



PROJECT No.: TCS/00512/09

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

**SOK KWU WAN PORTION AREA
Quarterly Environmental Monitoring and Audit
(EM&A) Summary Report No.Q5
(August to October 2011)**

PREPARED FOR
**LEADER CIVIL ENGINEERING CORPORATION
LIMITED**

| Quality Index Date | Reference No. | Prepared By | Certified By |
|-----------------------|-------------------------|--|---|
| 23 November 2011 | TCS00512/09/600/R0372v2 |  |  |
| | | Nicola Hon Environmental Consultant | T.W. Tam Environmental Team Leader |

| Version | Date | Description |
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| | | |

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Your reference:

Our reference: 05117/6/16/383544

Date: 28 November 2011

Attention: Mr Kenley C K Kwok

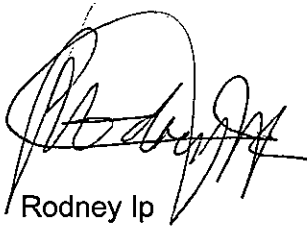
BY FAX ONLY

Dear Sirs,

Contract No. DC/2009/13
Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan
Sok Kwu Wan Portion Area
Quarterly EM&A Summary Report No. Q5 (August to October 2011)

We refer to the Environmental Permit (EP-281/2007/A) and the email from the Environmental Team, Action-United Environmental Services and Consulting (AUES), with the revised report for the captioned project, dated 24 November 2011. We have no comment and have verified the captioned report.

Yours faithfully
SCOTT WILSON CDM JOINT VENTURE



Rodney Ip

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 5th Quarterly Environmental Monitoring and Audit (EM&A) Summary Report for Sok Kwu Wan (hereinafter ‘this Report’) for the designated works under the Environmental Permit [EP-281/2007/A], covering the construction period from **1 August to 31 October 2011** (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 | 135 |
| | 24-hour TSP | 48 |
| Construction Noise | Leq (30min) Daytime | 56 |
| Water Quality | Marine Water Sampling | 39 |
| Inspection / Audit | ET Regular Environmental Site Inspection | 13 |

BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES.03 In this Reporting Period, no exceedance in air quality, construction noise and marine water quality monitoring were recorded. 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 | Leq _{30min} Daytime | 0 | 0 | 0 | -- | -- |
| Water Quality | DO | 0 | 0 | 0 | -- | -- |
| | Turbidity | 0 | 0 | 0 | -- | -- |
| | SS | 0 | 0 | 0 | -- | -- |

Note: NOE – Notification of Exceedance

ENVIRONMENTAL COMPLAINT

ES.04 No environmental complaint was recorded or received in this Reporting Period. The statistics of environmental complaint are summarized in the following table.

| Reporting Period | Environmental Complaint Statistics | | |
|----------------------|------------------------------------|------------|------------------|
| | Frequency | Cumulative | Complaint Nature |
| 1– 31 August 2011 | 0 | 0 | NA |
| 1– 30 September 2011 | 0 | 0 | NA |
| 1– 31 October 2011 | 0 | 0 | NA |

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.05 No environmental summons or successful prosecutions were recorded in this Reporting Period. The statistics of environmental complaint are summarized in the following tables.

| Reporting Period | Environmental Summons Statistics | | |
|----------------------|----------------------------------|------------|------------------|
| | Frequency | Cumulative | Complaint Nature |
| 1– 31 August 2011 | 0 | 0 | NA |
| 1– 30 September 2011 | 0 | 0 | NA |
| 1– 31 October 2011 | 0 | 0 | NA |

| Reporting Period | Environmental Prosecution Statistics | | |
|----------------------|--------------------------------------|------------|------------------|
| | Frequency | Cumulative | Complaint Nature |
| 1– 31 August 2011 | 0 | 0 | NA |
| 1– 30 September 2011 | 0 | 0 | NA |
| 1– 31 October 2011 | 0 | 0 | NA |

REPORTING CHANGE

ES.06 There are no reporting changes in this Reporting Period.

SITE INSPECTION BY EXTERNAL PARTIES

ES.07 No site inspection was undertaken by external parties i.e. EPD or AFCD within the Reporting Period.

FUTURE KEY ISSUES

ES.08 During dry season, special attention should be paid to the dust mitigation measures to avoid fugitive dust emissions from loose soil surface or haul road. Nevertheless, mitigation measures implemented for control the surface runoff including wheel wash facilities, covering of the loose soil surface or stockpile with tarpaulin sheet, etc., should fully implement.

ES.09 Muddy water and other water quality pollutants via site surface water runoff into the sea body within Fish Culture Zone (FCZ) at Picnic Bay and the secondary recreation contact subzone at Mo Tat Wan is the key issue of the Project. Mitigation measures for water quality should be properly maintained to prevent any muddy or sandy runoff from the loose soil surface overflow on the site boundary.

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1 INTRODUCTION

1.1 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 instead 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 1,430m³/day and 2,850m³/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 laying of underground sewerage pipeline. The site layout plan for the captioned work under the Project is showing in [Appendix A](#).
- 1.03 According to the Particular Specification (PS) and [Appendix 25](#) of the Project, Leader should establish an Environmental Team to implement the environmental monitoring and auditing works to fulfill the requirements as stipulated in the Environmental Monitoring and Audit (EM&A) Manuals. This EM&A Manual is referred to the Appendix B of the Review Report on EIA Study – Sok Kwu Wan (Final) in January 2007 (Agreement No. CE 20/2005(DS)).
- 1.04 Action-United Environmental Services and Consulting (AUES) has been commissioned by Leader as the ET to implement the relevant EM&A program. Organization chart of the Environmental Team for the Project is shown in [Appendix B](#). For ease of reporting, the proposed EM&A programme for baseline and impact monitoring is split 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 5th Quarterly EM&A Summary Report for Sok Kwu Wan Portion Area presenting the monitoring results and inspection findings for the reporting period from **1 August to 31 October 2011**.

1.2 REPORT STRUCTURE

The Quarterly Environmental Monitoring and Audit (EM&A) Report is structured into the following sections:-

| | |
|------------------|---|
| SECTION 1 | INTRODUCTION |
| SECTION 2 | SUMMARY OF IMPACT ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS |
| SECTION 3 | MONITORING RESULTS AND BREACHES OF ENVIRONMENTAL QUALITY CRITERIA |
| SECTION 4 | NON-COMPLIANCE, COMPLAINTS, NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS |
| SECTION 5 | CONCLUSION |

2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

2.1 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*.

2.2 CONSTRUCTION PROGRESS

2.02 The master and three month rolling construction programs are enclosed in *Appendix C* and the major construction activities undertaken in this quarter are listed below:-

1 to 31 August 2011

- Construction for pumping station no.1 & 2
- Construction of the rising main
- Rock slope cutting works

1 to 30 September 2011

- Construction for pumping station no.1 & 2
- Construction of the rising main
- Rock slope cutting works

1 to 31 October 2011

- Construction of Pumping Station No. 1 & 2
- Construction of Rising Main
- Rock Slope Cutting Works
- Construction of HDD Platform

2.3 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

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

Table 2-1 Status of Environmental Licenses and Permits

| Item | Description | License/Permit Status |
|------|--|---|
| 1 | Air pollution Control (Construction Dust) Regulation | Notified EPD on 19 May 2010 Ref.: 317486 |
| 2 | Chemical Waste Producer Registration | Issued on 8/6/2010 WPN 5213-912-L2720-01 |
| 3 | Water Pollution Control Ordinance | Approved on 29/9/2010 Valid to: 30/09/2015 Licence no.: WT00007567-2010 |
| 4 | Billing Account for Disposal of Construction Waste | Issued on 26 May 2010 A/C No: 7010815 |
| 5 | Construction Noise Permit | Permit no. GW-RS044-11 Valid from: 7 Feb 2011 Until: 6 Aug 2011 |
| 6 | Construction Noise Permit | Permit no. GW-RS0771-11 Valid from: 2 Sep 2011 Until: 1 Mar 2012 |

3 SUMMARY OF MONITORING REQUIREMENTS

3.1 ENVIRONMENTAL ASPECT

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

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

| Environmental Issue | Parameters |
|----------------------|---|
| Air Quality | <ul style="list-style-type: none"> • 1-hour TSP Monitoring by Real-Time Portable Dust Meter; and • 24-hour TSP Monitoring by High Volume Air Sampler. |
| Noise | <ul style="list-style-type: none"> • Leq (30min) during normal working hours; and • Leq (15min) during Restricted Hours. |
| Marine Water Quality | <p><i>In-situ Measurements</i></p> <ul style="list-style-type: none"> • Dissolved Oxygen Concentration (DO) (mg/L); • Dissolved Oxygen Saturation (%); • Turbidity (NTU); • pH unit; • Salinity (ppt); • Water depth (m); and • Temperature (°C). <p><i>Laboratory Analysis</i></p> <ul style="list-style-type: none"> • Suspended Solids (SS) (mg/L) |

3.2 MONITORING LOCATIONS

Air Quality

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

Table 3-2 Location of Air Quality Monitoring Station

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

Construction Noise

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

and graphical is shown in *Appendix D*.

Table 3-3 Location of Construction Noise Monitoring Station

| Sensitive Receiver | Location |
|--------------------|---------------------------------------|
| NM1 | 1, Chung Mei Village |
| NM2 | 20, Sok Kwu Wan |
| RNM3 | Sok Kwu Wan Sitting-out Area |
| NM4 | 2-storey village house at Ta Shui Wan |

Water Quality

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

Table 3-4 Location of Marine Water Quality Monitoring Station

| Station | Description | Co-ordination | |
|------------|--|---------------|----------|
| | | Easting | Northing |
| W1 | Secondary recreation contact subzone at Mo Tat Wan | 832 968 | 807 732 |
| W2 | Fish culture zone at Picnic Bay | 832 670 | 807 985 |
| W3 | Fish culture zone at Picnic Bay | 832 045 | 807 893 |
| C1 (flood) | Control Station | 833 703 | 808 172 |
| C2 | Control Station | 831 467 | 807 747 |
| C3 (ebb) | Control Station | 832 220 | 808 862 |

3.3 MONITORING FREQUENCY AND PERIOD

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

Air Quality Monitoring

Parameters: 1-hour TSP and 24-hour TSP.

Frequency: Once in every six days for 24-hour TSP and three times in every six days for 1-hour TSP.

Duration: Throughout the construction period.

Noise Monitoring

Parameters: Leq (30min) & Leq (5min), L10 and L90.

Leq (15min) & Leq (5min), L10 and L90 during the construction undertaken during Restricted Hours (19:00 to 07:00 hours next of normal working day and full day of public holiday and Sunday)

Frequency: Once per week during 0700-1900 hours on normal weekdays. Restricted Hour monitoring should depend on conditions stipulated in Construction Noise Permit.

Duration: Throughout the construction period.

Marine Water Quality Monitoring

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

Post-Construction Monitoring – Marine Water

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

3.4 MONITORING EQUIPMENT

Air Quality Monitoring

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

Noise Monitoring

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

Water Quality Monitoring

- 3.11 ***Dissolved Oxygen and Temperature Measuring Equipment*** – The instrument should be a portable and weatherproof dissolved oxygen (DO) measuring instrument complete with cable and sensor, and use a DC power source. The equipment should be capable of measuring as included a DO level in the range of 0 – 20mg L⁻¹ and 0 – 200% saturation; and a temperature of 0 – 45 degree Celsius.
- 3.12 ***pH Meter*** – The instrument shall consist of a potentiometer, a glass electrode, a reference electrode and a temperature-compensating device. It shall be readable to 0.1 pH in arrange of 0 to 14.
- 3.13 ***Turbidity (NTU) Measuring Equipment*** – The instrument should be a portable and weatherproof turbidity measuring instrument using a DC power source. It should have a photoelectric sensor capable of measuring turbidity between 0 - 1000 NTU.
- 3.14 ***Water Sampling Equipment*** – A water sampler should comprise a transparent PVC cylinder, with a capacity of not less than 2 litres, which can be effectively sealed with latex cups at both ends. The sampler should have a positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler is at the selected water depth.

- 3.15 **Water Depth Detector** – A portable, battery-operated echo sounder should be used for the determination of water depth at each designated monitoring station. This unit can either be hand held or affixed to the bottom of the work boat.
- 3.16 **Salinity Measuring Equipment** – A portable salinometer capable of measuring salinity in the range of 0 - 40 parts per thousand (ppt) should be provided for measuring salinity of the water at each monitoring location.
- 3.17 **Sample Containers and Storage** – Water samples for SS should be stored in high density polythene bottles with no preservative added, packed in ice (cooled to 4°C without being frozen).
- 3.18 **Monitoring Position Equipment** - A hand-held or boat-fixed type digital Differential Global Positioning System (DGPS) with way point bearing indication and Radio Technical Commission for maritime (RTCM) Type 16 error message ‘screen pop-up’ facilities (for real-time auto-display of error messages and DGPS corrections from the Hong Kong Hydrographic Office), or other equipment instrument of similar accuracy, should be provided and used during marine water monitoring to ensure the monitoring vessel is at the correct location before taking measurements.
- 3.19 **Suspended Solids Analysis** – Analysis of suspended solids shall be carried out in a HOKLAS or other international accredited laboratory.

3.5 EQUIPMENT CALIBRATION

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

3.6 METEOROLOGICAL INFORMATION

- 3.25 The meteorological information during the construction phase is obtained from the Wong Chuk Hang Station of the Hong Kong Observatory (HKO) which near the Project site. The meteorological information in this Reporting Period is presented in Appendix F.

3.7 DATA MANAGEMENT AND DATA QA/QC CONTROL

- 3.26 The impact monitoring data are handled by the ET’s systematic data recording and management, which complies with in-house Quality Management System. Standard Field Data Sheets (FDS) are used in the impact monitoring program.
- 3.27 The monitoring data recorded in the equipment e.g. 1-hour TSP meter, 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.

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

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

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

| Monitoring Station | Action Level ($\mu\text{g}/\text{m}^3$) | | Limit Level ($\mu\text{g}/\text{m}^3$) | |
|--------------------|---|---------|--|---------|
| | 1-hour | 24-hour | 1-hour | 24-hour |
| AM1 | 343 | 173 | 500 | 260 |
| AM2 | 331 | 175 | 500 | 260 |
| AM3 | 353 | 191 | 500 | 260 |

Table 3-6 Action and Limit Levels for Construction Noise

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

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

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

4 IMPACT MONITORING RESULTS

4.01 The environmental monitoring results will be compared against the Action and Limit Levels established based on the baseline monitoring results and statutory criteria. In case the measured data exceed the environmental quality criteria, remedial actions will be triggered according to the Event and Action Plan. In the Reporting Period, the graphical plots of the trends of monitored parameter over the past three months are presented in [Appendix E](#).

