E&M0210	E&M0620
E&M0490	Delivery of BS Equipment	180	25	11/12/11 A	25/12/12	11/12/11 A	05/06/13	162d	E&M0220	E&M0630
E&M0500	Delivery FS Equipment	180	25	11/12/11 A	06/01/13	11/12/11 A	03/07/13	178d	E&M0230	E&M0330, E&M0640
E&M0510	Install Membrane Modules in MBR Tank no. 4	90	0	03/09/12	01/12/12	03/09/12	01/12/12	0	E&M0360, YSW0705, YSW0820	KD0115
E&M0520	Install Membrane Modules in MBR Tank No. 1 to 3	130	0	19/11/12	28/03/13	25/12/12	03/05/13	36d	E&M0370, YSW08305	E&M0590, E&M0690
E&M0530	Install Grit Removal Equipment	60	65	01/06/12 A	27/03/13	01/06/12 A	03/05/13	37d	E&M0380, E&M0540, YSW0800	E&M0590, E&M0660
E&M0540	Install Coarse Screens	75	90	23/04/12 A	06/03/13	23/04/12 A	19/03/13	13d	E&M0390, YSW0800	E&M0530, E&M0550, E&M0570, E&M0590, E&M0660
E&M0550	Install Fine Screens	60	80	01/06/12 A	18/03/13	01/06/12 A	03/05/13	46d	E&M0400, E&M0540, YSW0800	E&M0590, E&M0660
E&M0560	Install Pumps	90	40	23/04/12 A	22/04/13	23/04/12 A	19/03/13	-33d	E&M0410, YSW0800	E&M0570, E&M0590, E&M0660
E&M0580	Install Sludge Dewatering Equipment	280	20	29/05/12 A	09/10/13	29/05/12 A	13/10/13	5d	E&M0440, YSW0800	E&M0690
E&M0600	Install Penstocks (Batch 1, GL H - T)	180	50	23/04/12 A	28/05/13	23/04/12 A	13/10/13	139d	E&M0460, YSW0800	E&M0690
E&M0605	Install Penstocks (Batch 2, GL A - F)	120	0	26/11/12	25/03/13	16/06/13	13/10/13	202d	E&M0450, YSW08305	E&M0690
Sok Kwu Wan										
Preliminary										
SKW0250	Approval of Environmental Team	16	0	31/07/12	15/08/12	21/05/12	06/06/12	-71d	KD0020	SKW0260
SKW0260	Baseline monitoring (Air & Noise)	14	0	16/08/12	29/08/12	06/06/12	20/06/12	-71d	SKW0250	SKW0242, SKW0265, SKW0592, SKW0681, SKW0921, SKW1141
SKW0265	Baseline Monitoring Submission (A & N)	14	0	30/08/12	12/09/12	20/06/12	04/07/12	-71d	SKW0260	SKW0242, SKW0592, SKW0681, SKW0921, SKW1141
Section W3 - Footpath Diversion in Portion G										
Civil & Geotechnical Works										
SKW0240	Site Clearance	21	100	17/05/10 A	06/06/10 A	17/05/10 A	06/06/10 A			SKW0241
SKW0241	Initial Survey	9	100	07/06/10 A	15/06/10 A	07/06/10 A	15/06/10 A		SKW0240	SKW0242
SKW0242	Retaining Wall Bay 0-10 (Incl. VO. 001A)	177	100	30/06/10 A	23/12/10 A	30/06/10 A	23/12/10 A		SKW0241, SKW0260, SKW0265	SKW0461
SKW0461	Utilities Laying and Diversion	70	100	24/12/10 A	03/03/11 A	24/12/10 A	03/03/11 A		SKW0242	SKW0471
SKW0471	Concreting for Pavement	7	100	04/03/11 A	10/03/11 A	04/03/11 A	10/03/11 A		SKW0461	SKW0481
SKW0481	Footpath Diversion - Stage 1	14	100	11/03/11 A	24/03/11 A	11/03/11 A	24/03/11 A		SKW0471	KD0050, SKW04811, SKW0491
SKW04811	Excavate for FP transition at CH0-35 &CH130-141	37	100	25/03/11 A	30/04/11 A	25/03/11 A	30/04/11 A		SKW0481	SKW04821
SKW04821	Construction of Drainage outfall near bay 10	3	100	01/05/11 A	03/05/11 A	01/05/11 A	03/05/11 A		SKW04811	SKW04831
SKW04831	Cable diversion by HEC	26	100	04/05/11 A	29/05/11 A	04/05/11 A	29/05/11 A		SKW04821	SKW04841
SKW04841	Diversion of Ducting and Draw pit by PCCW	12	100	20/05/11 A	31/05/11 A	20/05/11 A	31/05/11 A		SKW04831	SKW04851
SKW04851	Soil backfilling behind FP retaining wall	14	100	01/06/11 A	14/06/11 A	01/06/11 A	14/06/11 A		SKW04841	SKW04861
SKW04861	Concreting for footpath pavement	7	100	15/06/11 A	21/06/11 A	15/06/11 A	21/06/11 A		SKW04851	SKW04871
SKW04871	Relocation of Temp Safety Fence at SKW STW A-G	57	100	22/06/11 A	17/08/11 A	22/06/11 A	17/08/11 A		SKW04861	SKW04881



Start date	05/05/10
Finish date	22/11/15
Data date	31/07/12
Run date	22/08/12
Page number	4A
c Primavera Systems, Inc.	

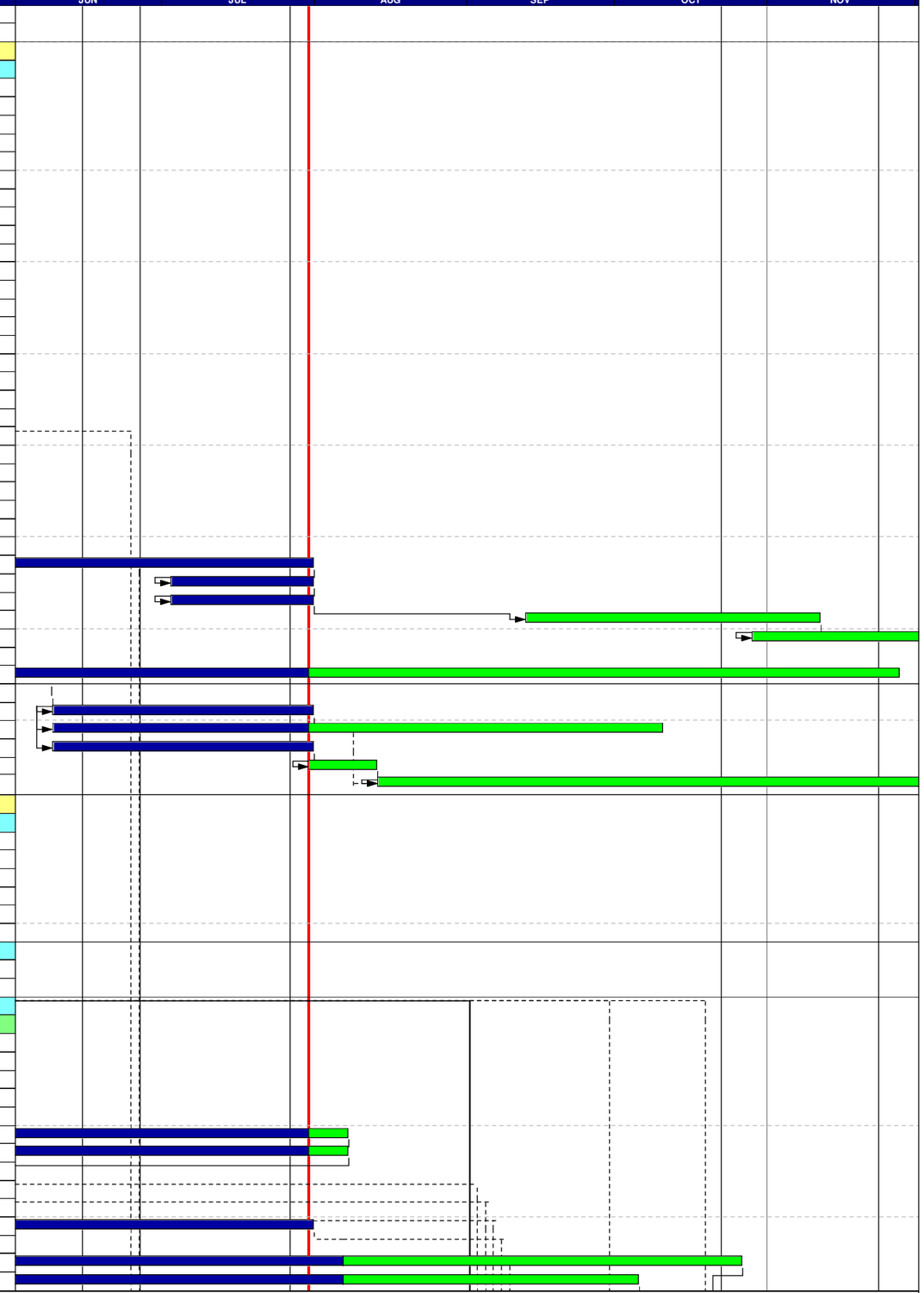
Early bar
Progress bar
Critical bar
Summary bar
Progress point
Critical point
Summary point
Start milestone point
Finish milestone poir

Leader Civil Engineering Corp. Ltd.
Contract No. DC/2009/13
Construction of Sewage Treatment Works at YSW & SKW
3-month Rolling Programme (Aug 2012 - Oct 2012)

(Marked on 31 July 2012)

Date	Revision	Checked	Approved
31/07/12	Revision 0	RH	VC

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors
SKW04881	Disposal of excavation material at A-G SKW STW	138	100	18/08/11 A	02/01/12 A	18/08/11 A	02/01/12 A		SKW04871	SKW04885
SKW04885	Footpath Diversion - Stage 2	7	100	03/01/12 A	09/01/12 A	03/01/12 A	09/01/12 A		SKW04881	SKW1261
Section W4 - Slope Works in Portions H & I										
Geotechnical Works										
SKW0588	Construct scaffolding access	30	100	15/06/10 A	14/07/10 A	15/06/10 A	14/07/10 A		KD0020	SKW0590
SKW0590	Site Clearance for Slope	100	100	15/07/10 A	22/10/10 A	15/07/10 A	22/10/10 A		SKW0588	SKW0591
SKW0591	Initial Survey for Slope	28	100	21/09/10 A	18/10/10 A	21/09/10 A	18/10/10 A		SKW0590	SKW0592
SKW0592	Temporary Rockfall fence at ex. Footpath	43	100	31/08/10 A	12/10/10 A	31/08/10 A	12/10/10 A		SKW0260, SKW0265, SKW0591	SKW05931
SKW05931	Construction of Haul Road (To +30mPD)	50	100	03/09/10 A	22/10/10 A	03/09/10 A	22/10/10 A		SKW0592	SKW05932
SKW05932	Construction of Haul Road (To +42.5mPD)	68	100	23/10/10 A	29/12/10 A	23/10/10 A	29/12/10 A		SKW05931	SKW059322
SKW059321	Removal of Boulders (IBG 1 - 119, SI No. 11B)	121	100	03/11/10 A	03/03/11 A	03/11/10 A	03/03/11 A			SKW059411
SKW059322	Add. Site Invest. Works (VO. No. 9,12 &16)	174	100	11/01/11 A	03/07/11 A	11/01/11 A	03/07/11 A		SKW05932	SKW059341
SKW059323	Revised Profile at West Slope (+56 to +42.5mPD)	1	100	17/03/11 A	17/03/11 A	17/03/11 A	17/03/11 A			SKW059324
SKW059324	Construction of Haul Road (+42.5 to +56mPD)	12	100	18/03/11 A	29/03/11 A	18/03/11 A	29/03/11 A		SKW059323	SKW059325
SKW059325	Removal of Boulders (IBG 120-139, SI No. 11C)	17	100	30/03/11 A	15/04/11 A	30/03/11 A	15/04/11 A		SKW059324	SKW05933
SKW05933	West Slope Cutting (+56mPD to +42.5mPD)	2	100	16/04/11 A	17/04/11 A	16/04/11 A	17/04/11 A		SKW059325	SKW059331
SKW059331	Removal of Boulders (IBG 140-189, SI No. 11D)	45	100	18/04/11 A	01/06/11 A	18/04/11 A	01/06/11 A		SKW05933	SKW05934
SKW05934	West Slope Cutting (+42.5mPD to +35mPD)	32	100	02/06/11 A	03/07/11 A	02/06/11 A	03/07/11 A		SKW059331	SKW059341
SKW059341	Revised Profile at West Slope (+20 to +4.8mPD)	1	100	04/07/11 A	04/07/11 A	04/07/11 A	04/07/11 A		SKW059322, SKW05934	SKW05935
SKW05935	West Slope Cutting (+35mPD to +27.5mPD)	83	100	08/07/11 A	28/09/11 A	08/07/11 A	28/09/11 A		SKW059341	SKW05936
SKW05936	West Slope Cutting (+27.5mPD to +20mPD)	61	100	29/09/11 A	28/11/11 A	29/09/11 A	28/11/11 A		SKW05935	SKW05937
SKW05937	West Slope Cutting (+20mPD to +12.5mPD)	39	100	29/11/11 A	06/01/12 A	29/11/11 A	06/01/12 A		SKW05936	SKW05938
SKW05938	West Slope Cutting (+12.5mPD to +4.8mPD)	90	100	07/01/12 A	27/03/12 A	07/01/12 A	27/03/12 A		SKW05937	KD0060, SKW1261, SKW1311,
SKW05941	Slope Stormw ater Drainage	300	100	28/03/12 A	25/05/12 A	28/03/12 A	25/05/12 A		KD0060	SKW05942
SKW059411	East Slope Cutting (+50mPD to +42.5mPD)	72	100	04/03/11 A	14/05/11 A	04/03/11 A	14/05/11 A		SKW059321	SKW059412
SKW059412	East Slope Cutting (+42.5mPD to +35mPD)	82	100	15/05/11 A	04/08/11 A	15/05/11 A	04/08/11 A		SKW059411	SKW059413
SKW059413	East Slope Cutting (+35mPD to +27.5mPD)	55	100	05/08/11 A	28/09/11 A	05/08/11 A	28/09/11 A		SKW059412	SKW059414
SKW059414	East Slope Cutting (+27.5mPD to +20mPD)	61	100	29/09/11 A	28/11/11 A	29/09/11 A	28/11/11 A		SKW059413	SKW059415
SKW059415	East Slope Cutting (+20mPD to +12.5mPD)	39	100	29/11/11 A	06/01/12 A	29/11/11 A	06/01/12 A		SKW059414	SKW059416
SKW059416	East Slope Cutting (+12.5mPD to +4.8mPD)	81	100	07/01/12 A	27/03/12 A	07/01/12 A	27/03/12 A		SKW059415	KD0060, SKW1311, SKW1371
SKW05942	Slope Miscellaneous Works	61	100	26/05/12 A	31/07/12 A	26/05/12 A	31/07/12 A		SKW05941	SKW05943, SKW0595
SKW05943	Buttress & surface Protection (SI No. 31)	60	100	03/07/12 A	31/07/12 A	03/07/12 A	31/07/12 A		SKW05942	SKW05944
SKW05944	Slope Treatment (SI. No. 36)	60	100	03/07/12 A	31/07/12 A	03/07/12 A	31/07/12 A		SKW05943	SKW05945
SKW05945	Rock Slope Treatment (SI. No. 68)	60	0	13/09/12	11/11/12	26/10/12	24/12/12	43d	SKW05944	SKW05946
SKW05946	Rock Slope Treatment (SI. No. 98)	60	0	29/10/12	27/12/12	11/12/12	08/02/13	43d	SKW05945	SKW05947
SKW05947	Rock Slope Treatment (SI. No. 115)	60	0	14/12/12	11/02/13	26/01/13	26/03/13	43d	SKW05946	KD0135
SKW05948	Soil Nailing Works (VO. No. 52)	300	60	10/02/12 A	27/11/12	10/02/12 A	04/07/14	584d		SKW05963
SKW05963	Determine Alignment & Foundation Design of RFB	120	100	10/02/13 A	08/06/12 A	10/02/13 A	08/06/12 A		SKW05948	SKW059631, SKW05964, SKW05965
SKW059631	GEO Approval of Foundation Design	70	100	09/06/12 A	31/07/12 A	09/06/12 A	31/07/12 A		SKW05963	SKW05968
SKW05964	Fabrication & Shipping of RFB Material	180	60	09/06/12 A	10/10/12	09/06/12 A	14/04/15	916d	SKW05963	SKW05972
SKW05965	Site clearance & Formation of access	62	100	09/06/12 A	31/07/12 A	09/06/12 A	31/07/12 A		SKW05963	SKW05967
SKW05967	Plant mobilization	14	0	31/07/12	13/08/12	07/03/14	20/03/14	584d	SKW05965	SKW05968
SKW05968	Construction of anchors & pull out test	180	0	14/08/12	09/02/13	21/03/14	16/09/14	584d	SKW059631, SKW05967	SKW05969
Section W5 - P.S. No. 1 in Portion D										
Civil & Geotechnical Works										
SKW0651	Site Clearance	7	100	17/05/10 A	23/05/10 A	17/05/10 A	23/05/10 A		KD0020	SKW0652
SKW0652	Initial Survey	7	100	24/05/10 A	30/05/10 A	24/05/10 A	30/05/10 A		SKW0651	SKW0661, SKW0681
SKW0661	Transplantation for uncommon vegatation	30	100	31/05/10 A	29/06/10 A	31/05/10 A	29/06/10 A		SKW0652	SKW0681
SKW0681	Excavate to low er the w orking platform to +3mPD	49	100	30/06/10 A	17/08/10 A	30/06/10 A	17/08/10 A		SKW0260, SKW0265, SKW0652,	SKW0691
SKW0691	ELS to +2.2mPD	40	100	18/08/10 A	26/09/10 A	18/08/10 A	26/09/10 A		SKW0681	SKW0721
SKW0721	Excavate to formation	270	100	17/09/10 A	13/06/11 A	17/09/10 A	13/06/11 A		SKW0691	SKW0741
Structural Works										
SKW0741	RC Works for Structure	240	100	14/06/11 A	08/02/12 A	14/06/11 A	08/02/12 A		SKW0721	KD0070, SKW0841
SKW0841	ABWF w orks	60	100	09/02/12 A	08/04/12 A	09/02/12 A	08/04/12 A		SKW0741	E&M1101, E&M1102, E&M1103,
E&M Works (PS1)										
Submission & Delivery										
E&M1001	Submission of Pumps	198	100	17/05/10 A	24/02/11 A	17/05/10 A	24/02/11 A		KD0020	E&M1011
E&M1002	Submission of Gen-Set	198	100	17/05/10 A	24/02/11 A	17/05/10 A	24/02/11 A			E&M1012
E&M1003	Submission of DeO System	198	100	17/05/10 A	11/07/11 A	17/05/10 A	11/07/11 A			E&M1013
E&M1004	Submission of LV SB & MCC	180	100	17/05/10 A	09/01/12 A	17/05/10 A	09/01/12 A			E&M1014
E&M1005	Submission of Instrumentation	243	100	17/05/10 A	12/03/12 A	17/05/10 A	12/03/12 A			E&M1015
E&M1006	Submission of FS System	243	97	17/05/10 A	07/08/12	17/05/10 A	04/05/13	270d		E&M1016
E&M1007	Submission of BS System	243	97	17/05/10 A	07/08/12	17/05/10 A	25/05/13	292d		E&M1017
E&M1011	Delivery of Pumps	150	100	24/02/11 A	21/07/11 A	24/02/11 A	21/07/11 A		E&M1001	E&M1101
E&M1012	Delivery of Gen-Set	150	100	24/02/11 A	23/09/11 A	24/02/11 A	23/09/11 A		E&M1002	E&M1102
E&M1013	Delivery of DeO System	150	100	11/07/11 A	28/10/11 A	11/07/11 A	28/10/11 A		E&M1003	E&M1103
E&M1014	Delivery of LV SB & MCC	150	100	01/06/12 A	31/07/12 A	01/06/12 A	31/07/12 A		E&M1004	E&M1104
E&M1015	Delivery of Instrumentation	90	100	01/11/11 A	03/11/11 A	01/11/11 A	03/11/11 A		E&M1005	E&M1105
E&M1016	Delivery of FS Equipment	107	25	01/12/11 A	26/10/12	01/12/11 A	23/07/13	270d	E&M1006	E&M1106
E&M1017	Delivery of BS Equipment	107	45	15/11/11 A	05/10/12	15/11/11 A	23/07/13	292d	E&M1007	E&M1107



Start date	05/05/10
Finish date	22/11/15
Data date	31/07/12
Run date	22/08/12
Page number	5A
c Primavera Systems, Inc.	

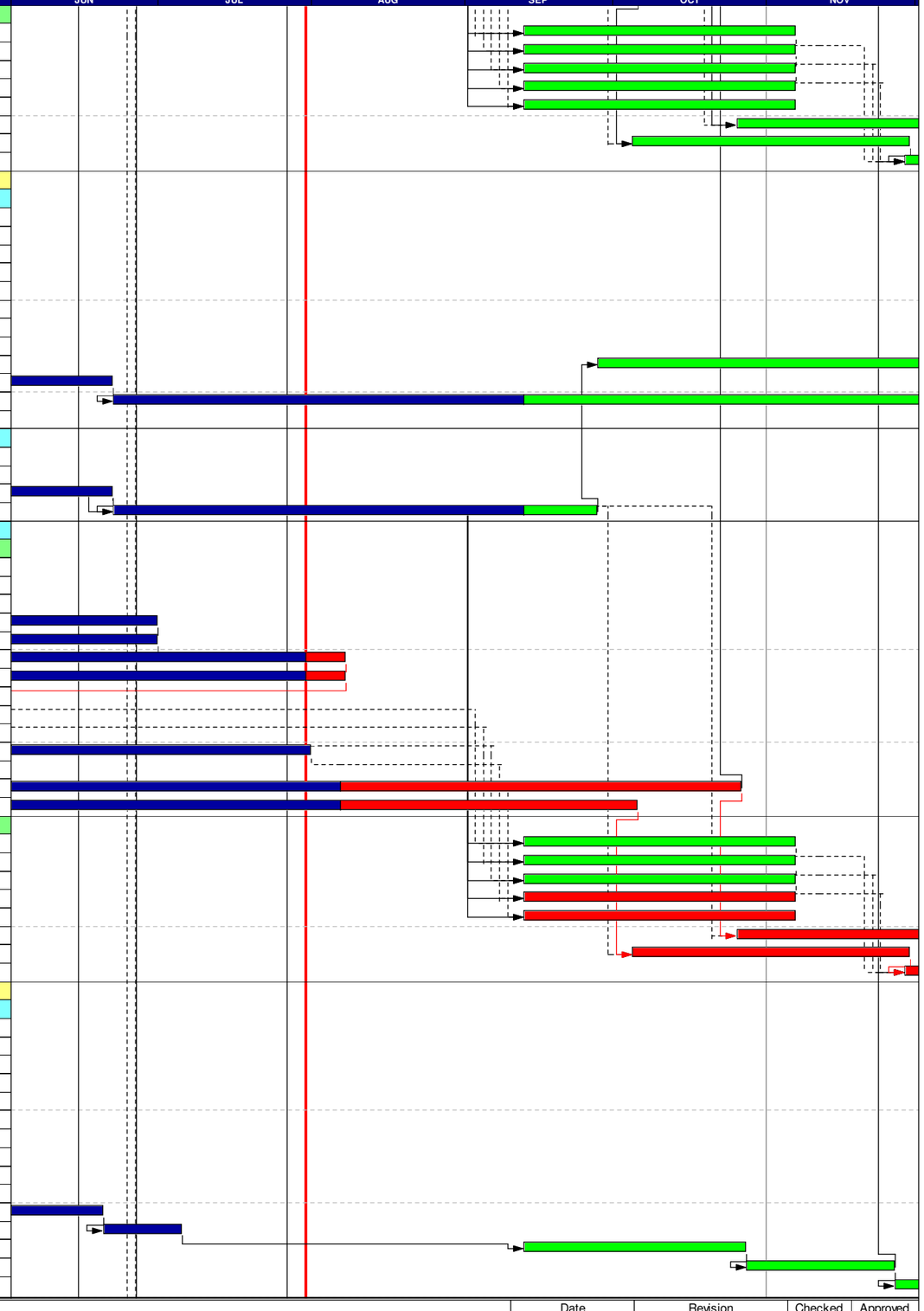
Early bar
Progress bar
Critical bar
Summary bar
Progress point
Critical point
Summary point
Start milestone point
Finish milestone poir

Leader Civil Engineering Corp. Ltd.
Contract No. DC/2009/13
Construction of Sewage Treatment Works at YSW & SKW
3-month Rolling Programme (Aug 2012 - Oct 2012)

(Marked on 31 July 2012)

Date	Revision	Checked	Approved
31/07/12	Revision 0	RH	VC

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors
Installation, T&C										
E&M1101	Install Pumps	55	0	13/09/12	06/11/12	23/07/13	16/09/13	314d	E&M1011, SKW0841	E&M1110, E&M1140
E&M1102	Install Gen Set	55	0	13/09/12	06/11/12	23/07/13	16/09/13	314d	E&M1012, SKW0841	E&M1110, E&M1140
E&M1103	Install DeO System	55	0	13/09/12	06/11/12	23/07/13	16/09/13	314d	E&M1013, SKW0841	E&M1110, E&M1140
E&M1104	Install LV SB & MCC	55	0	13/09/12	06/11/12	23/07/13	16/09/13	314d	E&M1014, SKW0841	E&M1140
E&M1105	Install Instrumentation	55	0	13/09/12	06/11/12	23/07/13	16/09/13	314d	E&M1015, SKW0841	E&M1140
E&M1106	Install FS Equipment	55	0	26/10/12	20/12/12	23/07/13	16/09/13	270d	E&M1016, SKW0841	E&M1130, E&M1140
E&M1107	Install BS Equipment	55	0	05/10/12	29/11/12	23/07/13	16/09/13	292d	E&M1017, SKW0841	E&M1110, E&M1140
E&M1110	Install Valves, Pipes & Fittings	46	0	29/11/12	14/01/13	16/10/13	01/12/13	322d	E&M1101, E&M1102, E&M1103,	E&M1120
Section W6 - Sewer and PS No.2 in Portions E&H										
Civil & Geotechnical Works										
SKW0881	Site Clearance	7	100	17/05/10 A	23/05/10 A	17/05/10 A	23/05/10 A		KD0020	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	22/06/10 A		SKW0891	SKW0901
SKW0901	Tree Transplantation	90	100	23/06/10 A	20/09/10 A	23/06/10 A	20/09/10 A		SKW0892	SKW0921
SKW0921	Cut Slope & U-Channel	14	100	21/09/10 A	04/10/10 A	21/09/10 A	04/10/10 A		SKW0260, SKW0265, SKW0901	SKW0931, SKW0951
SKW0931	Hoarding & Fencing	14	100	05/10/10 A	18/10/10 A	05/10/10 A	18/10/10 A		SKW0921	SKW0950, SKW0951
SKW0950	Removal of Rock Boulders before ELS	66	100	19/10/10 A	23/12/10 A	19/10/10 A	23/12/10 A		SKW0931	SKW0951
SKW0951	ELS & Excavate to formation	169	100	24/12/10 A	10/06/11 A	24/12/10 A	10/06/11 A		SKW0921, SKW0931, SKW0950	SKW0971
SKW0961	Mass Conc. Retaining Wall	90	0	28/09/12	26/12/12	12/11/12	09/02/13	45d	SKW1081	KD0155
SKW1491	LCS (ChA0+45 to 1+75) VO.7	90	100	24/03/12 A	21/06/12 A	24/03/12 A	21/06/12 A		PRE0100, SKW1021	SKW15111
SKW15111	Tw in DN150 DI Rising Main (ChA1+75 - ChA5+79)	180	50	22/06/12 A	11/12/12	22/06/12 A	17/01/13	37d	SKW1491	SKW1531
SKW1531	Extent village sew ers S163.1 & S164.1	34	0	12/12/12	14/01/13	18/01/13	20/02/13	37d	SKW15111	SKW1581
Structural Works										
SKW0971	Structural Works (Phase 1)	245	100	11/06/11 A	10/02/12 A	11/06/11 A	10/02/12 A		SKW0951	KD0080, SKW1021
SKW1021	Structural Works (Phase 2)	42	100	11/02/12 A	23/03/12 A	11/02/12 A	23/03/12 A		SKW0971	SKW1061, SKW1081, SKW1491
SKW1061	ABWF Works	90	100	24/03/12 A	21/06/12 A	24/03/12 A	21/06/12 A		SKW1021	E&M2101, E&M2102, E&M2103,
SKW1081	375mm U-channel/catchpits/outfall	30	50	22/06/12 A	27/09/12	22/06/12 A	11/11/12	45d	SKW1021, SKW1061	KD0155, SKW0961
E&M Works (PS2)										
Submission & Delivery										
E&M2001	Submission of Pumps	198	100	17/05/10 A	24/02/11 A	17/05/10 A	24/02/11 A		KD0020	E&M2011
E&M2002	Submission of Gen-Set	198	100	17/05/10 A	24/02/11 A	17/05/10 A	24/02/11 A			E&M2012
E&M2003	Submission of DeO System	198	100	17/05/10 A	11/07/11 A	17/05/10 A	11/07/11 A			E&M2013
E&M2004	Submission of LV SB & MCC	271	100	17/05/10 A	30/06/12 A	17/05/10 A	30/06/12 A			E&M2014
E&M2005	Submission of Instrumentation	243	100	17/05/10 A	30/06/12 A	17/05/10 A	30/06/12 A			E&M2015
E&M2006	Submission of FS System	243	97	17/05/10 A	07/08/12	17/05/10 A	07/05/12	-92d		E&M2016
E&M2007	Submission of BS System	243	97	17/05/10 A	07/08/12	17/05/10 A	29/05/12	-70d		E&M2017
E&M2011	Delivery of Pumps	150	100	24/02/11 A	21/07/11 A	24/02/11 A	21/07/11 A		E&M2001	E&M2101
E&M2012	Delivery of Gen-Set	150	100	24/02/11 A	23/09/11 A	24/02/11 A	23/09/11 A		E&M2002	E&M2102
E&M2013	Delivery of DeO System	150	100	11/07/11 A	28/10/11 A	11/07/11 A	28/10/11 A		E&M2003	E&M2103
E&M2014	Delivery of LV SB & MCC	150	100	29/02/12 A	31/07/12 A	29/02/12 A	31/07/12 A		E&M2004	E&M2104
E&M2015	Delivery of Instrumentation	90	100	21/06/11 A	03/11/11 A	21/06/11 A	03/11/11 A		E&M2005	E&M2105
E&M2016	Delivery of FS Equipment	107	25	01/12/11 A	26/10/12	01/12/11 A	26/07/12	-92d	E&M2006	E&M0350, E&M2106
E&M2017	Delivery of BS Equipment	107	45	15/01/11 A	05/10/12	15/01/11 A	26/07/12	-70d	E&M2007	E&M2107
Installation, T&C										
E&M2101	Install Pumps	55	0	13/09/12	06/11/12	27/09/12	20/11/12	14d	E&M2011, SKW1061	E&M2110
E&M2102	Install Gen Set	55	0	13/09/12	06/11/12	27/09/12	20/11/12	14d	E&M2012, SKW1061	E&M2110
E&M2103	Install DeO System	55	0	13/09/12	06/11/12	27/09/12	20/11/12	14d	E&M2013, SKW1061	E&M2110
E&M2104	Install LV SB & MCC	55	0	13/09/12	06/11/12	27/07/12	19/09/12	-48d	E&M2014, SKW1061	E&M2140
E&M2105	Install Instrumentation	55	0	13/09/12	06/11/12	27/07/12	19/09/12	-48d	E&M2015, SKW1061	E&M2140
E&M2106	Install FS Equipment	55	0	26/10/12	20/12/12	27/07/12	19/09/12	-92d	E&M2016, SKW1061	E&M2140
E&M2107	Install BS Equipment	55	0	05/10/12	29/11/12	27/07/12	19/09/12	-70d	E&M2017, SKW1061	E&M2110, E&M2140
E&M2110	Install Valves, Pipes & Fittings	46	0	29/11/12	14/01/13	21/11/12	05/01/13	-8d	E&M2101, E&M2102, E&M2103,	E&M2120
Section W7 - SKW STW,Sewer and Submarine Outfall										
Submarine Outfall										
SKW1130	Approval of IHS Consultant	180	100	17/05/10 A	27/08/10 A	17/05/10 A	27/08/10 A			SKW1131
SKW1131	Hydrographical Survey (SKW)	300	100	01/02/11 A	28/02/11 A	01/02/11 A	28/02/11 A		KD0020, SKW1130	SKW1231
SKW1141	Baseline Monitoring (Water)	213	100	27/07/10 A	31/12/10 A	27/07/10 A	31/12/10 A		SKW0260, SKW0265	SKW1151
SKW1151	Set up Temporary Working Platform	90	100	15/06/11 A	30/09/11 A	15/06/11 A	30/09/11 A		PRE0090, SKW1141	SKW1171
SKW1171	ELS for HDD Set-up (SKW)	90	100	01/09/11 A	30/09/11 A	01/09/11 A	30/09/11 A		SKW1151	SKW1181
SKW1181	Mobilization of HDD plant & equipment to SKW	60	100	06/01/12 A	07/01/12 A	06/01/12 A	07/01/12 A		SKW1171, YSW0360	SKW1191
SKW1191	Setting up at drillhole location	33	100	09/01/12 A	14/01/12 A	09/01/12 A	14/01/12 A		SKW1181	SKW1201
SKW1201	Drill pilot hole and reaming hole - NS280 - 750m	45	100	16/01/12 A	16/02/12 A	16/01/12 A	16/02/12 A		SKW1191	SKW1211
SKW1211	Receiving Pit for HDD (SKW)	60	100	16/01/12 A	29/02/12 A	16/01/12 A	29/02/12 A		SKW1201	SKW1221
SKW1221	Installaiton of NS280 HDPE 450mm dia. pipe	30	100	31/03/12 A	30/04/12 A	31/03/12 A	30/04/12 A		SKW1211	KD0090, SKW1231, SKW1441
SKW1231	Removal of Receiving Platform	60	100	01/05/12 A	19/06/12 A	01/05/12 A	19/06/12 A		SKW1131, SKW1221	SKW1241
SKW1241	Dredging of MD for Diffuser (PS CL 1.122(3))	60	100	20/06/12 A	05/07/12 A	20/06/12 A	05/07/12 A		SKW1231	E&M3359, SKW1251
SKW1251	Diffuser Construction	45	0	13/09/12	27/10/12	18/04/13	01/06/13	217d	SKW1241	SKW1431
SKW1431	Removal of silt curtain	30	0	28/10/12	26/11/12	02/06/13	01/07/13	217d	SKW1251	KD0090, SKW1440, YSW0365
SKW1440	Sew er of Outfall Chamber to connection pit VC37A	90	0	27/11/12 *	24/02/13	26/07/13	24/10/13	242d	SKW1431	SKW1441



Start date	05/05/10
Finish date	22/11/15
Data date	31/07/12
Run date	22/08/12
Page number	6A
c Primavera Systems, Inc.	

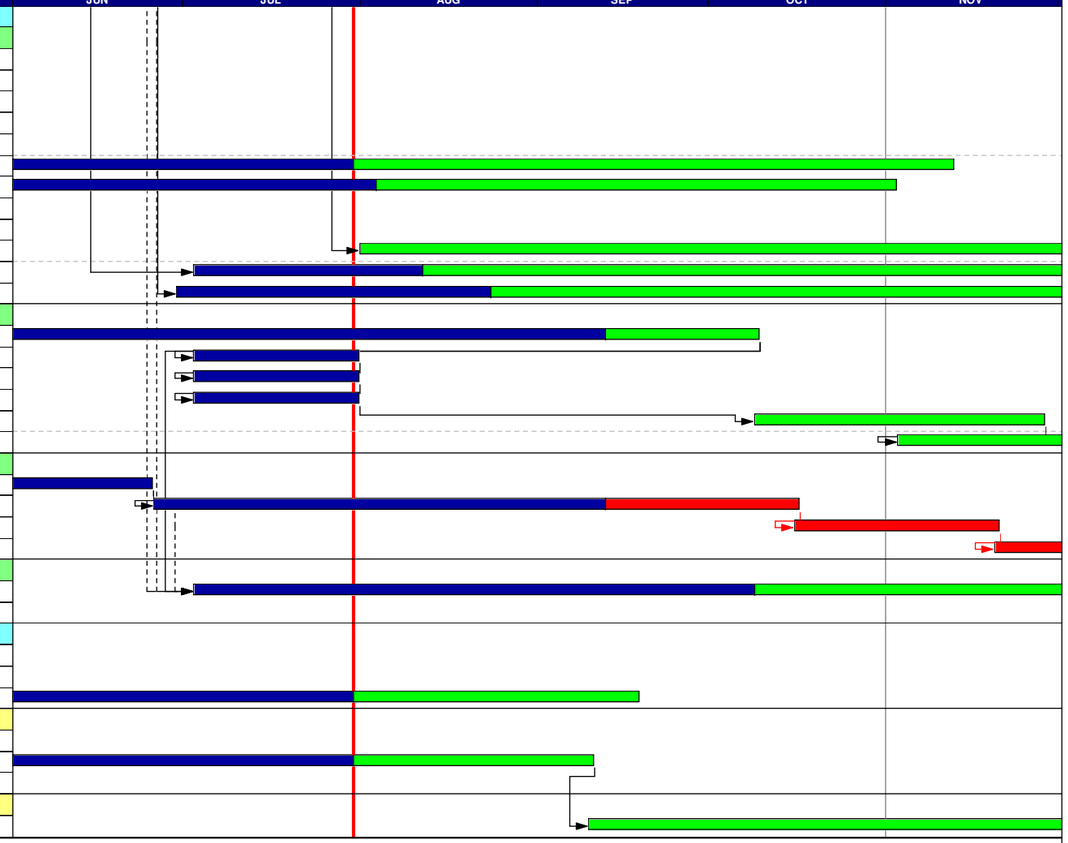
Early bar
Progress bar
Critical bar
Summary bar
Progress point
Critical point
Summary point
Start milestone point
Finish milestone poir

Leader Civil Engineering Corp. Ltd.
Contract No. DC/2009/13
Construction of Sewage Treatment Works at YSW & SKW
3-month Rolling Programme (Aug 2012 - Oct 2012)

(Marked on 31 July 2012)

Date	Revision	Checked	Approved
31/07/12	Revision 0	RH	VC

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors
SKW STW										
Submission & Delivery (E&M)										
E&M3010	Delivery of MBR M.M. - 1st shipment for Temp STP	150	100	24/02/11 A	17/10/11 A	24/02/11 A	17/10/11 A		E&M0160	E&M3170
E&M3030	Delivery of Grit Removal Equipment	180	100	10/10/11 A	29/12/11 A	10/10/11 A	29/12/11 A		E&M0150	E&M3190
E&M3060	Delivery of Fine Screens	136	100	12/09/11 A	30/11/11 A	12/09/11 A	30/11/11 A		E&M0120	E&M3210
E&M3070	Delivery of Pumps	136	100	23/06/11 A	05/09/11 A	23/06/11 A	05/09/11 A		E&M0130	E&M3220
E&M3080	Delivery of Submersible Mixers	180	100	26/07/11 A	17/11/11 A	26/07/11 A	17/11/11 A		E&M0140	E&M3230
E&M3090	Delivery of Sludge Dewatering Equipment	210	50	01/09/11 A	12/11/12	01/09/11 A	27/11/13	380d	E&M0170	E&M3240
E&M3100	Delivery of Valves, Pipes & Fittings	180	50	30/08/11 A	02/11/12	30/08/11 A	05/10/13	337d	E&M0180	E&M3250
E&M3110	Delivery of Penstocks	180	100	12/08/11 A	24/12/11 A	12/08/11 A	24/12/11 A		E&M0190	E&M3260
E&M3130	Delivery of instruments	180	100	21/06/11 A	03/11/11 A	21/06/11 A	03/11/11 A		E&M0200	E&M3270
E&M3140	Delivery of MCC LVSB	180	0	01/08/12	28/01/13	20/02/13	19/08/13	203d	E&M0210	E&M3261
E&M3150	Delivery of BS Equipment	180	5	03/07/12 A	30/01/13	03/07/12 A	20/10/13	263d	E&M0220	E&M3291
E&M3160	Delivery of FS Equipment	180	5	30/06/12 A	11/02/13	30/06/12 A	08/11/13	270d	E&M0230	E&M0340, E&M3300
Construction of Grid A-G										
SKW1261	Excavate for SKW STW Structure (Grid A -G)	164	84	28/03/12 A	09/10/12	28/03/12 A	16/10/12	8d	SKW04885, SKW05938	SKW1271, SKW1371
SKW1271	55 M3 Fire Sprinkle Water Tank (FL +0.9 mPD)	36	100	03/07/12 A	31/07/12 A	03/07/12 A	31/07/12 A		SKW1261	SKW1281
SKW1281	Ground Floor Slab (Grid A-G)	46	100	03/07/12 A	31/07/12 A	03/07/12 A	31/07/12 A		SKW1271	SKW1291
SKW1291	Columns & Walls to 1/F & 1/F Slab (Grid A-G)	50	100	03/07/12 A	31/07/12 A	03/07/12 A	31/07/12 A		SKW1281	KD0090, SKW1301
SKW1301	Columns & Walls to R/F & R/F Slab (Grid A-G)	50	0	09/10/12	28/11/12	18/01/13	08/03/13	101d	SKW1291	E&M3261, E&M3291, E&M3311,
SKW1411	ABWF Works	105	0	03/11/12	16/02/13	12/02/13	27/05/13	101d	SKW1301	E&M3261, E&M3291, E&M3311,
Construction of Grid G-N										
SKW1311	Excavate for SKW STW Structure (Grid G-N)	90	100	28/03/12 A	25/06/12 A	28/03/12 A	25/06/12 A		SKW05938, SKW059416	SKW1321, SKW1371
SKW1321	Equalization Tank no.1 & 2 with base slabs (-2.1	42	20	26/06/12 A	16/10/12	26/06/12 A	06/08/12	-71d	SKW1311	SKW1331
SKW1331	Columns & Walls from B/S to G/F Slab (Grid G-N)	35	0	16/10/12	20/11/12	07/08/12	10/09/12	-71d	SKW1321	SKW1341
SKW1341	Ground Floor Slab (Grid G-N)	35	0	20/11/12	25/12/12	11/09/12	15/10/12	-71d	SKW1331	SKW1351
Construction of Grid N-T										
SKW1371	Excavate for SKW STW Structure (Grid N-T)	97	40	03/07/12 A	06/12/12	03/07/12 A	13/12/12	8d	SKW05938, SKW059416, SKW1261,	SKW1381
SKW1381	Ground Floor Slabs include MBR Tank (Grid N-T)	45	0	06/12/12	20/01/13	14/12/12	27/01/13	8d	SKW1371	SKW1391
Rising Main										
SKW1481	Subm, Approval & Delivery of DI pipes	120	100	17/05/10 A	13/09/10 A	17/05/10 A	13/09/10 A		KD0020	SKW1501
SKW1501	LCS (ChB0+00 - ChB1+20)	300	100	14/09/10 A	10/07/11 A	14/09/10 A	10/07/11 A		PRE0100, SKW1481	SKW1521
SKW1521	Tw in DN150 DI Rising Main (ChB0+00 - ChA4+55)	250	80	11/07/11 A	18/09/12	11/07/11 A	12/09/14	724d	SKW1501	KD0090
Section W8 - Landscape Softworks in All Portions										
SKW1591	Tree Survey	21	100	17/05/10 A	06/06/10 A	17/05/10 A	06/06/10 A		KD0020	SKW1621
SKW1611	Preservation & Protection of Trees	822	95	17/05/10 A	10/09/12	17/05/10 A	08/03/13	180d	KD0020	KD0100, SKW1631
SKW1621	Transplantation at SKW	90	100	07/06/10 A	04/09/10 A	07/06/10 A	04/09/10 A		SKW1591	KD0100
Section W9 - Establishment Works in All Portions										
SKW1631	Section W9 - Establishment Works	365	0	10/09/12	10/09/13	12/03/13	11/03/14	183d	SKW1611	KD0110



Start date	05/05/10
Finish date	22/11/15
Data date	31/07/12
Run date	22/08/12
Page number	7A
c Primavera Systems, Inc.	

Early bar
Progress bar
Critical bar
Summary bar
Progress point
Critical point
Summary point
Start milestone point
Finish milestone poir

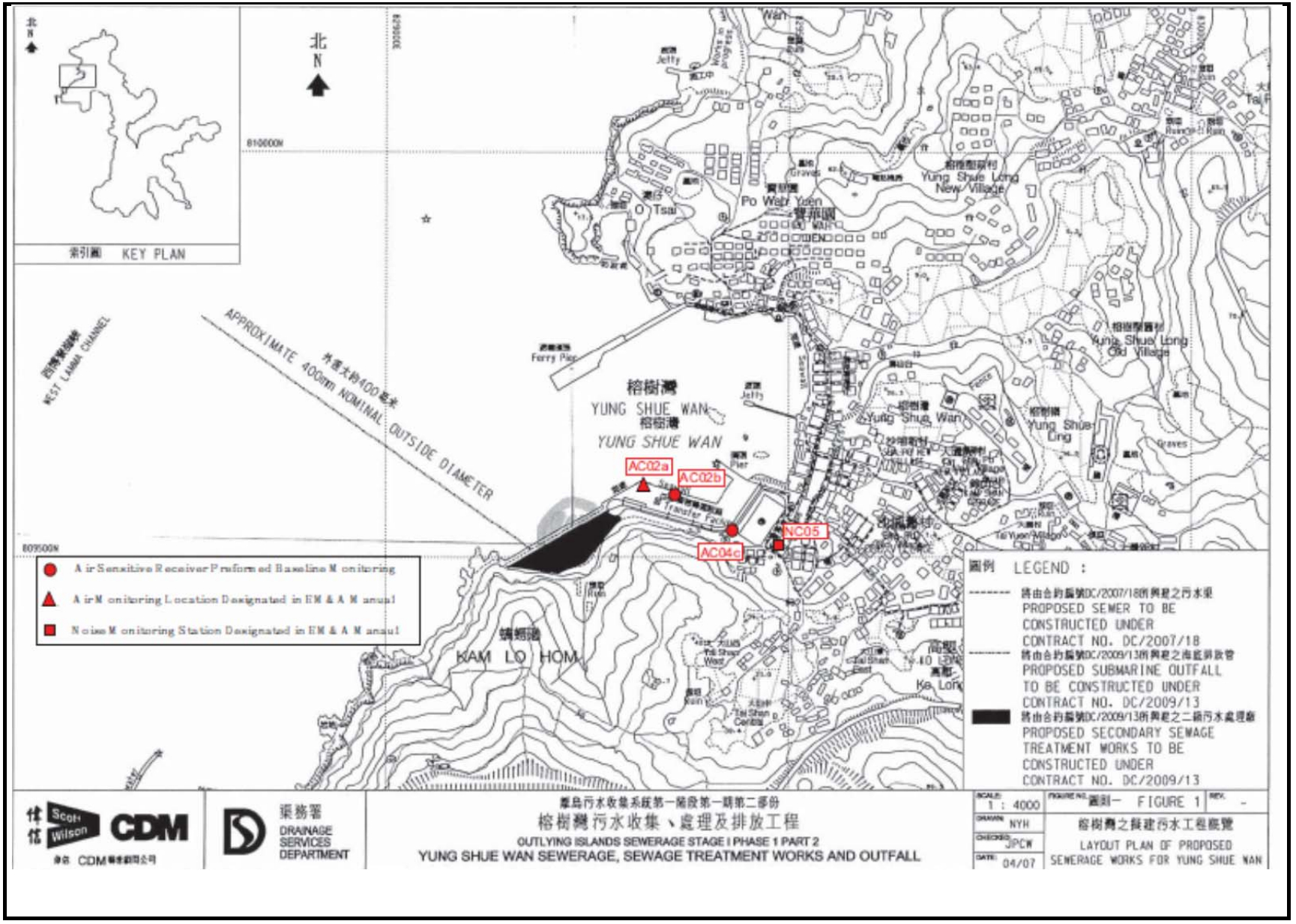
Leader Civil Engineering Corp. Ltd.
Contract No. DC/2009/13
Construction of Sewage Treatment Works at YSW & SKW
3-month Rolling Programme (Aug 2012 - Oct 2012)

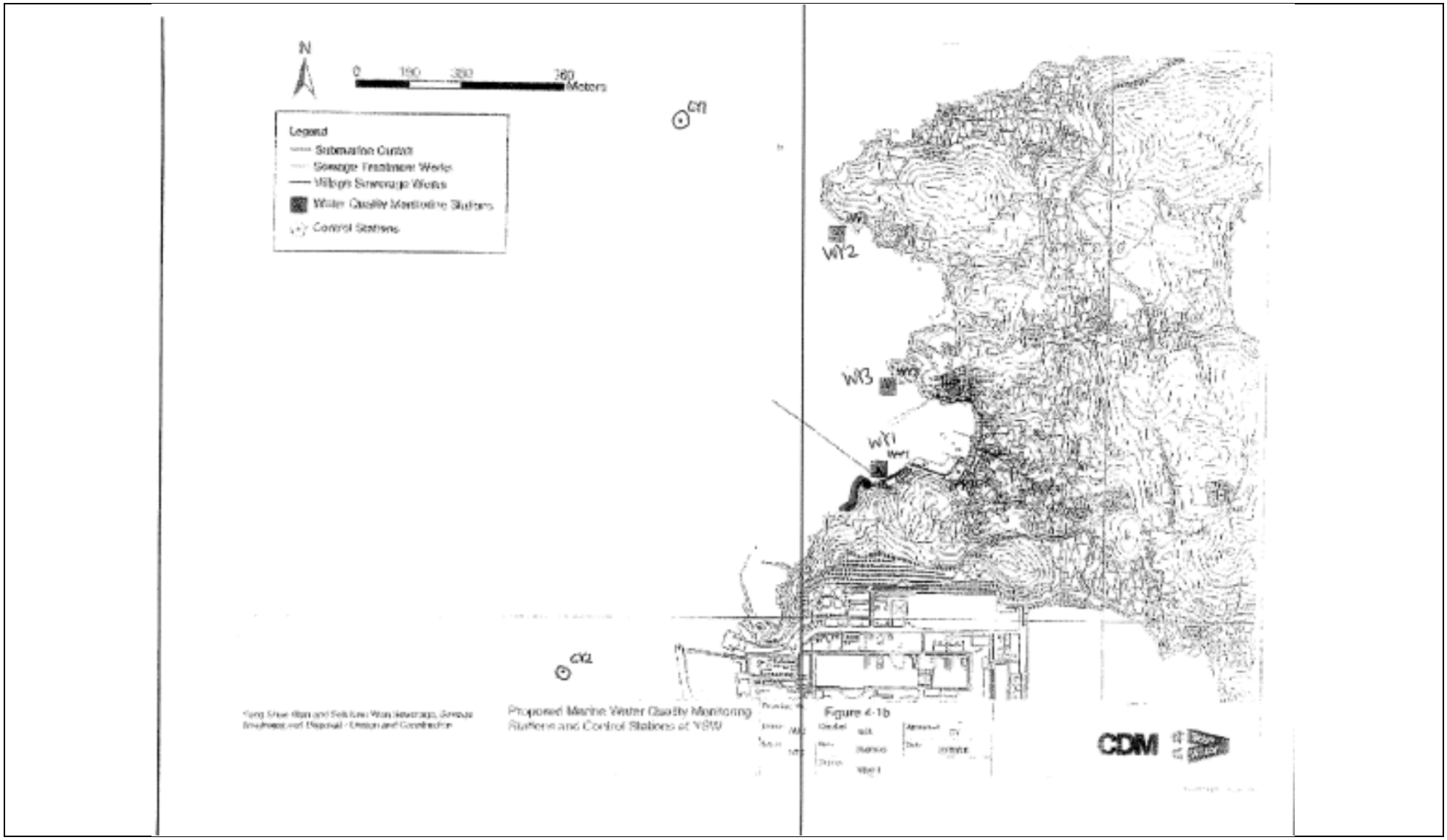
(Marked on 31 July 2012)

Date	Revision	Checked	Approved
31/07/12	Revision 0	RH	VC

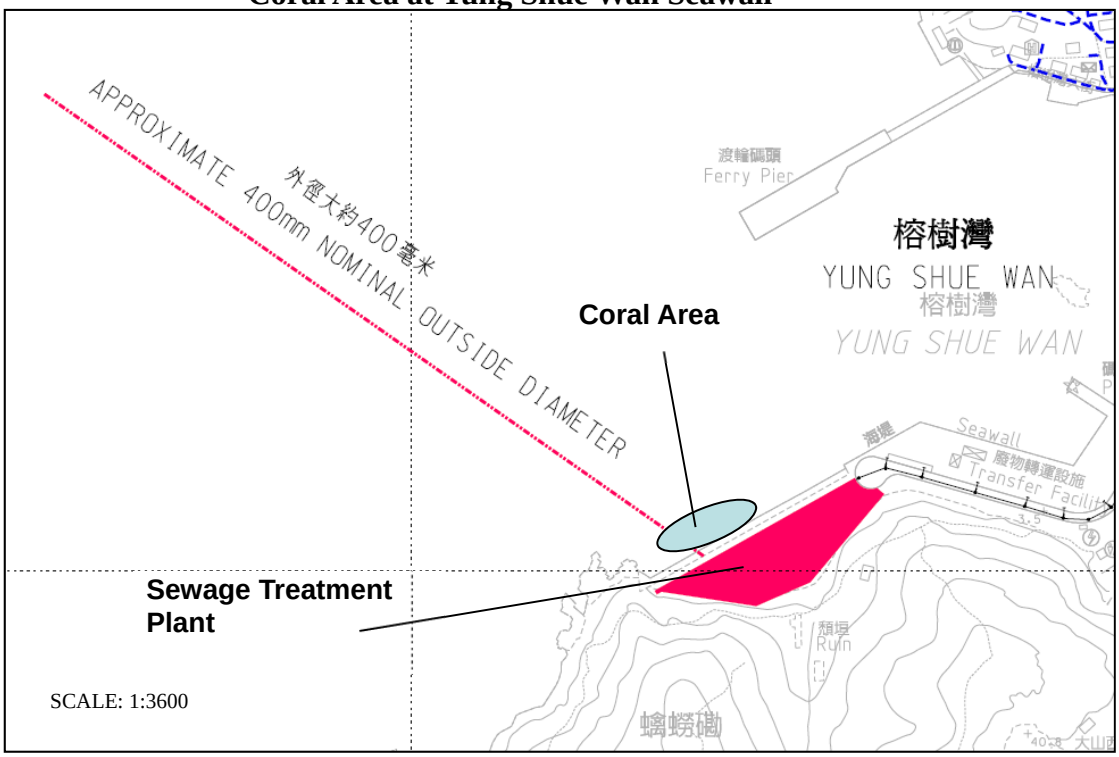
Appendix D

Location of Monitoring Stations
(Air Quality / Construction Noise / Water Quality / Dive Surveys of Coral)

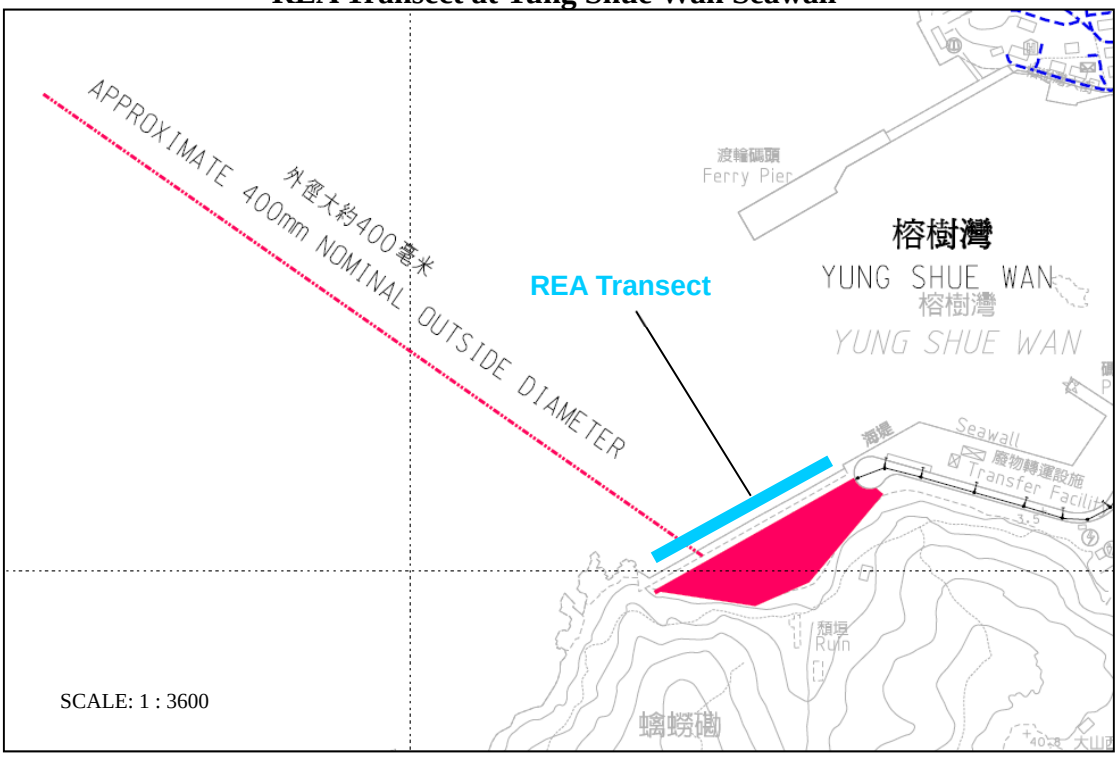

索引圖 KEY PLAN
北 N
APPROXIMATE 400mm NOMINAL OUTSIDE DIAMETER
外徑大約400毫米
WEST LAMMA CHANNEL
榕樹灣
YUNG SHUE WAN
榕樹灣
YUNG SHUE WAN
AC02a
AC02b
AC04c
NC05
KAM LO HOM
Air Sensitive Receiver Preformed Baseline Monitoring
Air Monitoring Location Designated in EM & A Manual
Noise Monitoring Station Designated in EM & A Manual
圖例 LEGEND :
將由合約編號DC/2007/18所興建之污水渠
PROPOSED SEWER TO BE CONSTRUCTED UNDER CONTRACT NO. DC/2007/18
將由合約編號DC/2009/13所興建之海底排放管
PROPOSED SUBMARINE OUTFALL TO BE CONSTRUCTED UNDER CONTRACT NO. DC/2009/13
將由合約編號DC/2009/13所興建之二級污水處理廠
PROPOSED SECONDARY SEWAGE TREATMENT WORKS TO BE CONSTRUCTED UNDER CONTRACT NO. DC/2009/13
Scott Wilson
CDM
DRAINAGE SERVICES DEPARTMENT
渠務署
榕樹灣污水收集、處理及排放工程
OUTLYING ISLANDS SEWERAGE STAGE I PHASE 1 PART 2
YUNG SHUE WAN SEWERAGE, SEWAGE TREATMENT WORKS AND OUTFALL
SCALE 1 : 4000
FIGURE NO. 圖則一 FIGURE 1
REV. -
DRAWN NYH
CHECKED JPCW
DATE 04/07
榕樹灣之擬建污水工程概覽
LAYOUT PLAN OF PROPOSED SEWERAGE WORKS FOR YUNG SHUE WAN


N
0
190
380
Meters
Legend
Submarine Outfall
Sewage Treatment Works
Village Sewerage Works
Water Quality Monitoring Stations
Control Stations
CR1
CR2
WY1
WY2
WY3
WS1
WS2
WS3
Proposed Marine Water Quality Monitoring Stations and Control Stations at YSW
Figure 4-1b
CDM

Coral Area at Yung Shue Wan Seawall



REA Transect at Yung Shue Wan Seawall



Coral Area at Sham Wan

REA Transect at Sham Wan

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 - May 17, 2012 Rootsmeter S/N 0438320 Ta (K) - 294
Operator Tisch Orifice I.D. - 1483 Pa (mm) - 754.38

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.4140	3.2	2.00
2	NA	NA	1.00	0.9960	6.4	4.00
3	NA	NA	1.00	0.8910	7.9	5.00
4	NA	NA	1.00	0.8510	8.7	5.50
5	NA	NA	1.00	0.7020	12.8	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
1.0018	0.7085	1.4185		0.9957	0.7042	0.8829
0.9976	1.0016	2.0061		0.9915	0.9955	1.2486
0.9955	1.1173	2.2429		0.9894	1.1105	1.3959
0.9945	1.1686	2.3524		0.9884	1.1615	1.4641
0.9890	1.4088	2.8371		0.9830	1.4003	1.7657
Qstd slope (m) =		2.02742		Qa slope (m) =		1.26953
intercept (b) =		-0.02027		intercept (b) =		-0.01262
coefficient (r) =		0.99996		coefficient (r) =		0.99996
y axis = SQRT[H2O(Pa/760)(298/Ta)]				y axis = SQRT[H2O(Ta/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}

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : YSW RE Offices
Location ID : AC02b

Date of Calibration: 30-May-12
Next Calibration Date: 30-Jul-12
Technician: Mr. Ben Tam

CONDITIONS

Sea Level Pressure (hPa)	1007.8	Corrected Pressure (mm Hg)	755.85
Temperature (ºC)	26.7	Temperature (K)	300

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11693
Model->	5025A	Qstd Intercept ->	-0.02568
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.6	5.6	11.2	1.584	59	58.50	Slope = 28.2192
13	4.3	4.3	8.6	1.390	52	51.56	Intercept = 13.1014
10	3.4	3.4	6.8	1.237	48	47.60	Corr. coeff. = 0.9978
7	2.2	2.2	4.4	0.997	42	41.65	
5	1.4	1.4	2.8	0.798	36	35.70	

Calculations :

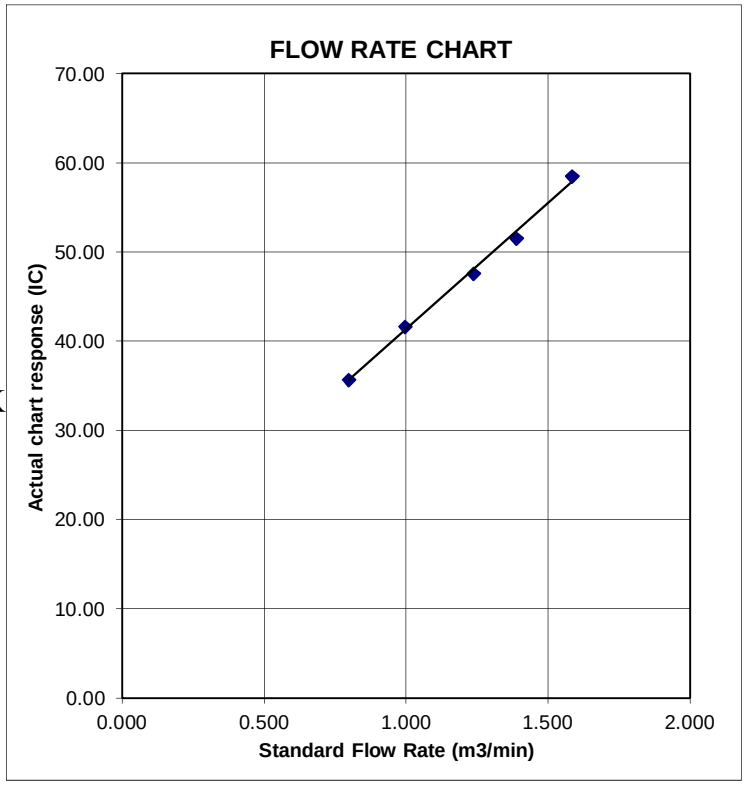
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K
Pstd = actual pressure during calibration (mm Hg

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : YSW Playground
Location ID : AC04c

Date of Calibration: 30-May-12
Next Calibration Date: 30-Jul-12
Technician: Mr. Ben Tam

CONDITIONS

Sea Level Pressure (hPa)	1007.8	Corrected Pressure (mm Hg)	755.85
Temperature (ºC)	26.7	Temperature (K)	300

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11693
Model->	5025A	Qstd Intercept ->	-0.02568
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.1	5.1	10.2	1.512	59	58.50	Slope = 35.2431
13	4.1	4.1	8.2	1.357	54	53.55	Intercept = 5.3315
10	3.2	3.2	6.4	1.201	48	47.60	Corr. coeff. = 0.9989
7	2.3	2.3	4.6	1.020	41	40.66	
5	1.7	1.7	3.4	0.878	37	36.69	

Calculations :

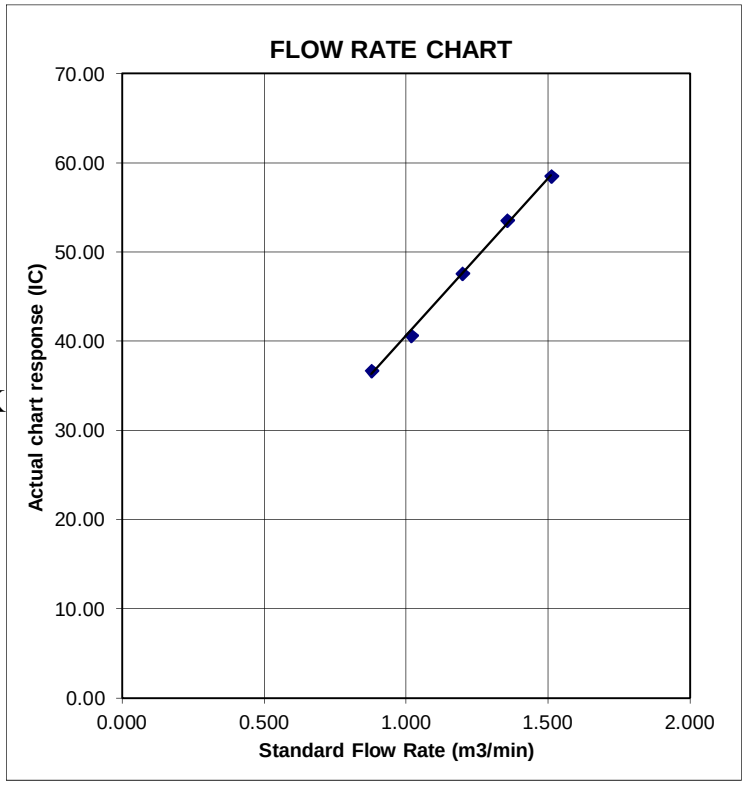
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K
Pstd = actual pressure during calibration (mm Hg

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : YSW RE Offices
Location ID : AC02b

Date of Calibration: 29-Jul-12
Next Calibration Date: 29-Sep-12
Technician: Mr. Ben Tam

CONDITIONS

Sea Level Pressure (hPa)	1004.4	Corrected Pressure (mm Hg)	753.3
Temperature (°C)	28.9	Temperature (K)	302

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11693
Model->	5025A	Qstd Intercept ->	-0.02568
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.6	5.6	11.2	1.576	59	57.98	Slope = 31.1522
13	4.2	4.2	8.4	1.366	54	53.07	Intercept = 9.4795
10	3.4	3.4	6.8	1.231	48	47.17	Corr. coeff. = 0.9956
7	2.2	2.2	4.4	0.992	42	41.27	
5	1.5	1.5	3	0.821	35	34.40	

Calculations :

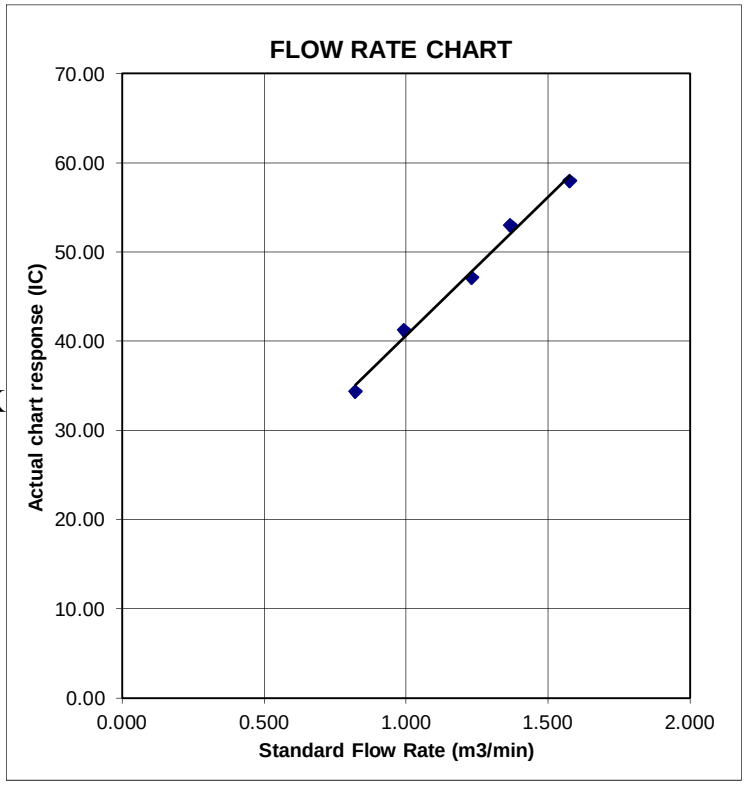
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K
Pstd = actual pressure during calibration (mm Hg

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : YSW Playground
Location ID : AC04c

Date of Calibration: 29-Jul-12
Next Calibration Date: 29-Sep-12
Technician: Mr. Ben Tam

CONDITIONS

Sea Level Pressure (hPa)	1004.4	Corrected Pressure (mm Hg)	753.3
Temperature (ºC)	28.9	Temperature (K)	302

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11693
Model->	5025A	Qstd Intercept ->	-0.02568
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.1	5.1	10.2	1.504	59	57.98	Slope = 34.0870
13	4.1	4.1	8.2	1.350	54	53.07	Intercept = 6.5875
10	3.2	3.2	6.4	1.194	47	46.19	Corr. coeff. = 0.9972
7	2.1	2.1	4.2	0.970	41	40.29	
5	1.6	1.6	3.2	0.848	36	35.38	

Calculations :

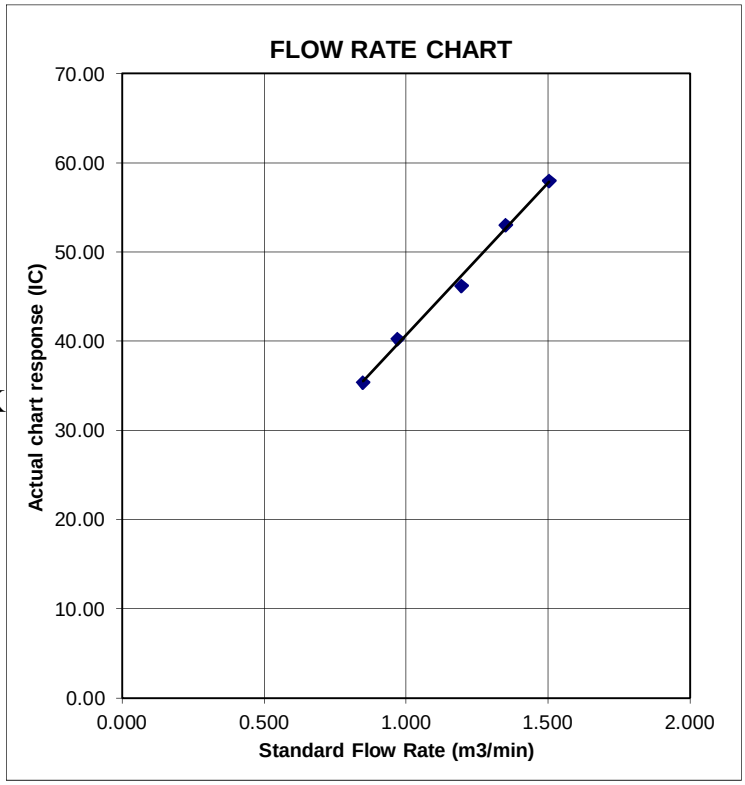
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K
Pstd = actual pressure during calibration (mm Hg

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



CERTIFICATE OF CALIBRATION AND TESTING

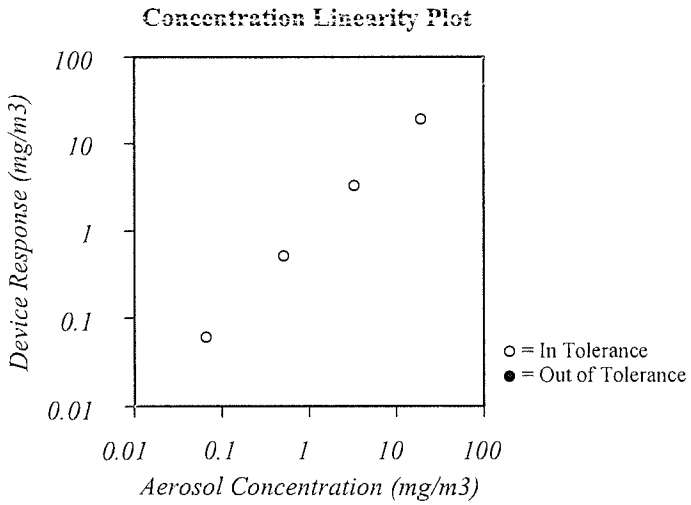
TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

Environment Condition		
Temperature	68.7 (20.4)	°F (°C)
Relative Humidity	41	%RH
Barometric Pressure	28.98 (981.4)	inHg (hPa)

Model	**8520**
Serial Number	**23079**

☒ As Left ☐ As Found

☒ In Tolerance ☐ Out of Tolerance



System ID: DTII01-02

Zero Stability Results			
Average:	Minimum:	Maximum:	Time:
0.000 :mg/m³	0.000 :mg/m³	0.001 :mg/m³	4:00 :hrs.