4.1 RESULTS OF AIR QUALITY MONITORING

4.02 Results of air quality monitoring at the identified locations during the Reporting Period are summarized in [Tables 4-1](#). In this Reporting Period, a total of **135** events of 1-hour TSP and **48** events of 24-hour TSP measurements were conducted at designated Location AM1, AM2 and AM3. 24-hour and 1-hour TSP results fluctuated below the Action Level during the Reporting Period. No Notification of Exceedance (NOE) of 24-hour and 1-hour TSP air quality criteria or corrective action was therefore required.

Table 4-1 Summary of 1-hour and 24-hour TSP Results

| Station | 1-hour TSP ($\mu\text{g}/\text{m}^3$) | | | 24-hour TSP ($\mu\text{g}/\text{m}^3$) | | |
|-------------|---|-----------|-----------|--|----------|-----------|
| | Max | Min | Mean | Max | Min | Mean |
| AM1 | 91 | 46 | 64 | 124 | 11 | 49 |
| Record Date | 4-Oct-11 | 3-Aug-11 | 45 events | 21-Oct-11 | 2-Aug-11 | 16 events |
| AM2 | 87 | 47 | 63 | 116 | 21 | 56 |
| Record Date | 4-Oct-11 | 15-Aug-11 | 45 events | 21-Oct-11 | 2-Aug-11 | 16 events |
| AM3 | 120 | 46 | 68 | 176 | 25 | 73 |
| Record Date | 9-Aug-11 | 22-Sep-11 | 45 events | 6-Sep-11 | 2-Aug-11 | 16 events |

4.2 RESULTS OF CONSTRUCTION NOISE MONITORING

4.03 Summary of construction noise monitoring at the identified locations during the Reporting Period are summarized in [Table 4-2](#) below. In this Reporting Period, a total of **56** events of construction noise measurement were conducted while no documented construction complaint was received and all the construction noise results were below the Limit level. No NOE or corrective action was recommended for this parameter.

Table 4-2 Summary of Construction Noise Monitoring Results

| Station | Leq(30min) (dB(A)) | |
|-------------|--------------------|-------------------------|
| | Max | Min |
| NM1 | 67.5 | 51.8 |
| Record Date | 4-Oct-11 | 15-Aug-11 and 10-Oct-11 |
| NM2 | 68.4 | 55.4 |
| Record Date | 4-Oct-11 | 26-Oct-11 |
| RNM3 | 65.2 | 57.2 |
| Record Date | 20-Oct-11 | 15-Aug-11 |
| NM4 | 65.9 | 46.4 |
| Record Date | 9-Aug-11 | 20-Oct-11 |

4.3 RESULTS OF MARINE WATER QUALITY OF MONITORING

4.01 The construction of marine outfall works was commenced on 19 July 2011 and therefore the marine water quality monitoring is required in this Reporting Period.

4.02 In this Reporting Period, **39** monitoring events have been carried out at the designated locations. The statistical analysis result for the parameters of DO, turbidity and suspended solids in this

reporting quarter are shown in *Tables 4-3 to 4-6*.

Table 4-3 Statistic of Monitoring Result for DO concentration (mg/L) (Surface & Mid-layers)

| Station | WY1 | WY2 | WY3 | CY1 | CY2 | CY3 |
|----------------|------|------|------|------|------|------|
| Average | 6.24 | 6.14 | 6.08 | 6.38 | 6.27 | 6.28 |
| Min | 5.42 | 4.82 | 4.82 | 4.93 | 4.40 | 4.86 |
| Max | 8.24 | 8.81 | 7.90 | 9.35 | 8.90 | 7.92 |

Table 4-4 Statistic of Monitoring Result for DO concentration (mg/L) (Bottom layers)

| Station | WY1 | WY2 | WY3 | CY1 | CY2 | CY3 |
|----------------|-----|------|------|------|------|------|
| Average | N.A | 5.57 | 5.58 | 5.57 | 5.52 | 5.51 |
| Min | N.A | 3.58 | 3.96 | 3.58 | 3.80 | 3.46 |
| Max | N.A | 6.81 | 6.76 | 6.92 | 7.05 | 6.96 |

Table 4-5 Statistic of Monitoring Result for Turbidity (NTU)

| Station | WY1 | WY2 | WY3 | CY1 | CY2 | CY3 |
|----------------|------|------|------|------|------|------|
| Average | 3.68 | 3.96 | 4.14 | 4.39 | 4.41 | 4.60 |
| Min | 2.75 | 2.71 | 2.57 | 2.62 | 2.92 | 2.92 |
| Max | 4.35 | 5.48 | 5.88 | 6.18 | 6.33 | 6.72 |

Table 4-6 Statistic of Monitoring Result for Suspended Solids (mg/L)

| Station | WY1 | WY2 | WY3 | CY1 | CY2 | CY3 |
|----------------|-------|------|-------|-------|------|-------|
| Average | 4.70 | 4.59 | 4.45 | 4.91 | 4.80 | 4.98 |
| Min | 1.20 | 1.23 | 1.27 | 2.00 | 2.23 | 1.67 |
| Max | 11.00 | 9.07 | 10.37 | 12.40 | 9.77 | 12.10 |

4.03 A summary of exceedances for the three parameters: dissolved oxygen (DO), turbidity and suspended solids are shown in *Table 4-7*.

Table 4-7 Summary of Exceedances in 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 |

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

4.4 ECOLOGICAL MONITORING

- 4.05 According to Clause 3.7 and Figure 4 in the Environmental Permit No. EP-281/2007/A, a total of 12 numbers *Celtis Timorensis* (uncommon species) in Chung Mei at Sok Kwu Wan, are identified to require labeling, fencing and protection. Out of these, four numbers located in the Pumping Station No.1 area are required to be transplanted in advance of pumping station construction and the transplanted proposal has been submitted to EPD previously.
- 4.06 Since the health condition of CT7 to CT10 are poor, as a contingency measure in case that CT7 to CT10 can no longer be recovered, additional 7 no. of *Celtis Timorensis* were planted adjacent to the under-monitoring *Celtis Timorensis* CT7 to CT10 on 30 April 2011. A full review of the uncommon species was carried out on **19 May 2011** by the landscaping sub-Contractor (Melofield Nursery and Landscape Contractor Limited) and inspection work was suspended in June 2011. Since health condition for the transplanted and newly planted *Celtis Timorensis* were still unsatisfactory, regular inspection was carried out on **9, 26 August, 5, 23 September and 10, 24 October 2011 2011**. The copies of the inspection reports are attached in relevant Monthly EM&A Report (**August, September and October 2011**).

5 WASTE MANAGEMENT

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

5.1 RECORDS OF WASTE QUANTITIES

5.02 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.

5.03 The quantities of waste for disposal in this Reporting Period are summarized in [Table 5-1](#) and [5-2](#) and the Monthly Summary Waste Flow Table is shown in [Appendix G](#). Whenever possible, materials were reused on-site as far as practicable.

Table 5-1 Summary of Quantities of Inert C&D Materials

| Type of Waste | Quantity | | | Disposal Location |
|--|----------|--------|--------|-------------------------------|
| | Aug 11 | Sep 11 | Oct 11 | |
| C&D Materials (Inert) ('000m ³) | 0.006 | 0.004 | 0.007 | Sok Kwu Wan Transfer Facility |
| Reused in the Contract (Inert) ('000m ³) | 0 | 0 | 0 | - |
| Reused in other Projects (Inert) ('000m ³) | 3.519 | 1.473 | 1.674 | - |
| Disposal as Public Fill (Inert) ('000m ³) | 0 | 0 | 0 | Sok Kwu Wan Transfer Facility |

Table 5-2 Summary of Quantities of C&D Wastes

| Type of Waste | Quantity | | | Disposal Location |
|--------------------------------|----------|--------|--------|-------------------------------|
| | Aug 11 | Sep 11 | Oct 11 | |
| Metal (kg) | 0 | 0 | 0 | - |
| Paper / Cardboard Packing (kg) | 0 | 0 | 0 | - |
| Plastic (kg) | 0 | 0 | 0 | - |
| Chemical Wastes (kg) | 0 | 0 | 0 | - |
| General Refuses (tonne) | 1.83 | 2.42 | 6.85 | Sok Kwu Wan Transfer Facility |

5.04 There was no site effluent discharged but the estimated volume of surface runoff was less than 50m³ in this reporting quarter.

6 SITE INSPECTION

- 6.01 According to the Final Report Environmental Monitoring and Audit Manual [2095/13.3], the environmental site inspection should be formulated by ET Leader. Regular environmental site inspections had been carried out by the ET to confirm the environmental performance. In this Reporting Period, site inspection was carried out on **2, 9, 17, 23, 30 August 2011, 6, 14, 20, 27 September 2011 and 4, 11, 18, 25 October 2011**. Besides, routine joint-site visit by IEC, RE, Leader and ET was carried out on **9 August, 20 September and 11 October 2011**.
- 6.02 Observations for the site inspections and monthly audit within this Reporting Month are summarized in *Table 6-1*.

Table 6-1 Site Observations

| Date | Findings / Deficiencies | Follow-Up Status |
|-------------------|---|--|
| 2 August 2011 | <ul style="list-style-type: none"> The silt curtain was not completely enclosed the sea bank. The Contractor should modify the curtain to ensure its de-silting effectiveness. | The silt curtain was modified on 9 August 2011. |
| 9 August 2011 | <ul style="list-style-type: none"> No environmental issue was observed during the site inspection. | N.A |
| 17 August 2011 | <ul style="list-style-type: none"> No environmental issue was observed during the site inspection. | N.A |
| 23 August 2011 | <ul style="list-style-type: none"> The Contractor should provide enough drip trays or covering for the chemical containers. | <ul style="list-style-type: none"> Drip trays were provided for the containers on 30 August 2011. |
| 30 August 2011 | <ul style="list-style-type: none"> Oil leakage was observed. The Contractor should provide repairing and avoid further leakage for water or soil contamination. | To be followed |
| 6 September 2011 | <ul style="list-style-type: none"> The Contractor should clear the accumulated sediment in the tank to restore its desilting effectiveness. | The tank has been cleared on 14 September 2011. |
| 14 September 2011 | <ul style="list-style-type: none"> The Contractor should remove the scattered general refuse on the hill to minimize dust nuisance and improve site tidiness. | The general refuse was found to be removed. |
| 20 September 2011 | <ul style="list-style-type: none"> Gaps were observed along the silt curtain. The contractor should regularly check and repair as appropriate. | The silt curtain was found to be repaired. |
| 27 September 2011 | <ul style="list-style-type: none"> The Contractor should provide drip tray for the oil drum. | Drip tray was found to be provided on 3 Oct 2011. |
| 4 October 2011 | <ul style="list-style-type: none"> Drip tray should be provided for all chemical containers. Silt curtain should be reinstated after storm as appropriate. | Drip tray was found to be provided on 11 October 2011. Silt curtain was found to be reinstated on 11 October 2011. |
| 11 October 2011 | <ul style="list-style-type: none"> No environmental issue was observed during site inspection. | N.A. |
| 18 October 2011 | <ul style="list-style-type: none"> Sedimentation tank under concrete plant at Portion L2 has to be cleaned up to restore its de-silting function. | To be followed. |
| 25 October 2011 | <ul style="list-style-type: none"> Sedimentation tank under concrete plant at Portion L2 has to be cleaned up to restore its de-silting function. | To be followed. |

7 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

7.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

7.01 No environmental complaint, summons and prosecution was received in this Reporting Period. The statistical summary table of environmental complaint is presented in [Tables 7-1, 7-2](#) and [7-3](#).

Table 7-1 Statistical Summary of Environmental Complaints

| Reporting Period | Environmental Complaint Statistics | | |
|----------------------|------------------------------------|------------|------------------|
| | Frequency | Cumulative | Complaint Nature |
| 1– 31 August 2011 | 0 | 0 | NA |
| 1– 30 September 2011 | 0 | 0 | NA |
| 1– 31 October 2011 | 0 | 0 | NA |

Table 7-2 Statistical Summary of Environmental Summons

| Reporting Period | Environmental Summons Statistics | | |
|----------------------|----------------------------------|------------|------------------|
| | Frequency | Cumulative | Complaint Nature |
| 1– 31 August 2011 | 0 | 0 | NA |
| 1– 30 September 2011 | 0 | 0 | NA |
| 1– 31 October 2011 | 0 | 0 | NA |

Table 7-3 Statistical Summary of Environmental Prosecution

| Reporting Period | Environmental Prosecution Statistics | | |
|----------------------|--------------------------------------|------------|------------------|
| | Frequency | Cumulative | Complaint Nature |
| 1– 31 August 2011 | 0 | 0 | NA |
| 1– 30 September 2011 | 0 | 0 | NA |
| 1– 31 October 2011 | 0 | 0 | NA |

8 IMPLEMENTATION STATUS OF MITIGATION MEASURES

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

Dust Mitigation Measure

- 8.02 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

- 8.03 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:
- Use of quiet equipment for the construction activities of the Pumping Stations and sewer alignment;
 - Use of temporary noise barrier around the site boundary of Pumping Station P1a;
 - Use of kick ripper (saw and lift) method to replace the breaker for pavement removal during sewer alignment construction;
 - Restriction on the number of plant during sewer alignment construction;
 - 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;
 - 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
 - Implementation of the following good site practices:
 - Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program.
 - Mobile plant, if any, should be sited as far away from NSRs as possible.
 - Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.
 - Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs.
 - Material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities.

Water Quality Mitigation Measure

- 8.04 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.

- 8.05 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 55m³/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 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; and
 - loading of barges and hoppers should be controlled to prevent splashing of dredged material to the surrounding water, and barges and hoppers should not be filled to a level which would cause the overflow of materials or sediment laden water during loading or transportation; and
 - the decks of all vessels should be kept tidy and free of oil or other substances that might be accidentally or otherwise washed overboard.

Construction Run-off and Drainage

- 8.06 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

- 8.07 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

- 8.08 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

- 8.09 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).
- 8.10 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.
- 8.11 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

- 8.12 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.
- 8.13 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.
- 8.14 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

- 8.15 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

- 8.16 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.
- 8.17 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

- 8.18 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.
- 8.19 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

Terrestrial Ecology

- 8.20 The uncommon tree species should be labelled and probably fenced to avoid direct or indirect disturbance during construction. Works areas should avoid woodland habitats, in particular where these trees are located.
- 8.21 Construction and maintenance of site runoff control measures would be required at all work sites

during construction. These should include barriers to direct runoff to sand/silt removal facilities (sand/silt/traps and/or sediment basins); minimisation of earthworks during rainy season (May to September); and coverage of sand/fill piles and exposed earth during storms.

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

Intertidal and Subtidal Ecology

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

Fisheries Mitigation Measure

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

Landscape & Visual Mitigation Measure

- 8.26 Mitigation measures recommended in the EIA Report for landscape and visual impacts during the construction stage are summarised below.
- Screening of site construction works by use of hoarding that is appropriate to its site context;
 - Retaining existing trees and minimising damage to vegetation where possible by close co-ordination and on site alignment adjusted of rising main and gravity sewer pipelines. Tree protective measures should be implemented to ensure trees identified as to be retained are satisfactorily protected during the construction phase;
 - Careful and efficient transplanting of affected trees (1 no.) to temporary or final transplant location (the proposed tree to be transported is a semi-mature *Macaranga tanarius* and is located at the proposed Pumping Station P2 location);
 - Short excavation and immediate backfilling of sections upon completion of works to reduce active site area;
 - Conservation of top-soil for reuse.
 - Night-time light source from marine fleets should be directed away from the residential units
- 8.27 Leader had been implementing the required environmental mitigation measures according to the Sok Kwu Wan Environmental Monitoring and Audit Manual subject to the site condition. Environmental mitigation measures generally implemented by Leader in this Reporting Month are summarized in [Table 8-1](#).

Table 8-1 Environmental Mitigation Measures

| Issues | Environmental Mitigation Measures |
|-------------------------------|---|
| Water Quality | <ul style="list-style-type: none"> • Drainage channels were provided to convey run-off into the treatment facilities; and • Drainage systems were regularly and adequately maintained. |
| Air Quality | <ul style="list-style-type: none"> • 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. |
| Noise | <ul style="list-style-type: none"> • Good site practices to limit noise emissions at the sources; • Use of quiet 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 | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • The site was generally kept tidy and clean. |

9 CONCLUSIONS AND RECOMMENTATIONS

9.1 CONCLUSIONS

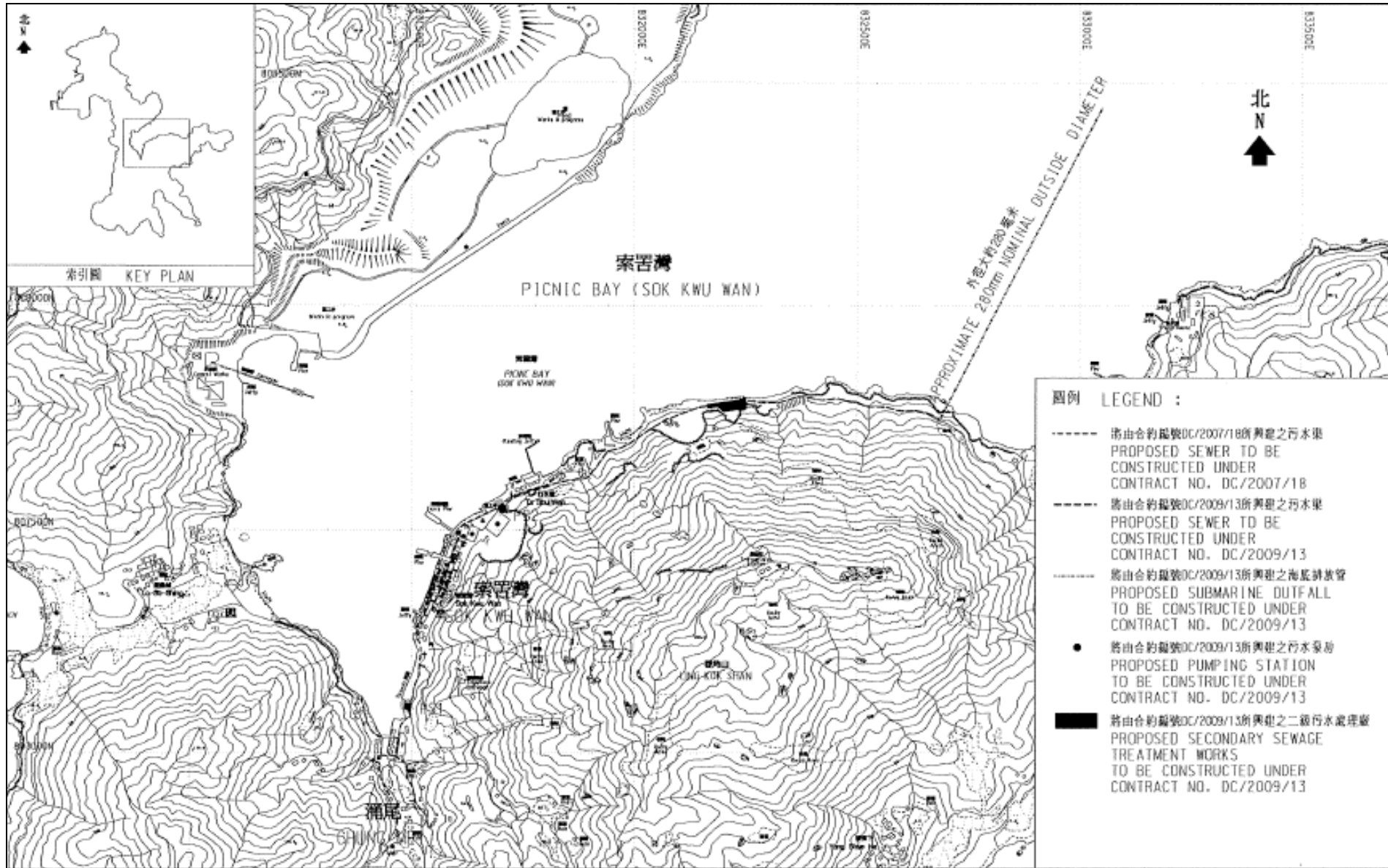
- 9.01 This is the 5th Quarterly EM&A Summary Report for Sok Kwu Wan Portion Area under the Project covering the construction period from **1 August to 31 October 2011**.
- 9.02 No noise complaint (which is an Action Level exceedance) was received and no construction noise measurement results that exceeded the Limit Level were recorded in this Reporting Period. No NOE or the associated corrective actions were therefore issued.
- 9.03 In this Reporting Period, no 1-hour TSP or 24-hr TSP monitoring results was found to be triggered the Action or Limit Level.
- 9.04 As informed by the Contractor, the marine work of outfall construction has been commenced on 19 July 2011 and therefore water quality was undertaken in this Reporting Period. The monitoring result demonstrated no exceedance of Action or Limit Level in this Reporting Period
- 9.05 No documented complaint, notification of summons or successful prosecution was received in this Reporting Period.
- 9.06 **13** events of site inspection were carried out by ET in this Reporting Period and no non-compliance was observed during the inspection. In general, all the observation has been rectified during the next week site inspection. The environmental performance of the Project was therefore considered as satisfactory.
- 9.07 No site inspection was undertaken by external parties i.e. EPD or AFCD within the Reporting Period.

9.2 RECOMMENDATIONS

- 9.08 During dry season, special attention should be paid to the dust mitigation measures to avoid fugitive dust emissions from loose soil surface or haul road. Nevertheless, mitigation measures implemented for control the surface runoff including wheel wash facilities, covering of the loose soil surface or stockpile with tarpaulin sheet, etc., should fully implement.
- 9.09 Muddy water and other water quality pollutants via site surface water runoff into the sea body within Fish culture zone at Picnic Bay and the Secondary recreation contact subzone at Mo Tat Wan is the key issue of the Project. Mitigation measures for water quality should be properly maintained to prevent any muddy or sandy runoff from the loose soil surface overflow on the site boundary.

Appendix A

Site Layout Plan – Sok Kwu Wan Portion Area



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. AU Chi Kwong | - | - |
| SCJV | Engineer's Representative | Mr. Neil Wong | 2982 0240 | 2982 4129 |
| SCJV | Resident Engineer | Mr. Alfred Cheung | 2982 0240 | 2982 4129 |
| Scott Wilson | Independent Environmental Checker | Mr. Rodney Ip | 2410 3750 | 2428 9922 |
| Leader | Project Manager | Mr. Vincent Chan | 2982 1750 | 2982 1163 |
| Leader | Site Agent | Mr. Stephen Leung | 2982 1750 | 2982 1163 |
| Leader | Environmental Officer | Mr. K.Y. So | 2982 8652 | 2982 8650 |
| Leader | Section Engineer | Mr. Burgess Yip | 2982 1750 | 2982 1163 |
| Leader | Safety Officer | Mr. Edwin Leung | 2982 1750 | 2982 1163 |
| AUES | Environmental Team Leader | Mr. T. W. Tam | 2959 6059 | 2959 6079 |
| AUES | Environmental Consultant | Ms. Nicola Hon | 2959 6059 | 2959 6079 |
| AUES | Assistance Environmental Consultant | Mr. Ray Cheung | 2959 6059 | 2959 6079 |
| AUES | Team Supervisor | Mr. Ben Tam | 2959 6059 | 2959 6079 |

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 Programs

| Activity ID | Description | Original Duration | Percent Complete | Early Start | Early Finish | Late Start | Late Finish | Total Float | Predecessors | Successors | 2011 | | | | | | | |
|-----------------------------------|--|-------------------|------------------|-------------|--------------|------------|-------------|-------------|---------------------------|----------------------------|------|-----|-----|-----|-----|-----|-----|--|
| | | | | | | | | | | | MAY | JUN | JUL | AUG | SEP | OCT | NOV | |
| 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, | | | | | | | | |
| KD0050 | Section W3 - Footpath Diversion in Ptn G (273d) | 0 | 100 | | 24/03/11 A | | 24/03/11 A | | SKW0551 | KD0125 | | | | | | | | |
| KD0115 | Start Operate Temp Sewage Treatment in Port. A&H | 0 | 0 | | 01/12/11 | | 30/06/11 * | -154d * | E&M0510 | KD0125 | | | | | | | | |
| 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 Accom | 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 | 23/11/10 A | 17/05/10 A | 23/11/10 A | | KD0020 | SKW1151 | | | | | | | | |
| PRE0100 | Application & Consent of XP from HyD (Mo Tat Rd) | 120 | 100 | 17/05/10 A | 13/10/10 A | 17/05/10 A | 13/10/10 A | | KD0020 | SKW1491, SKW1501 | | | | | | | | |
| PRE0130 | Setup Web-site for EM&A Reporting | 90 | 100 | 17/05/10 A | 31/08/10 A | 17/05/10 A | 31/08/10 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 | 98 | 17/05/10 A | 02/08/11 | 17/05/10 A | 16/06/11 | -47d | E&M0020 | E&M0080 | | | | | | | | |
| E&M0080 | Approval from the Engineer | 14 | 0 | 02/08/11 | 16/08/11 | 17/06/11 | 30/06/11 | -47d | E&M0030 | E&M0295 | | | | | | | | |
| Hydraulic Design | | | | | | | | | | | | | | | | | | |
| E&M0040 | Submission | 21 | 100 | 17/05/10 A | 16/09/10 A | 17/05/10 A | 16/09/10 A | | E&M0010, E&M0020 | E&M0050, E&M0101, E&M0240, | | | | | | | | |
| E&M0050 | Vetting and Comment by ER | 14 | 100 | 17/09/10 A | 09/11/10 A | 17/09/10 A | 09/11/10 A | | E&M0040 | E&M0060 | | | | | | | | |
| E&M0060 | Revision and Resubmission | 97 | 95 | 19/08/10 A | 04/08/11 | 19/08/10 A | 28/06/11 | -38d | E&M0050 | E&M0430 | | | | | | | | |
| E&M0430 | Approval from the Engineer | 7 | 60 | 29/03/11 A | 07/08/11 | 29/03/11 A | 30/06/11 | -38d | 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 | 95 | 04/08/10 A | 04/08/11 | 04/08/10 A | 15/02/11 | -170d | E&M0040 | E&M0102 | | | | | | | | |
| E&M0102 | Vetting and Comment by ER | 60 | 95 | 18/11/10 A | 07/08/11 | 18/11/10 A | 18/02/11 | -170d | E&M0101 | E&M0103 | | | | | | | | |
| E&M0103 | Revision and Resubmission | 60 | 80 | 01/02/11 A | 19/08/11 | 01/02/11 A | 02/03/11 | -170d | 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 | 0 | 19/08/11 | 18/09/11 | 29/04/11 | 28/05/11 | -113d | E&M0103 | E&M0400, E&M3060 | | | | | | | | |
| E&M0130 | Approval on Pumps | 30 | 0 | 19/08/11 | 18/09/11 | 03/03/11 | 01/04/11 | -170d | 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 | 0 | 19/08/11 | 18/09/11 | 29/04/11 | 28/05/11 | -113d | E&M0103 | E&M0380, E&M3030 | | | | | | | | |
| E&M0160 | Approval on MBR Membrane Modules (M.M.) | 105 | 100 | 02/08/10 A | 24/02/11 A | 02/08/10 A | 24/02/11 A | | E&M0100 | E&M0360, E&M0370, E&M3010 | | | | | | | | |
| E&M0170 | Approval on Sludge Dewatering Equipment | 30 | 0 | 19/08/11 | 18/09/11 | 03/03/11 | 01/04/11 | -170d | E&M0103 | E&M0440, E&M3090 | | | | | | | | |
| E&M0180 | Approval on Valves, Pipes & Fittings | 30 | 0 | 19/08/11 | 18/09/11 | 28/06/11 | 27/07/11 | -53d | E&M0103 | E&M0450, E&M3100 | | | | | | | | |
| E&M0190 | Approval on Penstocks | 30 | 0 | 19/08/11 | 18/09/11 | 11/06/11 | 10/07/11 | -70d | E&M0103 | E&M0460, E&M3110 | | | | | | | | |
| E&M0200 | Approval on Instrumentation | 30 | 0 | 19/08/11 | 18/09/11 | 09/10/11 | 07/11/11 | 51d | E&M0103 | E&M0470, E&M3130 | | | | | | | | |
| E&M0210 | Approval on MCC & LVSB | 30 | 0 | 19/08/11 | 18/09/11 | 03/03/11 | 01/04/11 | -170d | E&M0103 | E&M0480, E&M3140 | | | | | | | | |
| E&M0220 | Approval on BS Equipment | 30 | 0 | 30/08/11 | 28/09/11 | 31/07/11 | 29/08/11 | -30d | E&M0103, E&M0280 | E&M0490, E&M3150 | | | | | | | | |
| E&M0230 | Approval on FS Equipment | 30 | 0 | 30/08/11 | 28/09/11 | 01/06/11 | 30/06/11 | -90d | E&M0103, E&M0290 | E&M0295, E&M0320, E&M0500, | | | | | | | | |
| Drawings Submission & Approval | | | | | | | | | | | | | | | | | | |
| E&M0235 | Sub. P&ID Drawings | 100 | 100 | 24/06/10 A | 22/08/10 A | 24/06/10 A | 22/08/10 A | | E&M0010 | | | | | | | | | |
| E&M0240 | Sub. Plant GA Drawings | 45 | 90 | 04/08/10 A | 04/08/11 | 04/08/10 A | 30/06/11 | -35d | E&M0040 | E&M0250, E&M0280, E&M0290 | | | | | | | | |
| E&M0250 | Sub. Builder's Works Requirements Drawings | 15 | 90 | 04/08/10 A | 10/08/11 | 04/08/10 A | 01/07/11 | -40d | E&M0240, E&M0260, E&M0270 | E&M0280, E&M0290 | | | | | | | | |
| E&M0260 | Sub. Mechanical Installation Drawings | 60 | 85 | 27/09/10 A | 08/08/11 | 27/09/10 A | 30/06/11 | -40d | E&M0040 | E&M0250 | | | | | | | | |
| E&M0270 | Sub. Electrical Installation Drawings | 60 | 85 | 27/09/10 A | 08/08/11 | 27/09/10 A | 30/06/11 | -40d | E&M0040 | E&M0250, E&M0280 | | | | | | | | |
| E&M0280 | Sub. BS Installation Drawings | 120 | 75 | 27/09/10 A | 29/08/11 | 27/09/10 A | 30/07/11 | -30d | E&M0240, E&M0250, E&M0270 | E&M0220 | | | | | | | | |
| E&M0290 | Sub. FS Installation Drawings | 120 | 75 | 13/11/10 A | 29/08/11 | 13/11/10 A | 31/05/11 | -90d | E&M0240, E&M0250 | E&M0230 | | | | | | | | |
| Statutory Submission | | | | | | | | | | | | | | | | | | |
| E&M0295 | Preparation of Submission to HEC | 39 | 0 | 29/09/11 | 06/11/11 | 01/07/11 | 08/08/11 | -90d | E&M0080, E&M0230, E&M0430 | E&M0300 | | | | | | | | |

| | | | |
|-------------|----------|--|------------------------|
| Start date | 05/05/10 | | Early bar |
| Finish date | 13/03/15 | | Progress bar |
| Data date | 31/07/11 | | Critical bar |
| Run date | 08/08/11 | | Summary bar |
| Page number | 1A | | Progress point |
| | | | Critical point |
| | | | Summary point |
| | | | Start milestone point |
| | | | Finish milestone point |