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass of standard ISO 12103-1, A1 test dust (Arizona dust) Our calibration ratio is greater than 1.2:1

Measurement Variable	System ID	Last Cal.	Cal. Due
Barometric Pressure	E003733	01-15-11	02-15-12
Humidity	E002873	11-24-10	11-24-11
DC Voltage	E003315	01-05-11	01-05-12
Microbalance	E001324	01-04-11	01-04-12
Flowmeter	E003769	06-13-11	06-13-12

Measurement Variable	System ID	Last Cal.	Cal. Due
Temperature	E002873	11-24-10	11-24-11
DC Voltage	E003314	01-05-11	01-05-12
Photometer	E003319	07-25-11	01-25-12
Pressure	E003511	11-12-10	11-12-11

T. Thao
Calibrated

☑ Final Function Check

September 13, 2011
Date

TSI P/N 2300157

輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C122427
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC12-0960)

Description / 儀器名稱	:	Integrating Sound Level Meter (EQ010)
Manufacturer / 製造商	:	Bruel & Kjaer
Model No. / 型號	:	2238
Serial No. / 編號	:	2285721
Supplied By / 委託者	:	Action-United Environmental Services and Consulting Unit A, 20/F., Gold King Industrial Building, 35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C
Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 20 April 2012

TEST RESULTS / 測試結果

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
- Rohde & Schwarz Laboratory, Germany
- Fluke Precision Measurement Ltd., UK
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested By 測試 : L K Yeung

Certified By 核證 : K C Lee

Date of Issue 簽發日期 : 23 April 2012

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C122427
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 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	C120016
CL281	Multifunction Acoustic Calibrator	DC110233

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT	IEC 60651
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)	Type 1 Spec. (dB)
50 - 130	L_{AFP}	A	F	94.00	1	94.0	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)
50 - 130	L_{AFP}	A	F	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		114.0

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

6.2 Time Weighting

6.2.1 Continuous Signal

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

Certificate of Calibration
校正證書

Certificate No. : C122427
證書編號

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
30 - 110	L_{AFP}	A	F	106.0	Continuous	106.0	Ref.
	L_{AFMax}				200 ms	105.0	-1.0 ± 1.0
	L_{ASP}		S		Continuous	106.0	Ref.
	L_{ASMax}				500 ms	101.9	-4.1 ± 1.0

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L_{AFP}	A	F	94.00	31.5 Hz	54.6	-39.4 ± 1.5
					63 Hz	67.8	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.0
					250 Hz	85.3	-8.6 ± 1.0
					500 Hz	90.7	-3.2 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	95.0	+1.0 ± 1.0
					8 kHz	92.9	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.7	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L_{CFP}	C	F	94.00	31.5 Hz	91.1	-3.0 ± 1.5
					63 Hz	93.3	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.0
					250 Hz	94.0	0.0 ± 1.0
					500 Hz	94.0	0.0 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.0
					4 kHz	93.2	-0.8 ± 1.0
					8 kHz	90.9	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.8	-6.2 (+3.0 ; -6.0)

Certificate of Calibration
校正證書

Certificate No. : C122427
證書編號

6.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Integrating Time	Frequency (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
30 - 110	L_{Aeq}	A	10 sec.	4	1	1/10	110.0	100	99.9	± 0.5
						$1/10^2$		90	89.6	± 0.5
			60 sec.			$1/10^3$		80	79.8	± 1.0
			5 min.			$1/10^4$		70	69.8	± 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	: ± 0.40 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 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 : 1 kHz		: ± 0.10 dB (Ref. 94 dB)
Burst equivalent level		: ± 0.2 dB (Ref. 110 dB continuous sound level)

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

Note :
The values given in this Certificate 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.

輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C122426
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC12-0960)

Description / 儀器名稱	:	Acoustical Calibrator (EQ082)
Manufacturer / 製造商	:	Bruel & Kjaer
Model No. / 型號	:	4231
Serial No. / 編號	:	2713428
Supplied By / 委託者	:	Action-United Environmental Services and Consulting Unit A, 20/F., Gold King Industrial Building, 35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C
Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration

DATE OF TEST / 測試日期 : 20 April 2012

TEST RESULTS / 測試結果

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
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested By 測試 : L K Yeung

Certified By 核證 : K C Lee

Date of Issue 簽發日期 : 23 April 2012

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C122426
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 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	Description	Certificate No.
CL130	Universal Counter	C113350
CL281	Multifunction Acoustic Calibrator	DC110233
TST150A	Measuring Amplifier	C120886

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

5.1.1 Before Adjustment

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.1	± 0.2	± 0.2
114 dB, 1 kHz	114.1		

5.1.2 After Adjustment

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

5.2 Frequency Accuracy

5.2.1 Before Adjustment

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

5.2.2 After Adjustment

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

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C122426
證書編號

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

Note :
The values given in this Certificate 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.

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

ALS Technichem (HK) Pty Ltd

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR RAY CHEUNG	**WORK ORDER:**	HK1219668
CLIENT:	ACTION UNITED ENVIRO SERVICES	**LABORATORY:**	HONG KONG
ADDRESS:	RM A 20/F., GOLDEN KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T., HONG KONG.	**DATE RECEIVED:**	25/07/2012
		DATE OF ISSUE:	01/08/2012
PROJECT:	--		

COMMENTS

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.
Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal aceptance criteria of ALS will be followed.

Scope of Test:	Dissolved Oxygen, pH, Salinity, Temperature and Trubidity
Description:	YSI Sonde
Brand Name:	YSI
Model No.:	YSI 6820 / 650MDS
Serial No.:	02J0912/02K0788 AA
Equipment No.:	--
Date of Calibration:	31 July, 2012

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: HONG KONG

Address

ALS Technichem (HK) Pty Ltd

11/F Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung
HONG KONG

Phone: 852-2610 1044
Fax: 852-2610 2021
Email: hongkong@alsglobal.com

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1219668
Date of Issue: 01/08/2012
Client: ACTION UNITED ENVIRO SERVICES

Description: YSI Sonde
Brand Name: YSI
Model No.: YSI 6820 / 650MDS
Serial No.: 02J0912/02K0788 AA
Equipment No.: --
Date of Calibration: 31 July, 2012 Date of next Calibration: 31 October, 2012

Parameters:

Dissolved Oxygen **Method Ref: APHA (21st edition), 4500O: G**

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
3.08	2.93	-0.15
6.46	6.64	0.18
8.33	8.17	-0.16
	Tolerance Limit (±mg/L)	0.20

pH Value **Method Ref: APHA (21st edition), 4500H:B**

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	4.03	0.03
7.0	6.98	-0.02
10.0	9.93	-0.07
	Tolerance Limit (±unit)	0.20

Salinity **Method Ref: APHA (21st edition), 2520B**

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)
0	0.00	--
10	9.40	-6.0
20	20.66	3.3
30	30.99	3.3
	Tolerance Limit (±%)	10.0

Temperature **Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.**

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)
10.0	9.15	-0.9
21.5	21.60	0.1
40.5	39.17	-1.3
	Tolerance Limit (°C)	2.0

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1219668
Date of Issue: 01/08/2012
Client: ACTION UNITED ENVIRO SERVICES

Description: YSI Sonde
Brand Name: YSI
Model No.: YSI 6820 / 650MDS
Serial No.: 02J0912/02K0788 AA
Equipment No.: --
Date of Calibration: 31 July, 2012 Date of next Calibration: 31 October, 2012

Parameters:

Turbidity **Method Ref: ALPHA 21st Ed. 2130B**

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.1	--
4	4.3	7.50
40	41.6	4.00
80	82.9	3.63
400	414.6	3.65
800	836.7	4.59
	Tolerance Limit (±%)	10.0

Mr Chan Kwok Fai, Godfrey
Laboratory Manager – Hong Kong

Hong Kong Accreditation Service
香港認可處

Certificate of Accreditation
認可證書

This is to certify that
特此證明

ALS TECHNICHEM (HK) PTY LIMITED

11/F., Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, New Territories, Hong Kong
香港新界葵涌永業街1-3號忠信針織中心11樓

has been accepted by the HKAS Executive, on the recommendation of the Accreditation Advisory Board, as a
為香港認可處執行機關根據認可諮詢委員會建議而接受的

HOKLAS Accredited Laboratory
「香港實驗所認可計劃」認可實驗所

This laboratory meets the requirements of ISO / IEC 17025 : 2005 – General requirements for the competence of testing and calibration laboratories and it has been accredited for performing specific tests or calibrations as listed in the HOKLAS Directory of Accredited Laboratories within the test category of
此實驗所符合ISO / IEC 17025 : 2005 –《測試及校正實驗所能力的通用規定》所訂的要求，獲認可進行載於香港實驗所認可計劃《認可實驗所名冊》內下述測試類別中的指定測試或校正工作

Environmental Testing
環境測試

This laboratory is accredited in accordance with the recognised International Standard ISO / IEC 17025 : 2005.
本實驗所乃根據公認的國際標準 ISO / IEC 17025 : 2005 獲得認可。
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (see joint IAF-ILAC-ISO Communiqué).
這項認可資格演示在指定範疇所需的技術能力及實驗所質量管理體系的運作（見國際認可論壇、國際實驗所認可合作組織及國際標準化組織的聯合公報）。

The common seal of the Hong Kong Accreditation Service is affixed hereto by the authority of the HKAS Executive
香港認可處根據認可處執行機關的權限在此蓋上通用印章

CHAN Sing Sing, Terence, Executive Administrator
執行幹事 陳成城
Issue Date : 5 May 2009
簽發日期：二零零九年五月五日

Registration Number : HOKLAS 066
註冊號碼：

Date of First Registration : 15 September 1995
首次註冊日期：一九九五年九月十五日

This certificate is issued subject to the terms and conditions laid down by HKAS
本證書按照香港認可處訂立的條款及條件發出

L 000552

Appendix F

Event and Action Plan

Air Quality

EVENT	ACTION			
	ET	IC(E)	ER	CONTRACTOR
ACTION LEVEL				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IC(E) and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IC(E) and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IC(E) and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IC(E) and ER; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial to ER within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.
LIMIT LEVEL				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform ER, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IC(E) within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
2. Exceedance for two or more consecutive samples	1. Notify IC(E), ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IC(E) and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IC(E), agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IC(E) within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Construction Noise

EVENT	ACTION			
	ET	**IC(E)**	**ER**	**CONTRACTOR**
Action Level	1. Notify IC(E) and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IC(E), ER and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5. Increase monitoring frequency to check mitigation effectiveness	1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IC(E); 2. Implement noise mitigation proposals.
Limit Level	1. Identify source; 2. Inform IC(E), ER, EPD and Contractor; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IC(E), ER and EPD the causes and actions taken for the exceedances; 7. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IC(E) within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Water Quality

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

Coral Monitoring

EVENT	ACTION		
	ET	**CONTRACTOR**	**ER/ IC(E)**
Action Level being exceeded	Inform contractor, AFCD and EPD immediately; Discuss mitigation measure with ER/IC(E) and Contractor; Ensure mitigation measures are implemented.	Inform the Engineer and confirm notification of the non-compliance in writing; Propose mitigation measure to ER/IC€ within 1 working day and discuss with Et and ER/IC(E); Ensure mitigation measures are implemented.	Inform contractor, Review water quality monitoring data; Determine whether water quality monitoring data shows effects attributable to the backfilling works; If water quality monitoring data indicates effects attributable to backfilling works, then make agreement on mitigation measures to be implemented; If water quality monitoring data indicates no effects attributable to backfilling works then Action Level is not triggered; Assess the effectiveness of the implemented mitigation measures.
Limit Level	Inform contractor, AFCD and EPD immediately; Discuss mitigation measure with ER/IC(E) and Contractor; Ensure mitigation measures are implemented.	Inform the Engineer and confirm notification of the non-compliance in writing; Suspend backfilling operations; Propose mitigation measure to ER/IC(E) within 3 working days and discuss with Et and ER/IC(E); Implement the agreed mitigation measures.	Inform contractor to suspend backfilling operations; Make agreement on the mitigation measures to be implemented; Assess the effectiveness of the implemented mitigation measures.

Appendix G

Monitoring Data Sheet

24-hour TSP Monitoring Data Sheet

Air Quality Monitoring - 24-hour TSP monitoring data for Yung Shue Wan

24-hour TSP Monitoring Results - AC02b

DATE	ELAPSED TIME			CHART READING				AVG	STANDARD			INITIAL	FINAL	WEIGHT	DUST
	SAMPLE NUMBER	INITIAL	FINAL	ACTUAL (min)	MIN	MAX	AVG	TEMP (oC)	AVG PRESS (hPa)	FLOW RATE (m3/min)	AIR VOLUME (std m3)	FILTER WEIGHT (g)	FILTER WEIGHT (g)	DUST COLLECTED (g)	24-hour TSP IN AIR (ug/m^3)
30-Jul-12	24920	5598.49	5622.48	1439.40	33	35	34.0	29.4	1001.2	0.77	1112	2.7894	2.9004	0.1110	100
4-Aug-12	24927	5622.48	5646.47	1439.40	32	34	33.0	29.8	998.7	0.74	1064	2.7709	2.8848	0.1139	107
9-Aug-12	24930	5646.47	5670.46	1439.40	33	34	33.5	30.5	1000.9	0.75	1086	2.8025	2.8724	0.0699	64
15-Aug-12	24976	5670.46	5694.45	1439.40	33	34	33.5	30	1003.9	0.76	1090	2.7794	2.8375	0.0581	53
21-Aug-12	24978	5694.45	5718.44	1439.40	32	34	33.0	29.1	1006.4	0.74	1071	2.8003	2.8994	0.0991	93

Action Level: *161ug/m^3*

Limit Level: *260ug/m^3*

24-hour TSP Monitoring Results - AC04c

DATE	ELAPSED TIME			CHART READING				AVG	STANDARD			INITIAL	FINAL	WEIGHT	DUST
	SAMPLE NUMBER	INITIAL	FINAL	ACTUAL (min)	MIN	MAX	AVG	TEMP (oC)	AVG PRESS (hPa)	FLOW RATE (m3/min)	AIR VOLUME (std m3)	FILTER WEIGHT (g)	FILTER WEIGHT (g)	DUST COLLECTED (g)	24-hour TSP IN AIR (ug/m^3)
30-Jul-12	24921	8141.03	8165.02	1439.40	32	34	33.0	29.4	1001.2	0.76	1097	2.7824	2.9107	0.1283	117
4-Aug-12	24926	8165.02	8189.01	1439.40	33	35	34.0	29.8	998.7	0.79	1136	2.7511	2.8666	0.1155	102
9-Aug-12	24931	8189.01	8213	1439.40	33	34	33.5	30.5	1000.9	0.77	1115	2.7829	2.8344	0.0515	46
15-Aug-12	24977	8213	8236.99	1439.40	33	34	33.5	30	1003.9	0.78	1118	2.8039	2.8521	0.0482	43
21-Aug-12	24979	8236.99	8260.98	1439.40	32	34	33.0	29.1	1006.4	0.76	1101	2.7384	2.8821	0.1437	131

Action Level: *176ug/m^3*

Limit Level: *260ug/m^3*

Marine Water Quality Monitoring Data Sheet

Contract No. DC/2009/13

Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan

AUES

Marine Water Quality Monitoring Result at Yung Shue Wan

Date 27-Jul-12

Date / Time	Location	Tide	Co-ordinates		Water Depth	Sampling Depth	Temp	DO Conc	DO Saturation	Turbidity	Salinity	pH	SS
			East	North	m	m	℃	mg/L	%	NTU	ppt	unit	mg/l
2012/7/27 8:12	WY1	ME	829176	809534	4.4	1.000	25.80	5.43	78.8	1.71	29.49	8.87	6.8
						1.000	25.80	5.42	78.8	1.85	29.58	8.84	
						3.400	26.20	4.36	64.1	1.77	30.72	8.23	10.4
						3.400	26.20	4.25	62.5	1.91	30.84	8.22	
2012/7/27 8:34	WY2	ME	829016	810395	7.9	1.000	26.20	5.51	80.9	1.34	30.51	9.22	5.7
						1.000	26.20	5.40	79.5	1.52	30.70	9.17	
						3.950	26.30	5.44	79.9	1.06	29.95	8.81	10.5
						3.950	26.30	5.36	79.3	1.21	31.38	8.77	
						6.900	26.20	4.95	73.3	1.65	31.77	8.60	11.2
						6.900	26.20	4.84	71.6	1.89	31.79	8.56	
2012/7/27 8:25	WY3	ME	829213	809871	4.8	1.000	25.90	5.68	83.7	1.54	31.95	9.11	8.4
						1.000	25.90	5.53	80.6	1.62	29.98	9.05	
						3.800	26.10	5.14	75.4	1.71	30.36	8.71	10.2
						3.800	26.10	5.54	74.7	1.92	30.33	8.67	
2012/7/27 8:51	CY1	ME	828421	810813	12.6	1.000	25.70	5.36	77.2	1.92	28.77	8.51	9.7
						1.000	25.70	5.29	76.2	2.01	28.79	8.49	
						6.300	25.80	5.27	76.5	2.56	29.74	8.60	5.3
						6.300	25.80	5.09	74.0	2.61	29.95	8.52	
						11.600	26.00	4.29	63.2	3.04	31.45	8.28	9.7
						11.600	26.00	4.46	65.8	3.07	31.67	8.26	
2012/7/27 8:19	CY2	ME	828024	808811	17.8	1.000	25.70	5.33	76.9	3.01	28.91	8.42	6.9
						1.000	25.70	5.19	74.9	3.12	28.94	8.39	
						8.900	25.80	5.01	73.1	4.17	30.36	8.34	5.1
						8.900	25.90	5.38	72.1	4.58	30.28	8.34	
						16.800	26.00	4.54	67.0	6.47	31.68	8.28	9.3
						16.800	26.00	4.55	67.1	6.49	31.73	8.27	
2012/7/27 13:10	WY1	MF	829192	809554	5.3	1.000	26.50	5.09	75.4	1.77	31.34	8.85	9.6
						1.000	26.50	5.08	75.3	1.79	31.36	8.83	
						4.300	26.50	4.62	68.3	1.62	30.98	8.70	7
						4.300	26.50	4.52	67.1	1.69	31.28	8.67	
2012/7/27 13:25	WY2	MF	828994	810407	9.2	1.000	25.90	5.11	74.6	1.38	30.28	8.78	5.8
						1.000	26.00	5.03	73.5	1.42	30.44	8.76	
						4.600	26.20	4.61	68.0	1.16	31.17	8.47	8.9
						4.600	26.20	4.62	68.2	1.24	31.33	8.46	
						8.200	26.20	4.03	59.3	2.04	31.00	8.33	17.5
						8.200	26.20	4.09	60.3	2.11	31.08	8.34	
2012/7/27 13:17	WY3	MF	829194	809862	5.7	1.000	25.90	5.33	77.3	1.73	29.22	8.74	10.9
						1.000	25.90	5.28	76.6	1.79	29.14	8.70	
						4.700	26.60	4.64	68.8	1.61	31.03	8.62	7.4
						4.700	26.60	4.49	66.7	1.74	31.25	8.59	
2012/7/27 13:37	CY1	MF	828414	810826	13.8	1.000	25.80	5.26	75.8	2.12	28.36	8.65	2.8
						1.000	25.80	5.24	75.6	2.19	28.37	8.61	
						6.900	26.10	5.34	78.8	2.23	31.56	8.34	10.8
						6.900	26.10	5.20	76.7	2.16	31.77	8.29	
						12.800	26.10	4.91	72.5	2.89	31.80	8.63	15.6
						12.800	26.10	4.82	71.2	3.07	31.80	8.64	
2012/7/27 13:55	CY2	MF	828016	808826	19.6	1.000	26.50	5.75	84.8	3.18	30.26	8.67	7.2
						1.000	26.60	5.63	83.4	3.12	30.62	8.62	
						9.800	26.20	5.91	79.9	4.17	30.80	8.51	11
						9.800	26.10	5.64	76.3	4.58	30.85	8.45	
						18.600	26.10	5.33	78.7	6.47	31.63	8.46	8.5
						18.600	26.10	5.25	77.5	6.49	31.87	8.44	

Remarks: MF - Middle Flood tida
ME - Middle Ebb tida

Contract No. DC/2009/13

Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan

AUES

Marine Water Quality Monitoring Result at Yung Shue Wan

Date 31-Jul-12

Date / Time	Location	Tide*	Co-ordinates		Water Depth	Sampling Depth	Temp	DO Conc	DO Saturation	Turbidity	Salinity	pH	SS
			East	North	m	m	℃	mg/L	%	NTU	ppt	unit	mg/l
2012/7/31 10:08	WY1	ME	829165	809541	5.4	1.000	27.70	6.09	90.3	1.25	27.81	8.34	4.5
						1.000	27.70	6.10	90.4	1.29	27.81	8.32	
						4.400	27.20	5.21	77.2	1.44	29.15	8.33	4.6
						4.400	27.20	5.03	74.7	1.51	29.30	8.33	
2012/7/31 10:20	WY2	ME	829013	810387	9.6	1.000	27.70	6.07	90.2	1.17	28.10	9.14	2.6
						1.000	27.70	6.04	89.8	1.28	28.11	9.03	
						4.800	26.50	5.17	76.8	1.39	31.41	8.75	34
						4.800	26.40	4.99	74.1	1.27	31.63	8.74	
						8.600	26.30	3.90	57.8	2.12	31.65	8.78	2.7
						8.600	26.30	3.92	58.9	1.98	31.65	8.73	
2012/7/31 10:13	WY3	ME	829216	809846	5.7	1.000	27.50	5.88	87.2	1.36	28.11	8.29	5.6
						1.000	27.50	5.86	86.9	1.42	28.11	8.26	
						4.700	26.60	4.17	61.8	1.53	30.90	8.85	3.3
						4.700	26.60	4.16	61.8	1.61	31.30	8.81	
2012/7/31 11:41	CY1	ME	828417	810821	13.3	1.000	27.40	7.20	98.7	1.76	28.50	8.33	3.5
						1.000	27.40	6.78	92.6	1.77	28.10	8.31	
						6.650	27.00	5.41	80.0	1.52	29.28	8.73	3.6
						6.650	27.00	5.31	78.5	1.61	29.45	8.68	
						12.300	26.20	4.54	67.2	2.07	31.76	8.71	5.5
						12.300	26.20	4.45	65.9	2.12	31.88	8.67	
2012/7/31 10:47	CY2	ME	828029	808824	19.6	1.000	27.70	7.17	91.3	2.18	27.98	8.43	2
						1.000	27.70	7.19	91.5	2.11	27.80	8.43	
						9.800	27.00	6.43	80.8	1.73	30.26	8.40	5.2
						9.800	27.10	6.41	80.6	1.94	30.54	8.42	
						18.600	26.80	5.75	72.0	3.01	31.12	8.30	4.7
						18.600	26.80	5.73	71.7	2.94	31.53	8.30	
2012/7/31 17:01	WY1	MF	829167	809558	4.5	1.000	27.90	6.59	90.8	1.47	27.56	8.73	10.7
						1.000	27.90	6.55	90.2	1.56	27.60	8.61	
						3.500	28.10	5.75	85.7	2.12	27.45	8.57	9.1
						3.500	28.10	5.56	82.8	2.08	27.45	8.55	
2012/7/31 17:20	WY2	MF	829026	810417	7.8	1.000	27.90	6.52	96.8	1.93	27.31	8.55	5.8
						1.000	27.90	6.51	96.6	1.97	27.38	8.51	
						3.900	27.90	6.48	96.4	1.86	27.53	8.43	6.9
						3.900	27.90	6.43	95.6	1.74	27.53	8.41	
						6.800	27.90	6.30	93.5	1.66	27.10	8.28	6.2
						6.800	27.90	6.10	90.6	1.67	27.46	8.25	
2012/7/31 17:07	WY3	MF	829213	809859	4.7	1.000	27.80	6.15	91.0	1.82	27.05	8.76	8.1
						1.000	27.80	6.12	90.5	1.86	27.05	8.75	
						3.700	27.90	5.22	77.2	1.98	26.94	8.45	9.7
						3.700	27.90	5.18	76.6	2.08	26.94	8.43	
2012/7/31 17:38	CY1	MF	828427	810815	12.1	1.000	27.50	5.61	82.3	2.12	26.14	8.73	6
						1.000	27.50	5.45	79.9	2.04	26.12	8.71	
						6.050	26.80	4.95	73.2	1.74	29.93	8.65	6.7
						6.050	26.80	4.94	73.2	1.79	29.99	8.64	
						11.100	26.40	4.56	67.6	2.52	31.36	8.50	10.6
						11.100	26.40	4.61	68.3	2.53	31.54	8.50	
2012/7/31 18:04	CY2	MF	828019	808814	17.4	1.000	27.20	5.09	75.0	1.84	27.95	8.42	6
						1.000	27.20	5.09	75.0	1.87	27.96	8.42	
						8.700	26.50	4.78	71.0	2.10	31.52	8.47	5.6
						8.700	26.40	4.66	69.2	2.08	31.59	8.45	
						16.400	26.40	4.42	65.1	2.27	30.28	8.36	9.3
						16.400	26.40	4.42	65.2	2.57	30.59	8.35	

Remarks: MF - Middle Flood tida
ME - Middle Ebb tida

Contract No. DC/2009/13

Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan

AUES

Marine Water Quality Monitoring Result at Yung Shue Wan

Date 2-Aug-12

Date / Time	Location	Tide*	Co-ordinates		Water Depth	Sampling Depth	Temp	DO Conc	DO Saturation	Turbidity	Salinity	pH	SS
			East	North	m	m	℃	mg/L	%	NTU	ppt	unit	mg/l
2012/8/2 10:00	WY1	ME	829176	809548	5.2	1.000	28.27	7.28	111.0	1.3	31.03	7.57	5.6
						1.000	28.36	7.23	110.4	1.4	30.99	7.58	
						4.200	27.78	7.22	109.6	1.2	31.66	7.57	3.8
						4.200	27.78	7.22	109.6	1.3	31.66	7.57	
2012/8/2 10:24	WY2	ME	829007	810411	9.4	1.000	28.28	7.66	117.1	1.6	31.40	7.68	4.3
						1.000	28.30	7.46	114.0	1.8	31.37	7.67	
						4.700	27.80	7.42	112.5	1.5	31.35	7.63	3.9
						4.700	27.80	7.42	112.5	1.6	31.35	7.63	
						8.400	27.80	7.42	112.5	1.8	31.35	7.63	11.3
						8.400	27.80	7.42	112.5	1.9	31.35	7.63	
2012/8/2 10:11	WY3	ME	829207	809843	5.4	1.000	28.16	6.47	98.6	1.4	31.33	7.58	3
						1.000	28.15	6.57	100.1	1.6	31.33	7.59	
						4.400	27.55	6.73	101.9	1.8	31.77	7.57	8.4
						4.400	27.48	6.57	99.3	1.8	31.83	7.56	
2012/8/2 10:40	CY1	ME	828416	810827	13.4	1.000	27.73	7.70	117.0	2.0	32.01	7.62	3.1
						1.000	27.68	7.52	114.3	1.9	32.01	7.61	
						6.700	26.67	7.49	112.7	1.8	33.39	7.53	4.6
						6.700	26.57	7.08	106.3	1.9	33.36	7.51	
						12.400	26.27	5.78	86.7	2.3	33.81	7.43	4.4
						12.400	26.26	5.64	84.5	2.5	33.81	7.42	
2012/8/2 11:00	CY2	ME	828013	808826	19.9	1.000	27.61	9.19	138.0	1.6	30.15	7.45	5.7
						1.000	27.68	8.57	128.8	1.8	30.10	7.42	
						9.950	27.31	8.51	128.6	1.8	32.20	7.42	4.3
						9.950	27.35	8.83	133.5	1.7	32.24	7.40	
						18.900	26.20	5.54	83.1	3.1	34.06	7.14	2.1
						18.900	26.19	5.51	82.5	3.1	34.10	7.13	
2012/8/2 16:37	WY1	MF	829164	809563	4.3	1.000	28.10	7.47	113.6	1.8	31.11	7.48	11.5
						1.000	28.20	8.01	122.0	1.7	31.04	7.47	
						3.300	27.59	8.30	125.2	1.2	31.14	7.39	9.4
						3.300	27.64	7.35	111.1	1.1	31.11	7.34	
2012/8/2 17:00	WY2	MF	829007	810414	8.6	1.000	27.84	8.42	127.3	1.4	30.62	7.39	6.4
						1.000	27.80	8.34	126.0	1.4	30.65	7.40	
						4.300	27.61	8.63	131.6	1.2	32.94	7.28	12.1
						4.300	27.66	8.12	123.8	1.2	32.89	7.26	
						7.600	26.20	6.47	97.0	1.8	34.19	7.16	7.5
						7.600	26.23	5.99	89.9	1.9	34.16	7.12	
2012/8/2 16:28	WY3	MF	829198	809861	4.7	1.000	28.14	9.66	147.1	1.5	31.06	7.41	13.4
						1.000	28.08	9.29	141.3	1.3	31.05	7.39	
						3.700	27.53	8.31	125.7	1.6	31.72	7.20	9.9
						3.700	27.53	7.68	116.2	1.7	31.73	7.20	
2012/8/2 17:22	CY1	MF	828412	810820	12.1	1.000	27.29	5.75	86.1	1.8	30.69	7.43	9.8
						1.000	27.29	6.13	91.8	1.9	30.67	7.41	
						6.050	27.08	5.93	88.8	1.6	31.40	7.39	6.5
						6.050	27.08	6.13	91.9	1.5	31.40	7.38	
						11.100	26.47	5.86	87.7	2.1	33.12	7.33	8
						11.100	26.46	5.49	82.2	2.0	33.15	7.31	
2012/8/2 17:00	CY2	MF	828021	808813	17.3	1.000	27.31	7.58	113.5	1.7	30.62	7.37	10.9
						1.000	27.29	6.81	101.9	1.8	30.57	7.33	
						8.650	26.96	6.42	96.3	2.1	31.78	7.23	7.2
						8.650	26.98	6.28	94.1	2.3	31.76	7.21	
						16.300	26.32	5.50	82.4	3.0	33.73	7.13	8.7
						16.300	26.34	5.28	79.1	2.9	33.50	7.12	