Leader Civil Engineering Corp. Ltd.
 Contract No. DC/2009/13
 Construction of Sewage Treatment Works at YSW & SKW
 3-month Rolling Programme (Aug 2011 - Oct 2011)

(Marked on 31 Jul 2011)

| | | | |
|----------|------------|---------|----------|
| Date | Revision | Checked | Approved |
| 31/07/10 | Revision 0 | StL | VC |
| | | | |
| | | | |

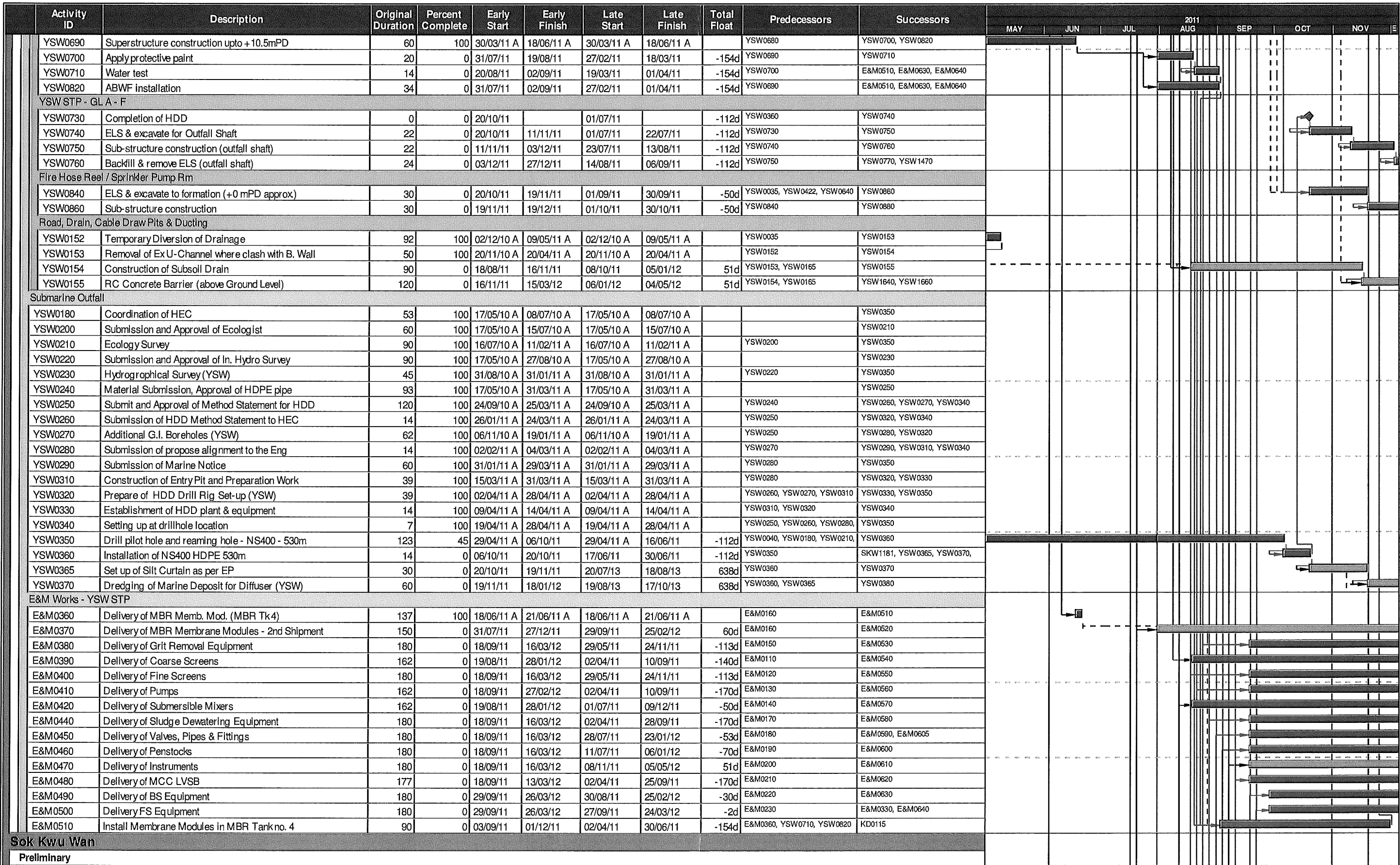
| Activity ID | Description | Original Duration | Percent Complete | Early Start | Early Finish | Late Start | Late Finish | Total Float | Predecessors | Successors | 2011 | | | | | | | | |
|--|---|-------------------|------------------|-------------|--------------|------------|-------------|-------------|----------------------------|----------------------------|------|-----|-----|-----|-----|-----|-----|--|--|
| | | | | | | | | | | | MAY | JUN | JUL | AUG | SEP | OCT | NOV | | |
| E&M0300 | Application & Approval from HEC | 150 | 0 | 07/11/11 | 04/04/12 | 09/08/11 | 05/01/12 | -90d | E&M0295 | E&M0305 | | | | | | | | | |
| E&M0320 | Form 314 Submission to FSD | 14 | 0 | 29/09/11 | 12/10/11 | 15/04/12 | 28/04/12 | 199d | E&M0230 | E&M0325, E&M0670 | | | | | | | | | |
| E&M0325 | Submission to WSD | 14 | 0 | 13/10/11 | 26/10/11 | 29/04/12 | 12/05/12 | 199d | E&M0320 | E&M0670, E&M0680 | | | | | | | | | |
| E&M0350 | Form 501 Submission to FSD (PS1 & PS2) | 28 | 0 | 27/11/11 | 25/12/11 | 04/02/15 | 13/03/15 | 1103d | E&M2016 | | | | | | | | | | |
| 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 | YSW0030, YSW0040 | | | | | | | | | |
| YSW0030 | Baseline monitoring (Air & Noise) | 14 | 100 | 31/07/10 A | 22/08/10 A | 31/07/10 A | 22/08/10 A | | YSW0020 | YSW0035 | | | | | | | | | |
| YSW0035 | Baseline Monitoring Report Submission (A & N) | 14 | 100 | 23/08/10 A | 07/09/10 A | 23/08/10 A | 07/09/10 A | | YSW0030 | YSW0120, YSW0152, YSW0500, | | | | | | | | | |
| YSW0040 | Baseline monitoring (Water) | 213 | 100 | 30/07/10 A | 31/12/10 A | 30/07/10 A | 31/12/10 A | | YSW0020 | YSW0350 | | | | | | | | | |
| YSW0050 | Erect Hoarding and Fencing | 60 | 100 | 17/05/10 A | 15/07/10 A | 17/05/10 A | 15/07/10 A | | | | | | | | | | | | |
| 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 | YSW0100 | | | | | | | | | |
| YSW0080 | Site Clearance | 30 | 100 | 17/05/10 A | 15/06/10 A | 17/05/10 A | 15/06/10 A | | | YSW0085, YSW0120 | | | | | | | | | |
| YSW0085 | Initial Survey | 14 | 100 | 02/06/10 A | 15/06/10 A | 02/06/10 A | 15/06/10 A | | YSW0080 | YSW0120 | | | | | | | | | |
| YSW0090 | Verify the Rock Boulder required Stabilization Wk | 30 | 100 | 19/07/10 A | 21/03/11 A | 19/07/10 A | 21/03/11 A | | | YSW0100, YSW0110 | | | | | | | | | |
| YSW0100 | Removal of Rock Boulder | 280 | 100 | 20/09/10 A | 03/06/11 A | 20/09/10 A | 03/06/11 A | | YSW0075, YSW0090 | YSW0150 | | | | | | | | | |
| YSW0110 | Stabilizing work for rock boulder | 280 | 50 | 16/07/11 A | 17/12/11 | 16/07/11 A | 15/08/11 | -124d | YSW0090 | YSW0150 | | | | | | | | | |
| YSW0120 | Cut the slope to design profile | 100 | 100 | 13/09/10 A | 14/09/10 A | 13/09/10 A | 14/09/10 A | | YSW0035, YSW0080, YSW0085 | YSW0131, YSW0165 | | | | | | | | | |
| YSW0131 | Mobilization of Plant and Material of Soil Nails | 20 | 100 | 01/09/10 A | 14/09/10 A | 01/09/10 A | 14/09/10 A | | YSW0120 | YSW0132 | | | | | | | | | |
| YSW0132 | Erect Scaffold and Working Platform | 20 | 100 | 15/09/10 A | 16/09/10 A | 15/09/10 A | 16/09/10 A | | YSW0131 | YSW0133 | | | | | | | | | |
| YSW0133 | Setting out and Verify Locations of Soil Nails | 10 | 100 | 14/09/10 A | 31/10/10 A | 14/09/10 A | 31/10/10 A | | YSW0132 | YSW0134 | | | | | | | | | |
| YSW0134 | Drilling and Soil Nails Installation | 20 | 100 | 08/10/10 A | 19/11/10 A | 08/10/10 A | 19/11/10 A | | YSW0133 | YSW0135 | | | | | | | | | |
| YSW0135 | Construction of Nail Heads | 10 | 100 | 24/11/10 A | 01/12/10 A | 24/11/10 A | 01/12/10 A | | YSW0134 | YSW0136 | | | | | | | | | |
| YSW0136 | Mesh Installation on Cut Slope | 10 | 100 | 04/12/10 A | 04/12/10 A | 04/12/10 A | 04/12/10 A | | YSW0135 | YSW0137 | | | | | | | | | |
| YSW0137 | Hydroseeding | 30 | 0 | 31/07/11 | 29/08/11 | 27/06/11 | 27/07/11 | -33d | YSW0136 | YSW0140 | | | | | | | | | |
| YSW0140 | Construct U-channels & Step Channel on Cut Slope | 116 | 90 | 02/04/11 A | 10/09/11 | 02/04/11 A | 08/08/11 | -33d | YSW0137 | YSW0150 | | | | | | | | | |
| YSW0150 | Construction of access, u-channels and catch pit | 76 | 90 | 10/01/11 A | 17/12/11 | 10/01/11 A | 15/08/11 | -124d | YSW0100, YSW0110, YSW0140, | KD0030 | | | | | | | | | |
| YSW0165 | Construction of Barrier Wall (below Ground Lev) | 226 | 92 | 10/09/10 A | 18/08/11 | 10/09/10 A | 08/08/11 | -10d | YSW0120 | YSW0150, YSW0154, YSW0155 | | | | | | | | | |
| 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 STP - GL H - T | | | | | | | | | | | | | | | | | | | |
| YSW0500 | ELS & Excavation for Inlet Pumping Station | 62 | 100 | 17/09/10 A | 16/12/10 A | 17/09/10 A | 16/12/10 A | | YSW0035, YSW0422 | YSW0510 | | | | | | | | | |
| YSW0510 | Sub-structure construction (Inlet Pumping Stn) | 30 | 100 | 17/12/10 A | 04/04/11 A | 17/12/10 A | 04/04/11 A | | YSW0432, YSW0500 | YSW0520 | | | | | | | | | |
| YSW0520 | Backfill & Remove ELS (Inlet Pumping Stn) | 30 | 100 | 03/01/11 A | 05/05/11 A | 03/01/11 A | 05/05/11 A | | YSW0510 | YSW0530, YSW0610 | | | | | | | | | |
| YSW0530 | ELS & Excavation for Equalization Tank | 40 | 100 | 11/01/11 A | 08/06/11 A | 11/01/11 A | 08/06/11 A | | YSW0520 | YSW0540 | | | | | | | | | |
| YSW0540 | Sub-structure construction (Equalization Tank) | 40 | 85 | 13/06/11 A | 05/08/11 | 13/06/11 A | 13/02/11 | -173d | YSW0530 | YSW0550 | | | | | | | | | |
| YSW0550 | Backfilling & Remove ELS (Equalization Tank) | 40 | 0 | 06/08/11 | 14/09/11 | 14/02/11 | 25/03/11 | -173d | YSW0540 | YSW0570 | | | | | | | | | |
| YSW0570 | Excavate to formation by open cut | 30 | 80 | 02/07/11 A | 20/09/11 | 02/07/11 A | 31/03/11 | -173d | YSW0550 | YSW0580 | | | | | | | | | |
| YSW0580 | Base slab construction | 30 | 10 | 06/07/11 A | 17/10/11 | 06/07/11 A | 27/04/11 | -173d | YSW0570 | YSW0590 | | | | | | | | | |
| YSW0590 | G/F to 1/F construction | 50 | 0 | 18/10/11 | 06/12/11 | 28/04/11 | 16/06/11 | -173d | YSW0580 | YSW0600 | | | | | | | | | |
| YSW STP - GL T - X | | | | | | | | | | | | | | | | | | | |
| YSW0610 | Excavate to formation | 50 | 100 | 08/09/10 A | 17/09/10 A | 08/09/10 A | 17/09/10 A | | YSW0035, YSW0422, YSW0520 | YSW0620 | | | | | | | | | |
| YSW0620 | Base slab construction | 60 | 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 | 95 | 100 | 27/12/10 A | 19/07/11 A | 27/12/10 A | 19/07/11 A | | YSW0620 | YSW0640 | | | | | | | | | |
| YSW0640 | 1/F to Roof Construction | 91 | 10 | 20/07/11 A | 20/10/11 | 20/07/11 A | 21/08/11 | -60d | YSW0630 | YSW0810, YSW0840 | | | | | | | | | |
| YSW0810 | ABWF Installation | 86 | 0 | 30/08/11 | 24/11/11 | 02/07/11 | 25/09/11 | -60d | YSW0640 | E&M0610, E&M0620, E&M0630, | | | | | | | | | |
| YSW STP - GL F - H & DN Tanks | | | | | | | | | | | | | | | | | | | |
| YSW0650 | ELS & Excavation for DN Tanks | 70 | 100 | 21/08/10 A | 14/10/10 A | 21/08/10 A | 14/10/10 A | | YSW0035, YSW0422 | YSW0660 | | | | | | | | | |
| YSW0660 | Sub-structure construction (DN Tanks) | 40 | 100 | 15/10/10 A | 31/12/10 A | 15/10/10 A | 31/12/10 A | | YSW0650 | YSW0670 | | | | | | | | | |
| YSW0670 | Backfill & Remove ELS (DN Tanks) | 32 | 100 | 08/01/11 A | 15/03/11 A | 08/01/11 A | 15/03/11 A | | YSW0660 | YSW0680 | | | | | | | | | |
| YSW0680 | Base slab construction | 30 | 100 | 16/03/11 A | 28/03/11 A | 16/03/11 A | 28/03/11 A | | YSW0670 | YSW0690 | | | | | | | | | |