Remarks: MF - Middle Flood tida
ME - Middle Ebb tida

Contract No. DC/2009/13

Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan

AUES

Marine Water Quality Monitoring Result at Yung Shue Wan

Date 4-Aug-12

Date / Time	Location	Tide*	Co-ordinates		Water Depth	Sampling Depth	Temp	DO Conc	DO Saturation	Turbidity	Salinity	pH	SS
			East	North	m	m	℃	mg/L	%	NTU	ppt	unit	mg/l
2012/8/4 11:44	WY1	ME	829163	809551	3.4	1.000	27.63	7.64	114.4	1.1	29.54	7.68	2.5
						1.000	27.64	7.55	113.1	1.4	29.83	7.67	
						2.400	27.65	7.00	105.0	2.1	29.96	7.66	2.4
						2.400	27.65	7.19	107.9	2.3	29.97	7.64	
2012/8/4 11:23	WY2	ME	829009	810424	7.3	1.000	27.63	7.80	117.1	1.9	30.11	7.62	2.2
						1.000	27.62	7.54	113.3	1.6	30.27	7.61	
						3.650	27.69	7.02	106.7	1.8	32.27	7.64	2.2
						3.650	27.54	6.98	105.9	1.9	32.42	7.65	
						6.300	26.72	7.14	107.5	1.8	33.27	7.65	2.2
						6.300	26.71	7.24	109.0	1.9	33.29	7.64	
2012/8/4 11:36	WY3	ME	829207	809876	3.7	1.000	27.61	7.97	119.4	1.5	29.66	7.68	2.6
						1.000	27.61	8.10	121.2	1.5	29.71	7.66	
						2.700	27.64	6.80	102.2	1.5	30.36	7.64	3
						2.700	27.65	7.14	107.4	1.6	30.35	7.63	
2012/8/4 11:10	CY1	ME	828417	810786	12.4	1.000	27.35	6.94	103.3	1.6	29.47	7.54	0.6
						1.000	27.37	6.96	103.7	1.7	29.56	7.53	
						6.200	26.52	7.02	105.3	1.7	33.24	7.57	1.1
						6.200	26.51	6.89	103.3	1.8	33.24	7.57	
						11.400	26.45	6.77	101.5	2.1	33.34	7.55	4.9
						11.400	26.45	6.52	97.8	2.1	33.36	7.55	
2012/8/4 12:00	CY2	ME	828024	808773	17.2	1.000	27.59	7.49	112.2	1.8	29.86	7.69	2.8
						1.000	27.60	7.38	110.6	1.9	29.81	7.69	
						8.600	26.88	7.62	115.1	2.2	33.35	7.76	2.9
						8.600	26.88	7.72	116.5	2.2	33.35	7.76	
						16.200	26.43	6.84	102.7	2.9	33.79	7.65	2.2
						16.200	26.42	6.59	98.9	3.0	33.80	7.64	
2012/8/4 17:01	WY1	MF	829179	809558	5.2	1.000	27.69	4.59	69.3	1.5	30.78	7.63	2.5
						1.000	27.71	6.70	101.1	1.5	30.78	7.59	
						4.200	27.40	7.45	112.5	1.6	31.81	7.55	2.8
						4.200	27.34	7.12	107.3	1.5	31.77	7.54	
2012/8/4 17:20	WY2	MF	828993	810412	8.7	1.000	27.68	6.69	101.0	1.4	30.82	7.64	2.8
						1.000	27.67	6.67	100.6	1.4	30.84	7.64	
						4.350	27.39	6.39	96.1	1.7	31.32	7.62	3.9
						4.350	27.40	6.47	97.3	1.9	31.30	7.61	
						7.700	27.01	6.10	92.2	1.8	33.05	7.57	7.4
						7.700	27.01	6.03	91.1	1.9	33.14	7.49	
2012/8/4 17:09	WY3	MF	829213	809838	5.4	1.000	27.48	7.35	110.6	1.7	30.85	7.60	6.8
						1.000	27.46	6.94	104.3	1.8	30.86	7.59	
						4.400	27.34	6.62	99.7	2.1	31.38	7.56	5.4
						4.400	27.34	6.55	98.6	2.1	31.39	7.56	
2012/8/4 17:32	CY1	MF	828411	810809	13.8	1.000	27.36	5.98	89.1	2.1	29.42	7.63	2.6
						1.000	27.37	5.61	83.4	2.1	29.15	7.61	
						6.900	27.17	5.80	86.6	3.1	30.64	7.60	7.4
						6.900	27.18	5.70	85.1	3.1	30.51	7.59	
						12.800	27.17	5.98	89.4	3.5	30.79	7.58	10.9
						12.800	27.17	5.47	81.6	3.6	30.52	7.56	
2012/8/4 18:00	CY2	MF	828006	808829	20.4	1.000	27.24	6.78	101.0	1.5	29.97	7.68	5.5
						1.000	27.22	6.52	97.2	1.8	30.12	7.64	
						10.200	27.07	5.64	84.3	1.6	31.05	7.63	7.3
						10.200	26.91	5.21	78.1	1.7	31.90	7.61	
						19.400	26.51	5.19	78.0	2.6	33.61	7.64	6.1
						19.400	26.52	5.96	89.5	2.7	33.59	7.64	

Remarks: MF - Middle Flood tida
ME - Middle Ebb tida

Contract No. DC/2009/13

Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan

AUES

Marine Water Quality Monitoring Result at Yung Shue Wan

Date 6-Aug-12

Date / Time	Location	Tide*	Co-ordinates		Water Depth	Sampling Depth	Temp	DO Conc	DO Saturation	Turbidity	Salinity	pH	SS
			East	North	m	m	℃	mg/L	%	NTU	ppt	unit	mg/l
2012/8/6 13:11	WY1	ME	829159	809551	4.2	1.000	28.43	9.03	138.2	1.5	31.01	7.27	10.8
						1.000	28.37	8.78	134.2	1.6	31.05	7.29	
						3.200	28.22	7.19	110.0	1.2	31.77	7.32	10.6
						3.200	28.19	7.27	111.0	1.3	31.70	7.35	
2012/8/6 13:28	WY2	ME	829013	810386	7.6	1.000	28.25	7.65	116.5	1.8	30.89	6.82	2.5
						1.000	28.19	7.51	114.2	2.1	30.86	6.82	
						3.800	27.79	7.53	114.3	2.0	31.52	6.79	2
						3.800	27.72	7.09	107.8	2.0	32.10	6.78	
						6.600	26.55	6.07	91.7	2.0	34.41	6.65	2.7
						6.600	26.53	5.88	88.8	2.0	34.40	6.63	
2012/8/6 13:20	WY3	ME	829186	809876	4.6	1.000	28.36	8.23	125.4	1.5	30.57	6.98	3.4
						1.000	28.19	8.86	134.7	1.4	30.69	6.87	
						3.600	27.72	6.78	102.6	1.6	31.32	6.65	4.8
						3.600	27.77	6.46	97.9	1.5	31.35	6.87	
2012/8/6 13:41	CY1	ME	828384	810785	12.2	1.000	28.09	7.70	116.6	2.1	29.54	7.04	5.9
						1.000	28.08	7.08	107.2	2.5	29.56	7.05	
						6.100	27.32	6.83	102.9	2.0	32.59	7.01	7.2
						6.100	27.28	6.04	90.9	2.2	32.76	7.01	
						11.200	26.17	4.85	75.6	2.6	34.85	6.84	5.3
						11.200	26.20	5.25	79.1	2.8	34.80	6.80	
2012/8/6 14:01	CY2	ME	828029	808793	17.4	1.000	29.30	7.16	108.2	2.3	31.37	7.15	3.4
						1.000	30.02	6.57	99.3	2.6	31.38	7.13	
						8.700	26.72	6.09	94.6	1.8	33.93	6.83	3.4
						8.700	26.78	6.19	95.4	1.6	33.79	6.81	
						16.400	26.57	5.24	79.1	3.0	34.26	6.69	6.2
						16.400	26.60	4.93	74.4	3.1	34.24	6.70	
2012/8/6 8:15	WY1	MF	829179	809548	5.4	1.000	27.61	7.00	104.8	1.2	29.77	7.35	2.4
						1.000	27.56	6.85	102.8	1.2	29.85	7.38	
						4.400	27.39	6.84	102.6	1.5	30.69	7.45	4.8
						4.400	27.39	6.61	99.0	1.5	30.73	7.45	
2012/8/6 8:35	WY2	MF	829014	810416	8.6	1.000	27.74	7.37	111.2	1.3	30.68	7.63	3.7
						1.000	27.62	6.64	99.9	1.3	30.61	7.62	
						4.300	27.79	4.65	70.8	1.4	32.31	7.60	3.1
						4.300	27.62	5.06	76.8	1.3	32.11	7.58	
						7.600	26.72	5.40	81.5	1.3	33.63	7.54	3.1
						7.600	26.70	5.31	79.9	1.2	33.30	7.49	
2012/8/6 8:26	WY3	MF	829200	809863	5.7	1.000	27.66	7.55	113.5	1.2	30.19	7.59	3.4
						1.000	27.59	7.12	106.8	1.1	30.22	7.58	
						4.700	27.32	7.93	118.9	1.1	30.91	7.57	2.3
						4.700	27.30	7.44	111.6	1.2	30.95	7.55	
2012/8/6 8:49	CY1	MF	828419	810784	13.5	1.000	27.93	7.36	112.0	1.6	31.56	7.60	2.8
						1.000	27.84	6.48	98.4	1.4	31.62	7.58	
						6.750	26.59	6.54	98.6	1.2	34.05	7.49	2.6
						6.750	26.62	5.74	86.6	1.1	33.99	7.49	
						12.500	26.28	5.79	87.2	2.5	34.55	7.41	6.1
						12.500	26.29	4.90	73.8	2.6	34.55	7.40	
2012/8/6 8:35	CY2	MF	827983	808816	20.1	1.000	27.95	7.11	108.3	2.3	31.79	7.17	1.1
						1.000	27.90	7.03	106.7	1.2	31.34	7.14	
						10.050	26.34	5.62	84.6	1.1	34.51	6.90	2.5
						10.050	26.35	5.54	83.4	1.0	34.52	6.90	
						19.100	25.99	4.26	64.1	3.4	35.11	6.82	3.2
						19.100	26.03	4.06	61.0	3.4	35.07	6.79	

Remarks: MF - Middle Flood tida
ME - Middle Ebb tida

Contract No. DC/2009/13

Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan

AUES

Marine Water Quality Monitoring Result at Yung Shue Wan

Date 8-Aug-12

Date / Time	Location	Tide*	Co-ordinates		Water Depth	Sampling Depth	Temp	DO Conc	DO Saturation	Turbidity	Salinity	pH	SS
			East	North	m	m	℃	mg/L	%	NTU	ppt	unit	mg/l
2012/8/8 14:35	WY1	ME	829170	809545	4.4	1.000	29.66	8.69	134.0	1.5	30.32	7.16	6.2
						1.000	29.80	8.45	130.3	1.5	30.20	7.21	
						3.400	28.98	6.23	96.3	1.2	30.90	7.32	10.2
						3.400	29.02	6.61	102.9	1.2	30.93	7.33	
2012/8/8 14:52	WY2	ME	829006	810411	7.8	1.000	29.55	8.07	124.9	0.7	29.84	7.27	4.6
						1.000	29.59	7.97	123.3	0.8	29.88	7.28	
						3.900	28.82	7.73	118.5	1.0	30.44	7.13	5.6
						3.900	28.96	7.36	113.2	1.1	30.57	7.12	
						6.800	26.44	5.45	82.3	1.2	34.48	6.82	9.4
						6.800	26.42	5.74	86.5	1.6	34.49	6.76	
2012/8/8 14:43	WY3	ME	829210	809855	4.8	1.000	30.46	8.71	136.8	1.2	29.94	7.02	6.1
						1.000	30.55	8.57	134.8	1.2	29.90	7.00	
						3.800	29.50	7.74	119.9	1.4	30.31	6.85	6.9
						3.800	29.50	7.64	118.5	1.4	30.33	6.84	
2012/8/8 15:05	CY1	ME	828398	810814	12.3	1.000	28.88	7.03	107.1	1.7	28.98	7.34	4.1
						1.000	28.89	7.97	121.4	1.8	28.98	7.31	
						6.150	27.05	7.66	116.2	1.9	33.60	7.06	3.4
						6.150	27.30	6.89	104.7	1.9	33.29	7.03	
						11.300	26.19	5.30	79.8	2.2	34.92	6.85	5.2
						11.300	26.18	4.96	74.6	2.3	34.95	6.84	
2012/8/8 15:26	CY2	ME	828008	808791	17.6	1.000	28.70	8.00	121.4	1.3	28.88	7.41	7.5
						1.000	28.60	8.73	132.4	1.5	28.94	7.36	
						8.800	28.26	8.34	126.0	1.6	29.35	7.29	6.1
						8.800	28.20	8.14	123.1	1.6	29.60	7.28	
						16.600	26.16	5.75	86.4	3.0	34.79	7.02	6.6
						16.600	26.13	5.20	78.2	3.1	34.85	7.02	
2012/8/8 8:03	WY1	MF	829174	809561	5.2	1.000	28.68	6.61	100.4	1.1	29.07	7.45	6.7
						1.000	28.63	7.70	116.8	1.3	29.14	7.50	
						4.200	28.43	7.58	114.8	1.4	29.34	7.51	8.5
						4.200	28.43	7.45	112.8	1.4	29.29	7.49	
2012/8/8 8:21	WY2	MF	829017	810384	8.6	1.000	28.53	8.08	122.4	1.7	29.09	7.63	5.9
						1.000	28.56	8.04	121.9	1.6	29.08	7.63	
						4.300	28.27	7.55	114.2	1.7	29.67	7.59	5.1
						4.300	28.26	7.36	111.2	1.5	29.48	7.59	
						7.600	27.27	6.15	92.9	1.7	32.26	7.50	5.6
						7.600	27.28	5.97	90.0	1.8	31.73	7.51	
2012/8/8 8:12	WY3	MF	829196	809838	5.4	1.000	28.76	7.95	121.1	1.5	29.27	7.58	4.7
						1.000	28.76	7.82	119.1	1.5	29.27	7.58	
						4.400	28.71	7.70	117.3	1.5	29.35	7.57	4.7
						4.400	27.88	7.67	115.9	1.6	30.65	7.54	
2012/8/8 8:35	CY1	MF	828377	810812	13.6	1.000	27.69	7.28	108.9	2.0	29.27	7.54	4.9
						1.000	27.70	7.41	110.8	1.8	29.24	7.54	
						6.800	26.78	5.80	87.4	1.4	33.18	7.45	7.3
						6.800	26.80	5.59	84.3	1.6	33.22	7.44	
						12.600	26.25	4.94	74.1	1.9	34.25	7.40	8.7
						12.600	26.25	4.65	69.8	2.0	33.99	7.35	
2012/8/8 8:59	CY2	MF	828019	808824	19.5	1.000	27.76	7.47	111.9	1.5	29.28	7.40	5.7
						1.000	27.71	7.64	114.4	1.7	29.34	7.39	
						9.750	26.38	6.85	103.2	1.4	34.43	7.27	7.3
						9.750	26.40	5.74	86.5	1.4	34.43	7.23	
						18.500	26.06	5.17	77.7	2.1	35.03	7.18	7.5
						18.500	26.03	4.71	70.8	2.2	35.06	7.18	

Remarks: MF - Middle Flood tida
ME - Middle Ebb tida

Contract No. DC/2009/13

Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan

AUES

Marine Water Quality Monitoring Result at Yung Shue Wan

Date 10-Aug-12

Date / Time	Location	Tide*	Co-ordinates		Water Depth	Sampling Depth	Temp	DO Conc	DO Saturation	Turbidity	Salinity	pH	SS
			East	North	m	m	℃	mg/L	%	NTU	ppt	unit	mg/l
2012/8/10 15:52	WY1	ME	829177	809550	4.4	1.000	30.15	7.46	115.0	1.6	27.41	7.72	5.6
						1.000	30.14	8.62	133.0	1.7	27.42	7.73	
						3.400	30.16	7.31	112.9	1.6	27.79	7.68	6
						3.400	30.18	7.48	115.6	1.8	27.80	7.68	
2012/8/10 16:13	WY2	ME	829026	810429	7.9	1.000	29.79	7.30	111.4	2.1	26.55	7.89	5.3
						1.000	29.80	7.18	109.8	2.2	26.76	7.88	
						3.950	29.86	7.91	121.1	3.14	26.91	7.85	6.5
						3.950	29.86	6.95	104.8	2.98	26.87	7.86	
						6.900	26.71	6.38	97.4	2.72	34.31	7.35	5.7
						6.900	26.40	6.12	92.6	2.53	34.62	7.23	
2012/8/10 16:00	WY3	ME	829176	809823	4.8	1.000	29.97	7.55	116.0	1.84	27.36	7.80	6.8
						1.000	29.95	7.15	110.0	1.96	27.31	7.77	
						3.800	29.95	6.60	101.2	1.91	27.35	7.78	7.4
						3.800	29.95	6.96	106.8	1.84	27.35	7.76	
	CY1	ME											
	CY2	ME											
2012/8/10 9:50	WY1	MF	829165	809555	5.4	1.000	29.38	8.47	129.7	1.74	28.61	7.35	17.4
						1.000	29.38	8.40	128.8	1.86	28.71	7.56	
						4.400	29.20	7.71	118.1	1.96	29.06	7.63	17.5
						4.400	29.03	7.67	117.3	2.05	29.27	7.61	
2012/8/10 10:06	WY2	MF	829019	810401	9.3	1.000	29.54	8.31	128.0	1.96	28.95	7.84	8.2
						1.000	29.59	7.29	112.3	1.81	28.94	7.84	
						4.650	29.23	7.93	121.5	1.74	29.00	7.73	8.1
						4.650	29.24	7.61	116.6	1.77	29.01	7.72	
						8.300	27.07	6.58	99.8	2.02	33.45	7.31	10.4
						8.300	27.01	5.31	80.4	1.98	33.46	7.22	
2012/8/10 9:57	WY3	MF	829211	809861	5.7	1.000	29.35	8.33	127.9	2.01	28.99	7.78	11.8
						1.000	29.34	8.22	126.1	2.12	28.99	7.78	
						4.700	29.23	7.28	111.6	2.26	29.08	7.75	13.5
						4.700	29.24	7.05	108.2	2.41	29.11	7.74	
2012/8/10 10:17	CY1	MF	828411	810784	13.3	1.000	28.64	9.18	139.0	2.24	28.71	7.70	11.9
						1.000	28.69	9.65	146.3	2.58	28.71	7.68	
						6.650	27.33	8.62	130.2	2.69	32.11	7.41	15.4
						6.650	27.36	7.87	118.8	2.81	32.00	7.39	
						12.300	26.31	5.56	78.8	3.42	34.59	7.20	20.4
						12.300	26.32	4.73	71.3	3.78	34.58	7.18	
2012/8/10 10:37	CY2	MF	828029	808824	19.4	1.000	29.38	8.46	130.0	2.16	29.02	7.32	8.3
						1.000	29.38	8.50	131.2	2.33	29.06	7.25	
						9.700	26.24	7.61	110.3	2.35	34.88	6.65	9.3
						9.700	26.20	7.13	107.4	2.24	34.92	6.56	
						18.400	25.97	3.85	57.8	4.07	34.78	6.66	9.1
						18.400	25.98	3.97	59.5	3.92	34.78	6.65	

Remarks: MF - Middle Flood tida
ME - Middle Ebb tida

Contract No. DC/2009/13

Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan

AUES

Marine Water Quality Monitoring Result at Yung Shue Wan

Date 14-Aug-12

Date / Time	Location	Tide*	Co-ordinates		Water Depth	Sampling Depth	Temp	DO Conc	DO Saturation	Turbidity	Salinity	pH	SS
			East	North	m	m	℃	mg/L	%	NTU	ppt	unit	mg/l
2012/8/14 9:01	WY1	ME	829163	809541	4.1	1.000	29.00	5.98	90.7	1.36	27.83	7.76	2.6
						1.000	29.01	5.45	82.7	1.52	27.86	7.83	
						3.100	28.91	4.28	65.0	1.29	28.33	7.83	3.3
						3.100	28.94	6.13	93.1	1.47	28.29	7.84	
2012/8/14 9:18	WY2	ME	829015	810397	7.4	1.000	29.05	6.49	98.4	1.48	27.64	7.83	2.2
						1.000	29.04	6.22	94.2	1.39	27.52	7.83	
						3.700	28.45	4.69	71.3	1.36	30.12	7.74	5
						3.700	28.46	5.52	84.0	1.43	30.13	7.73	
						6.400	27.17	3.08	46.9	1.65	34.02	7.43	3.9
						6.400	27.12	3.94	60.0	1.69	34.08	7.37	
2012/8/14 9:08	WY3	ME	829183	809839	4.5	1.000	29.09	5.68	86.5	1.54	28.31	7.89	3.2
						1.000	29.15	6.00	91.4	1.60	28.07	7.88	
						3.500	29.11	6.01	91.6	1.71	28.51	7.85	3
						3.500	29.10	6.03	92.0	1.73	28.55	7.86	
2012/8/14 9:32	CY1	ME	828408	810805	12.1	1.000	28.58	8.03	120.2	1.42	26.80	7.79	2.6
						1.000	28.51	7.28	108.9	1.48	26.89	7.75	
						6.050	28.20	7.82	119.5	1.87	31.54	7.55	5
						6.050	28.04	5.18	78.6	1.91	30.67	7.53	
						11.100	25.78	2.64	39.8	1.83	36.16	7.14	4.8
						11.100	25.76	3.06	46.0	1.72	36.15	7.09	
2012/8/14 9:52	CY2	ME	828017	808821	18.6	1.000	28.77	8.55	128.8	1.62	27.24	7.90	4.5
						1.000	28.76	8.49	127.8	1.81	27.28	7.88	
						9.300	26.85	6.40	97.3	1.31	34.74	7.35	4.4
						9.300	26.60	6.20	94.0	1.69	34.97	7.33	
						17.600	25.81	4.05	61.0	2.07	35.83	7.20	3.9
						17.600	25.80	3.65	55.9	2.27	35.35	7.09	
2012/8/14 14:51	WY1	MF	829175	809543	5.5	1.000	29.75	7.46	108.8	1.17	28.32	7.34	3.9
						1.000	29.76	7.65	111.6	1.32	28.33	7.28	
						4.500	28.11	7.15	104.3	1.22	32.16	7.76	7.6
						4.500	28.05	7.04	102.7	1.34	32.19	7.71	
2012/8/14 15:15	WY2	MF	828987	810386	8.2	1.000	30.07	6.21	95.4	1.61	28.05	7.77	4.3
						1.000	30.06	6.66	102.6	1.37	28.04	7.76	
						4.100	29.09	4.75	72.6	1.45	29.19	7.69	3
						4.100	28.94	4.26	65.2	1.64	29.54	7.66	
						7.200	28.04	5.02	76.8	1.82	32.09	7.42	4.4
						7.200	27.99	4.77	72.8	1.56	32.17	7.39	
2012/8/14 15:07	WY3	MF	829212	809861	5.7	1.000	30.21	7.07	103.1	1.41	28.55	7.59	4.3
						1.000	30.05	7.21	105.2	1.68	28.35	7.57	
						4.700	27.91	7.68	112.0	1.26	31.57	7.27	4.9
						4.700	28.56	6.24	95.2	1.28	30.33	7.33	
2012/8/14 15:27	CY1	MF	828391	810773	13.1	1.000	28.25	7.10	103.6	1.14	28.90	7.77	4.8
						1.000	28.21	7.02	102.4	1.22	29.03	7.72	
						6.550	27.51	6.80	99.2	1.39	30.81	7.55	4.3
						6.550	27.43	6.75	98.5	1.14	30.87	7.49	
						12.100	26.50	4.80	70.0	1.73	34.30	7.24	4.6
						12.100	26.49	4.61	78.4	1.97	34.27	7.22	
2012/8/14 15:49	CY2	MF	828018	808821	20.7	1.000	28.66	6.65	97.0	1.29	29.60	7.84	3.7
						1.000	28.62	6.96	101.5	1.18	29.63	7.83	
						10.350	25.90	4.12	60.1	1.44	35.18	7.40	5.6
						10.350	25.69	3.89	56.7	1.61	35.41	7.32	
						19.700	24.47	3.56	51.9	1.96	36.57	7.16	4.8
						19.700	24.44	3.65	53.2	2.19	36.61	7.14	

Remarks: MF - Middle Flood tida
ME - Middle Ebb tida

Contract No. DC/2009/13

Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan

AUES

Marine Water Quality Monitoring Result at Yung Shue Wan

Date 16-Aug-12

Date / Time	Location	Tide*	Co-ordinates		Water Depth	Sampling Depth	Temp	DO Conc	DO Saturation	Turbidity	Salinity	pH	SS
			East	North	m	m	℃	mg/L	%	NTU	ppt	unit	mg/l
2012/8/16 10:32	WY1	ME	829170	809543	4.7	1.000	28.94	8.01	122.0	1.31	28.63	7.73	2.8
						1.000	28.91	8.85	134.6	1.37	28.69	7.71	
						3.700	28.25	7.64	116.1	1.66	30.41	7.54	5.6
						3.700	28.24	8.24	125.2	1.62	30.38	7.52	
2012/8/16 10:47	WY2	ME	829011	810421	7.6	1.000	29.11	8.50	129.6	1.24	28.59	7.88	4
						1.000	29.06	8.64	131.7	1.32	28.64	7.85	
						3.800	28.54	7.68	121.8	1.17	29.49	7.77	4.8
						3.800	28.47	7.65	122.6	1.27	29.55	7.72	
						6.600	27.97	5.76	88.6	1.54	33.22	7.49	6.4
						6.600	28.09	4.92	75.8	1.73	33.10	7.46	
2012/8/16 10:39	WY3	ME	829183	809834	4.8	1.000	28.94	9.60	146.3	1.43	28.81	7.77	5.4
						1.000	28.91	9.46	144.0	1.45	28.83	7.75	
						3.800	28.68	7.59	115.4	1.51	29.25	7.70	7.2
						3.800	28.66	7.57	115.1	1.47	29.26	7.68	
2012/8/16 11:02	CY1	ME	828412	810823	12.8	1.000	29.19	9.14	145.4	1.29	28.31	7.73	4.6
						1.000	29.19	9.69	147.8	1.16	28.32	7.72	
						6.400	27.75	9.02	136.2	1.41	30.73	7.47	6.5
						6.400	27.72	8.97	135.5	1.52	30.85	7.43	
						11.800	25.38	5.67	84.9	2.12	36.34	6.92	6.6
						11.800	25.41	4.67	74.5	2.04	36.32	6.86	
2012/8/16 11:21	CY2	ME	828016	808825	18.3	1.000	29.35	9.57	146.4	1.73	28.48	7.82	6.1
						1.000	29.31	9.47	144.8	1.89	28.54	7.82	
						9.150	26.39	5.70	86.1	1.42	35.17	7.19	8.7
						9.150	26.30	3.92	59.2	1.58	35.26	7.15	
						17.300	25.15	3.16	47.3	2.05	36.36	6.94	
						17.300	25.15	3.07	45.8	2.17	36.26	6.90	
	WY1	MF											
	WY2	MF											
	WY3	MF											
	CY1	MF											
	CY2	MF											

Remarks: MF - Middle Flood tida
ME - Middle Ebb tida

Contract No. DC/2009/13

Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan

AUES

Marine Water Quality Monitoring Result at Yung Shue Wan

Date 18-Aug-12

Date / Time	Location	Tide*	Co-ordinates		Water Depth	Sampling Depth	Temp	DO Conc	DO Saturation	Turbidity	Salinity	pH	SS
			East	North	m	m	℃	mg/L	%	NTU	ppt	unit	mg/l
2012/8/18 11:46	WY1	ME	829177	809557	4.4	1.000	27.13	5.85	88.7	1.72	33.58	7.37	15.7
						1.000	27.05	5.41	82.1	1.83	33.65	7.42	
						3.400	26.74	5.76	86.9	1.71	33.76	7.44	16.5
						3.400	26.74	5.22	82.6	1.91	33.75	7.43	
2012/8/18 12:02	WY2	ME	829015	810407	8.1	1.000	27.34	6.27	99.5	1.91	33.95	7.66	7.4
						1.000	27.27	6.64	101.2	2.04	33.92	7.65	
						4.050	26.93	6.95	105.4	2.17	33.98	7.62	8.6
						4.050	26.84	7.06	106.9	2.23	34.00	7.62	
						7.100	26.73	7.35	111.0	2.42	33.99	7.59	8.5
						7.100	26.73	6.13	92.7	2.49	34.00	7.58	
2012/8/18 11:54	WY3	ME	829208	809863	4.8	1.000	27.04	5.74	87.2	1.67	33.80	7.55	13
						1.000	27.01	7.79	118.1	1.73	33.80	7.54	
						3.800	26.86	6.42	97.2	1.74	33.82	7.52	13.3
						3.800	26.81	7.98	120.7	1.77	33.85	7.49	
2012/8/18 12:15	CY1	ME	828421	810827	12.6	1.000	27.53	7.57	114.8	1.80	32.11	7.60	6.7
						1.000	27.45	7.23	109.7	1.87	32.44	7.60	
						6.300	26.94	6.16	93.5	2.12	33.94	7.56	6.3
						6.300	26.96	6.08	90.9	2.36	33.87	7.55	
						11.600	26.66	4.70	71.0	3.77	34.02	7.49	5.8
						11.600	26.68	4.78	72.2	4.00	34.02	7.46	
2012/8/18 12:45	CY2	ME	828023	808819	17.9	1.000	27.20	7.42	111.2	2.11	32.76	7.56	6.8
						1.000	27.10	7.23	109.3	2.13	32.94	7.54	
						8.950	27.22	6.69	102.0	2.22	34.14	7.49	6.7
						8.950	27.19	6.98	106.6	2.15	34.20	7.48	
						16.900	26.69	4.74	71.8	3.14	34.33	7.43	6.1
						16.900	26.68	4.48	67.8	3.09	34.32	7.41	
2012/8/18 17:01	WY1	MF	829164	809546	5.3	1.000	27.84	5.66	86.3	1.69	32.19	6.81	16.8
						1.000	27.88	6.27	95.6	1.75	32.14	6.73	
						4.300	27.80	5.61	85.5	1.74	32.46	6.70	15.3
						4.300	27.78	5.15	78.3	1.87	32.44	6.67	
2012/8/18 17:16	WY2	MF	829014	810394	9.2	1.000	27.66	4.95	75.2	2.09	32.30	7.29	12.8
						1.000	27.65	6.42	97.6	2.07	32.30	7.25	
						4.600	27.55	6.47	98.4	2.18	32.59	7.22	13.2
						4.600	27.60	5.90	89.8	2.36	32.57	7.20	
						8.200	27.37	5.77	87.7	2.72	33.12	7.07	13.7
						8.200	27.38	6.08	92.4	2.68	33.11	7.10	
2012/8/18 17:07	WY3	MF	829213	809861	5.6	1.000	27.61	6.59	100.0	1.77	32.20	7.08	14.5
						1.000	27.60	4.65	70.7	1.69	32.22	7.05	
						4.600	27.60	4.61	70.0	1.82	32.24	6.95	14.2
						4.600	27.61	5.36	81.4	1.75	32.24	6.94	
2012/8/18 17:27	CY1	MF	828416	810819	13.7	1.000	27.13	5.78	86.7	2.01	31.35	7.31	7.2
						1.000	27.12	4.33	64.7	2.05	31.05	7.30	
						6.850	27.12	4.93	73.9	1.94	31.48	7.27	6.8
						6.850	27.09	4.53	67.8	1.99	31.31	7.26	
						12.700	26.86	5.22	78.2	3.12	32.13	7.21	7.8
						12.700	26.86	5.00	75.0	3.17	32.05	7.19	
2012/8/18 17:51	CY2	MF	828021	808811	19.7	1.000	27.13	5.18	77.4	1.99	30.81	7.53	13.9
						1.000	27.13	5.61	83.9	2.08	30.79	7.51	
						9.850	26.73	5.05	75.3	2.14	31.61	7.41	13.5
						9.850	26.71	5.53	82.8	2.27	31.61	7.40	
						18.700	26.72	4.33	64.6	3.08	32.43	7.39	13.7
						18.700	27.11	4.18	62.6	2.95	31.41	7.28	

Remarks: MF - Middle Flood tida
ME - Middle Ebb tida

Contract No. DC/2009/13

Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan

AUES

Marine Water Quality Monitoring Result at Yung Shue Wan

Date 20-Aug-12

Date / Time	Location	Tide*	Co-ordinates		Water Depth	Sampling Depth	Temp	DO Conc	DO Saturation	Turbidity	Salinity	pH	SS
			East	North	m	m	℃	mg/L	%	NTU	ppt	unit	mg/l
2012/8/20 12:01	WY1	ME	829166	809547	4.5	1.000	28.78	5.46	84.3	1.83	31.81	6.96	3.0
						1.000	28.81	5.41	83.7	1.99	31.95	6.93	
						3.500	28.61	5.54	85.6	2.01	32.39	6.79	4.7
						3.500	28.28	5.23	80.6	2.19	32.66	6.80	
2012/8/20 12:15	WY2	ME	829012	810407	8.4	1.000	28.36	6.31	96.9	2.02	32.01	7.12	5.5
						1.000	28.40	7.22	110.9	2.17	32.01	7.08	
						4.200	28.22	6.88	105.6	2.08	32.33	7.05	5.1
						4.200	28.18	7.00	107.4	2.23	32.30	7.04	
						7.400	27.39	6.59	100.8	2.49	34.15	6.96	4.2
						7.400	27.08	6.77	103.2	2.75	34.43	6.94	
2012/8/20 12:07	WY3	ME	829204	809838	4.7	1.000	29.52	6.74	105.5	1.97	31.96	7.06	4.2
						1.000	29.51	6.38	99.9	2.14	32.03	7.07	
						3.700	28.16	6.01	92.2	2.62	32.58	6.95	3.4
						3.700	28.05	7.26	111.5	2.78	32.86	6.87	
2012/8/20 12:25	CY1	ME	828414	810827	12.3	1.000	29.20	7.49	114.9	1.87	29.25	7.35	3.2
						1.000	28.50	7.36	111.8	1.96	29.74	7.28	
						6.150	27.25	6.93	105.9	2.03	34.26	7.18	6.7
						6.150	27.07	6.56	100.0	2.14	34.41	7.15	
						11.300	26.68	7.07	107.1	3.96	34.69	7.07	6.1
						11.300	26.71	7.17	108.8	4.62	34.69	7.03	
2012/8/20 12:44	CY2	ME	827973	808821	17.7	1.000	28.10	7.70	117.5	2.32	31.71	7.49	2.6
						1.000	28.00	7.83	119.5	2.49	32.03	7.45	
						8.850	26.64	7.90	119.6	2.45	34.54	7.30	5.8
						8.850	26.69	7.13	108.1	2.78	34.50	7.25	
						16.700	26.61	6.43	97.4	2.88	34.68	7.18	5.2
						16.700	26.62	6.32	95.7	3.16	34.70	7.17	
2012/8/20 8:01	WY1	MF	829164	809553	5.1	1.000	27.61	4.83	73.2	1.78	31.65	7.32	5.1
						1.000	27.64	5.37	81.3	1.69	31.65	7.35	
						4.100	26.99	5.56	84.3	1.76	33.69	7.38	8.4
						4.100	26.97	6.32	95.8	1.81	33.71	7.38	
2012/8/20 8:20	WY2	MF	82900	810412	9.6	1.000	27.80	7.46	114.2	1.98	33.04	7.58	6.7
						1.000	27.79	7.37	112.7	1.99	33.09	7.56	
						4.800	27.11	7.43	112.9	1.86	33.83	7.53	8.1
						4.800	27.05	7.78	118.1	1.94	33.86	7.52	
						8.600	26.85	6.92	104.9	2.11	34.13	7.48	7.0
						8.600	26.86	7.03	106.6	2.17	34.16	7.47	
2012/8/20 8:09	WY3	MF	829208	809858	5.4	1.000	27.61	7.66	116.3	1.64	32.26	7.53	7.1
						1.000	27.61	6.53	99.1	1.69	32.22	7.51	
						4.400	26.93	5.27	79.8	1.72	33.79	7.49	6.6
						4.400	26.93	6.92	104.8	1.83	33.81	7.49	
2012/8/20 8:33	CY1	MF	828419	810783	13.2	1.000	28.13	9.03	138.7	1.93	32.64	7.57	5.7
						1.000	28.17	9.60	147.5	2.17	32.64	7.57	
						6.600	26.80	8.37	126.9	2.42	34.30	7.55	4.8
						6.600	26.77	8.76	132.8	2.85	34.32	7.52	
						12.200	26.75	8.06	122.2	3.42	34.33	7.48	13.0
						12.200	26.77	7.71	116.8	4.07	34.33	7.48	
2012/8/20 8:57	CY2	MF	828021	808815	19.8	1.000	27.83	9.87	150.7	1.84	32.43	7.50	2.5
						1.000	27.82	9.22	140.6	1.87	32.39	7.48	
						9.900	26.72	8.58	129.9	1.96	34.35	7.41	6.6
						9.900	26.74	9.12	138.2	2.13	34.36	7.40	
						18.800	26.67	7.10	107.4	2.77	34.27	7.25	4.4
						18.800	26.67	7.35	110.2	3.09	32.72	7.06	

Remarks: MF - Middle Flood tida
ME - Middle Ebb tida

Contract No. DC/2009/13

Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan

AUES

Marine Water Quality Monitoring Result at Yung Shue Wan

Date 22-Aug-12

Date / Time	Location	Tide*	Co-ordinates		Water Depth	Sampling Depth	Temp	DO Conc	DO Saturation	Turbidity	Salinity	pH	SS
			East	North	m	m	℃	mg/L	%	NTU	ppt	unit	mg/l
2012/8/22 13:14	WY1	ME	829177	809561	4.2	1.000	28.82	8.20	125.6	1.38	30.30	7.70	4.6
						1.000	28.89	7.65	117.3	1.45	30.26	7.67	
						3.200	28.16	7.33	111.7	1.72	31.17	7.61	6.3
						3.200	28.12	6.66	101.4	1.80	31.27	7.60	
2012/8/22 13:58	WY2	ME	829015	810402	12.4	1.000	28.95	7.99	122.6	1.36	30.05	7.79	5.1
						1.000	28.88	7.47	114.5	1.36	30.13	7.75	
						6.200	28.12	6.70	102.1	1.49	31.29	7.69	5.2
						6.200	28.09	6.20	94.5	1.67	31.37	7.68	
						11.400	27.45	6.04	92.0	1.82	33.30	7.63	5.9
						11.400	27.14	5.74	87.0	1.93	33.57	7.60	
2012/8/22 14:06	WY3	ME	829206	809858	17.3	1.000	28.74	8.34	127.7	1.18	30.24	7.71	4.7
						1.000	28.70	7.97	121.8	1.37	30.30	7.70	
						16.300	28.33	7.71	117.4	1.87	30.55	7.71	4.3
						16.300	28.34	7.57	115.2	2.04	30.55	7.70	
2012/8/22 13:48	CY1	ME	828424	810812	8.2	1.000	28.10	7.73	116.2	1.47	28.97	7.69	5.7
						1.000	28.07	7.46	112.1	1.43	28.97	7.67	
						4.100	28.09	7.06	108.3	1.65	32.75	7.66	9.4
						4.100	28.05	6.33	97.1	1.68	32.78	7.65	
						7.200	26.50	6.02	91.0	1.81	34.69	7.56	6.9
						7.200	26.50	5.41	81.7	1.87	34.70	7.55	
2012/8/22 13:26	CY2	ME	828018	808823	4.4	1.000	29.01	7.79	120.3	1.26	31.08	7.72	6.1
						1.000	29.25	7.29	113.0	1.34	31.02	7.71	
						2.200	26.82	6.00	91.0	1.75	34.34	7.57	6
						2.200	26.82	5.95	90.3	1.69	34.34	7.55	
						3.400	26.27	4.21	63.5	1.85	35.09	7.41	6.1
						3.400	26.25	4.09	61.7	1.97	35.11	7.40	
2012/8/22 8:21	WY1	MF	829174	809543	5.3	1.000	28.25	7.10	107.1	1.46	29.38	7.47	7.3
						1.000	28.26	6.80	102.8	1.58	29.41	7.49	
						4.300	28.28	6.04	91.5	1.62	29.92	7.50	9.4
						4.300	28.24	6.09	92.2	1.67	29.96	7.49	
2012/8/22 8:40	WY2	MF	829011	810405	9.3	1.000	29.59	7.41	114.8	1.72	29.98	7.72	4.2
						1.000	29.65	7.20	111.8	1.83	30.04	7.71	
						4.650	28.47	7.16	109.0	1.58	30.05	7.66	5.4
						4.650	28.43	6.59	100.3	1.69	30.15	7.63	
						8.300	27.57	6.27	94.6	1.92	31.20	7.58	8.7
						8.300	27.56	5.92	89.4	1.97	31.20	7.56	
2012/8/22 8:30	WY3	MF	829201	809862	5.5	1.000	29.86	7.58	118.2	1.38	30.20	7.72	6.5
						1.000	29.82	7.36	114.6	1.51	30.19	7.71	
						4.500	28.64	7.24	110.5	1.66	30.17	7.67	5.6
						4.500	28.61	6.92	105.7	1.57	30.17	7.65	
2012/8/22 9:02	CY1	MF	828410	810829	13.6	1.000	27.84	8.15	124.2	1.43	32.11	7.69	11.2
						1.000	27.84	7.59	115.7	1.52	32.07	7.66	
						6.800	27.12	6.21	94.2	1.60	33.46	7.58	14.7
						6.800	27.10	5.90	89.4	1.63	33.50	7.57	
						12.600	26.64	5.27	79.8	1.74	34.38	7.52	12.8
						12.600	26.64	5.11	77.4	1.91	34.39	7.51	
2012/8/22 9:28	CY2	MF	828025	808816	20.1	1.000	27.74	4.75	72.4	1.39	32.34	7.56	7.3
						1.000	27.72	5.19	79.0	1.52	32.37	7.56	
						10.050	26.69	5.02	75.8	1.54	34.33	7.51	15.3
						10.050	26.69	4.81	72.7	1.55	34.33	7.50	
						19.100	26.45	4.31	65.0	1.84	34.45	7.45	12.6
						19.100	26.46	4.29	64.7	1.99	34.48	7.38	

Remarks: MF - Middle Flood tida
ME - Middle Ebb tida

Contract No. DC/2009/13
Construction of Sewage Treatment Works
at Yung Shue Wan and Sok Kwu Wan

AUES

Marine Water Quality Monitoring Result at Yung Shue Wan

Date 24-Aug-12

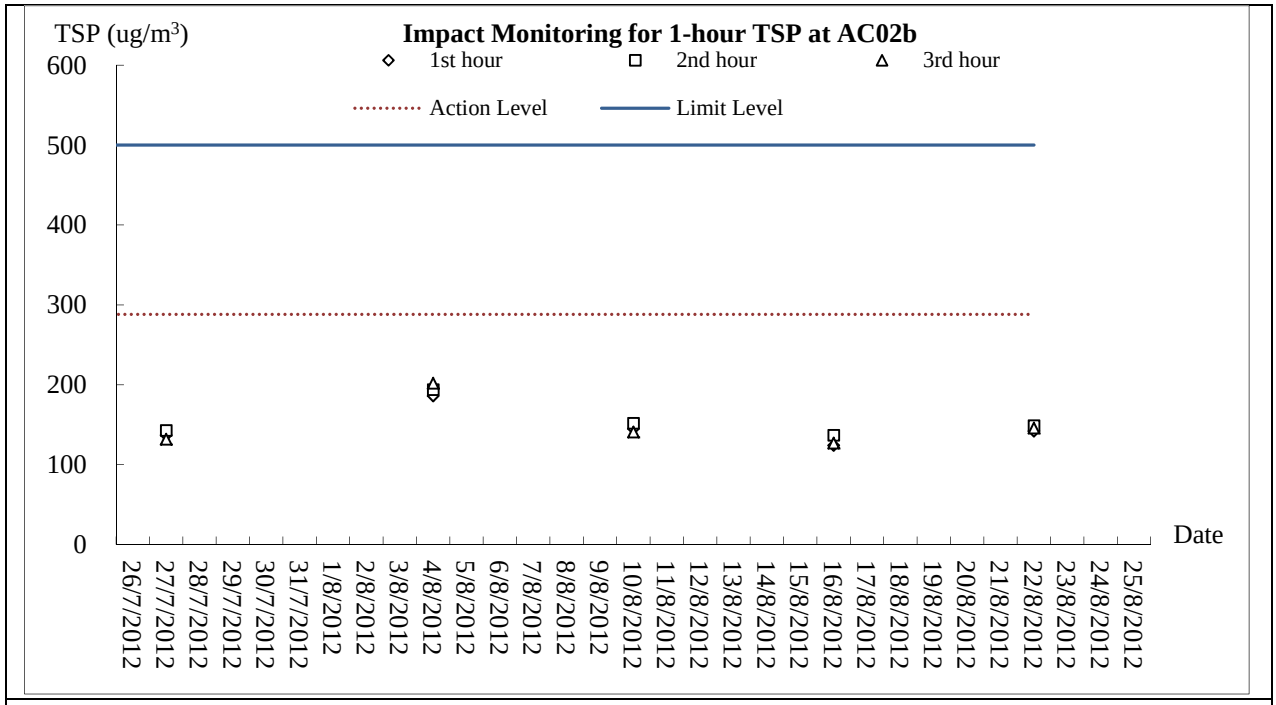
Date / Time	Location	Tide*	Co-ordinates		Water Depth	Sampling Depth	Temp	DO Conc	DO Saturation	Turbidity	Salinity	pH	SS
			East	North	m	m	℃	mg/L	%	NTU	ppt	unit	mg/l
2012/8/24 14:43	WY1	ME	829171	809556	4.4	1.000	29.57	8.20	128.1	0.92	31.62	6.64	8.2
						1.000	29.59	8.10	126.7	1.11	31.58	6.61	
						3.400	28.86	7.98	123.5	0.89	32.07	6.47	9
						3.400	28.90	7.44	115.3	0.94	32.05	6.45	
2012/8/24 15:00	WY2	ME	829022	809853	7.8	1.000	28.90	8.50	131.4	1.24	31.58	7.19	6.8
						1.000	28.88	8.50	131.3	1.20	31.61	7.18	
						3.900	28.79	8.31	128.7	1.26	32.23	7.16	10.6
						3.900	28.79	8.06	124.9	1.27	32.21	7.16	
						6.800	26.67	6.13	92.9	1.29	34.51	6.84	12.2
						6.800	26.67	5.63	85.3	1.40	34.51	6.82	
2012/8/24 14:50	WY3	ME	829205	809861	4.7	1.000	29.63	9.04	141.1	1.14	31.18	6.90	7.8
						1.000	29.58	8.59	134.0	1.32	31.22	6.90	
						3.700	28.88	7.56	117.0	1.28	31.88	6.79	12.2
						3.700	28.87	7.51	116.3	1.43	31.88	6.77	
2012/8/24 15:15	CY1	ME	828414	810823	12.3	1.000	27.96	7.35	111.8	1.71	31.40	7.15	8.1
						1.000	27.92	7.46	113.4	1.52	31.57	7.11	
						6.150	27.27	7.48	113.5	1.49	33.08	7.02	6.6
						6.150	27.32	7.19	109.2	1.55	32.94	7.01	
						11.300	26.36	6.30	94.9	1.61	34.49	6.84	7
						11.300	26.37	7.47	112.6	1.84	34.48	6.81	
2012/8/24 15:36	CY2	ME	828019	808814	17.2	1.000	27.99	8.12	123.6	1.19	31.39	6.94	8.7
						1.000	27.97	8.11	123.3	1.36	31.35	6.96	
						8.600	26.69	8.08	121.9	1.18	33.93	6.88	7.7
						8.600	26.65	7.50	113.2	1.22	33.99	6.86	
						16.200	25.62	6.24	93.2	1.79	35.24	6.71	7
						16.200	25.71	5.66	84.7	1.89	35.21	6.70	
2012/8/24 8:05	WY1	MF	829163	809557	5.3	1.000	28.48	7.97	121.6	1.13	30.28	7.32	10.8
						1.000	28.47	7.77	118.4	1.24	30.30	7.37	
						4.300	28.17	6.93	105.4	1.24	30.89	7.36	14.4
						4.300	28.16	6.75	102.6	1.29	30.89	7.36	
2012/8/24 8:21	WY2	MF	829013	810409	8.9	1.000	28.27	7.86	119.6	1.19	30.56	7.56	9.4
						1.000	28.27	7.68	117.0	1.36	30.57	7.55	
						4.450	28.08	7.45	113.5	1.31	31.27	7.51	9
						4.450	28.05	7.17	109.0	1.40	31.18	7.51	
						7.900	27.36	6.13	92.9	1.27	32.57	7.41	9.4
						7.900	27.31	5.95	90.2	1.56	32.63	7.40	
2012/8/24 8:12	WY3	MF	829210	809856	5.6	1.000	28.98	7.33	113.1	1.27	31.03	7.52	8
						1.000	28.98	7.24	111.8	1.38	31.04	7.51	
						4.600	28.19	7.14	108.8	1.45	31.16	7.47	11.3
						4.600	28.12	6.93	105.5	1.47	31.15	7.45	
2012/8/24 8:34	CY1	MF	828423	810812	13.1	1.000	27.69	7.78	117.3	1.62	30.62	7.49	4.7
						1.000	27.70	7.25	109.3	1.55	30.62	7.45	
						6.550	27.42	6.61	99.5	1.66	31.10	7.37	8.9
						6.550	27.47	6.57	98.9	1.71	31.04	7.36	
						12.100	26.72	5.91	89.3	1.64	34.16	7.30	9.3
						12.100	26.70	5.40	81.7	1.71	34.19	7.28	
2012/8/24 8:56	CY2	MF	828027	808823	19.6	1.000	28.14	8.85	134.6	1.08	31.05	7.52	4.6
						1.000	28.11	8.61	131.0	1.13	31.08	7.50	
						9.800	26.59	6.75	102.0	1.49	34.44	7.33	4.1
						9.800	26.56	6.36	96.1	1.42	34.48	7.31	
						18.600	25.86	5.28	79.1	1.93	35.16	7.18	9
						18.600	25.88	5.13	76.9	1.96	35.16	7.17	

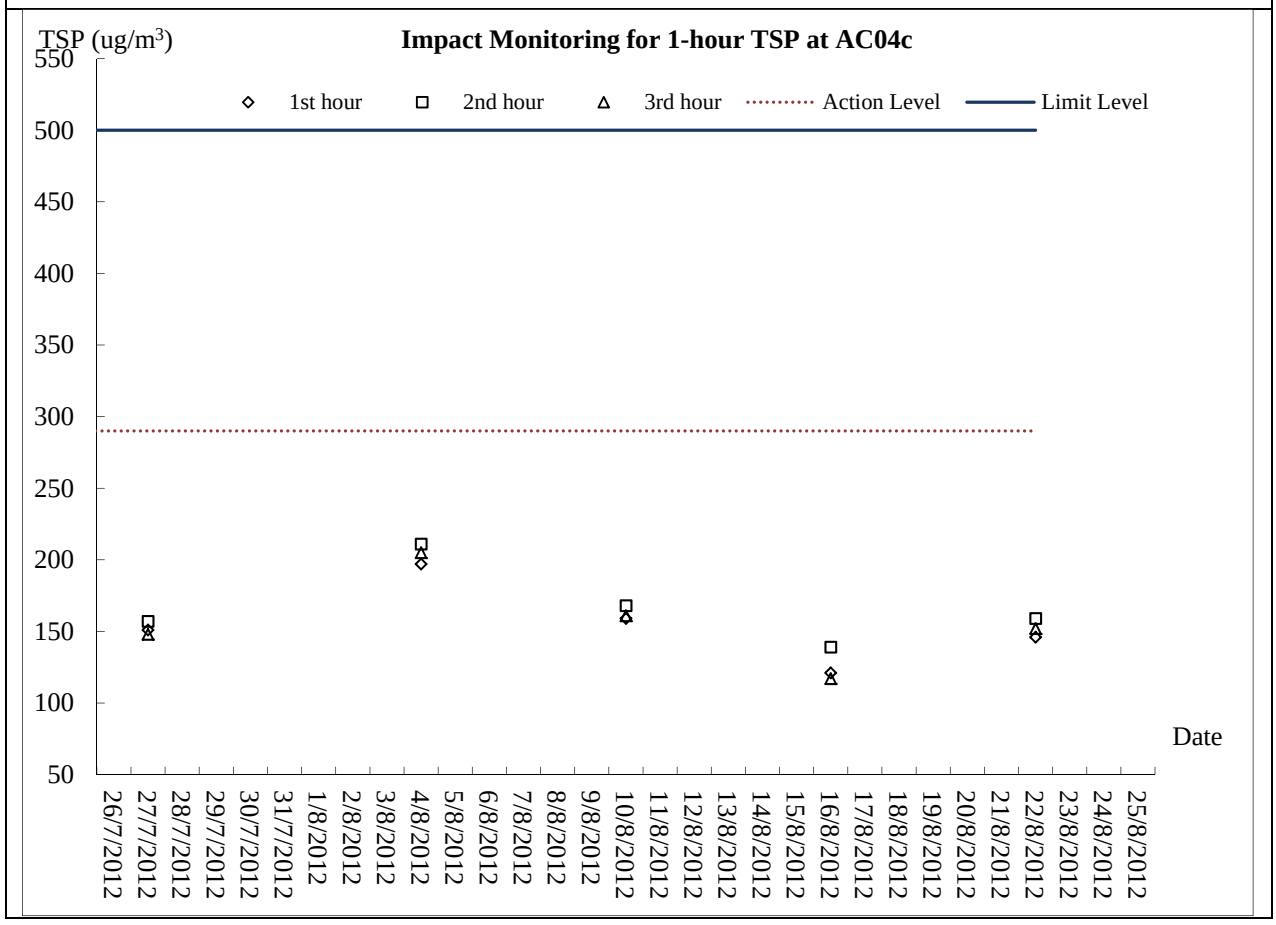
Remarks: MF - Middle Flood tida
ME - Middle Ebb tida