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| Start date | 05/05/10 | Early bar |
| Finish date | 13/03/15 | Progress bar |
| Data date | 31/07/11 | Critical bar |
| Run date | 08/08/11 | Summary bar |
| Page number | 2A | Progress point |
| | | Critical point |
| | | Summary point |
| | | Start milestone point |
| | | Finish milestone point |

Leader Civil Engineering Corp. Ltd.
Contract No. DC/2009/13
Construction of Sewage Treatment Works at YSW & SKW
3-month Rolling Programme (Aug 2011 - Oct 2011)

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| Date | Revision | Checked | Approved |
| 31/07/10 | Revision 0 | StL | VC |
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(Marked on 31 Jul 2011)



Sok Kwu Wan

Preliminary

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|-------------|----------|
| Start date | 05/05/10 |
| Finish date | 13/03/15 |
| Data date | 31/07/11 |
| Run date | 08/08/11 |
| Page number | 3A |

- Early bar
- Progress bar
- Critical bar
- Summary bar
- ▲ Progress point
- ▲ Critical point
- ▲ Summary point
- ◆ Start milestone point
- ◆ Finish milestone point

Leader Civil Engineering Corp. Ltd.
 Contract No. DC/2009/13
 Construction of Sewage Treatment Works at YSW & SKW
 3-month Rolling Programme (Aug 2011 - Oct 2011)

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| Date | Revision | Checked | Approved |
| 31/07/10 | Revision 0 | STL | VC |
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(Marked on 31 Jul 2011)

| Activity ID | Description | Original Duration | Percent Complete | Early Start | Early Finish | Late Start | Late Finish | Total Float | Predecessors | Successors | 2011 | | | | | | |
|---|--|-------------------|------------------|-------------|--------------|------------|-------------|-------------|---------------------------|-----------------------------|------|-----|-----|-----|-----|-----|-----|
| | | | | | | | | | | | MAY | JUN | JUL | AUG | SEP | OCT | NOV |
| SKW0250 | Approval of Environmental Team | 16 | 100 | 17/05/10 A | 01/06/10 A | 17/05/10 A | 01/06/10 A | | KD0020 | SKW0260 | | | | | | | |
| SKW0260 | Baseline monitoring (Air & Noise) | 14 | 100 | 02/06/10 A | 15/06/10 A | 02/06/10 A | 15/06/10 A | | SKW0250 | SKW0242, SKW0265, SKW0592, | | | | | | | |
| SKW0265 | Baseline Monitoring Submission (A & N) | 14 | 100 | 16/06/10 A | 08/07/10 A | 16/06/10 A | 08/07/10 A | | SKW0260 | SKW0242, SKW0592, SKW0681, | | | | | | | |
| 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 | Excavation to formation for Bay 1 to 5 | 50 | 100 | 16/06/10 A | 11/08/10 A | 16/06/10 A | 11/08/10 A | | SKW0241, SKW0260, SKW0265 | SKW0251 | | | | | | | |
| SKW0251 | Drill & Install Dowel Bar for Bay 1 & 3 | 20 | 100 | 02/08/10 A | 01/09/10 A | 02/08/10 A | 01/09/10 A | | SKW0242 | SKW0301 | | | | | | | |
| SKW0301 | Erect Formwork, mesh & weep hole for Bay 1 & 3 | 12 | 100 | 02/09/10 A | 15/09/10 A | 02/09/10 A | 15/09/10 A | | SKW0251 | SKW0311 | | | | | | | |
| SKW0311 | Concreting for Bay 1 & 3 | 12 | 100 | 19/06/10 A | 29/09/10 A | 19/06/10 A | 29/09/10 A | | SKW0301 | SKW0321 | | | | | | | |
| SKW0321 | Drilling & install Dowel Bar for Bay 2 & 5 | 6 | 100 | 30/09/10 A | 06/10/10 A | 30/09/10 A | 06/10/10 A | | SKW0311 | SKW0331 | | | | | | | |
| SKW0331 | Erect Formwork, mesh & weep hole for Bay 2 & 5 | 7 | 100 | 07/10/10 A | 13/10/10 A | 07/10/10 A | 13/10/10 A | | SKW0321 | SKW0341 | | | | | | | |
| SKW0341 | Concreting for Bay 2 & 5 | 7 | 100 | 14/10/10 A | 20/10/10 A | 14/10/10 A | 20/10/10 A | | SKW0331 | SKW0351 | | | | | | | |
| SKW0351 | Excavation to formation for Bay 6 to 9 | 20 | 100 | 21/10/10 A | 10/11/10 A | 21/10/10 A | 10/11/10 A | | SKW0341 | SKW0361 | | | | | | | |
| SKW0361 | Drill & install dowel Bar for Bay 4 & 7 | 6 | 100 | 11/11/10 A | 16/11/10 A | 11/11/10 A | 16/11/10 A | | SKW0351 | SKW0371 | | | | | | | |
| SKW0371 | Erect formwork, mesh & weep hole for Bay 4 & 7 | 7 | 100 | 11/11/10 A | 16/11/10 A | 11/11/10 A | 16/11/10 A | | SKW0361 | SKW0381 | | | | | | | |
| SKW0381 | Concreting for Bay 4 & 7 | 7 | 100 | 17/11/10 A | 23/11/10 A | 17/11/10 A | 23/11/10 A | | SKW0371 | SKW0391 | | | | | | | |
| SKW0391 | Drill & install dowel Bar for Bay 6 & 9 | 3 | 100 | 24/11/10 A | 27/11/10 A | 24/11/10 A | 27/11/10 A | | SKW0381 | SKW0401 | | | | | | | |
| SKW0401 | Erect formwork, mesh & weep hole for Bay 6 & 9 | 7 | 100 | 28/11/10 A | 05/12/10 A | 28/11/10 A | 05/12/10 A | | SKW0391 | SKW0411 | | | | | | | |
| SKW0411 | Concreting for Bay 6 & 9 | 7 | 100 | 06/12/10 A | 12/12/10 A | 06/12/10 A | 12/12/10 A | | SKW0401 | SKW0421 | | | | | | | |
| SKW0421 | Drill & install dowel Bar for Bay 8 | 1 | 100 | 13/12/10 A | 13/12/10 A | 13/12/10 A | 13/12/10 A | | SKW0411 | SKW0431 | | | | | | | |
| SKW0431 | Erect formwork, mesh & weep hole for Bay 8 | 4 | 100 | 15/12/10 A | 21/12/10 A | 15/12/10 A | 21/12/10 A | | SKW0421 | SKW0441 | | | | | | | |
| SKW0441 | Concreting for Bay 8 | 4 | 100 | 22/12/10 A | 27/12/10 A | 22/12/10 A | 27/12/10 A | | SKW0431 | SKW0461 | | | | | | | |
| SKW0461 | Excavation for no fine concrete Bay (1-9) | 3 | 100 | 26/07/11 A | 28/07/11 A | 26/07/11 A | 28/07/11 A | | SKW0441 | SKW0471 | | | | | | | |
| SKW0471 | Concreting for no-fine concrete | 7 | 100 | 01/02/11 A | 07/02/11 A | 01/02/11 A | 07/02/11 A | | SKW0461 | SKW0481 | | | | | | | |
| SKW0481 | Installation of Wall tie & stone facing | 14 | 100 | 08/02/11 A | 11/02/11 A | 08/02/11 A | 11/02/11 A | | SKW0471 | SKW0491 | | | | | | | |
| SKW0491 | Construction of Gabion Wall | 7 | 100 | 08/02/11 A | 14/02/11 A | 08/02/11 A | 14/02/11 A | | SKW0481 | SKW0501 | | | | | | | |
| SKW0501 | Place Geotextile | 3 | 100 | 08/01/11 A | 28/02/11 A | 08/01/11 A | 28/02/11 A | | SKW0491 | SKW0511 | | | | | | | |
| SKW0511 | Backfill behind the retaining wall to approx. +4 | 7 | 100 | 11/01/11 A | 28/02/11 A | 11/01/11 A | 28/02/11 A | | SKW0501 | SKW0521 | | | | | | | |
| SKW0521 | Watermain Laying and Diversion | 14 | 100 | 01/04/11 A | 10/05/11 A | 01/04/11 A | 10/05/11 A | | SKW0511 | SKW0531 | | | | | | | |
| SKW0531 | Concreting for Pavement | 7 | 100 | 02/06/11 A | 30/07/11 A | 02/06/11 A | 30/07/11 A | | SKW0521 | SKW0541 | | | | | | | |
| SKW0541 | Installation of Flower Pot | 7 | 0 | 31/07/11 | 06/08/11 | 15/02/11 | 22/02/11 | -166d | SKW0531 | SKW0551 | | | | | | | |
| SKW0551 | Permanent Footpath Diversion | 1 | 100 | 30/07/11 A | 30/07/11 A | 30/07/11 A | 30/07/11 A | | SKW0541 | KD0050, SKW1261, SKW1311 | | | | | | | |
| 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 | 19/10/10 A | 06/01/11 A | 19/10/10 A | 06/01/11 A | | SKW0260, SKW0265, SKW0591 | SKW05931 | | | | | | | |
| SKW05931 | Construction of Haul Road (To +21mPD) | 50 | 100 | 28/11/10 A | 30/12/10 A | 28/11/10 A | 30/12/10 A | | SKW0592 | SKW05932 | | | | | | | |
| SKW05932 | Construction of Haul Road (To +42mPD) | 60 | 100 | 15/12/10 A | 31/01/11 A | 15/12/10 A | 31/01/11 A | | SKW05931 | SKW05933, SKW05940, SKW0595 | | | | | | | |
| SKW05933 | Excavation of Rock Berm (+50mPD to +42.5mPD) | 30 | 100 | 01/03/11 A | 03/05/11 A | 01/03/11 A | 03/05/11 A | | SKW05932 | SKW05934 | | | | | | | |
| SKW05934 | Excavation of Rock Berm (+42.5mPD to +35mPD) | 30 | 100 | 04/05/11 A | 31/05/11 A | 04/05/11 A | 31/05/11 A | | SKW05933 | SKW05935, SKW05941 | | | | | | | |
| SKW05935 | Excavation of Rock Berm (+35mPD to +27.5mPD) | 30 | 20 | 02/07/11 A | 23/08/11 | 02/07/11 A | 21/03/11 | -155d | SKW05934 | SKW05936 | | | | | | | |
| SKW05936 | Excavation of Rock Berm (+27.5mPD to +20mPD) | 30 | 0 | 24/08/11 | 22/09/11 | 22/03/11 | 20/04/11 | -155d | SKW05935 | SKW05937, SKW05942 | | | | | | | |
| SKW05937 | Excavation of Rock Berm (+20mPD to +12.5mPD) | 30 | 0 | 23/09/11 | 22/10/11 | 21/04/11 | 20/05/11 | -155d | SKW05936 | SKW05938 | | | | | | | |
| SKW05938 | Excavation of Rock Berm (+12.5mPD to +5mPD) | 28 | 0 | 23/10/11 | 19/11/11 | 21/05/11 | 17/06/11 | -155d | SKW05937 | SKW05943, SKW1311, SKW1371 | | | | | | | |
| SKW05940 | Slope Drainage & Misc. at 50mPD | 60 | 100 | 01/04/11 A | 03/05/11 A | 01/04/11 A | 03/05/11 A | | SKW05932 | SKW05941 | | | | | | | |
| SKW05941 | Slope Drainage & Misc. (+50 to +35mPD) | 60 | 40 | 04/05/11 A | 04/09/11 | 04/05/11 A | 20/04/11 | -137d | SKW05934, SKW05940 | SKW05942 | | | | | | | |
| SKW05942 | Slope Drainage & Misc. (+35 to +20mPD) | 58 | 0 | 23/09/11 | 19/11/11 | 21/04/11 | 17/06/11 | -155d | SKW05936, SKW05941 | SKW05943 | | | | | | | |
| SKW0595 | Rock Meshing & Rockfall Fence | 260 | 0 | 31/07/11 | 15/04/12 | 29/11/10 | 15/08/11 | -244d | SKW05932 | KD0060 | | | | | | | |
| 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 | | | | | | | |

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| Start date | 05/05/10 | | Early bar |
| Finish date | 13/03/15 | | Progress bar |
| Date date | 31/07/11 | | Critical bar |
| Run date | 08/08/11 | | Summary bar |
| Page number | 4A | | Progress point |
| | | | Critical point |
| | | | Summary point |
| | | | Start milestone point |
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Contract No. DC/2009/13
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3-month Rolling Programme (Aug 2011 - Oct 2011)

(Marked on 31 Jul 2011)