Appendix H

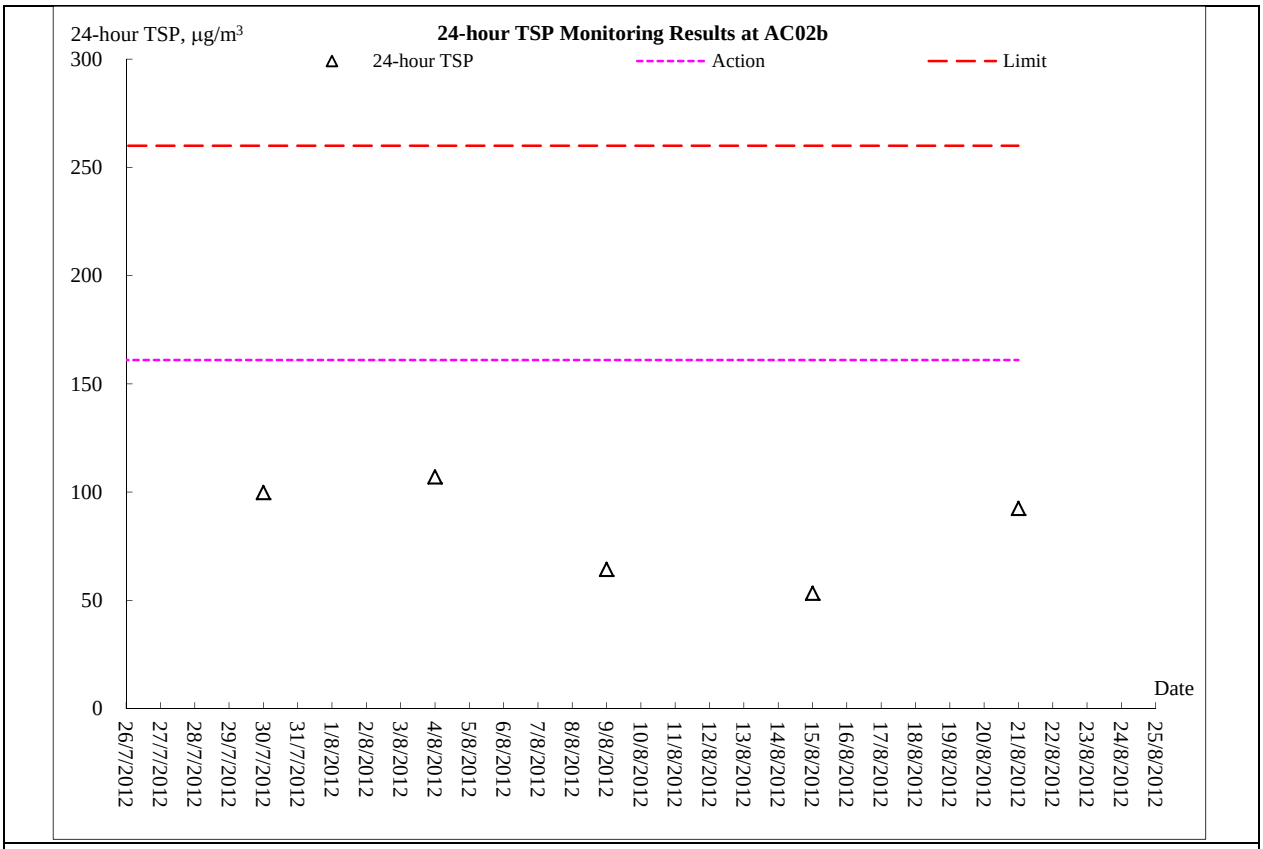
Graphical Plots of Monitoring Results

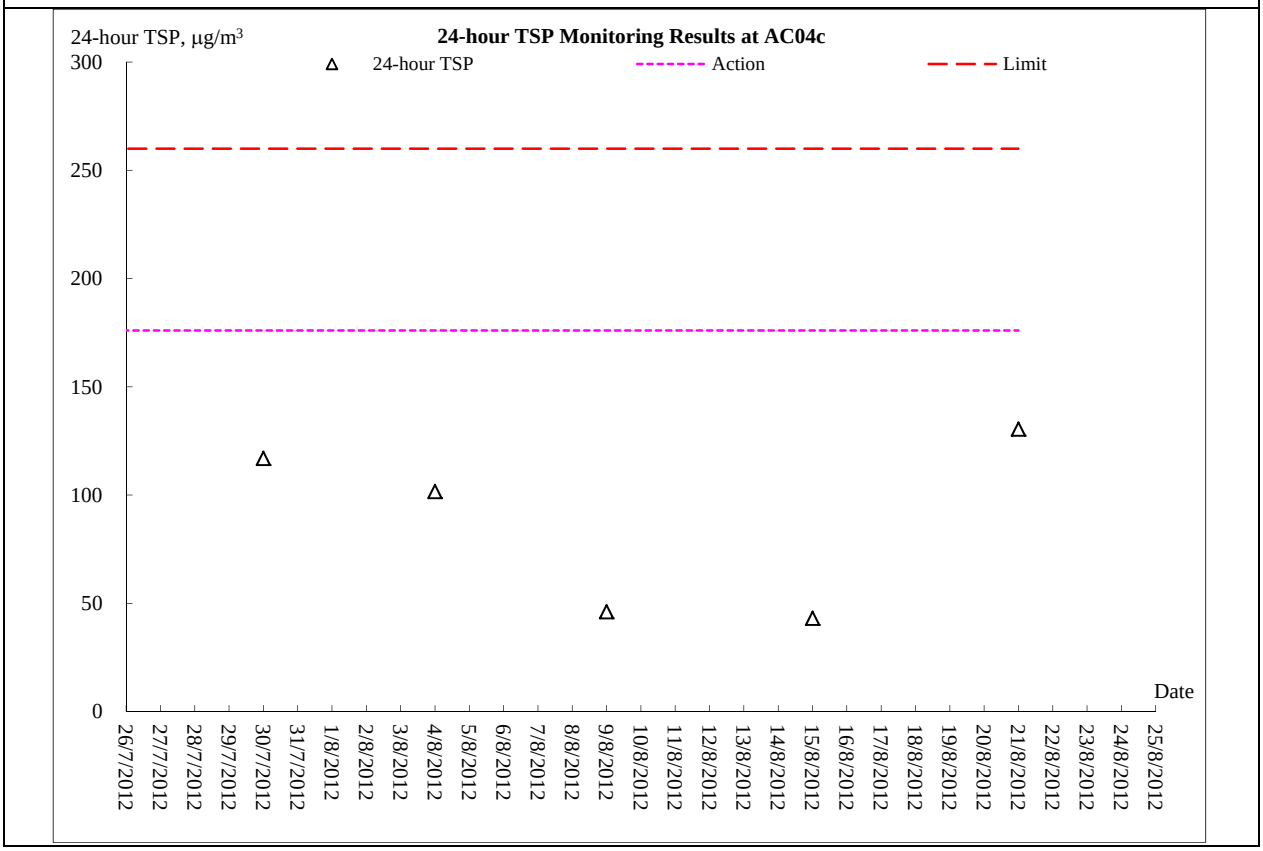
1-hour TSP Monitoring



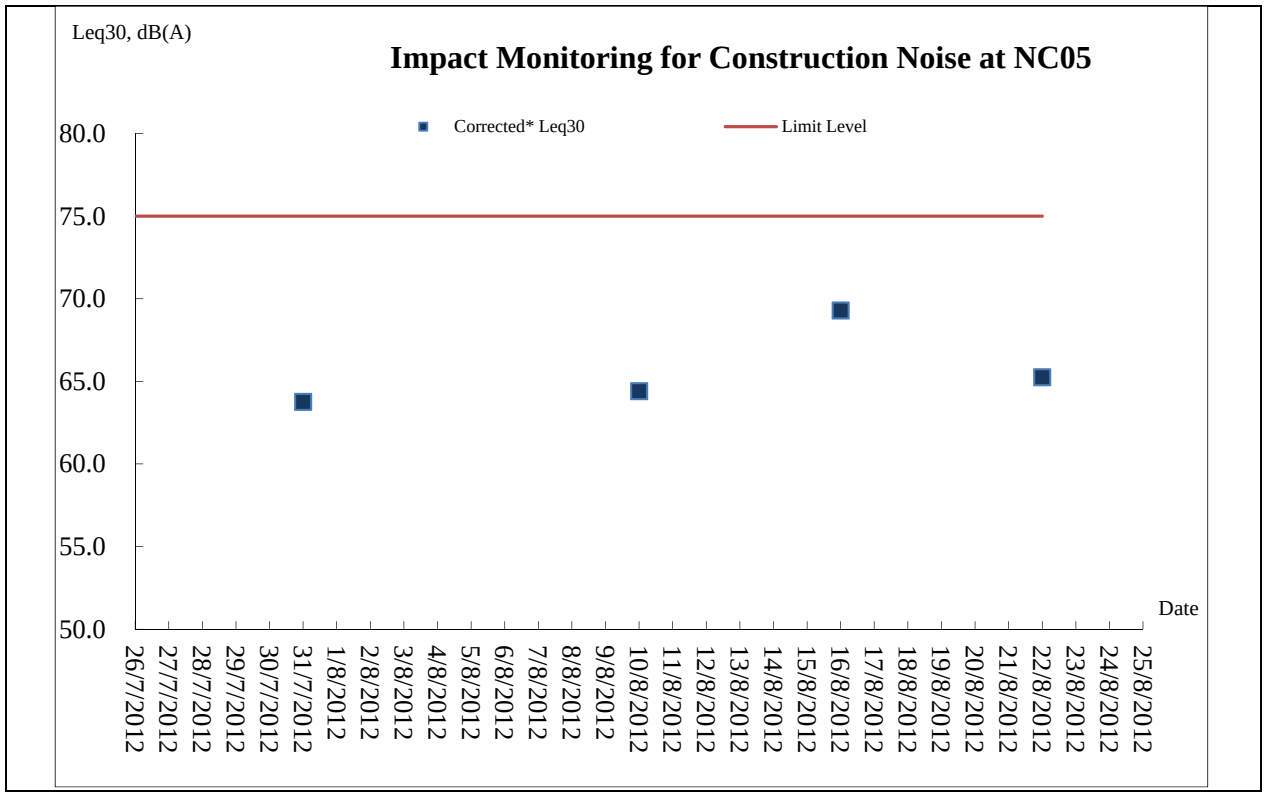


24-hour TSP Monitoring

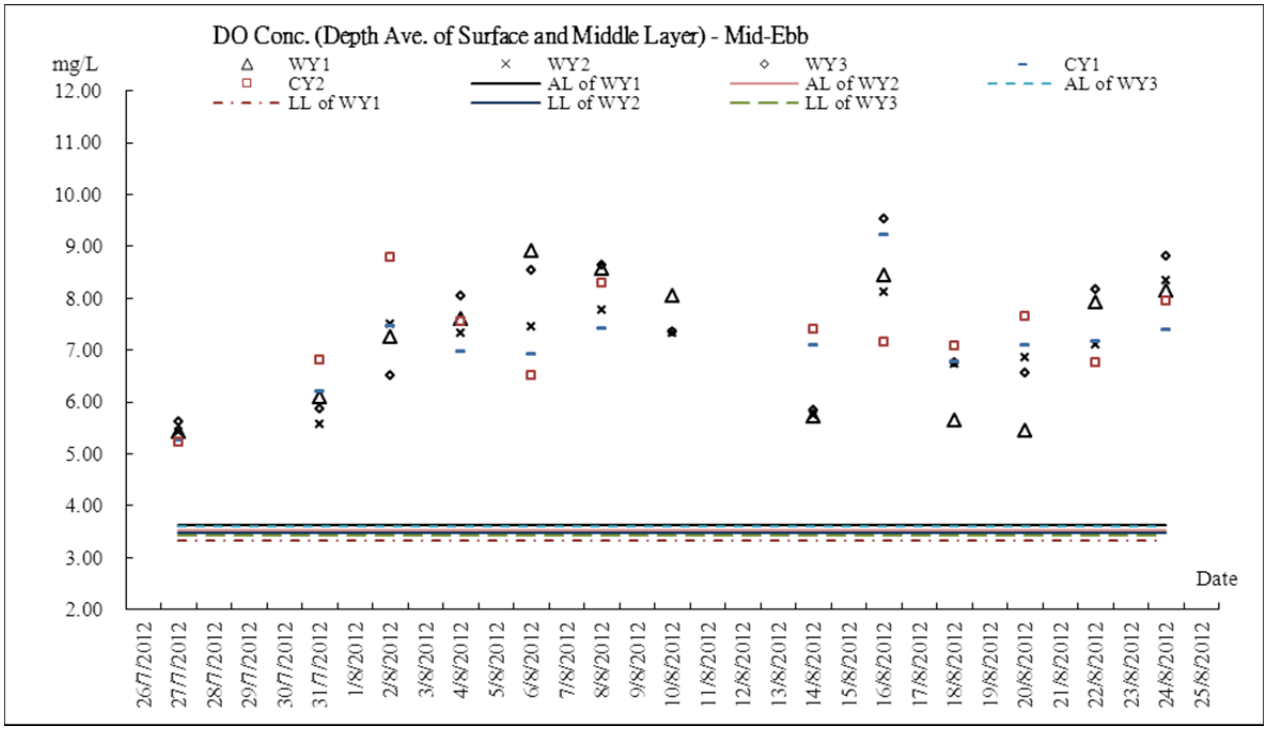


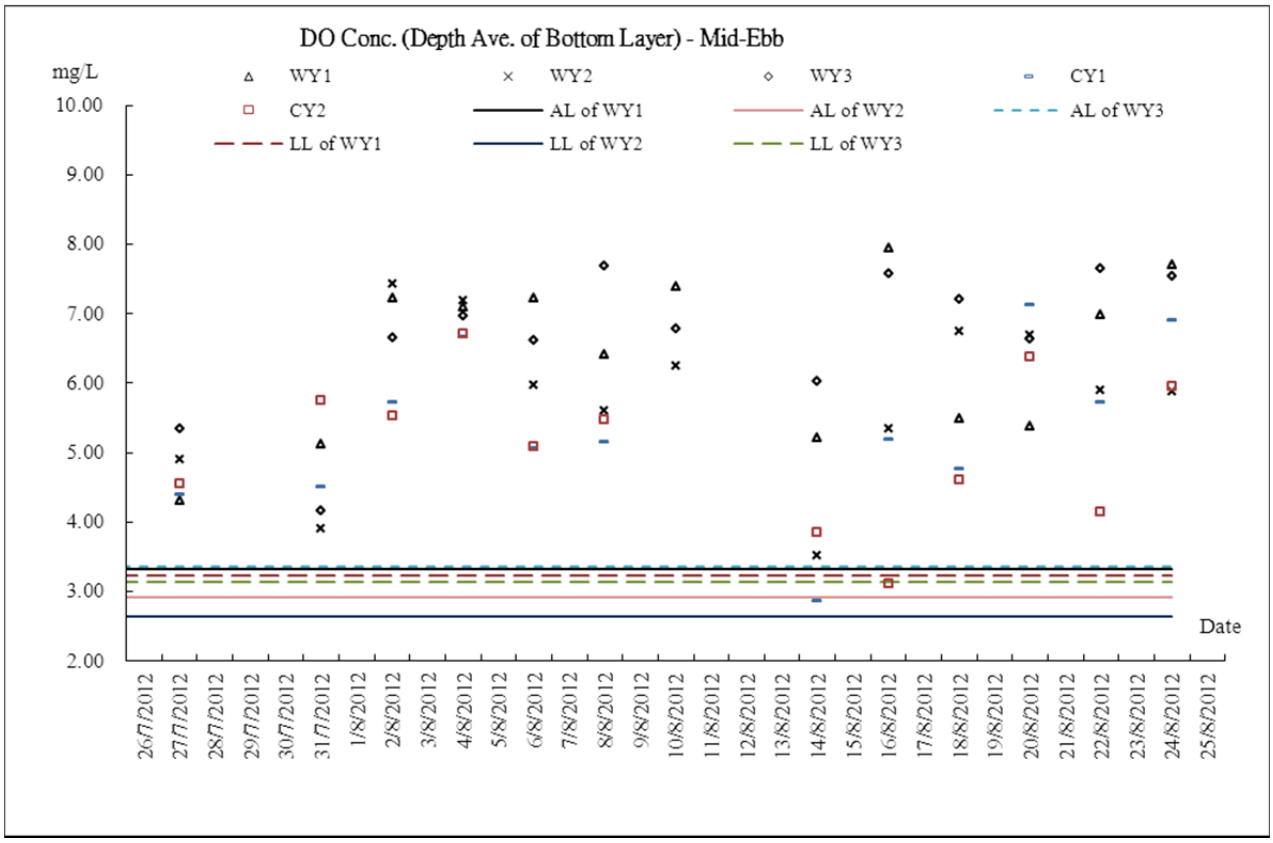


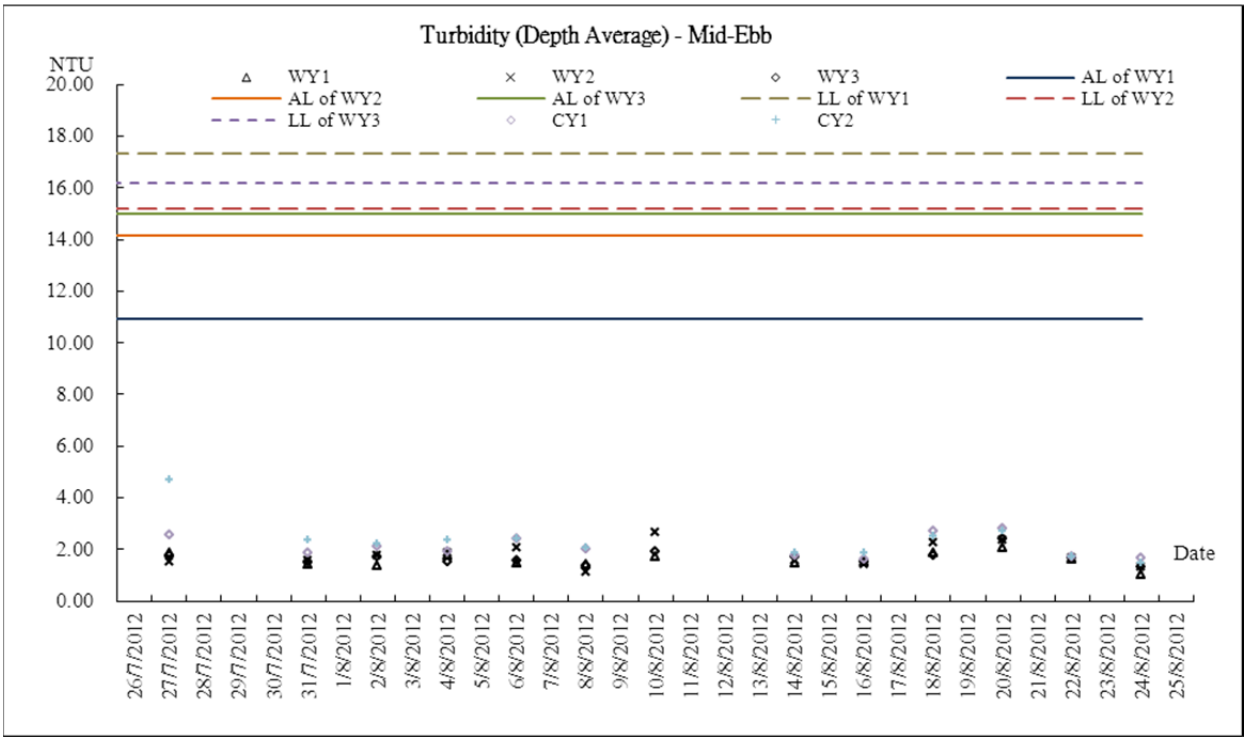
Noise Monitoring

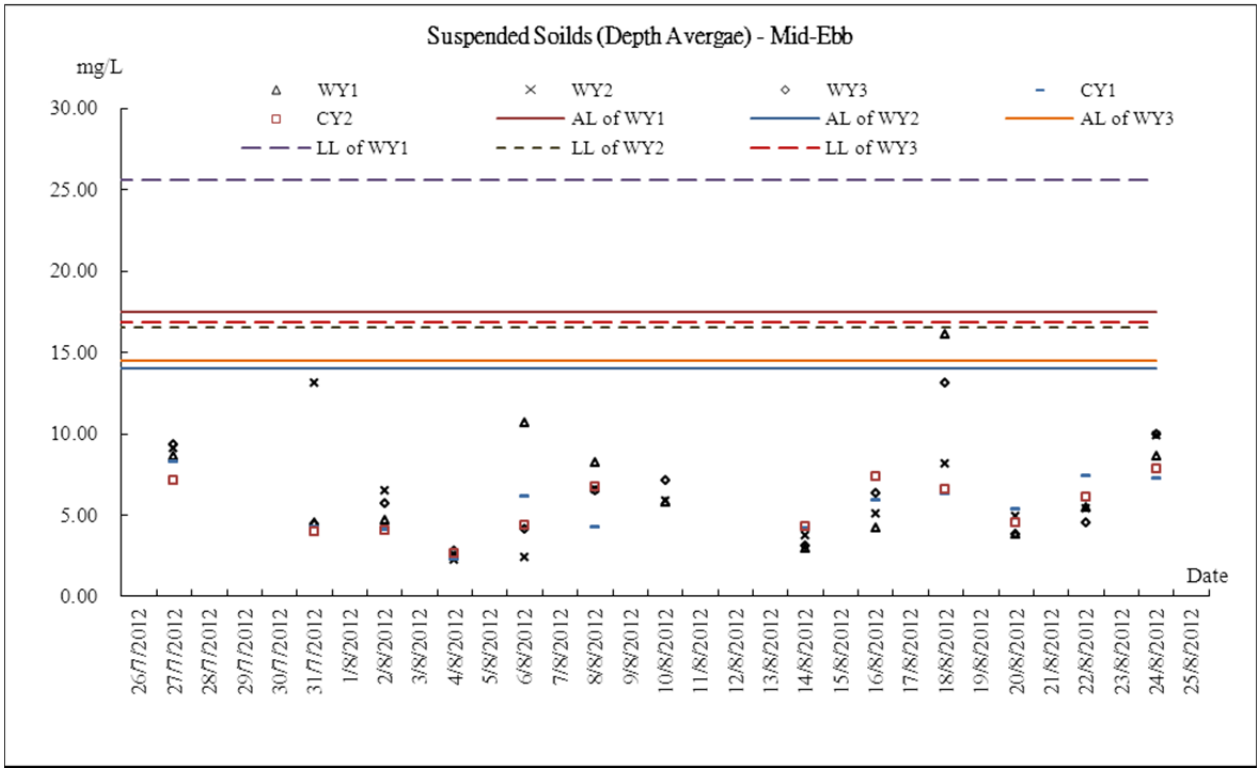


Marine Water Monitoring – Mid Ebb

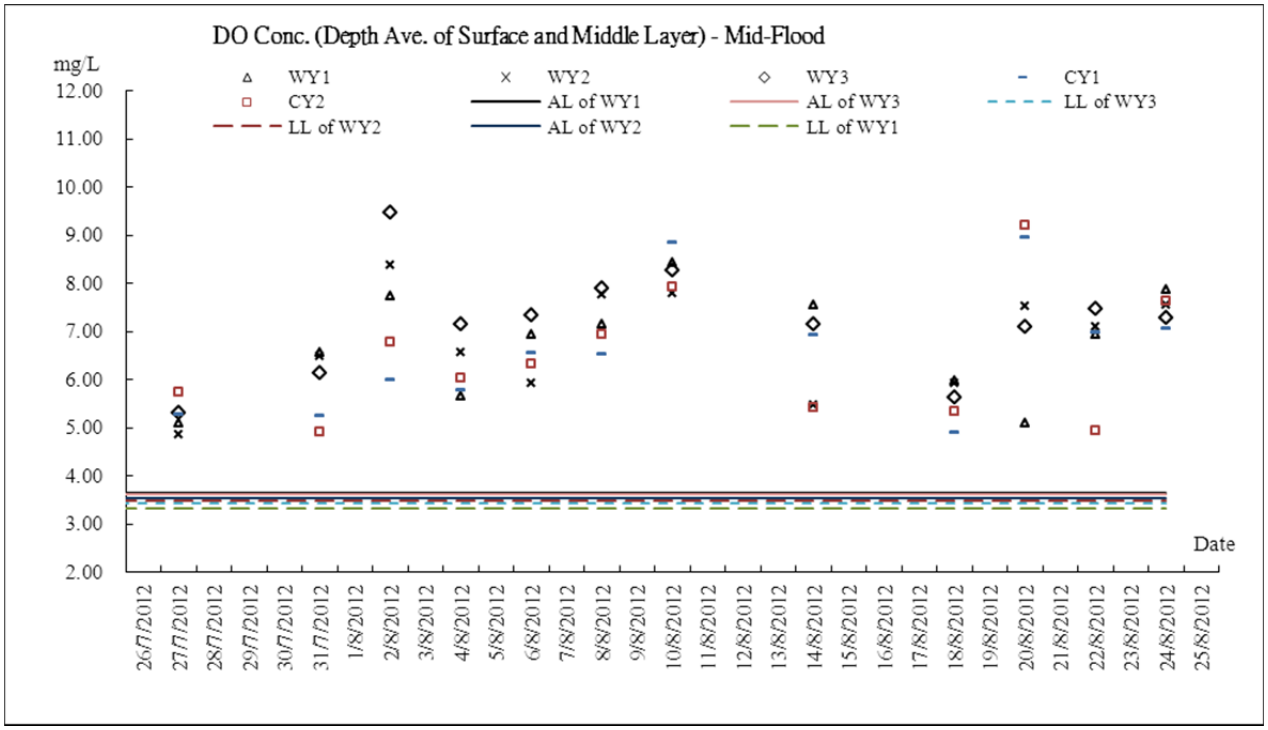


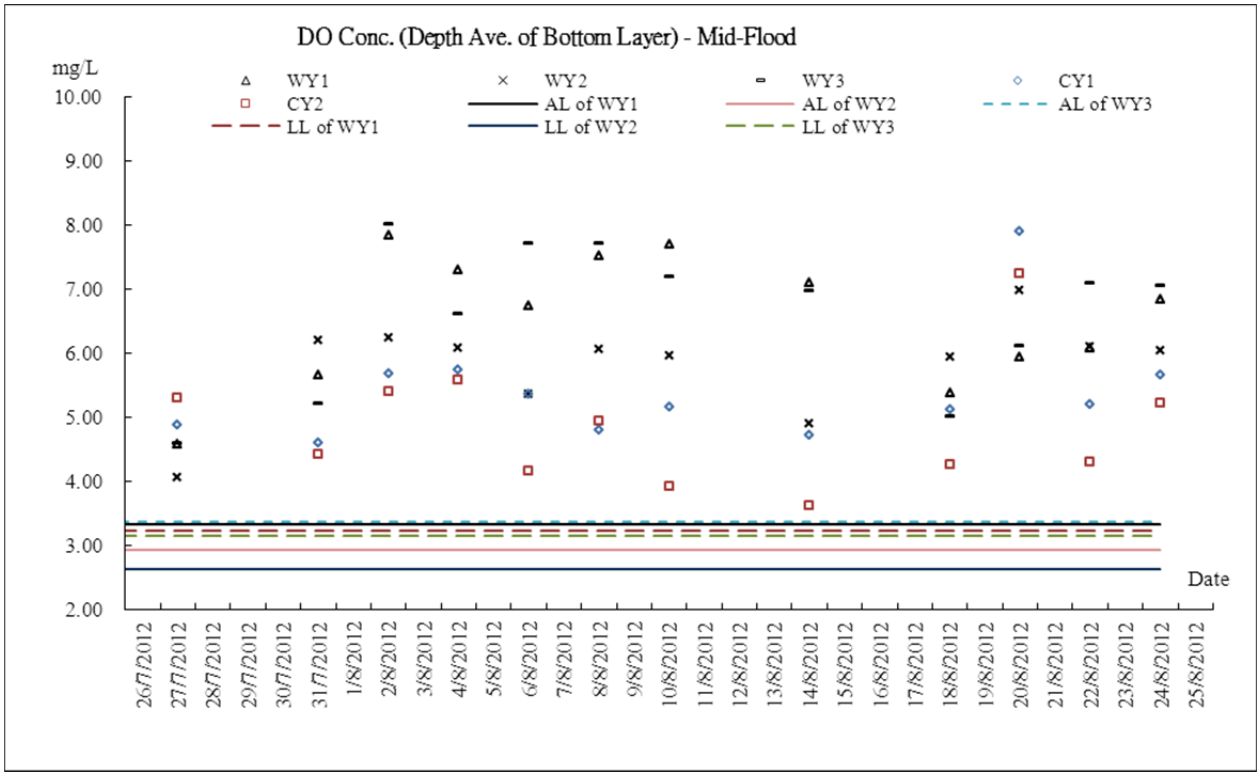


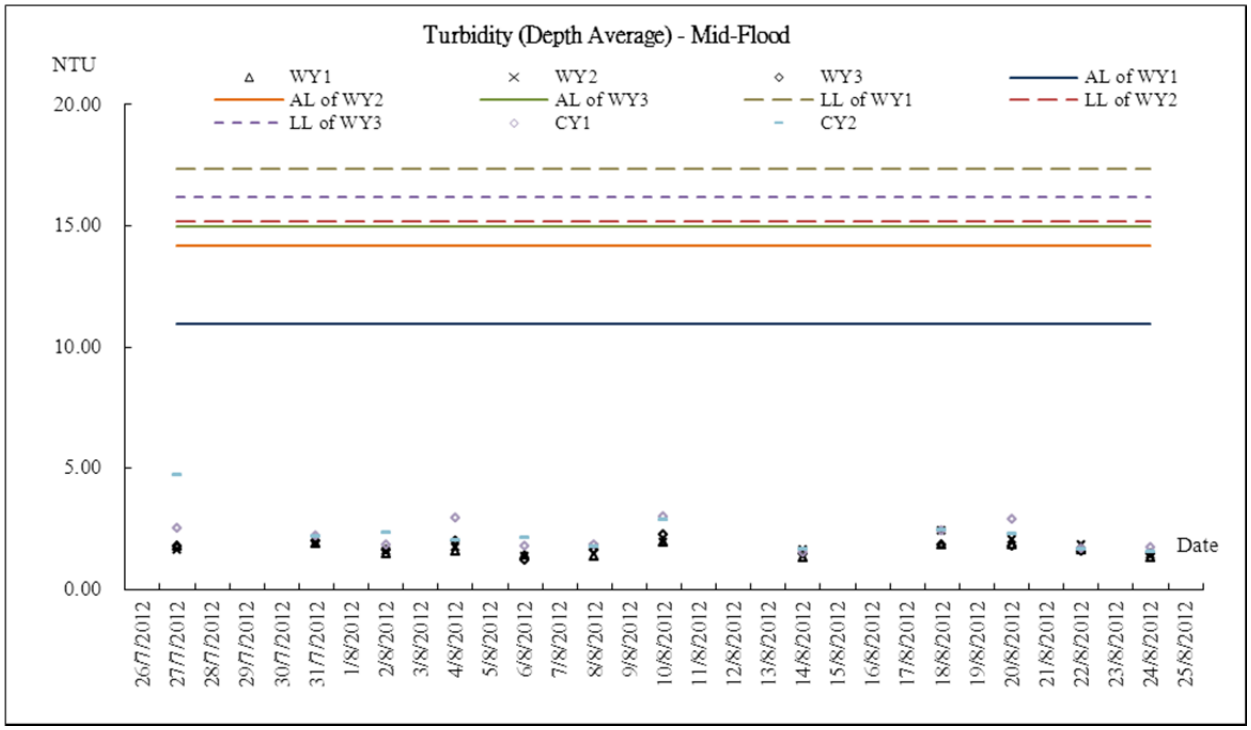

Turbidity (Depth Average) - Mid-Ebb
NTU
WY1
WY2
WY3
AL of WY1
AL of WY2
AL of WY3
LL of WY1
LL of WY2
LL of WY3
CY1
CY2
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Date
26/7/2012
27/7/2012
28/7/2012
29/7/2012
30/7/2012
31/7/2012
1/8/2012
2/8/2012
3/8/2012
4/8/2012
5/8/2012
6/8/2012
7/8/2012
8/8/2012
9/8/2012
10/8/2012
11/8/2012
12/8/2012
13/8/2012
14/8/2012
15/8/2012
16/8/2012
17/8/2012
18/8/2012
19/8/2012
20/8/2012
21/8/2012
22/8/2012
23/8/2012
24/8/2012
25/8/2012

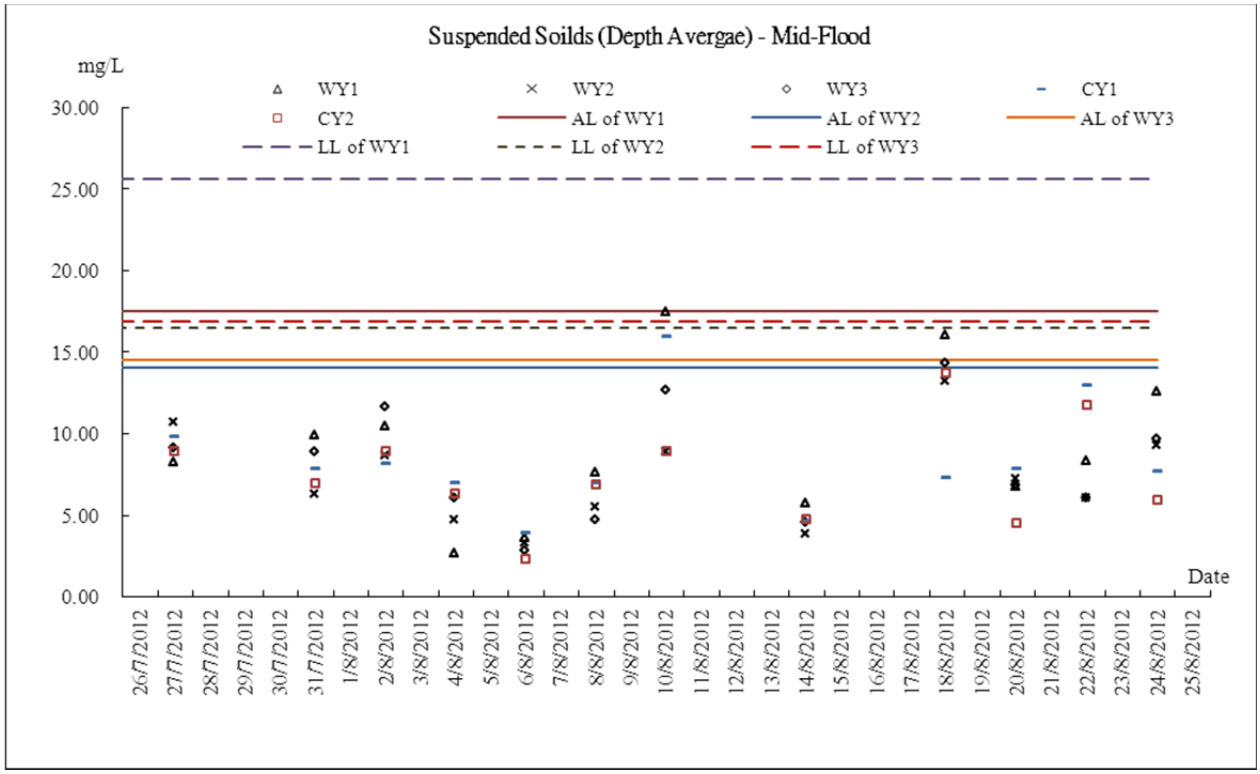

Suspended Soilds (Depth Avergae) - Mid-Ebb
mg/L
WY1
WY2
WY3
CY1
CY2
AL of WY1
AL of WY2
AL of WY3
LL of WY1
LL of WY2
LL of WY3
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Date
26/7/2012
27/7/2012
28/7/2012
29/7/2012
30/7/2012
31/7/2012
1/8/2012
2/8/2012
3/8/2012
4/8/2012
5/8/2012
6/8/2012
7/8/2012
8/8/2012
9/8/2012
10/8/2012
11/8/2012
12/8/2012
13/8/2012
14/8/2012
15/8/2012
16/8/2012
17/8/2012
18/8/2012
19/8/2012
20/8/2012
21/8/2012
22/8/2012
23/8/2012
24/8/2012
25/8/2012

Marine Water Monitoring – Mid Flood






Turbidity (Depth Average) - Mid-Flood
NTU
WY1
WY2
WY3
AL of WY1
AL of WY2
AL of WY3
LL of WY1
LL of WY2
LL of WY3
CY1
CY2
20.00
15.00
10.00
5.00
0.00
Date
26/7/2012
27/7/2012
28/7/2012
29/7/2012
30/7/2012
31/7/2012
1/8/2012
2/8/2012
3/8/2012
4/8/2012
5/8/2012
6/8/2012
7/8/2012
8/8/2012
9/8/2012
10/8/2012
11/8/2012
12/8/2012
13/8/2012
14/8/2012
15/8/2012
16/8/2012
17/8/2012
18/8/2012
19/8/2012
20/8/2012
21/8/2012
22/8/2012
23/8/2012
24/8/2012
25/8/2012


Suspended Soilds (Depth Avergae) - Mid-Flood
mg/L
WY1
WY2
WY3
CY1
CY2
AL of WY1
AL of WY2
AL of WY3
LL of WY1
LL of WY2
LL of WY3
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Date
26/7/2012
27/7/2012
28/7/2012
29/7/2012
30/7/2012
31/7/2012
1/8/2012
2/8/2012
3/8/2012
4/8/2012
5/8/2012
6/8/2012
7/8/2012
8/8/2012
9/8/2012
10/8/2012
11/8/2012
12/8/2012
13/8/2012
14/8/2012
15/8/2012
16/8/2012
17/8/2012
18/8/2012
19/8/2012
20/8/2012
21/8/2012
22/8/2012
23/8/2012
24/8/2012
25/8/2012

Appendix I

Meteorological Information

Meteorological Data Extracted from HKO during the Reporting Period

Date		Weather
26-Jul-12	Thu	Cloudy with scattered showers and a few squally thunderstorms.
27-Jul-12	Fri	Light winds.
28-Jul-12	Sat	Light winds.
29-Jul-12	Sun	Isolated showers in the afternoon
30-Jul-12	Mon	fine and very hot.
31-Jul-12	Tue	Amber Rainstorm Warning Signal
1-Aug-12	Wed	Isolated showers and thunderstorms
2-Aug-12	Thu	Sunny periods with haze.
3-Aug-12	Fri	isolated showers and one or two thunderstorms.
4-Aug-12	Sat	It will be very hot
5-Aug-12	Sun	Light to moderate westerly winds.
6-Aug-12	Mon	Isolated showers and thunderstorms
7-Aug-12	Tue	Fine and very hot but hazy.
8-Aug-12	Wed	Sunny periods with haze.
9-Aug-12	Thu	Cloudy with showers and isolated thunderstorms.
10-Aug-12	Fri	Moderate southwesterly winds.
11-Aug-12	Sat	Light to moderate southerly winds.
12-Aug-12	Sun	Mainly cloudy with showers
13-Aug-12	Mon	Light to moderate southerly winds.
14-Aug-12	Tue	Fine and very hot but hazy.
15-Aug-12	Wed	It will be very hot
16-Aug-12	Thu	Cloudy with occasional squally showers and thunderstorms.
17-Aug-12	Fri	Light winds.
18-Aug-12	Sat	Mainly fine and hot
19-Aug-12	Sun	Light winds.
20-Aug-12	Mon	Hot during the day
21-Aug-12	Tue	Sunny periods with haze
22-Aug-12	Wed	fine , very hot , hazy
23-Aug-12	Thu	isolated showers
24-Aug-12	Fri	winds moderate
25-Aug-12	Sat	very hot, fine , haze.

Appendix J

Monthly Summary Waste Flow Table

Name of Department: ~~ArchSD/CEDD/DSD/EMSD/HyD/WSD~~ **Contract No.:** **DC/2009/13**

Monthly Summary Waste Flow Table for August 2012

Month	Actual Quantities of Inert C&D Materials Generated Monthly												Actual Quantities of C&D Wastes Generated Monthly									
	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 '000m^3)		(in '000m^3)		(in '000m^3)		(in '000m^3)		(in '000m^3)		(in '000m^3)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in tonne)	
	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW
2012	10.430	33.543	0.160	0.407	0.740	1.059	0.000	0.000	9.690	32.484	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	206.870	46.690
Jan	0.000	3.311	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.311	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	22.530	5.090
Feb	0.170	6.271	0.000	0.000	0.000	0.000	0.000	0.000	0.170	6.271	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.860	5.660
Mar	0.619	4.543	0.000	0.000	0.000	0.000	0.000	0.000	0.619	4.543	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.940	9.500
Apr	0.157	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.157	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.520	1.700
May	0.353	0.916	0.000	0.000	0.000	0.000	0.000	0.000	0.353	0.916	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.750	5.090
Jun	0.091	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.091	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	26.710	6.400
Sub-total	11.820	48.585	0.160	0.410	0.740	1.059	0.000	0.000	11.080	47.526	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	294.180	80.130
Jul	0.248	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.248	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	15.610	2.960
Aug	0.144	0.999	0.000	0.000	0.000	0.999	0.000	0.000	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	19.730	3.750
Sep																						
Oct																						
Nov																						
Dec																						
Total	12.212	49.584	0.160	0.410	0.740	2.058	0.000	0.000	11.472	47.526	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	329.520	86.840
	61.795		0.569		2.798		0.000		58.998		0.000		0.000		0.000		0.000		0.000		416.360	

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

Environmental Team – Weekly Site Inspection and Audit Checklist – Yung Shue Wan

AUES

Project: TCS/00512/09
Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan

Inspected by
ETL/ ET's Representative: Ray Chang
RE's Representative: C. L. Chang
Contractor's Representative: Edwin Leung
IEC's Representative:

Checklist No. TCS512A-

Date: 31 - 7 - 2012

Time: 11am

PART A: GENERAL INFORMATION

Environmental Permit No.
☑ EP- 282/2007

Weather: ☐ Sunny ☑ Fine ☐ Cloudy ☐ Rainy
Temperature: ☐ °C
Humidity: ☐ High ☐ Moderate ☑ Low
Wind: ☐ Strong ☐ Breeze ☑ Light ☐ Calm

Area Inspected
1 Yung Shue Wan

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
Section 1: Water Quality							
1.01	Is an effluent discharge license obtained for the Project?	☐	☑	☐	☐	☐	
1.02	Is the effluent discharged in accordance with the discharge licence?	☐	☑	☐	☐	☐	
1.03	Is the discharge of turbid water avoided?	☐	☑	☐	☐	☐	
1.04	Are there proper desilting facilities in the drainage systems to reduce SS levels in effluent?	☐	☑	☐	☐	☐	
1.05	Are there channels, sandbags or bunds to direct surface run-off to sedimentation tanks?	☐	☑	☐	☐	☐	
1.06	Are there any perimeter channels provided at site boundaries to intercept storm runoff from crossing the site?	☐	☑	☐	☐	☐	
1.07	Is drainage system well maintained?	☐	☑	☐	☐	☐	
1.08	As excavation proceeds, are temporary access roads protected by crushed stone or gravel?	☐	☑	☐	☐	☐	
1.09	Are temporary exposed slopes properly covered?	☐	☑	☐	☐	☐	
1.10	Are earthworks final surfaces well compacted or protected?	☐	☑	☐	☐	☐	
1.11	Are manholes adequately covered or temporarily sealed?	☐	☑	☐	☐	☐	
1.12	Are there any procedures and equipment for rainstorm protection?	☐	☑	☐	☐	☐	
1.13	Are wheel washing facilities well maintained?	☐	☑	☐	☐	☐	
1.14	Is runoff from wheel washing facilities avoided?	☐	☑	☐	☐	☐	
1.15	Are there toilets provided on site?	☐	☐	☐	☐	☑	
1.16	Are toilets properly maintained?	☐	☐	☐	☐	☑	
1.17	Are the vehicle and plant servicing areas paved and located within roofed areas?	☐	☑	☐	☐	☐	
1.18	Is the oil/grease leakage or spillage avoided?	☐	☑	☐	☐	☐	
1.19	Are there any measures to prevent leaked oil from entering the drainage system?	☐	☑	☐	☐	☐	
1.20	Are there any measures to collect spilt cement and concrete washings during concreting works?	☐	☑	☐	☐	☐	
1.21	Are there any oil interceptors/grease traps in the drainage systems for vehicle and plant servicing areas, canteen kitchen, etc?	☐	☑	☐	☐	☐	
1.22	Are the oil interceptors/grease traps maintained properly?	☐	☑	☐	☐	☐	

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?	☐	☐	☐	☐	☑	
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 50m3 capacities for sedimentation.	☐	☐	☐	☐	☑	
1.25	No excavation is undertaken in the settlement area.	☐	☐	☐	☐	☑	
1.26	Concreting wastes water should be neutralized below the pH Action Levels before discharge.	☐	☐	☐	☐	☑	
1.27	Mobile toilets should provide on site and located away the stream course.	☐	☐	☐	☐	☑	
1.28	License collector should be employed for handling the sewage of mobile toilet.	☐	☐	☐	☐	☑	
1.29	Is ponding /stand water avoided?	☐	☑	☐	☐	☐	
Section 2: Air Quality							
2.01	Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?	☐	☑	☐	☐	☐	
2.02	Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?	☐	☑	☐	☐	☐	
2.03	Are the excavated materials sprayed with water during handling?	☐	☑	☐	☐	☐	
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?	☐	☑	☐	☐	☐	
2.06	Are the access roads sprayed with water to maintain the entire road surface wet or paved?	☐	☑	☐	☐	☐	
2.07	Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?	☐	☑	☐	☐	☐	
2.08	Is the load on vehicles covered entirely by clean impervious sheeting?	☐	☑	☐	☐	☐	
2.09	Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?	☐	☑	☐	☐	☐	
2.10	Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?	☐	☑	☐	☐	☐	
2.11	Is dark smoke emission from plant/equipment avoided?	☐	☑	☐	☐	☐	
2.12	Are de-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement?	☐	☑	☐	☐	☐	
2.13	Are site vehicles travelling within the speed limit not more than 15km/hour?	☐	☑	☐	☐	☐	
2.14	Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?	☐	☑	☐	☐	☐	
2.15	Is open burning avoided?	☐	☑	☐	☐	☐	
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.	☐	☑	☐	☐	☐	
Section 3: Noise							
3.01	Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?	☐	☑	☐	☐	☐	
3.02	Is silenced equipment adopted?	☐	☑	☐	☐	☐	
3.03	Is idle equipment turned off or throttled down?	☐	☑	☐	☐	☐	
3.04	Are all plant and equipment well maintained and in good condition?	☐	☑	☐	☐	☐	
3.05	Are noise barriers or enclosures provided at areas where construction activities cause noise impact on sensitive receivers?	☐	☑	☐	☐	☐	
3.06	Are hand held breakers fitted with valid noise emission labels during operation?	☐	☑	☐	☐	☐	
3.07	Are air compressors fitted with valid noise emission labels during operation?	☐	☑	☐	☐	☐	
3.08	Are flaps and panels of mechanical equipment closed during operation?	☐	☑	☐	☐	☐	

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
3.09	Are Construction Noise Permit(s) applied for percussive piling works?	☐	☑	☐	☐	☐	
3.10	Are Construction Noise Permit(s) applied for general construction works during restricted hours?	☐	☑	☐	☐	☐	
3.11	Are valid Construction Noise Permit(s) posted at site entrances?	☐	☑	☐	☐	☐	
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).	☐	☑	☐	☐	☐	
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)	☐	☐	☐	☐	☑	
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).	☐	☐	☐	☐	☑	
	Section 4: Waste/Chemical Management						
4.01	Waste Management Plan had been submit to Engineer for approval.	☐	☑	☐	☐	☐	
4.02	Are receptacles available for general refuse collection?	☐	☑	☐	☐	☐	
4.03	Is general refuse sorting or recycling implemented?	☐	☑	☐	☐	☐	
4.04	Is general refuse disposed of properly and regularly?	☐	☑	☐	☐	☐	
4.05	Is the Contractor registered as a chemical waste producer?	☐	☑	☐	☐	☐	
4.06	Are the chemical waste containers and storage area properly labelled?	☐	☑	☐	☐	☐	
4.07	Are the chemical wastes stored in proper storage areas?	☐	☑	☐	☐	☒	
4.08	Is the chemical container or equipment provided with drip tray?	☐	☑	☐	☐	☐	
4.09	Is the chemical waste storage area used for storage of chemical waste only?	☐	☑	☐	☐	☐	
4.10	Are incompatible chemical wastes stored in different areas?	☐	☑	☐	☐	☐	
4.11	Are the chemical wastes disposed of by licensed collectors?	☐	☑	☐	☐	☐	
4.12	Are trip tickets for chemical wastes disposal available for inspection?	☐	☑	☐	☐	☐	
4.13	Are chemical/fuel storage areas bounded?	☐	☑	☐	☐	☐	
4.14	Are designated areas identified for storage and sorting of construction wastes?	☐	☑	☐	☐	☐	
4.15	Are construction wastes sorted (inert and non-inert) on site?	☐	☑	☐	☐	☐	
4.16	Are construction wastes reused?	☐	☑	☐	☐	☐	
4.17	Are construction wastes disposed of properly?	☐	☑	☐	☐	☐	
4.18	Are site hoardings and signboards made of durable materials instead of timber?	☐	☑	☐	☐	☐	
4.19	Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?	☐	☑	☐	☐	☐	
4.20	Are appropriate procedures followed if contaminated material exists?	☐	☑	☐	☐	☐	
4.21	Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?	☐	☑	☐	☐	☐	
4.22	Site cleanliness and appropriate waste management training had provided for the site workers.	☐	☑	☐	☐	☐	
4.23	Contaminated sediments will managed according to WBTC No.12/2000 and EWTB TC(W) No. 34/2002.	☐	☐	☐	☐	☑	
	Section 5: Landscape & Visual						
5.01	Are retained and transplanted trees in health condition?	☐	☐	☐	☐	☑	

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
5.02	Are retained and transplanted trees properly protected?	☐	☐	☐	☐	☑	
5.03	Are surgery works carried out for the damaged trees?	☐	☐	☐	☐	☑	
5.04	Is damage to trees outside site boundary due to construction activities avoided?	☐	☑	☐	☐	☑	
5.05	Is the night-time lighting controlled to minimize glare to sensitive receivers?	☐	☑	☐	☐	☐	
Section 7: Others							
7.01	Are relevant Environmental Permits posted at all vehicle site entrances/exits?	☐	☑	☐	☐	☐	
7.02	Are the warning sign or larvicidal oil record shown clearly at the construction site?	☐	☑	☐	☐	☐	

(Yung Shue Wan)

Remarks

Findings of Site Inspection (31-7-2015): **Follow up:**

No environmental issue is observed during inspection.

IEC's representative	*RE's roprosentative*	*ET's representative*	*EO's representative*	*Contractor's representative*
( )	(C.C. CHEUNG)	(Ray Cheung)	(H.S. Leung)	( )

Environmental Team – Weekly Site Inspection and Audit Checklist – Yung Shue Wan

AUES

Project: TCS/00512/09
Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan

Inspected by
ETL/ ET's Representative: Ray Cheung
RE's Representative: C. C. Cheung
Contractor's Representative: Edwin Leung
IEC's Representative:

Checklist No. TCS512A-

Date: 7-8-2012

Time: 12:00pm

PART A: **GENERAL INFORMATION**

Environmental Permit No.
☑ EP- 282/2007

Weather: ☐ Sunny ☐ Fine ☐ Cloudy ☐ Rainy
Temperature: ____ °C
Humidity: ☐ High ☐ Moderate ☐ Low
Wind: ☐ Strong ☐ Breeze ☐ Light ☐ Calm

Area Inspected
1 Yung Shue Wan

PART B: **SITE AUDIT**

		Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
Note:	**Not Obs.**: Not Observed; **Yes**: Compliance; **No**: Non-Compliance; **Follow Up**: Observations requiring follow-up actions **N/A**: Not Applicable						
Section 1: Water Quality							
1.01	Is an effluent discharge license obtained for the Project?	☐	☑	☐	☐	☐	
1.02	Is the effluent discharged in accordance with the discharge licence?	☐	☑	☐	☐	☐	
1.03	Is the discharge of turbid water avoided?	☐	☑	☐	☐	☐	
1.04	Are there proper desilting facilities in the drainage systems to reduce SS levels in effluent?	☐	☑	☐	☐	☐	
1.05	Are there channels, sandbags or bunds to direct surface run-off to sedimentation tanks?	☐	☑	☐	☐	☐	
1.06	Are there any perimeter channels provided at site boundaries to intercept storm runoff from crossing the site?	☐	☑	☐	☐	☐	
1.07	Is drainage system well maintained?	☐	☑	☐	☑	☐	Remark 1
1.08	As excavation proceeds, are temporary access roads protected by crushed stone or gravel?	☐	☑	☐	☐	☐	
1.09	Are temporary exposed slopes properly covered?	☐	☑	☐	☐	☐	
1.10	Are earthworks final surfaces well compacted or protected?	☐	☑	☐	☐	☐	
1.11	Are manholes adequately covered or temporarily sealed?	☐	☑	☐	☐	☐	
1.12	Are there any procedures and equipment for rainstorm protection?	☐	☑	☐	☐	☐	
1.13	Are wheel washing facilities well maintained?	☐	☑	☐	☐	☐	
1.14	Is runoff from wheel washing facilities avoided?	☐	☑	☐	☐	☐	
1.15	Are there toilets provided on site?	☐	☑	☐	☐	☐	
1.16	Are toilets properly maintained?	☐	☑	☐	☐	☐	
1.17	Are the vehicle and plant servicing areas paved and located within roofed areas?	☐	☑	☐	☐	☐	
1.18	Is the oil/grease leakage or spillage avoided?	☐	☑	☐	☐	☐	
1.19	Are there any measures to prevent leaked oil from entering the drainage system?	☐	☑	☐	☐	☐	
1.20	Are there any measures to collect spilt cement and concrete washings during concreting works?	☐	☑	☐	☐	☐	
1.21	Are there any oil interceptors/grease traps in the drainage systems for vehicle and plant servicing areas, canteen kitchen, etc?	☐	☑	☐	☐	☐	
1.22	Are the oil interceptors/grease traps maintained properly?	☐	☑	☐	☐	☐	

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?	☐	☐	☐	☐	☑	
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 50m3 capacities for sedimentation.	☐	☐	☐	☐	☑	
1.25	No excavation is undertaken in the settlement area.	☐	☐	☐	☐	☑	
1.26	Concreting wastes water should be neutralized below the pH Action Levels before discharge.	☐	☐	☐	☐	☑	
1.27	Mobile toilets should provide on site and located away the stream course.	☐	☑	☐	☐	☐	
1.28	License collector should be employed for handling the sewage of mobile toilet.	☐	☑	☐	☐	☐	
1.29	Is ponding /stand water avoided?	☐	☒	☑	☐	☐	Remark 2
Section 2: Air Quality							
2.01	Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?	☐	☑	☐	☐	☐	
2.02	Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?	☐	☑	☐	☐	☐	
2.03	Are the excavated materials sprayed with water during handling?	☐	☑	☐	☐	☐	
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?	☐	☑	☐	☐	☐	
2.06	Are the access roads sprayed with water to maintain the entire road surface wet or paved?	☐	☑	☐	☐	☐	
2.07	Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?	☐	☑	☐	☐	☐	
2.08	Is the load on vehicles covered entirely by clean impervious sheeting?	☐	☑	☐	☐	☐	
2.09	Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?	☐	☑	☐	☐	☐	
2.10	Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?	☐	☑	☐	☐	☐	
2.11	Is dark smoke emission from plant/equipment avoided?	☐	☑	☐	☐	☐	
2.12	Are de-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement?	☐	☑	☐	☐	☐	
2.13	Are site vehicles travelling within the speed limit not more than 15km/hour?	☐	☑	☐	☐	☐	
2.14	Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?	☐	☑	☐	☐	☐	
2.15	Is open burning avoided?	☐	☑	☐	☐	☐	
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.	☐	☑	☐	☐	☐	
Section 3: Noise							
3.01	Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?	☐	☑	☐	☐	☐	
3.02	Is silenced equipment adopted?	☐	☑	☐	☐	☐	
3.03	Is idle equipment turned off or throttled down?	☐	☑	☐	☐	☐	
3.04	Are all plant and equipment well maintained and in good condition?	☐	☑	☐	☐	☐	
3.05	Are noise barriers or enclosures provided at areas where construction activities cause noise impact on sensitive receivers?	☐	☑	☐	☐	☐	
3.06	Are hand held breakers fitted with valid noise emission labels during operation?	☐	☑	☐	☐	☐	
3.07	Are air compressors fitted with valid noise emission labels during operation?	☐	☑	☐	☐	☐	
3.08	Are flaps and panels of mechanical equipment closed during operation?	☐	☑	☐	☐	☐	

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
3.09	Are Construction Noise Permit(s) applied for percussive piling works?	☐	☑	☐	☐	☐	
3.10	Are Construction Noise Permit(s) applied for general construction works during restricted hours?	☐	☑	☐	☐	☐	
3.11	Are valid Construction Noise Permit(s) posted at site entrances?	☐	☑	☐	☐	☐	
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).	☐	☑	☐	☐	☐	
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)	☐	☐	☐	☐	☑	
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).	☐	☐	☐	☐	☑	
Section 4: Waste/Chemical Management							
4.01	Waste Management Plan had been submit to Engineer for approval.	☐	☑	☐	☐	☐	
4.02	Are receptacles available for general refuse collection?	☐	☑	☐	☐	☐	
4.03	Is general refuse sorting or recycling implemented?	☐	☑	☐	☐	☐	
4.04	Is general refuse disposed of properly and regularly?	☐	☑	☐	☐	☐	
4.05	Is the Contractor registered as a chemical waste producer?	☐	☑	☐	☐	☐	
4.06	Are the chemical waste containers and storage area properly labelled?	☐	☑	☐	☐	☐	
4.07	Are the chemical wastes stored in proper storage areas?	☐	☑	☐	☐	☐	
4.08	Is the chemical container or equipment provided with drip tray?	☐	☑	☐	☐	☐	
4.09	Is the chemical waste storage area used for storage of chemical waste only?	☐	☑	☐	☐	☐	
4.10	Are incompatible chemical wastes stored in different areas?	☐	☑	☐	☐	☐	
4.11	Are the chemical wastes disposed of by licensed collectors?	☐	☑	☐	☐	☐	
4.12	Are trip tickets for chemical wastes disposal available for inspection?	☐	☑	☐	☐	☐	
4.13	Are chemical/fuel storage areas bounded?	☐	☑	☐	☐	☐	
4.14	Are designated areas identified for storage and sorting of construction wastes?	☐	☑	☐	☐	☐	
4.15	Are construction wastes sorted (inert and non-inert) on site?	☐	☑	☐	☐	☐	
4.16	Are construction wastes reused?	☐	☑	☐	☐	☐	
4.17	Are construction wastes disposed of properly?	☐	☑	☐	☐	☐	
4.18	Are site hoardings and signboards made of durable materials instead of timber?	☐	☑	☐	☐	☐	
4.19	Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?	☐	☑	☐	☐	☐	
4.20	Are appropriate procedures followed if contaminated material exists?	☐	☑	☐	☐	☐	
4.21	Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?	☐	☑	☐	☐	☐	
4.22	Site cleanliness and appropriate waste management training had provided for the site workers.	☐	☑	☐	☐	☐	
4.23	Contaminated sediments will managed according to WBTC No.12/2000 and EWTB TC(W) No. 34/2002.	☐	☐	☐	☐	☑	
Section 5: Landscape & Visual							
5.01	Are retained and transplanted trees in health condition?	☐	☐	☐	☐	☑	

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
5.02	Are retained and transplanted trees properly protected?	☐	☐	☐	☐	☑	
5.03	Are surgery works carried out for the damaged trees?	☐	☐	☐	☐	☑	
5.04	Is damage to trees outside site boundary due to construction activities avoided?	☐	☑	☐	☐	☐	
5.05	Is the night-time lighting controlled to minimize glare to sensitive receivers?	☐	☑	☐	☐	☐	
Section 7: Others							
7.01	Are relevant Environmental Permits posted at all vehicle site entrances/exits?	☐	☑	☐	☐	☐	
7.02	Are the warning sign or larvicidal oil record shown clearly at the construction site?	☐	☑	☐	☐	☐	

(Yung Shue Wan)

Remarks

Findings of Site Inspection (7-8-2012): **Follow up:**

1. Larvaride to be placed to sedimentation tanks which are not in use and cleaning up the sediment inside is also recommended.

Sediment was removed and mosquito control measures were observed.

2. Stagnant water near wall Bay B should be removed.

Stagnant water and the container was removed.

IEC's representative	*RE's representative*	*ET's representative*	*EO's representative*	*Contractor's representative*
( )	(C.C. CHEANG)	(Ray Cheung)	(H.S. Leung)	( )

Environmental Team – Weekly Site Inspection and Audit Checklist – Yung Shue Wan

AUES

Project:	TCS/00512/09 ***Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan***	**Inspected by**	**Checklist No.** TCS512A-
		ETL/ ET's Representative:	Wong Fu Nam
		RE's Representative:	C. C. Cheung
		Contractor's Representative:	Edvin Leung
		IEC's Representative:	—
Date:	14 August 2012	**Time:**	12:00

PART A: **GENERAL INFORMATION** **Environmental Permit No.**

Weather: ☐ Sunny ☐ Fine ☑ Cloudy ☐ Rainy ☑ EP- 282/2007

Temperature: 30 °C

Humidity: ☑ High ☐ Moderate ☐ Low

Wind: ☐ Strong ☐ Breeze ☑ Light ☐ Calm

Area Inspected

1 Yung Shue Wan

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
Section 1: Water Quality							
1.01	Is an effluent discharge license obtained for the Project?	☐	☑	☐	☐	☐	
1.02	Is the effluent discharged in accordance with the discharge licence?	☐	☑	☐	☐	☐	
1.03	Is the discharge of turbid water avoided?	☐	☑	☐	☐	☐	
1.04	Are there proper desilting facilities in the drainage systems to reduce SS levels in effluent?	☐	☑	☐	☐	☐	
1.05	Are there channels, sandbags or bunds to direct surface run-off to sedimentation tanks?	☐	☑	☐	☐	☐	
1.06	Are there any perimeter channels provided at site boundaries to intercept storm runoff from crossing the site?	☐	☑	☐	☐	☐	
1.07	Is drainage system well maintained?	☐	☑	☐	☐	☐	
1.08	As excavation proceeds, are temporary access roads protected by crushed stone or gravel?	☐	☑	☐	☐	☐	
1.09	Are temporary exposed slopes properly covered?	☐	☑	☐	☐	☐	
1.10	Are earthworks final surfaces well compacted or protected?	☐	☑	☐	☐	☐	
1.11	Are manholes adequately covered or temporarily sealed?	☐	☑	☐	☐	☐	
1.12	Are there any procedures and equipment for rainstorm protection?	☐	☑	☐	☐	☐	
1.13	Are wheel washing facilities well maintained?	☐	☑	☐	☐	☐	
1.14	Is runoff from wheel washing facilities avoided?	☐	☑	☐	☐	☐	
1.15	Are there toilets provided on site?	☐	☑	☐	☐	☐	
1.16	Are toilets properly maintained?	☐	☑	☐	☐	☐	
1.17	Are the vehicle and plant servicing areas paved and located within roofed areas?	☐	☑	☐	☐	☐	
1.18	Is the oil/grease leakage or spillage avoided?	☐	☑	☐	☐	☐	
1.19	Are there any measures to prevent leaked oil from entering the drainage system?	☐	☑	☐	☐	☐	
1.20	Are there any measures to collect spilt cement and concrete washings during concreting works?	☐	☑	☐	☐	☐	
1.21	Are there any oil interceptors/grease traps in the drainage systems for vehicle and plant servicing areas, canteen kitchen, etc?	☐	☑	☐	☐	☐	
1.22	Are the oil interceptors/grease traps maintained properly?	☐	☑	☐	☐	☐	

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?	☐	☐	☐	☐	☑	
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 50m3 capacities for sedimentation.	☐	☐	☐	☐	☑	
1.25	No excavation is undertaken in the settlement area.	☐	☐	☐	☐	☑	
1.26	Concreting wastes water should be neutralized below the pH Action Levels before discharge.	☐	☐	☐	☐	☑	
1.27	Mobile toilets should provide on site and located away the stream course.	☐	☑	☐	☐	☐	
1.28	License collector should be employed for handling the sewage of mobile toilet.	☐	☑	☐	☐	☐	
1.29	Is ponding /stand water avoided?	☐	☑	☐	☐	☐	
Section 2: Air Quality							
2.01	Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?	☐	☑	☐	☐	☐	
2.02	Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?	☐	☑	☐	☐	☐	
2.03	Are the excavated materials sprayed with water during handling?	☐	☑	☐	☐	☐	
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?	☐	☑	☐	☐	☐	
2.06	Are the access roads sprayed with water to maintain the entire road surface wet or paved?	☐	☑	☐	☐	☐	
2.07	Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?	☐	☑	☐	☐	☐	
2.08	Is the load on vehicles covered entirely by clean impervious sheeting?	☐	☑	☐	☐	☐	
2.09	Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?	☐	☑	☐	☐	☐	
2.10	Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?	☐	☑	☐	☐	☐	
2.11	Is dark smoke emission from plant/equipment avoided?	☐	☑	☐	☐	☐	
2.12	Are de-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement?	☐	☑	☐	☐	☐	
2.13	Are site vehicles travelling within the speed limit not more than 15km/hour?	☐	☑	☐	☐	☐	
2.14	Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?	☐	☑	☐	☐	☐	
2.15	Is open burning avoided?	☐	☑	☐	☐	☐	
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.	☐	☑	☐	☐	☐	
Section 3: Noise							
3.01	Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?	☐	☑	☐	☐	☐	
3.02	Is silenced equipment adopted?	☐	☑	☐	☐	☐	
3.03	Is idle equipment turned off or throttled down?	☐	☑	☐	☐	☐	
3.04	Are all plant and equipment well maintained and in good condition?	☐	☑	☐	☐	☐	
3.05	Are noise barriers or enclosures provided at areas where construction activities cause noise impact on sensitive receivers?	☐	☑	☐	☐	☐	
3.06	Are hand held breakers fitted with valid noise emission labels during operation?	☐	☑	☐	☐	☐	
3.07	Are air compressors fitted with valid noise emission labels during operation?	☐	☑	☐	☐	☐	
3.08	Are flaps and panels of mechanical equipment closed during operation?	☐	☑	☐	☐	☐	

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
3.09	Are Construction Noise Permit(s) applied for percussive piling works?	☐	☑	☐	☐	☐	
3.10	Are Construction Noise Permit(s) applied for general construction works during restricted hours?	☐	☑	☐	☐	☐	
3.11	Are valid Construction Noise Permit(s) posted at site entrances?	☐	☑	☐	☐	☐	
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).	☐	☑	☐	☐	☒	
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)	☐	☐	☐	☐	☑	
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).	☐	☐	☐	☐	☑	
Section 4: Waste/Chemical Management							
4.01	Waste Management Plan had been submit to Engineer for approval.	☐	☑	☐	☐	☐	
4.02	Are receptacles available for general refuse collection?	☐	☑	☐	☐	☐	
4.03	Is general refuse sorting or recycling implemented?	☐	☒	☐	☐	☐	
4.04	Is general refuse disposed of properly and regularly?	☐	☑	☐	☐	☐	
4.05	Is the Contractor registered as a chemical waste producer?	☐	☑	☐	☐	☐	
4.06	Are the chemical waste containers and storage area properly labelled?	☐	☑	☐	☐	☐	
4.07	Are the chemical wastes stored in proper storage areas?	☐	☑	☐	☐	☐	
4.08	Is the chemical container or equipment provided with drip tray?	☐	☑	☐	☐	☐	
4.09	Is the chemical waste storage area used for storage of chemical waste only?	☐	☑	☐	☐	☐	
4.10	Are incompatible chemical wastes stored in different areas?	☐	☑	☐	☐	☐	
4.11	Are the chemical wastes disposed of by licensed collectors?	☐	☑	☐	☐	☐	
4.12	Are trip tickets for chemical wastes disposal available for inspection?	☐	☑	☐	☐	☐	
4.13	Are chemical/fuel storage areas bounded?	☐	☑	☐	☐	☐	
4.14	Are designated areas identified for storage and sorting of construction wastes?	☐	☑	☐	☐	☐	
4.15	Are construction wastes sorted (inert and non-inert) on site?	☐	☑	☐	☐	☐	
4.16	Are construction wastes reused?	☐	☑	☐	☐	☐	
4.17	Are construction wastes disposed of properly?	☐	☑	☐	☐	☐	
4.18	Are site hoardings and signboards made of durable materials instead of timber?	☐	☑	☐	☐	☐	
4.19	Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?	☐	☑	☐	☐	☐	
4.20	Are appropriate procedures followed if contaminated material exists?	☐	☑	☐	☐	☐	
4.21	Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?	☐	☑	☐	☐	☐	
4.22	Site cleanliness and appropriate waste management training had provided for the site workers.	☐	☑	☐	☐	☐	
4.23	Contaminated sediments will managed according to WBTC No.12/2000 and EWTB TC(W) No. 34/2002.	☐	☑	☐	☐	☑	
Section 5: Landscape & Visual							
5.01	Are retained and transplanted trees in health condition?	☐	☑	☐	☐	☑	

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
5.02	Are retained and transplanted trees properly protected?	☐	☐	☐	☐	☑	
5.03	Are surgery works carried out for the damaged trees?	☐	☐	☐	☐	☑	
5.04	Is damage to trees outside site boundary due to construction activities avoided?	☐	☑	☐	☐	☐	
5.05	Is the night-time lighting controlled to minimize glare to sensitive receivers?	☐	☑	☐	☐	☐	
Section 7: Others							
7.01	Are relevant Environmental Permits posted at all vehicle site entrances/exits?	☐	☑	☐	☐	☐	
7.02	Are the warning sign or larvicidal oil record shown clearly at the construction site?	☐	☑	☐	☐	☐	

(Yung Shue Wan)

Remarks

Findings of Site Inspection (14 Aug 2012):

No adverse environmental impacts were observed during the site inspection. However, full implementation of the required mitigation measures is reminded.

Follow up: ~~Mosquito control measures were observed. Sediment was removed.~~ N/A

IEC's representative	*RE's representative*	*ET's representative*	*EO's representative*	*Contractor's representative*
( )	(C.C. CHEUNG)	(Wong Fu Nam)	(H.S. Leung)	( )

Appendix L

Implementation Schedule of Mitigation Measures

Implementation Schedule of Air Quality Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages**			Relevant Legislation & Guidelines
					D	C	O	
Construction Phase								
2.3.18	2.10.2	Adopting the following good site practices and follow the dust control requirements of the Air Pollution Control (Construction Dust) Regulation: • Stockpiles of imported material kept on site should be contained within hoardings, dampened and / or covered during dry and windy weather; • Material stockpiled alongside trenches should be covered with tarpaulins whenever works are close to village houses; • Water sprays should be used during the delivery and handling of cement, sands, aggregates and the like. • 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.	Work site / during construction	All contractors		√		TM- EIAO, APCO, Air Pollution Control (Construction Dust) Regulation
2.10.3	Section 2	1 hour and 24 hour dust monitoring and site audit	Designated air monitoring locations / throughout construction period	Contractor/ Environmental Team		√		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
N/A Not applicable

Implementation Schedule of Noise Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location/Timing	Implementation Agent	Implementation Stages **			Relevant Legislation & Guidelines
					D	C	O	
Construction Phase								
\2.4.16	3.8.2	Implementation of following measures during the sewer construction: • Use of quiet PME or method; • Restriction on the number plant (1 item for each type of plant); and • Good Site Practices ➢ Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme. ➢ 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 utilized, wherever practicable, in screening noise from on-site construction activities.	Work site /during the construction of Sewer.	Contractor		√		EIAO-TM, NCO
2.10.5 to 2.10.9	Section 35	Noise monitoring	Designated noise monitoring locations / throughout construction period	Contractor/ Environmental Team		√		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
N/A Not applicable

Implementation Schedule of Water Quality Control Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location (duration /completion of measures)	Implementation Agent	Implementation Stages**			Relevant Legislation and Guidelines
					D	C	O	
Construction Phase								
2.5.23	4.12.1	No-dig method using Horizontal Directional Drilling (HDD) would be used for the installation of main portion of outfall pipes	Marine works site / During construction of submarine outfall	Contractor		√		
4.5.38	4.12.3	Dredging Works Implementation of following measures during the dredging works: • dredging should be undertaken using closed grab dredgers with a maximum total production rate of 55m^3/hr; • 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; • dredging operation should be undertaken during ebb tide only; • 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 should 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 200mm) 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; • 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	Marine works site and at the identified water sensitive receivers/ During construction	Contractor		√		

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location (duration /completion of measures)	Implementation Agent	Implementation Stages**			Relevant Legislation and Guidelines
					D	C	O	
		• the decks of all vessels should be kept tidy and free of oil or other substances that might be accidentally or otherwise washed overboard.						
2.5.39	4.12.4	<u>Construction Run-off and Drainage</u> Implementation of the following site practices outlined in ProPECC PN 1/94 for "Construction Site Drainage" • 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 minimizing 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 should 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	Construction works sites	Contractor		√		ProPECC PN 1/94
2.5.39	4.12.5	<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.	Construction works sites	Contractor		√		

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location (duration /completion of measures)	Implementation Agent	Implementation Stages**			Relevant Legislation and Guidelines
					D	C	O	
		• 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.						
2.5.39	4.12.6	Wastewater Arising from Workforce 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		√		
2.10.10	Section 4	Water quality monitoring	Designated water monitoring locations/ throughout construction period	Contractor		√		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
N/A Not applicable

Implementation Schedule of Sediment Contamination Mitigation Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages**			Relevant Legislation & Guidelines
					D	C	O	
2.9.24	5.2.1	Carrying out Sediment Quality Investigation	Marine works site / prior to construction	DSD	√			WBTC No. 34/2002
2.9.23	5.2.1	Follow the requirement and procedures for dredged mud disposal specified under the WBTC No. 34/2002.	Marine works site / during dredging works	Contractor		√		WBTC No. 34/2002
2.9.23	5.2.2	Implement appropriate dredging methods which have been incorporated into the recommended water quality mitigation measures.	Marine works site, during dredging works	Contractor		√		
2.9.23	5.2.3	During the transportation and disposal of the dredged sediment, the following measures should be taken: • 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.	Marine works site and at the identified sensitive receivers	Contractor		√		

* 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
N/A Not applicable

Implementation Schedule of Solid Waste Management Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages **			Relevant Legislation & Guidelines
					D	C	O	
Construction Phase								
2.9.14	6.6.2	Good site practices • 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 • Training (proper waste management and chemical handling procedure) should be provided for site staffs • 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.	Work sites/During construction	Contractor		√		Waste Disposal Ordinance (Cap.54)
2.9.15	6.2.3	The Contractor will be required to open a billing account under the Construction Waste Disposal Charging Scheme, and to pay for disposal of all construction waste. The construction waste will be sent to a designated reception facility, which in this case will be YSW RTS, where drivers must present a valid chit for disposal of each load.	Work sites/During construction	Contractor		√		Waste disposal (Amendment) Ordinance 2004
2.9.16	6.2.4	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	Work sites/During construction	Contractor		√		WBTC No. 4/98, 5/98

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages **			Relevant Legislation & Guidelines
					D	C	O	
		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.						
2.9.18	6.2.5	<u>General Site Wastes</u> • A collection area for construction site waste should be provided where waste can be stored prior to removal from site • 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		√		Public Health and Municipal Services Ordinance (Cap. 132)
2.9.19	6.2.6 and 6.2.7	<u>Chemical Wastes</u> • After 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.	Work sites/During construction	Contractor		√		Waste Disposal (Chemical Waste) (General) Regulation, Code of Practice on the Packaging Labelling and Storage of Chemical Wastes

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages **			Relevant Legislation & Guidelines
					D	C	O	
		• 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						
2.9.21 and 2.9.22	6.2.8 and 6.2.9	<u>Construction and Demolition Material</u> • The C&D waste should be separated on-site into three categories: ➢ 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; ➢ C&D waste for re-use and / or recycling, the non-inert portion of the C&D material, (e.g. steel and other metals, woods, glass and plastic); ➢ C&D waste which cannot be re-used and / or recycled (e.g. wood, glass and plastic) • Where possible, inert material should be re-used on-site • Where practicable, steel and other metals should be separated for re-use and/or recycling prior to disposal of C&D material	During all construction phases	Contractors		√		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
N/A Not applicable

Implementation Schedule of Ecological Impact Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages			Relevant Legislation & Guidelines
					D	C	O	
Construction Phase								
2.10.11 and 2.10.12	7.2 and 7.3	Carry out monitoring of corals before, during and after marine works.	Work sites / during construction phase	Contractor		√		
2.6.45 to 2.6.48	7.6.1	Use horizontal directional drilling to avoid direct disturbance to corals	Marine works site / during dredging works	Contractor		√		
2.6.57 to 2.6.58	4.12.3	Deploying of 2-layer silt curtains with the first layer enclosing the grab an the second layer at around 50m from the dredging area while dredging works are in progress	All work sites / during construction phase	Contractor		√		
2.6.51	7.6.1	Fence off the slope stabilisation works area from surrounding shrubland and/ woodland, to prevent access to or disturbance of adjacent habitats. The works area should be as small as is possible, consistent with the requirements of the works.	STW/ During construction	Contractor		√		

* 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
N/A Not applicable

Implementation Schedule of Fisheries Impact Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages**			Relevant Legislation & Guidelines
					D	C	O	
2.5.37	4.12.4	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		√		TM on EIA Process

* 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
N/A Not applicable

Implementation Schedule of Landscape and Visual Impact Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages **			Relevant Legislation & Guidelines
					D	C	O	
Construction Phase								
2.8.37	9.2.2	Careful and efficient transplanting of affected trees to temporary or final transplant location (the proposed tree to be transplanted is a semi-mature *Macaranga tanarius* and is located at the proposed Pumping Station P2 location).	All sites	Contractor		√		WBTC No. 14/2002
2.8.37	9.2.2	Short excavation and immediate backfilling sections upon completion of works to reduce active site area.	All sites	Contractor		√		
2.8.37	9.2.2	Screening of site construction works by use of hoarding that is appropriate to its site.	All sites	Contractor		√		WBTC No. 19/2001
2.8.37	9.2.2	Conservation of topsoil for reuse.	All sites	Contractor		√		
2.8.30	9.2.2	Night-time light source from marine fleets should be directed away from the residential units.	Outfall area.	Contractor		√		

* 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
N/A Not applicable

Appendix M

Impact Coral Monitoring Report

1. BACKGROUND

1.1 Further to the Sewerage Master Plan (SMP) study of the Outlying Islands in 1994, Drainage Services Department (DSD) was commissioned by Environmental Protection Department (EPD) to carry out a Preliminary Project Feasibility Study (PPFS) for the Outlying Islands Sewerage Stage I Phase II in 1996. The project is part of an Outlaying Islands Sewerage Project, which involves construction of a sewage treatment works (STW) and submarine outfalls of approximately 500m in length and 325mm in diameter at Yung Shue Wan (YSW) on Lamma Island. Coral colonies were recorded at YSW site during the Environmental Impact Assessment (EIA) under the Preliminary Investigations Study (PIS).

1.2 According to the construction information provided by the Contractor, the marine works in Yung Shue Wan has been ceased since 19 January 2012. As agreed by the IEC and RE, the ecology monitoring was suspended from 6 February 2012 until further notice of the commencement of dredging works.

1.3 It is noticed that the remaining dredging work in Yung Shuen Wan will be commenced in late September 2012, as advised by IEC, coral monitoring has been carried out before the resumption of dredging work to oversee the background condition of the tagged corals for the upcoming impact monitoring events.

1.4 The coral monitoring report present the result coral monitoring exercise of corals at YSW and SW in June 2012 following the tagging for 20 corals on both sites for the Contract No. DC/2009/13 - Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan.

2. MONITORING EQUIPMENT

2.1 The monitoring equipment used for the coral monitoring are listed in **Table 2-1**.

Table 2-1 Monitoring Equipment for the Coral Monitoring

Equipment	Model
A4 size underwater slates	Handmade A4 size underwater slates
Coral Photos	Laminated Tagged Coral Photos
Quadrat	50 cm x 50 cm plastic quadrat (with 10 cm x 10 cm grid)
Underwater Camera	Canon G10 digital camera
Scuba Diving Equipment	Scubapro regulator, BCD and fins
Diving Boat	33 feet long diving boat with two 200hp outboard engines, registration #128328

3. MONITORING LOCATION

3.1 One control station at Sham Wan, Lamma Island and one impact stations at boulder seawall at Yung Shue Wan, Lamma Island were recommended in the *Method Statement Section 3.3*. These sites represent the coral site where uncommon coral species were recorded from the coral surveys carried out as part of the Review Report on the EIA Study. The coordinates of the monitoring location is listed in **Table 3-1**.

Table 3-1 Locations of Coral Monitoring Station

Dive Site	Coordinates	
	Easting	Northing
Yung Shue Wan, Lamma Island	829180.06E	809555.76N
Sham Wan, Lamma Island	832160.86E	805738.31N

4. METHODOLOGY

4.1 20 tagged hard coral colonies were monitored at the impact (Yung Shue Wan) and control station (Sham Wan). Laminated photos of the tagged corals were used underwater to relocate and identify the tagged corals.

4.2 Three parameters were recorded for each tagged coral and these are:

- Percentage sediment cover
  - Increase % sediment cover caused by marine work will affect the health of coral as it will block the sunlight that reaches the corals, this may result in bleaching or death of the coral colonies.
- Percentage bleached tissue – two bleaching categories will be recorded;
  - Unhealthy corals will show bleached tissue especially when sediment and turbidity increased, prolonged bleaching may result in total or partial death of the coral colonies.
  - Blanched or pale – a loss of zooxanthellae or photosynthetic pigments
  - Bleached – a total loss zooxanthellae and coral tissue still present
- Percentage dead – total or partial mortality.
  - Increased in total or partial mortality rate may be caused by the marine work.

4.3 Each parameter was assessed as a percentage of total colony area. To aid percentage cover estimates a 50 x 50 cm^2 quadrat with a 10x10 cm^2 lined grid was used.

4.4 During each survey, diversity, abundance and health status of the corals in the general area will be recorded.

4.5 Photos of each tagged corals were also taken during the monitoring survey.

5. RESULTS

5.1 Coral monitoring was carried out on 22nd August 2012. The weather conditions were summarised in **Table 5-1.**

Table 5-1 Weather Conditions on 22nd August 2012

Date	**22nd August 2012**	
Site	YSW	SW
Survey Time	14:30	13:30
Tidal Height	2.2m	
Air Temperature	32° C	
Water Temperature	23° C	
Water Depth	2m	2.5m
Wind Speed	Southwest force 4-5	
Weather	Rainy	
Water Visibility	0.5m	o.5m

Yung Shue Wan

5.2 This site is mainly composed of artificial sloping boulders down to 2.5 meters depth along coral area. Areas deeper than 3 meters are mainly muddy and sandy bottoms. The coral coverage was about 5% in which most of them were located on the artificial sloping boulders. 20 hard coral colonies were monitored on 22nd June 2012 and their species name, size and health condition were shown in **Table 5-2.**

5.3 Coral colony #6 was recorded to have 1% sediment in both colonies. No sediment was recorded in other coral colonies during the survey. No bleaching or mortality was recorded during the monitoring survey on the monitoring dates. The tag of coral colony #10 was missing. Photos of each tagged corals were shown in **Appendix II.**

5.4 In general the diversity and abundance of corals in this area is relatively low and common respectively when compared with other coral area in Hong Kong such as Hoi Ha Wan and Sharp Island.

Table 5-2 Species Name, Size and Heath Condition for Tagged Corals in YSW on 22nd August 2012

Site: Yung Shue Wan					Bleaching (%)			
Coral No.	Species Name	Specific Location	Size (cm) (Max. Length)	Sediment Cover (%)	Blanched/Pale	Bleached	Total/Partial Mortality (%)	Remarks
1	*Favites chinensis*	Boulder	32	0	0	0	0	N/A
2	*Favia speciosa*	Boulder	30	0	0	0	0	N/A
3	*Favites pentagona*	Boulder	38	0	0	0	0	N/A
4	*Favia favus*	Boulder	17	0	0	0	0	N/A
5	*Porites lutea*	Boulder	43	0	0	0	0	N/A
6	*Porites lobata*	Boulder	18	1	0	0	0	N/A
7	*Cyphastrea serailia*	Boulder	26	0	0	0	0	N/A
8	*Favites chinensis*	Boulder	22	0	0	0	0	N/A
9	*Favites pentagona*	Boulder	106	0	0	0	0	N/A
10	*Coscinaraea n* sp.	Boulder	16	0	0	0	0	N/A
11	*Goniopora stutchburyi*	Boulder	45	0	0	0	0	N/A
12	*Favites pentagona*	Boulder	20	0	0	0	0	N/A
13	*Goniopora stutchburyi*	Boulder	28	0	0	0	0	N/A
14	*Porites lobata*	Boulder	42	0	0	0	0	N/A
15	*Goniastrea aspera*	Boulder	19	0	0	0	0	50% missing
16	*Cyphastrea serailia*	Boulder	16	0	0	0	0	N/A
17	*Plesiastrea versipora*	Boulder	27	0	0	0	0	N/A
18	*Goniopora stutchburyi*	Boulder	23	0	0	0	0	N/A
19	*Cyphastrea serailia*	Boulder	21	0	0	0	0	N/A
20	*Porites lutea*	Boulder	52	0	0	0	0	N/A

Sham Wan

5.5 This site is mainly composed of bedrocks and big boulders down to 3.5 meters depth along the surveyed route. Areas deeper than 4 meters are mainly sandy bottoms. The coral coverage was about 10% in which most of corals were located on boulders or rock surfaces. 20 hard coral colonies were monitored on 22nd August 2012 and their species name, size and health condition were shown in **Table 5-3.**

5.6 15% mortality was recorded in coral colony #19. No sediment was recorded during the survey. No bleaching or mortality was recorded in other tagged coral colonies during the monitoring survey on the monitoring dates. The tags of coral colony #17,

#18, #19 and #20 were missing. Photos of each tagged corals were shown in **Appendix II.**

5.7 In general the diversity and abundance of corals in this area is relatively low and common respectively when compared with other coral area in Hong Kong such as Hoi Ha Wan and Sharp Island.