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| Date | Revision | Checked | Approved |
| 31/07/10 | Revision 0 | STL | VC |
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| Activity ID | Description | Original Duration | Percent Complete | Early Start | Early Finish | Late Start | Late Finish | Total Float | Predecessors | Successors | 2011 | | | | | | | | | | |
|--|--|-------------------|------------------|-------------|--------------|------------|-------------|-------------|---------------------------|------------------|------|-----|-----|-----|-----|-----|-----|--|--|--|--|
| | | | | | | | | | | | MAY | JUN | JUL | AUG | SEP | OCT | NOV | | | | |
| E&M2016 | Delivery of FS Equipment | 107 | 0 | 12/08/11 | 27/11/11 | 15/01/11 | 01/05/11 | -209d | E&M2006 | E&M0350, E&M2106 | | | | | | | | | | | |
| E&M2017 | Delivery of BS Equipment | 107 | 0 | 12/08/11 | 27/11/11 | 15/01/11 | 01/05/11 | -209d | E&M2007 | E&M2107 | | | | | | | | | | | |
| Installation, T&C | | | | | | | | | | | | | | | | | | | | | |
| E&M2105 | Install Instrumentation | 55 | 0 | 04/12/11 | 28/01/12 | 02/05/11 | 25/06/11 | -216d | E&M2015, SKW1051, SKW1061 | E&M2140 | | | | | | | | | | | |
| E&M2106 | Install FS Equipment | 55 | 0 | 04/12/11 | 28/01/12 | 02/05/11 | 25/06/11 | -216d | E&M2016, SKW1051, SKW1061 | E&M2140 | | | | | | | | | | | |
| E&M2107 | Install BS Equipment | 55 | 0 | 04/12/11 | 28/01/12 | 02/05/11 | 25/06/11 | -216d | E&M2017, SKW1051, SKW1061 | E&M2110, E&M2140 | | | | | | | | | | | |
| 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 | 185 | 80 | 15/06/11 A | 05/09/11 | 15/06/11 A | 15/09/11 | 10d | PRE0090, SKW1141 | SKW1171 | | | | | | | | | | | |
| SKW STW | | | | | | | | | | | | | | | | | | | | | |
| Submission & Delivery (E&M) | | | | | | | | | | | | | | | | | | | | | |
| E&M3010 | Delivery of MBR M.M. - 1st shipment for Temp STP | 150 | 0 | 31/07/11 | 27/12/11 | 10/03/14 | 20/08/14 | 953d | E&M0160 | E&M3170 | | | | | | | | | | | |
| E&M3030 | Delivery of Grit Removal Equipment | 180 | 0 | 18/09/11 | 16/03/12 | 31/08/11 | 26/02/12 | -19d | E&M0150 | E&M3190 | | | | | | | | | | | |
| E&M3060 | Delivery of Fine Screens | 136 | 0 | 18/09/11 | 01/02/12 | 15/08/11 | 28/12/11 | -35d | E&M0120 | E&M3210 | | | | | | | | | | | |
| E&M3070 | Delivery of Pumps | 136 | 0 | 18/09/11 | 01/02/12 | 15/08/11 | 28/12/11 | -35d | E&M0130 | E&M3220 | | | | | | | | | | | |
| E&M3080 | Delivery of Submersible Mixers | 180 | 0 | 19/08/11 | 15/02/12 | 15/09/11 | 12/03/12 | 27d | E&M0140 | E&M3230 | | | | | | | | | | | |
| E&M3090 | Delivery of Sludge Dewatering Equipment | 210 | 0 | 18/09/11 | 15/04/12 | 18/07/11 | 12/02/12 | -63d | E&M0170 | E&M3240 | | | | | | | | | | | |
| E&M3100 | Delivery of Valves, Pipes & Fittings | 180 | 0 | 18/09/11 | 16/03/12 | 22/12/13 | 19/06/14 | 826d | E&M0180 | E&M3250 | | | | | | | | | | | |
| E&M3110 | Delivery of Penstocks | 180 | 0 | 18/09/11 | 16/03/12 | 04/01/14 | 02/07/14 | 839d | E&M0190 | E&M3260 | | | | | | | | | | | |
| E&M3130 | Delivery of Instruments | 180 | 0 | 18/09/11 | 16/03/12 | 20/03/14 | 15/10/14 | 914d | E&M0200 | E&M3270 | | | | | | | | | | | |
| E&M3140 | Delivery of MCC LVSB | 180 | 0 | 18/09/11 | 16/03/12 | 09/05/11 | 04/11/11 | -133d | E&M0210 | E&M3261 | | | | | | | | | | | |
| E&M3150 | Delivery of BS Equipment | 180 | 0 | 29/09/11 | 26/03/12 | 06/01/14 | 04/07/14 | 830d | E&M0220 | E&M3291 | | | | | | | | | | | |
| E&M3160 | Delivery of FS Equipment | 180 | 0 | 29/09/11 | 26/03/12 | 14/01/12 | 11/07/12 | 107d | E&M0230 | E&M0340, E&M3300 | | | | | | | | | | | |
| Construction of Grid A-G | | | | | | | | | | | | | | | | | | | | | |
| SKW1261 | Excavate for SKW STW Structure (Grid A -G) | 164 | 5 | 30/07/11 A | 09/01/12 | 30/07/11 A | 27/07/11 | -166d | SKW0551 | SKW1271, SKW1371 | | | | | | | | | | | |
| Construction of Grid G-N | | | | | | | | | | | | | | | | | | | | | |
| SKW1311 | Excavate for SKW STW Structure (Grid G-N) | 36 | 0 | 20/11/11 | 25/12/11 | 29/06/11 | 03/08/11 | -144d | SKW0551, SKW0598 | SKW1321 | | | | | | | | | | | |
| Rising Main | | | | | | | | | | | | | | | | | | | | | |
| SKW1481 | Subm, Approval & Delivery of DI pipes | 120 | 100 | 17/05/10 A | 28/02/11 A | 17/05/10 A | 28/02/11 A | | KD0020 | SKW1501 | | | | | | | | | | | |
| SKW1501 | Concrete Trough (ChB0+00 - ChB1+20) | 300 | 0 | 31/07/11 | 25/05/12 | 14/09/10 | 10/07/11 | -320d | PRE0100, SKW1481 | SKW1521 | | | | | | | | | | | |
| 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 | 55 | 17/05/10 A | 03/08/12 | 17/05/10 A | 03/08/12 | 0 | KD0020 | KD0100, SKW1631 | | | | | | | | | | | |
| SKW1621 | Transplantation at SKW | 60 | 100 | 07/06/10 A | 05/10/10 A | 07/06/10 A | 05/10/10 A | | SKW1591 | | | | | | | | | | | | |

Start date 05/05/10
 Finish date 13/03/15
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 Primavera Systems, Inc.

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

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(Marked on 31 Jul 2011)

| Date | Revision | Checked | Approved |
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| 31/07/10 | Revision 0 | StL | VC |
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| Activity ID | Description | Original Duration | Percent Complete | Early Start | Early Finish | Late Start | Late Finish | Total Float | Predecessors | Successors | 2011 | | | | | | | |
|--|-------------|-------------------|------------------|-------------|--------------|------------|-------------|-------------|--------------|------------|------|-----|-----|-----|-----|-----|-----|--|
| | | | | | | | | | | | MAY | JUN | JUL | AUG | SEP | OCT | NOV | |
| +Project Key Date | | | | | | | | | | | | | | | | | | |
| | | 451 | 0 | 05/05/10 A | 01/12/11 | 05/05/10 A | 30/06/11 | -154d | | | | | | | | | | |
| +Preliminary (Civil) | | | | | | | | | | | | | | | | | | |
| | | 191 | 100 | 17/05/10 A | 23/11/10 A | 17/05/10 A | 23/11/10 A | | KD0020 | | | | | | | | | |
| Preliminary (E&M) | | | | | | | | | | | | | | | | | | |
| Technical Submission | | | | | | | | | | | | | | | | | | |
| +Process Design of SKWSTW & YSWSTW | | | | | | | | | | | | | | | | | | |
| | | 457 | 92 | 17/05/10 A | 16/08/11 | 17/05/10 A | 30/06/11 | -47d | | | | | | | | | | |
| +Hydraulic Design | | | | | | | | | | | | | | | | | | |
| | | 448 | 95 | 17/05/10 A | 07/08/11 | 17/05/10 A | 30/06/11 | -38d | | | | | | | | | | |
| +Equipment Submission & Approval | | | | | | | | | | | | | | | | | | |
| | | 500 | 58 | 17/05/10 A | 28/09/11 | 17/05/10 A | 07/11/11 | 40d | | | | | | | | | | |
| +Drawings Submission & Approval | | | | | | | | | | | | | | | | | | |
| | | 432 | 84 | 24/06/10 A | 29/08/11 | 24/06/10 A | 30/07/11 | -30d | | | | | | | | | | |
| +Statutory Submission | | | | | | | | | | | | | | | | | | |
| | | 189 | 0 | 29/09/11 | 04/04/12 | 01/07/11 | 13/03/15 | 1001d | | | | | | | | | | |
| Yung Shue Wan | | | | | | | | | | | | | | | | | | |
| +Preliminary | | | | | | | | | | | | | | | | | | |
| | | 229 | 100 | 17/05/10 A | 31/12/10 A | 17/05/10 A | 31/12/10 A | | | | | | | | | | | |
| +Section W 1 - Slope Works in Portion A & C | | | | | | | | | | | | | | | | | | |
| | | 580 | 84 | 17/05/10 A | 17/12/11 | 17/05/10 A | 15/08/11 | -124d | | | | | | | | | | |
| Section W 2 - YSW STW & Submarine Outfall | | | | | | | | | | | | | | | | | | |
| +Civil & Structural Work | | | | | | | | | | | | | | | | | | |
| | | 668 | 56 | 17/05/10 A | 15/03/12 | 17/05/10 A | 04/05/12 | 51d | | | | | | | | | | |
| +Submarine Outfall | | | | | | | | | | | | | | | | | | |
| | | 612 | 83 | 17/05/10 A | 18/01/12 | 17/05/10 A | 17/10/13 | 638d | | | | | | | | | | |
| +E&M Works - YSW STP | | | | | | | | | | | | | | | | | | |
| | | 283 | 6 | 18/06/11 A | 26/03/12 | 02/04/11 A | 05/05/12 | 40d | | | | | | | | | | |
| Sok Kwu Wan | | | | | | | | | | | | | | | | | | |
| +Preliminary | | | | | | | | | | | | | | | | | | |
| | | 53 | 100 | 17/05/10 A | 08/07/10 A | 17/05/10 A | 08/07/10 A | | | | | | | | | | | |
| Section W 3 - Footpath Diversion in Portion G | | | | | | | | | | | | | | | | | | |
| +Civil & Geotechnical Works | | | | | | | | | | | | | | | | | | |
| | | 447 | 98 | 17/05/10 A | 06/08/11 | 17/05/10 A | 30/07/11 | -166d | | | | | | | | | | |
| Section W 4 - Slope Works in Portions H & I | | | | | | | | | | | | | | | | | | |
| +Geotechnical Works | | | | | | | | | | | | | | | | | | |
| | | 671 | 50 | 15/06/10 A | 15/04/12 | 15/06/10 A | 15/08/11 | -244d | | | | | | | | | | |
| Section W 5 - P.S. No. 1 in Portion D | | | | | | | | | | | | | | | | | | |
| +Civil & Geotechnical Works | | | | | | | | | | | | | | | | | | |
| | | 319 | 100 | 17/05/10 A | 31/03/11 A | 17/05/10 A | 31/03/11 A | | | | | | | | | | | |
| +Structural Works | | | | | | | | | | | | | | | | | | |
| | | 391 | 4 | 20/04/11 A | 14/05/12 | 01/01/11 A | 15/11/11 | -181d | | | | | | | | | | |
| Section W 6 - Sewer and PS No.2 in Portions E&H | | | | | | | | | | | | | | | | | | |
| +Civil & Geotechnical Works | | | | | | | | | | | | | | | | | | |
| | | 697 | 51 | 17/05/10 A | 12/04/12 | 17/05/10 A | 15/11/11 | -149d | | | | | | | | | | |
| +Structural Works | | | | | | | | | | | | | | | | | | |
| | | 431 | 1 | 02/05/11 A | 06/07/12 | 18/12/10 A | 15/11/11 | -233d | | | | | | | | | | |
| E&M Works (PS2) | | | | | | | | | | | | | | | | | | |
| +Submission & Delivery | | | | | | | | | | | | | | | | | | |
| | | 600 | 61 | 17/05/10 A | 06/01/12 | 17/05/10 A | 02/07/11 | -188d | | | | | | | | | | |
| +Installation, T&C | | | | | | | | | | | | | | | | | | |
| | | 55 | 0 | 04/12/11 | 28/01/12 | 02/05/11 | 25/06/11 | -216d | | | | | | | | | | |
| Section W 7 - SKW STW, Sewer and Submarine Outfall | | | | | | | | | | | | | | | | | | |
| +Submarine Outfall | | | | | | | | | | | | | | | | | | |
| | | 477 | 96 | 17/05/10 A | 05/09/11 | 17/05/10 A | 15/09/11 | 10d | | | | | | | | | | |

| | |
|---------------------------|----------|
| Start date | 05/05/10 |
| Finish date | 13/03/15 |
| Data date | 31/07/11 |
| Run date | 08/08/11 |
| Page number | 1A |
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| | |
|--|------------------------|
| | Early bar |
| | Progress bar |
| | Critical bar |
| | Summary bar |
| | Progress point |
| | Critical point |
| | Summary point |
| | Start milestone point |
| | Finish milestone point |

Leader Civil Engineering Corp. Ltd.
 Contract No. DC/2009/13
 Construction of Sewage Treatment Works at YSW & SKW
 3-month Rolling Programme (Aug 2011 - Oct 2011)










(Outline page 1 of 2)

(Marked on 31 Jul 2011)

| Date | Revision | Checked | Approved |
|----------|------------|---------|----------|
| 31/07/10 | Revision 0 | StL | VC |
| | | | |
| | | | |
| | | | |

| Activity ID | Description | Original Duration | Percent Complete | Early Start | Early Finish | Late Start | Late Finish | Total Float | Predecessors | Successors | 2011 | | | | | | |
|--|-------------|-------------------|------------------|-------------|--------------|------------|-------------|-------------|--------------|------------|------|-----|-----|-----|-----|-----|-----|
| | | | | | | | | | | | MAY | JUN | JUL | AUG | SEP | OCT | NOV |
| SKW STW | | | | | | | | | | | | | | | | | |
| +Submission & Delivery (E&M) | | | | | | | | | | | | | | | | | |
| | | 260 | 0 | 31/07/11 | 15/04/12 | 09/05/11 | 15/10/14 | 884d | | | | | | | | | |
| +Construction of Grid A-G | | | | | | | | | | | | | | | | | |
| | | 164 | 5 | 30/07/11 A | 09/01/12 | 30/07/11 A | 27/07/11 | -166d | | | | | | | | | |
| +Construction of Grid G-N | | | | | | | | | | | | | | | | | |
| | | 36 | 0 | 20/11/11 | 25/12/11 | 29/06/11 | 03/08/11 | -144d | | | | | | | | | |
| +Rising Main | | | | | | | | | | | | | | | | | |
| | | 740 | 29 | 17/05/10 A | 25/05/12 | 17/05/10 A | 10/07/11 | -320d | | | | | | | | | |
| +Section W 8 - Landscape Softworks in All Portions | | | | | | | | | | | | | | | | | |
| | | 810 | 59 | 17/05/10 A | 03/08/12 | 17/05/10 A | 03/08/12 | 0 | | | | | | | | | |

Start date 05/05/10
 Finish date 13/03/15
 Data date 31/07/11
 Run date 08/08/11
 Page number 2A

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

Leader Civil Engineering Corp. Ltd.
 Contract No. DC/2009/13
 Construction of Sewage Treatment Works at YSW & SKW
 3-month Rolling Programme (Aug 2011 - Oct 2011)