Table 5-3 Species Name, Size and Heath Condition for Tagged Corals in SW on 22nd August 2012

Site: Sham Wan					Bleaching (%)			
Coral No.	Species Name	Specific Location	Size (cm) (Max. Length)	Sediment Cover (%)	Blanched/Pale	Bleached	Total/Partial Mortality (%)	Remarks
1	*Favia favus*	Boulder	14	0	0	0	0	N/A
2	*Favia rotumana*	Boulder	21	0	0	0	0	N/A
3	*Favia rotumana*	Boulder	27	0	0	0	0	N/A
4	*Favia favus*	Rock	14	0	0	0	0	N/A
5	*Goniopora stutchburyi*	Bedrock	32	0	0	0	0	N/A
6	*Porites lobata*	Bedrock	43	0	0	0	0	N/A
7	*Porites lobata*	Boulder	23	0	0	0	10	N/A
8	*Goniopora stutchburyi*	Bedrock	29	0	0	0	0	N/A
9	*Favites pentagona*	Bedrock	31	0	0	0	0	N/A
10	*Porites lobata*	Bedrock	34	0	0	0	0	N/A
11	*Porites lobata*	Boulder	33	0	0	0	0	N/A
12	*Coscinaraea n* sp.	Rock	15	0	0	0	0	N/A
13	*Cyphastrea serailia*	Bedrock	13	0	0	0	0	N/A
14	*Cyphastrea serailia*	Bedrock	12	0	0	0	0	N/A
15	*Favia favus*	Boulder	14	0	0	0	0	N/A
16	*Favia rutomana*	Boulder	30	0	0	0	0	N/A
17	*Favia favus*	Bedrock	26	0	0	0	0	N/A
18	*Favia rotumana*	Bedrock	28	0	0	0	0	N/A
19	*Cyphastrea serailia*	Bedrock	39	0	0	0	15	N/A
20	*Cyphastrea serailia*	Bedrock	27	0	0	0	0	N/A

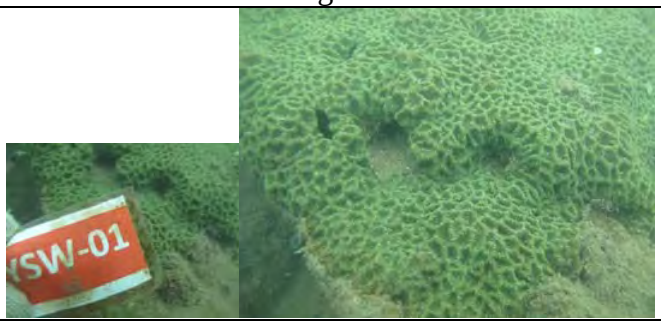
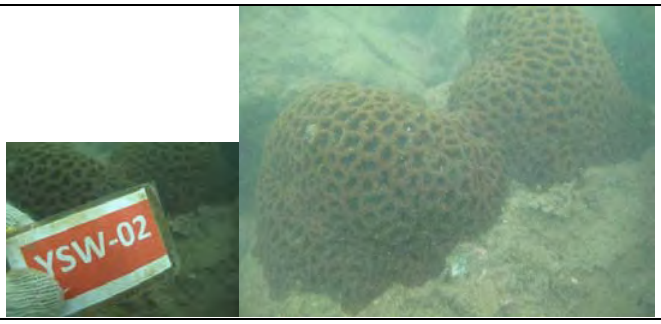
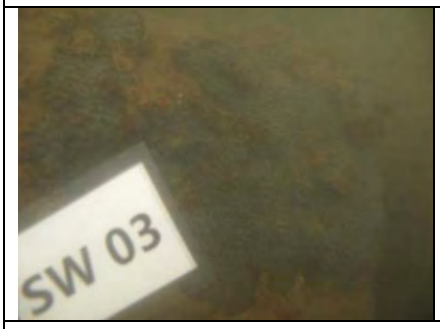
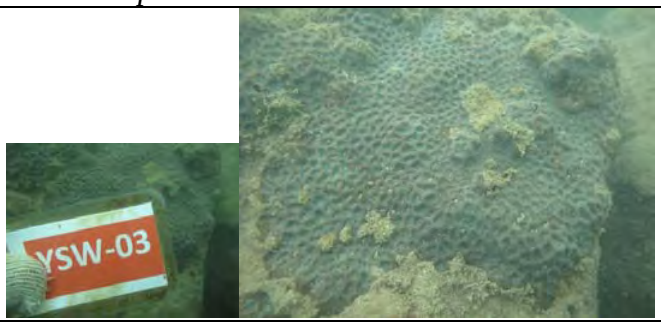
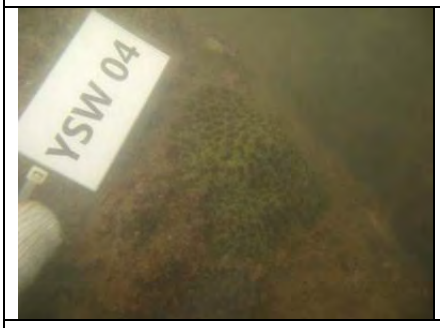
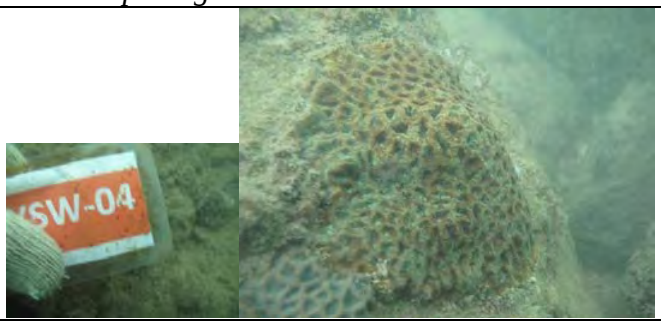
6. COMMENTS AND CONCLUSION

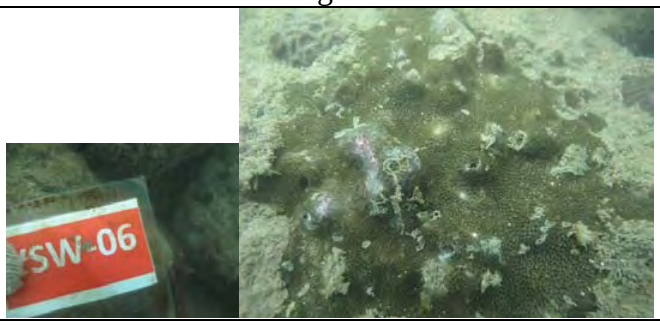
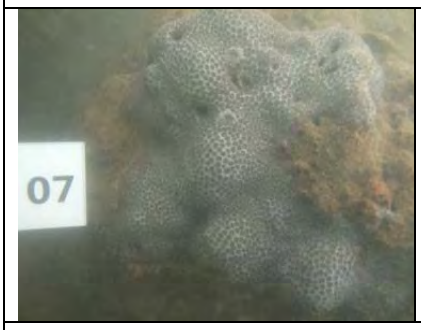
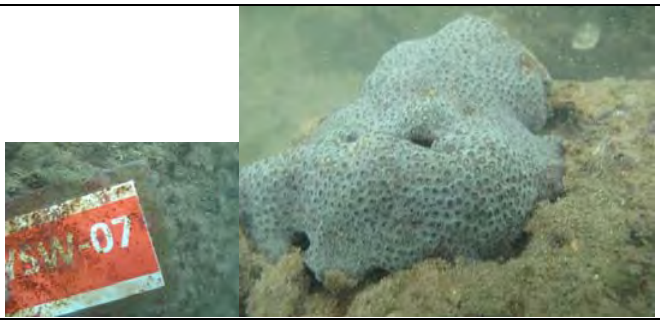
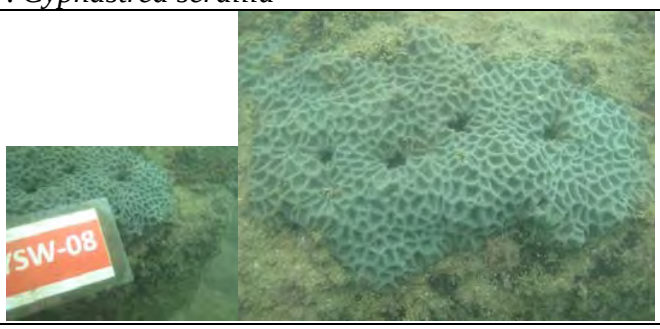
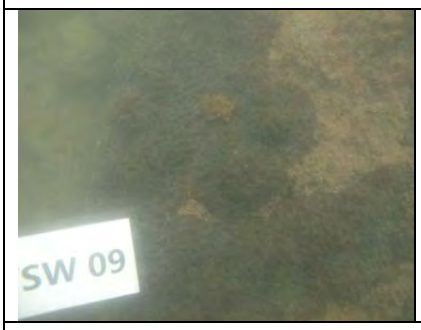
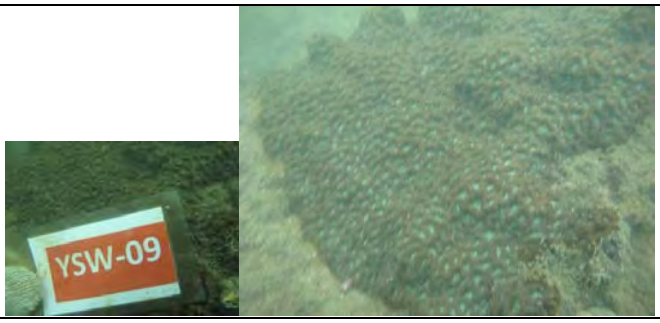
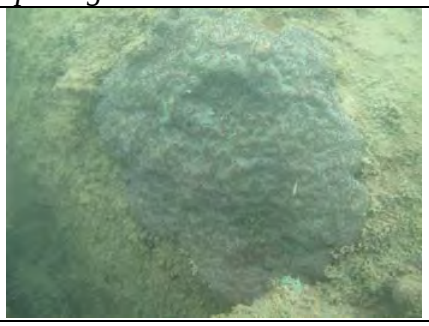
6.1 Coral monitoring were performed on 22nd August 2012 at Yung Shue Wan and Sham Wan and 20 hard coral colonies were monitored at each sites. Since most of the tags were missing during the survey, new tags were used to replace the old one.

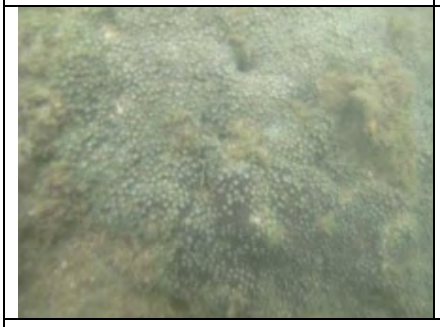
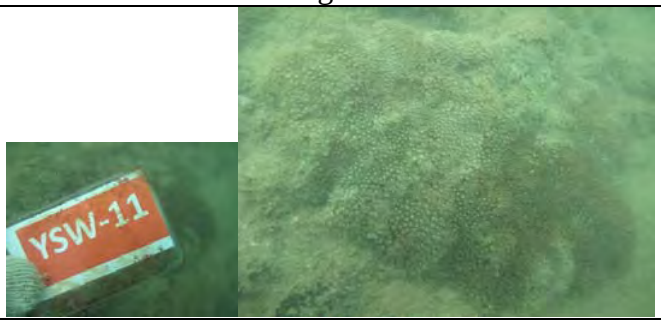
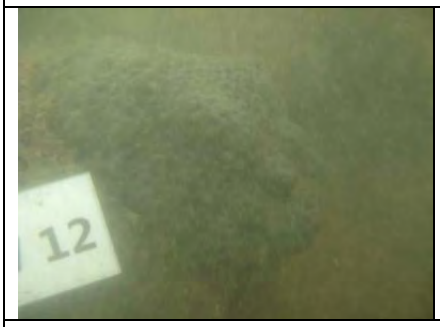
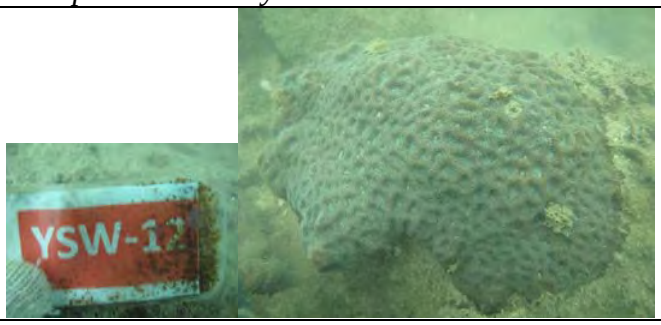
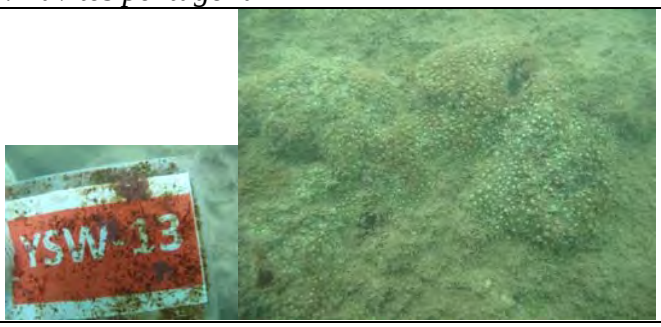
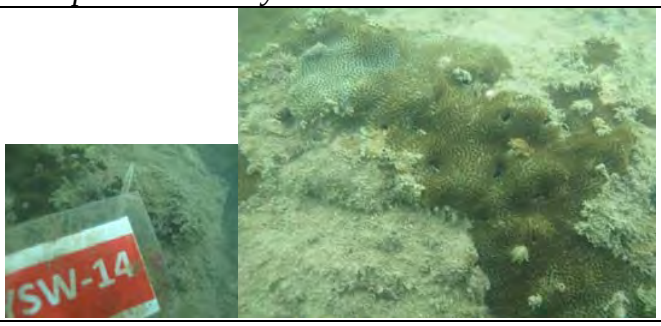
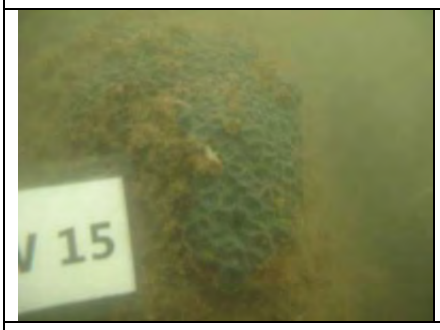
6.2 In Yung Shu Wan, coral colony #6 was recorded to have 1% sediment. In Sham Wan, 15% mortality was recorded in coral colony #6. No beaching or mortality was recorded on other corals on both sites during the monitoring period. The coral coverage in both impact site (YSW) and control site (SW) are relatively low when compared with other coral communities in Hong Kong (such as Sharp Island and Hoi Ha Wan). Most of the coral colonies recorded in both site are common species in Hong Kong water.

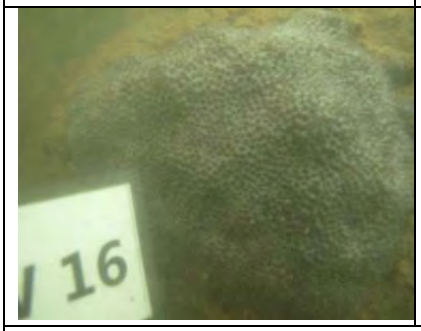
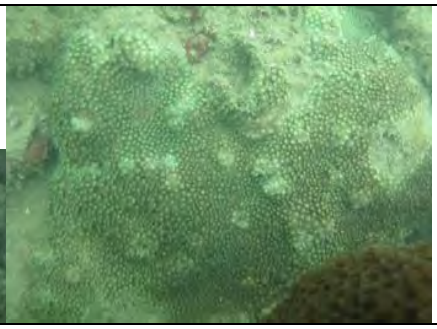
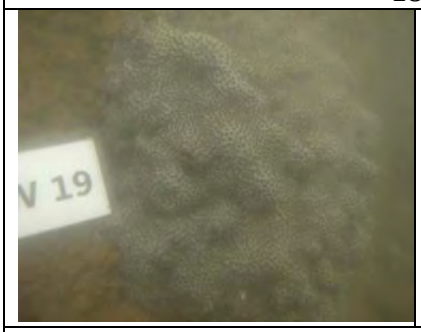
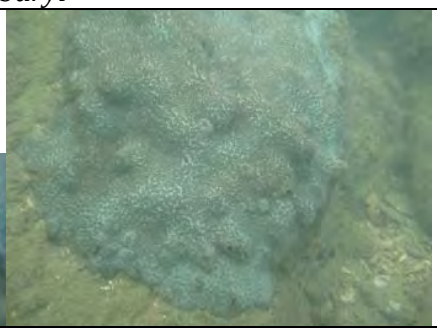
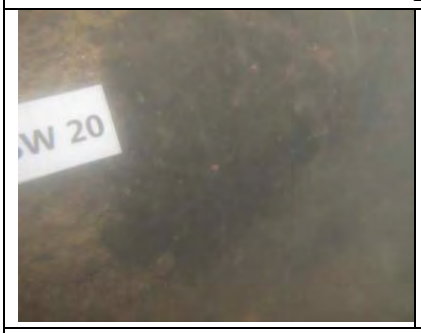
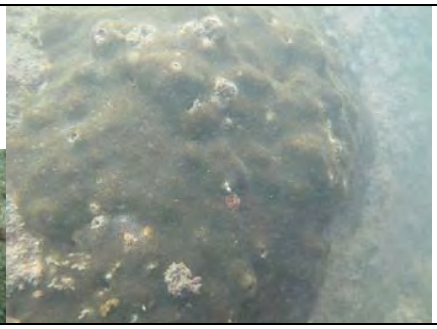
6.3 Partially mortality on the soft/black corals was not recorded at the monitoring site. No bleaching or deterioration in the general condition of the coral fauna was observed. No adverse deterioration of the coral community was observed in the ecological monitoring results when compared with the baseline ecological monitoring results.

APPENDIX A Tagged Corals at Yung Shue Wan

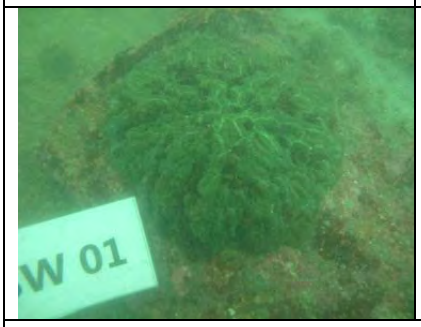
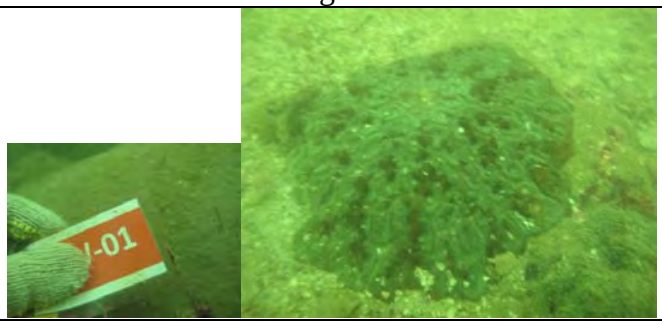
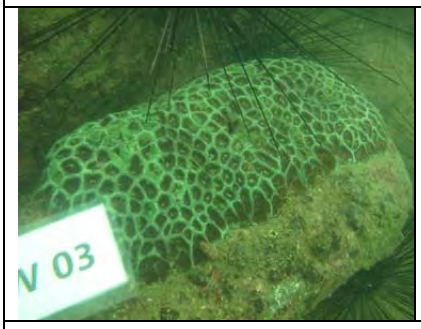
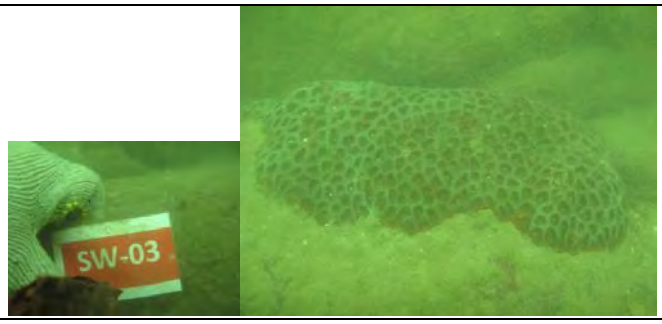
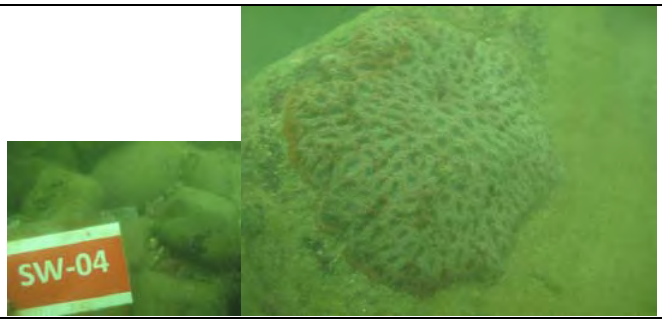
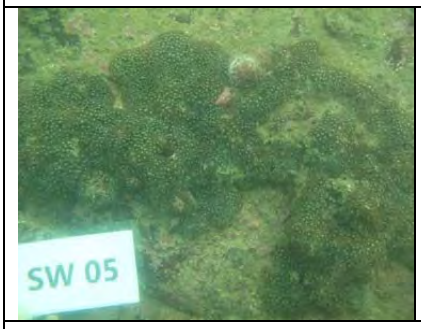
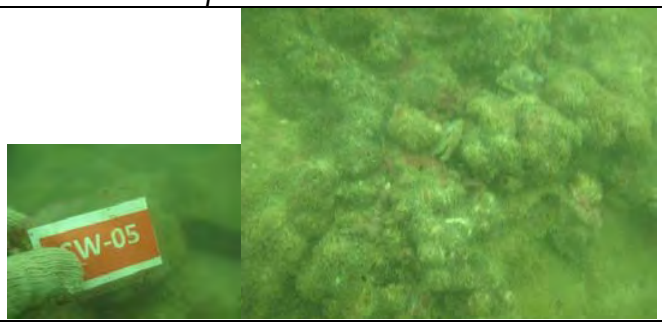
Baseline	22nd August 2012
	
01. Favites chinensis	
	
02. *Favia speciosa*	
	
03. *Favites pentagona*	
	
04. *Favia favus*	
	
05. *Porites lutea*	

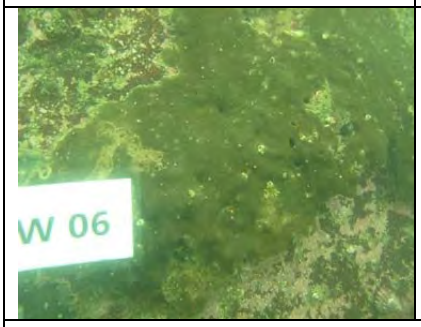
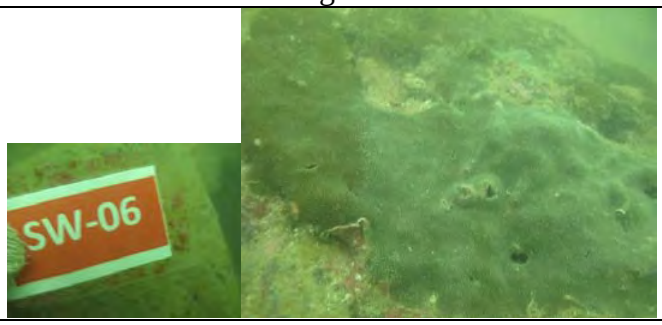
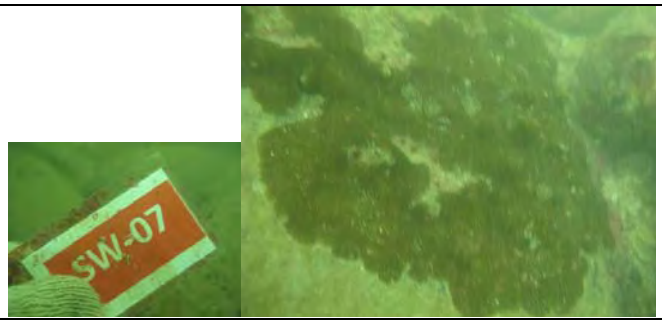
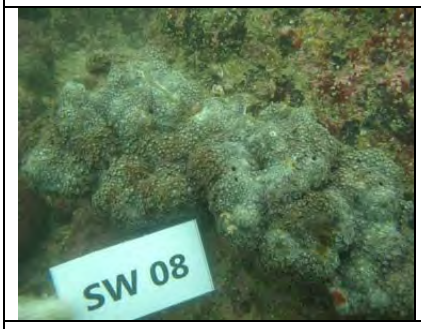
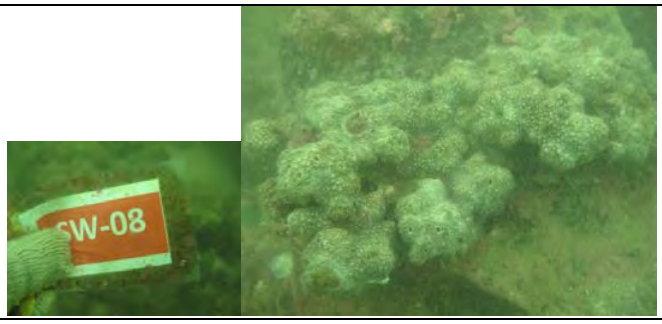
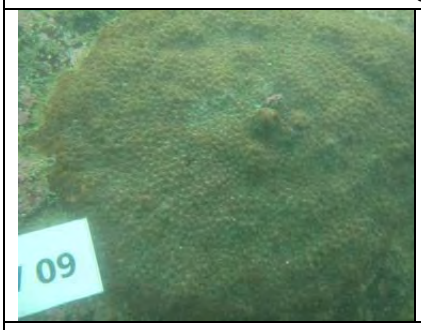
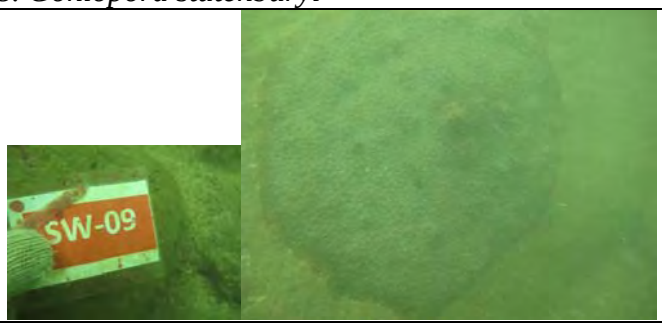
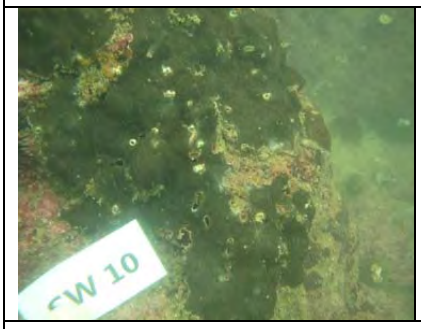
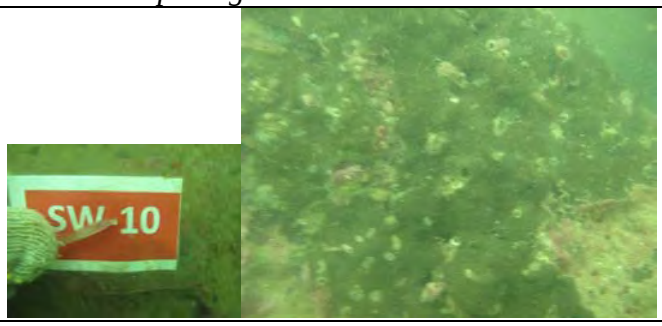
Baseline	22nd August 2012
	
06. *Porites lobata*	
	
07. *Cyphastrea serailia*	
	
08. *Favites chinensis*	
	
09. *Favites pentagona*	
	
10. *Coscinaraea* sp.	

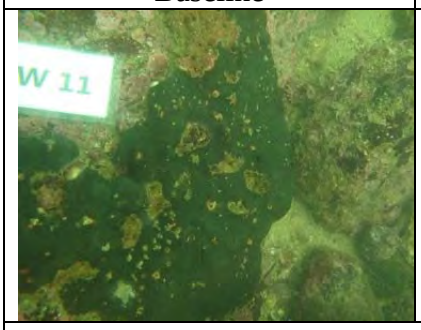
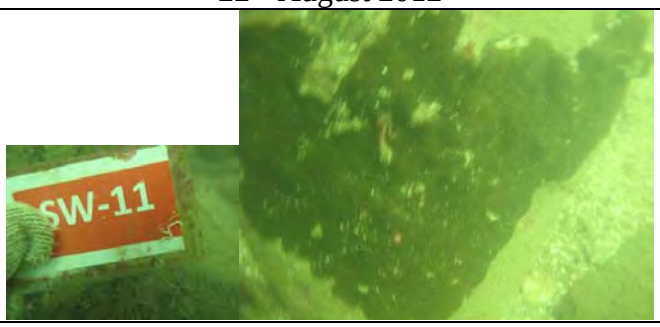
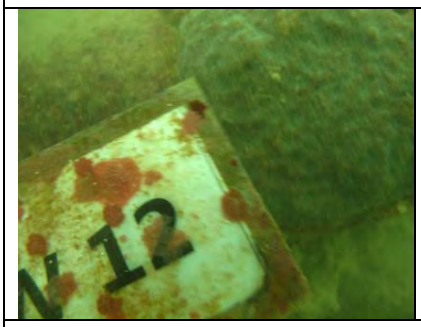
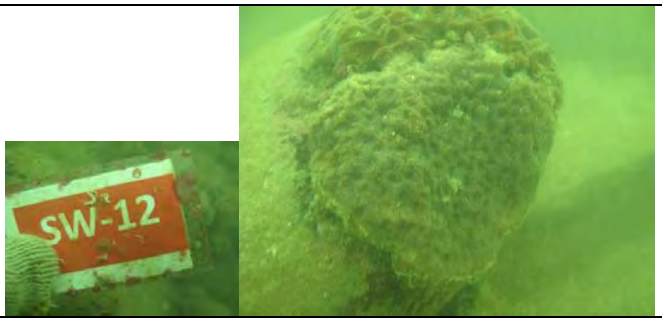
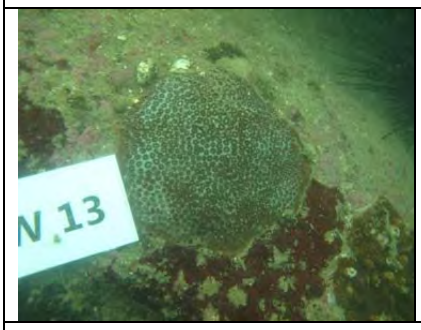
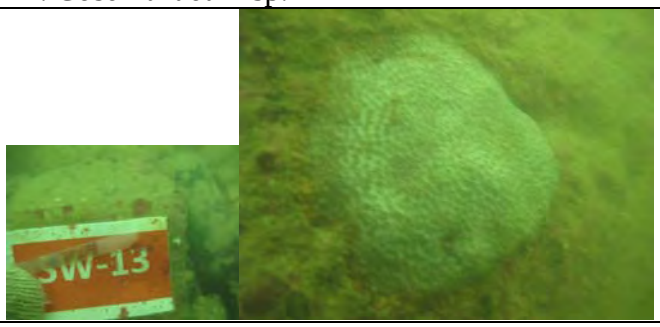
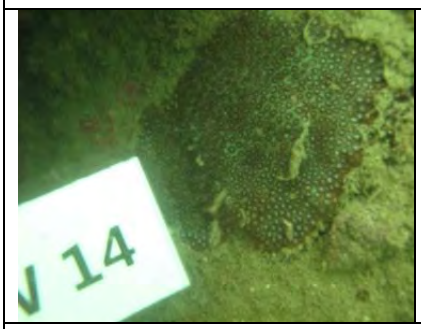
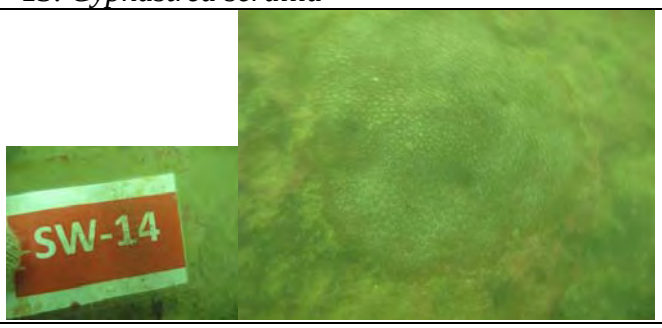
Baseline	22nd August 2012
	
11. *Goniopora stutchburyi*	
	
12. *Favites pentagona*	
	
13. *Goniopora stutchburyi*	
	
14. *Porites lobata*	
	
15. *Goniastrea aspera*	

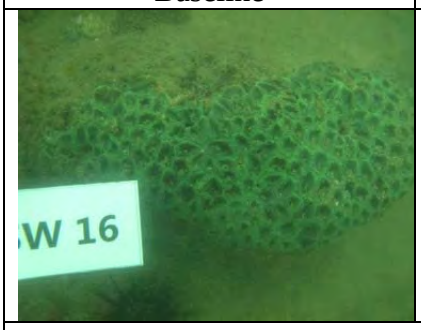
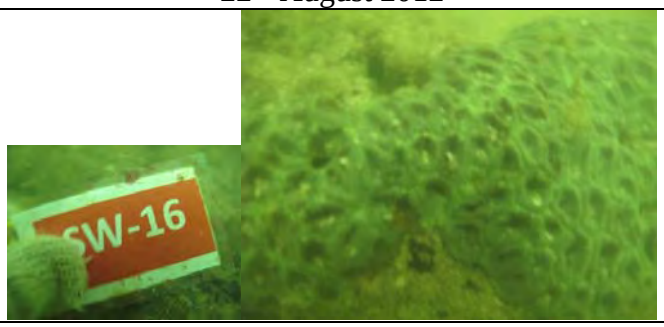
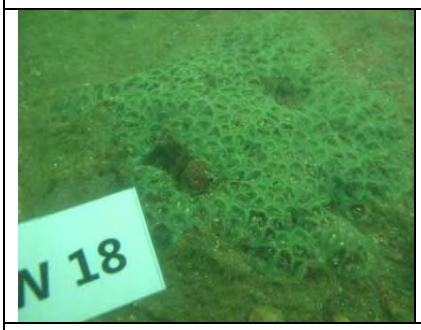
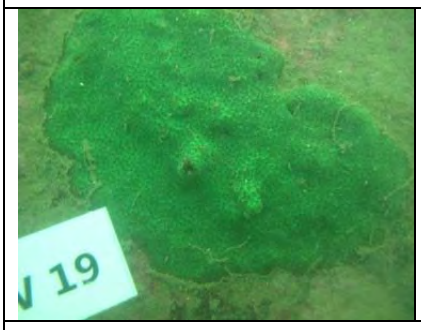
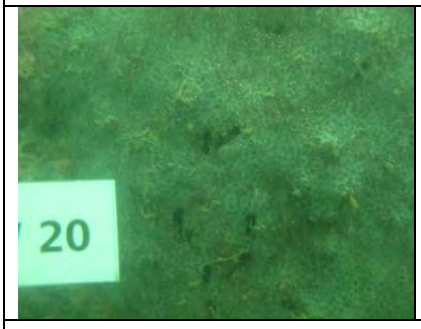
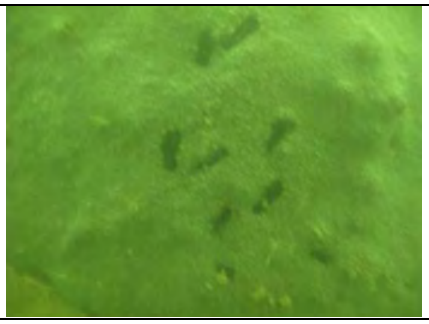
Baseline	22nd August 2012
	 
16. *Cyphastrea serailia*	
	 
17. *Plesiastrea versipora*	
	 
18. *Goniopora stutchburyi*	
	 
19. *Cyphastrea serailia*	
	 
20. *Porites lutea*	

APPENDIX B Tagged Corals at Sham Wan

Baseline	22nd August 2012
	
01. Favia favus	
	
02. Favia rotumana	
	
03. Favia rotumana	
	
04. Favia favus	
	
05. Goniopora stutchburyi	

Baseline	22nd August 2012
	
06. Porites lobata	
	
07. Porites lobata	
	
08. Goniopora stutchburyi	
	
09. Favites pentagona	
	
10. Porites lobata	

Baseline	22nd August 2012
	
11. Porites lobata	
	
12. Coscinaraea n sp.	
	
13. Cyphastrea serailia	
	
14. Cyphastrea serailia	
	
15. Favia favus	

Baseline	22nd August 2012
	
16. Favia rotumana	
	
17. Favia favus	
	
18. *Favia rotumana*	
	
19. *Cyphastrea serailia*	
	
20. *Cyphastrea serailia*	