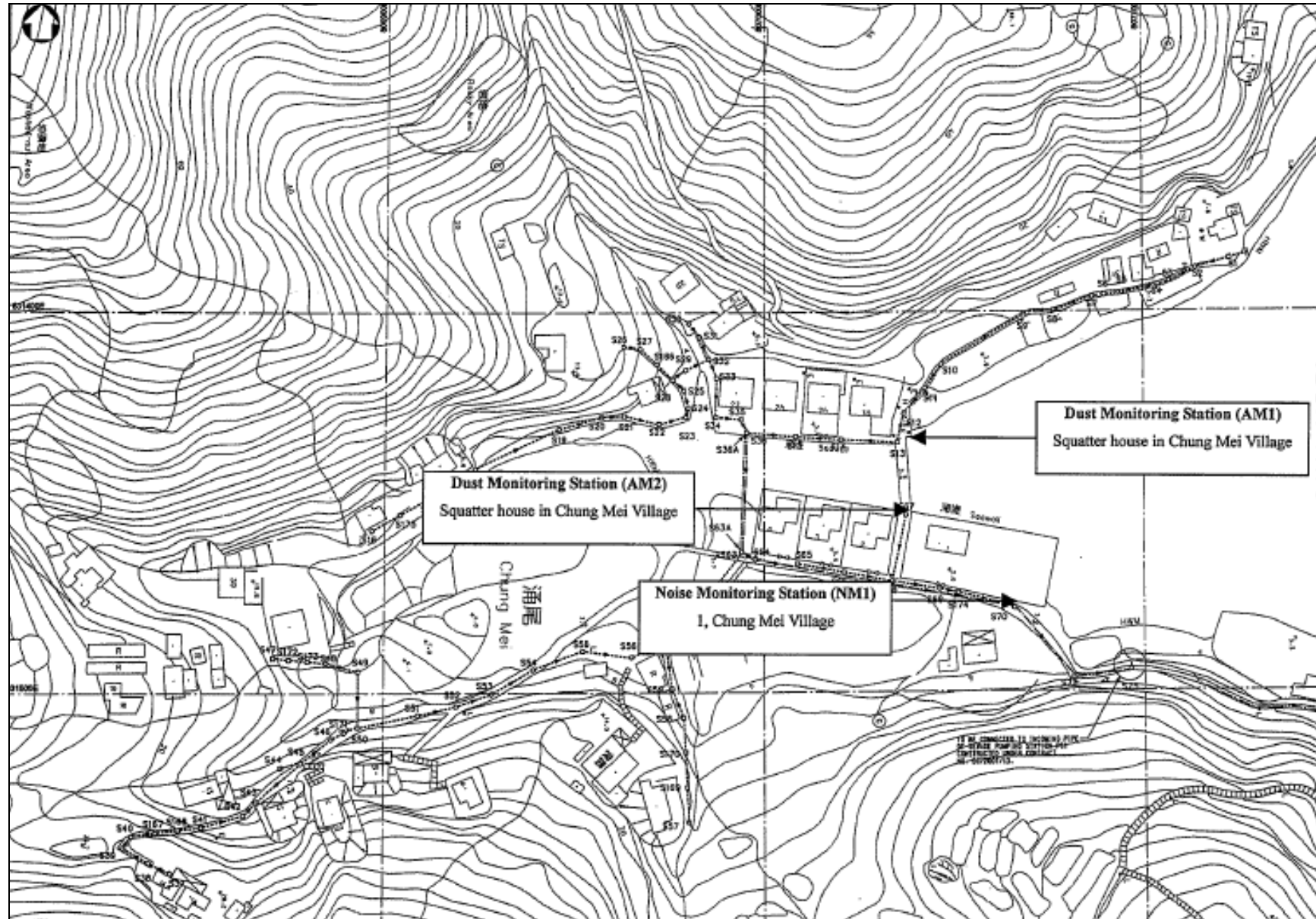
(Outline page 2 of 2)

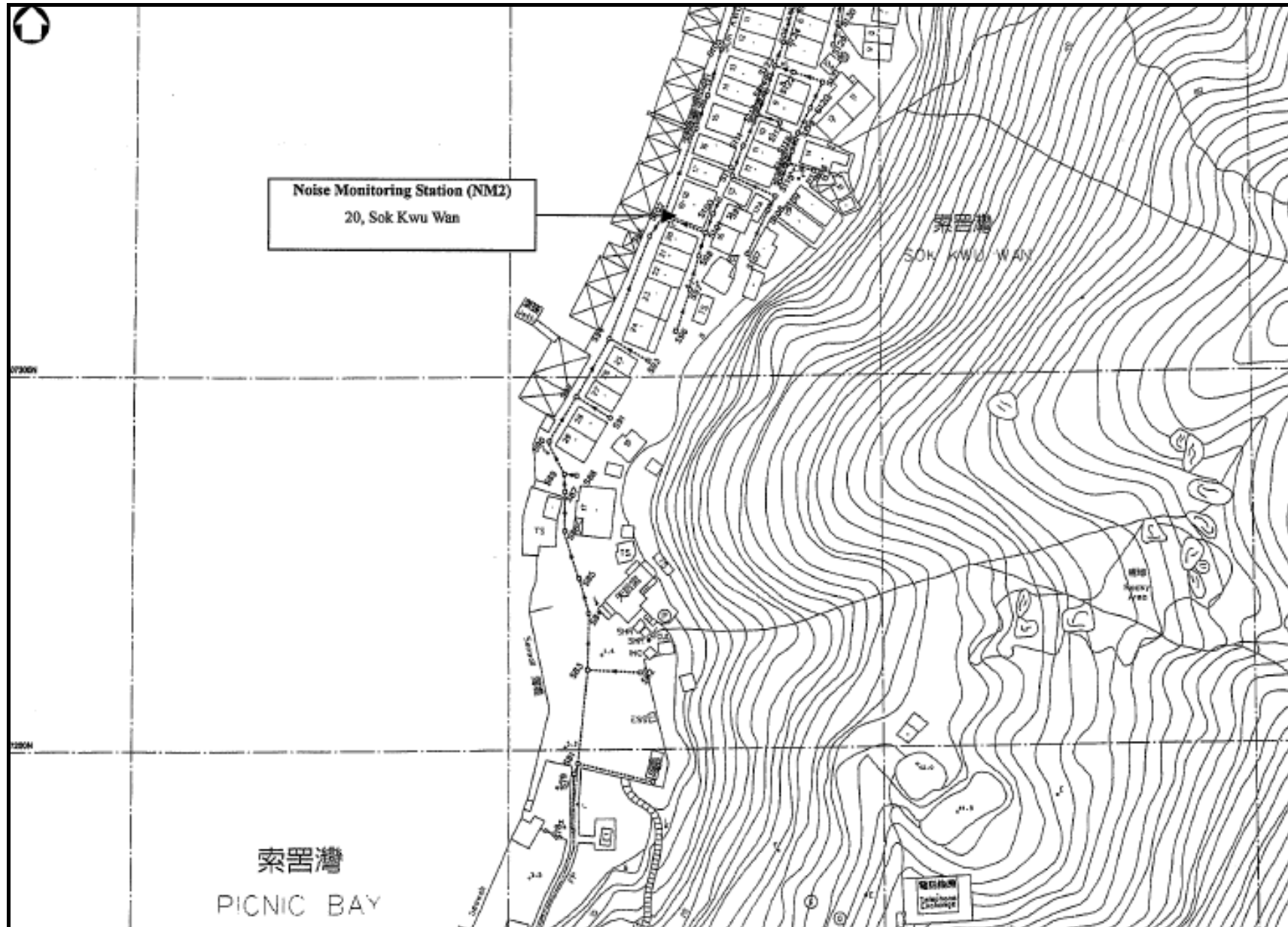
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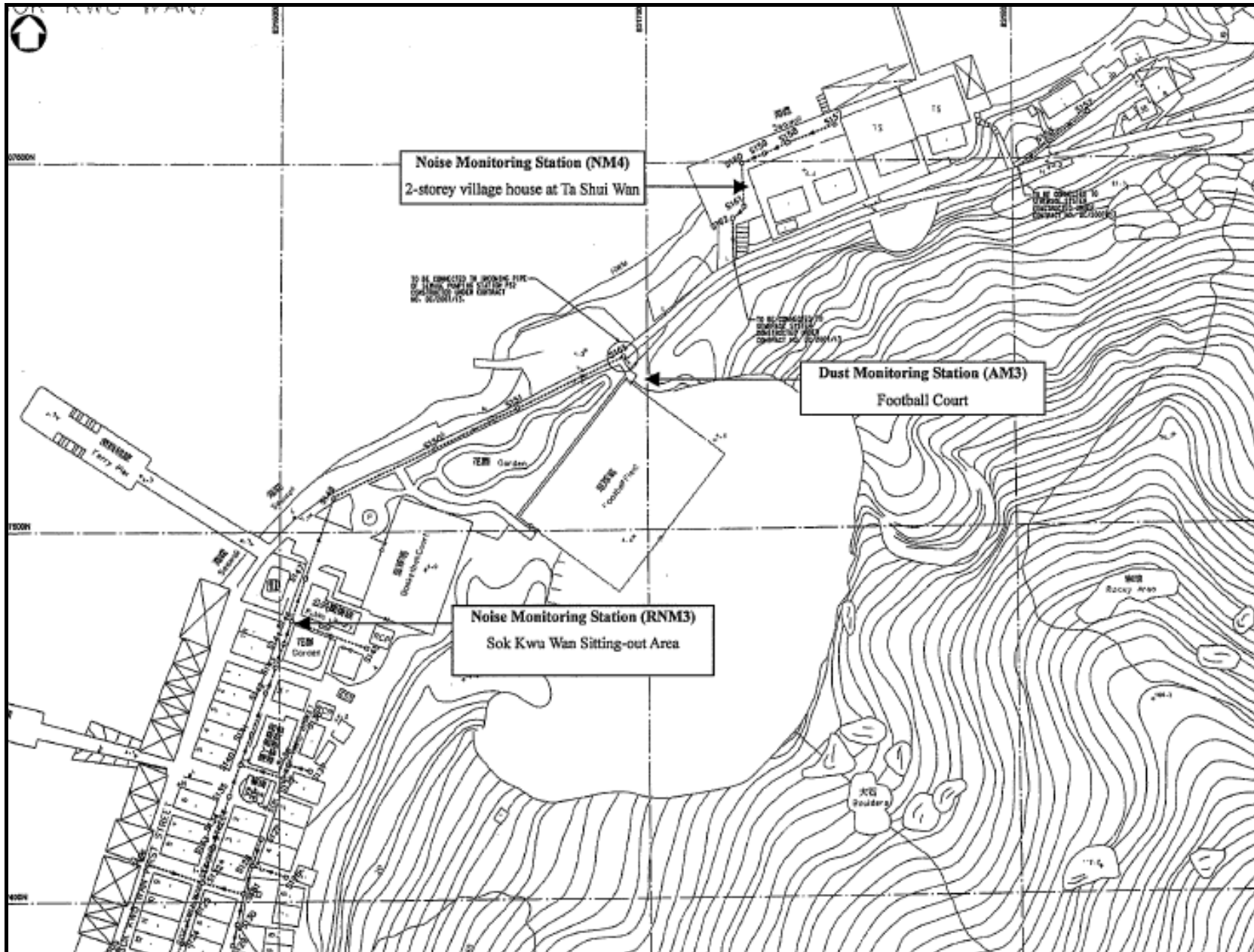
| Date | Revision | Checked | Approved |
|----------|------------|---------|----------|
| 31/07/10 | Revision 0 | StL | VC |
| | | | |
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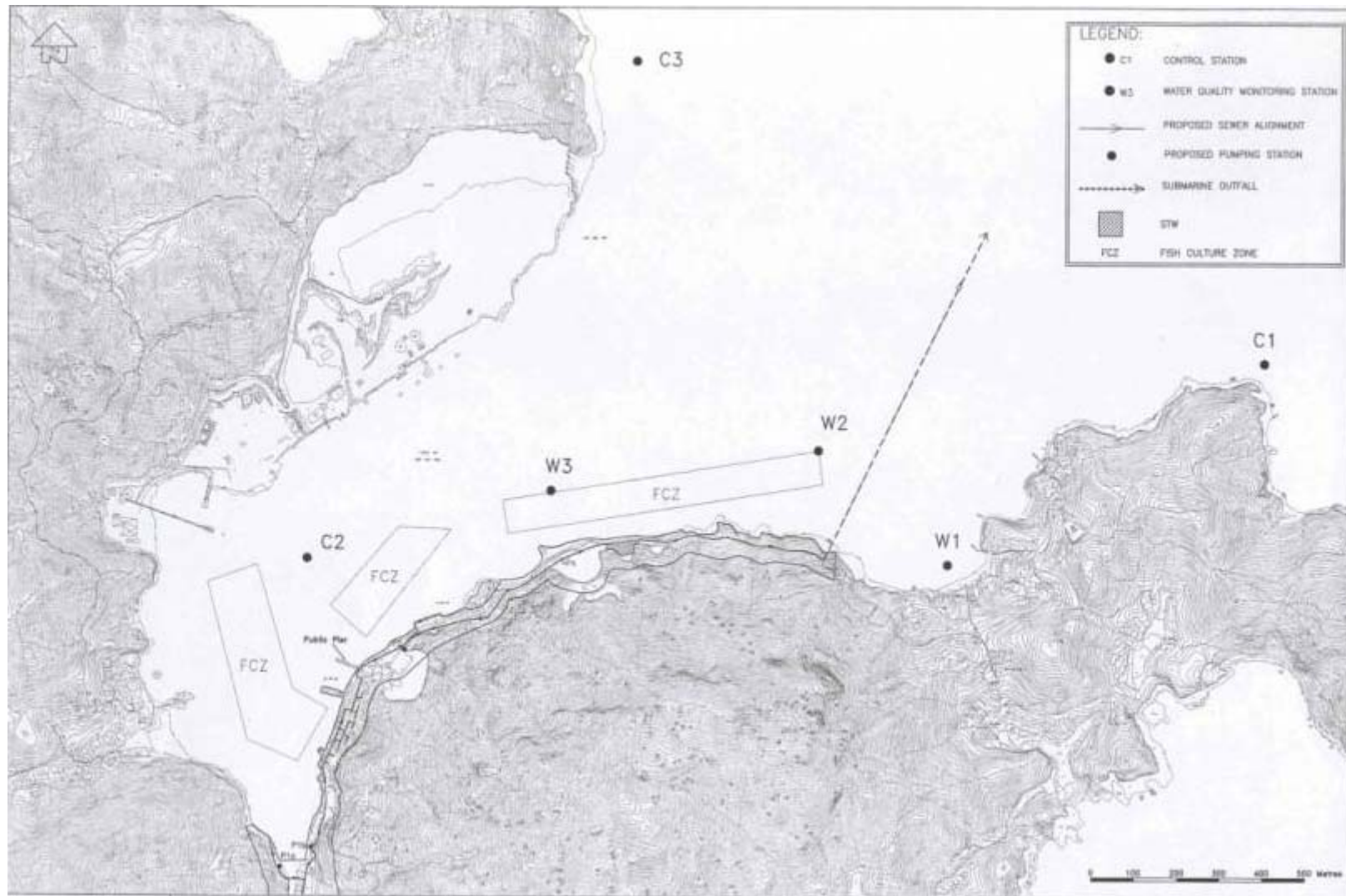
Appendix D

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







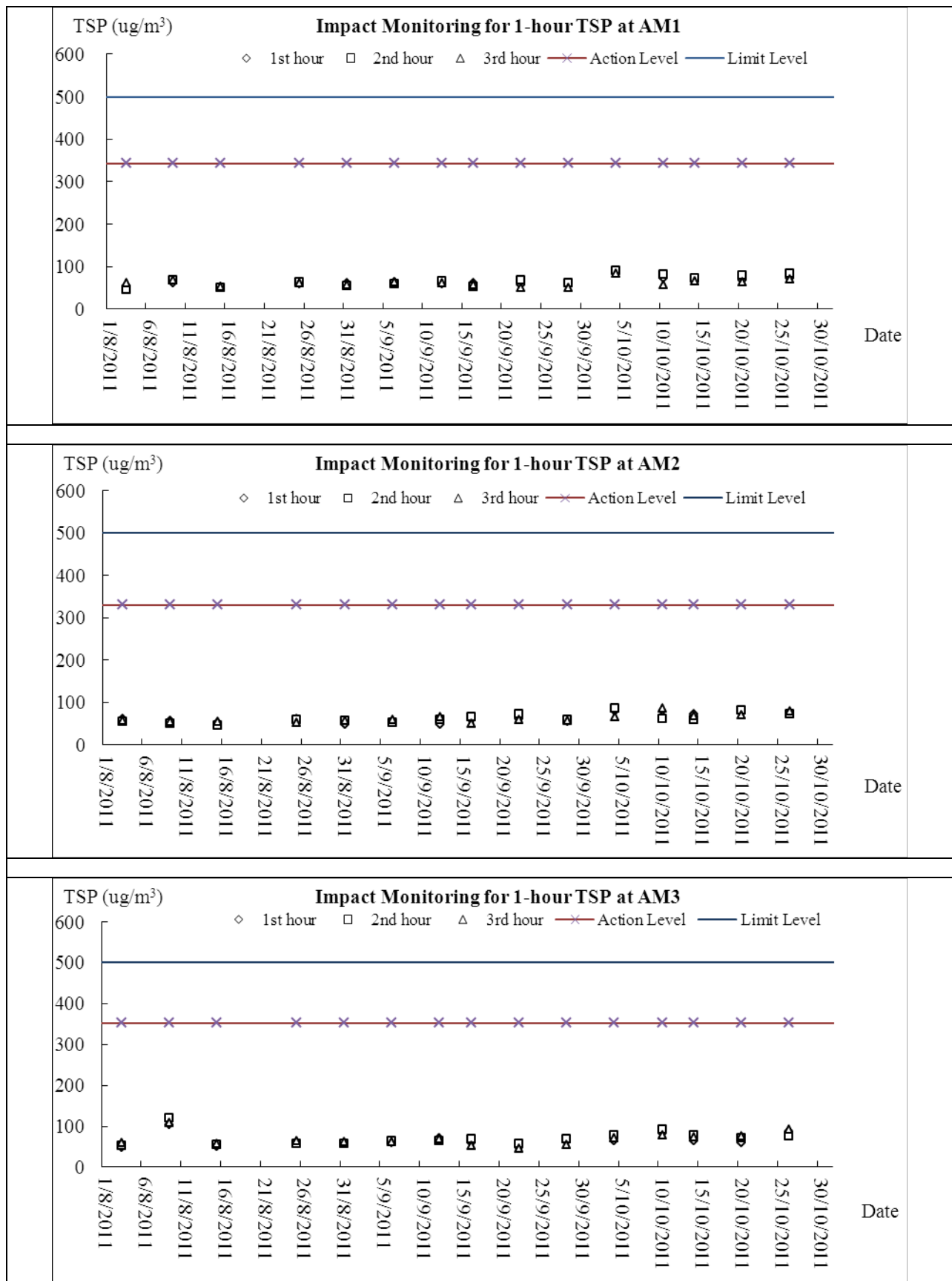


Appendix E

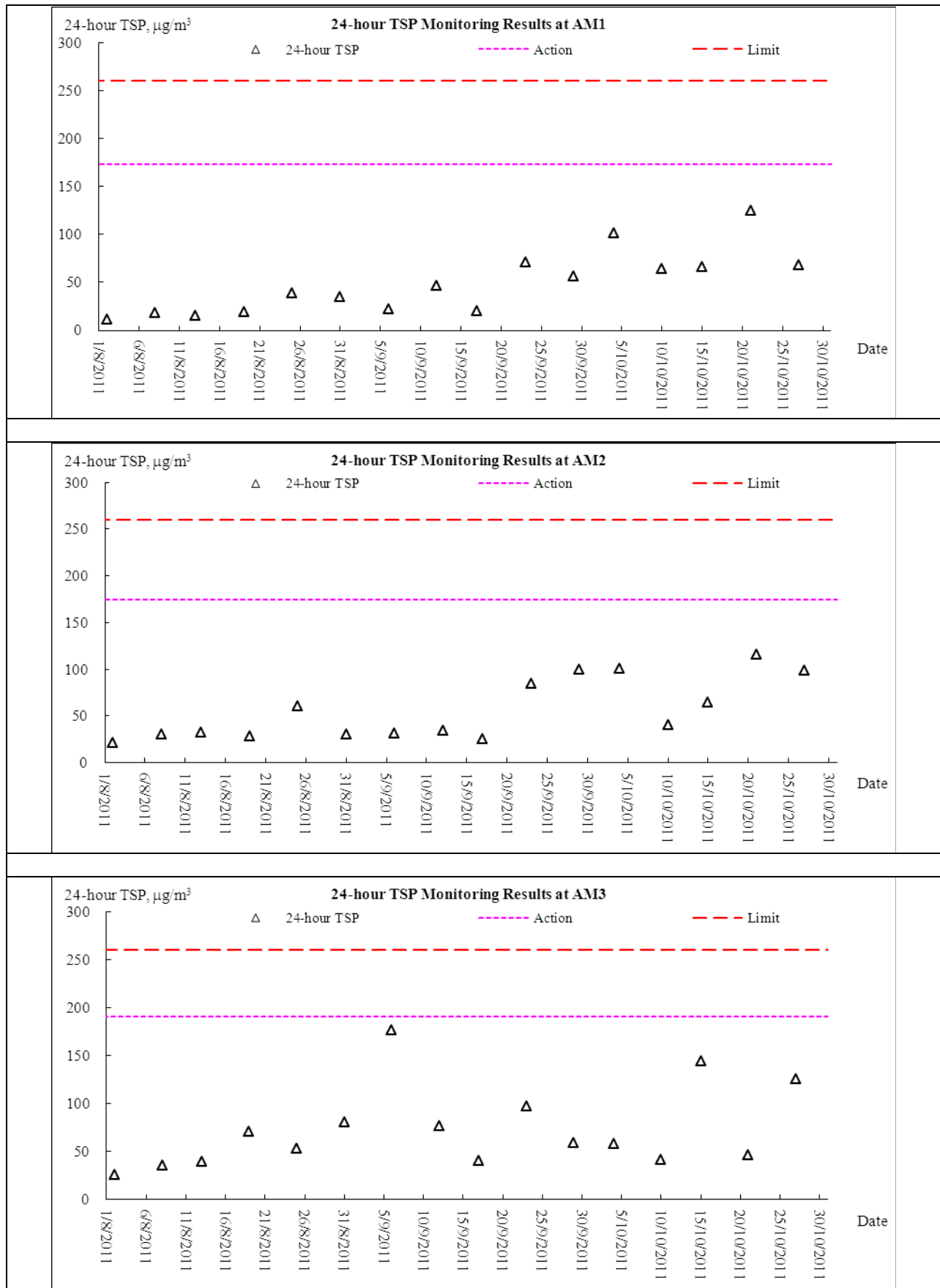
Graphical Plots of Impact Monitoring

- 1. Air Quality**
- 2. Construction Noise**
- 3. Marine Water Quality**

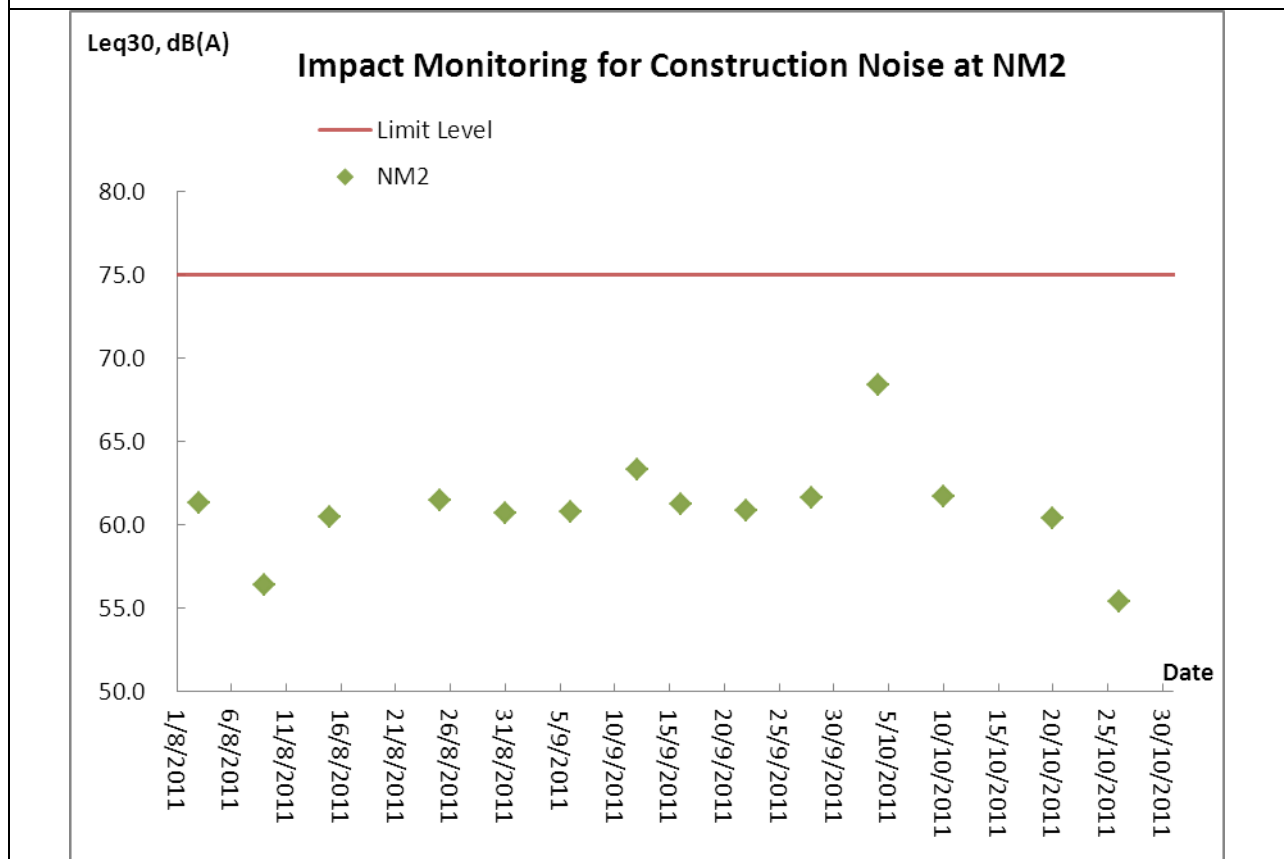
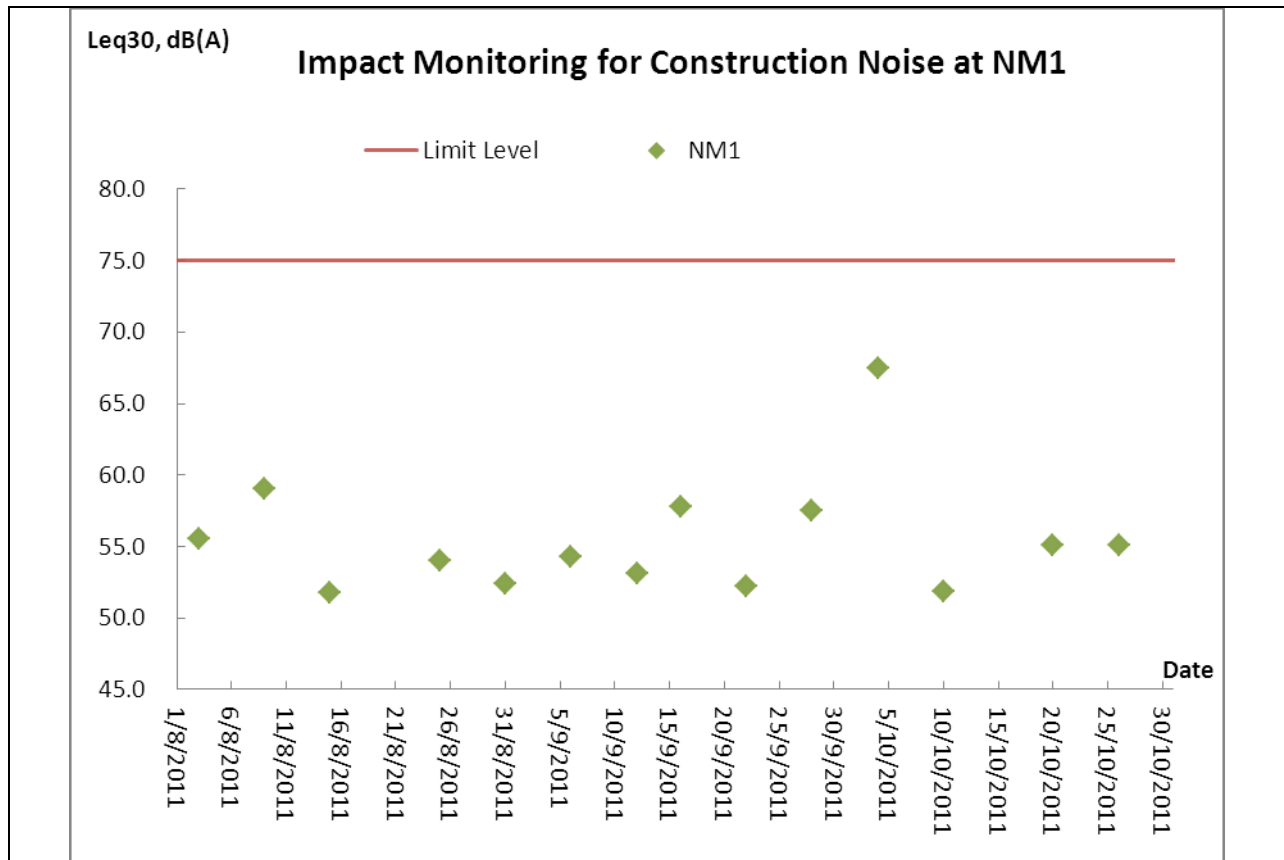
Air Quality Monitoring – 1 hour TSP Monitoring

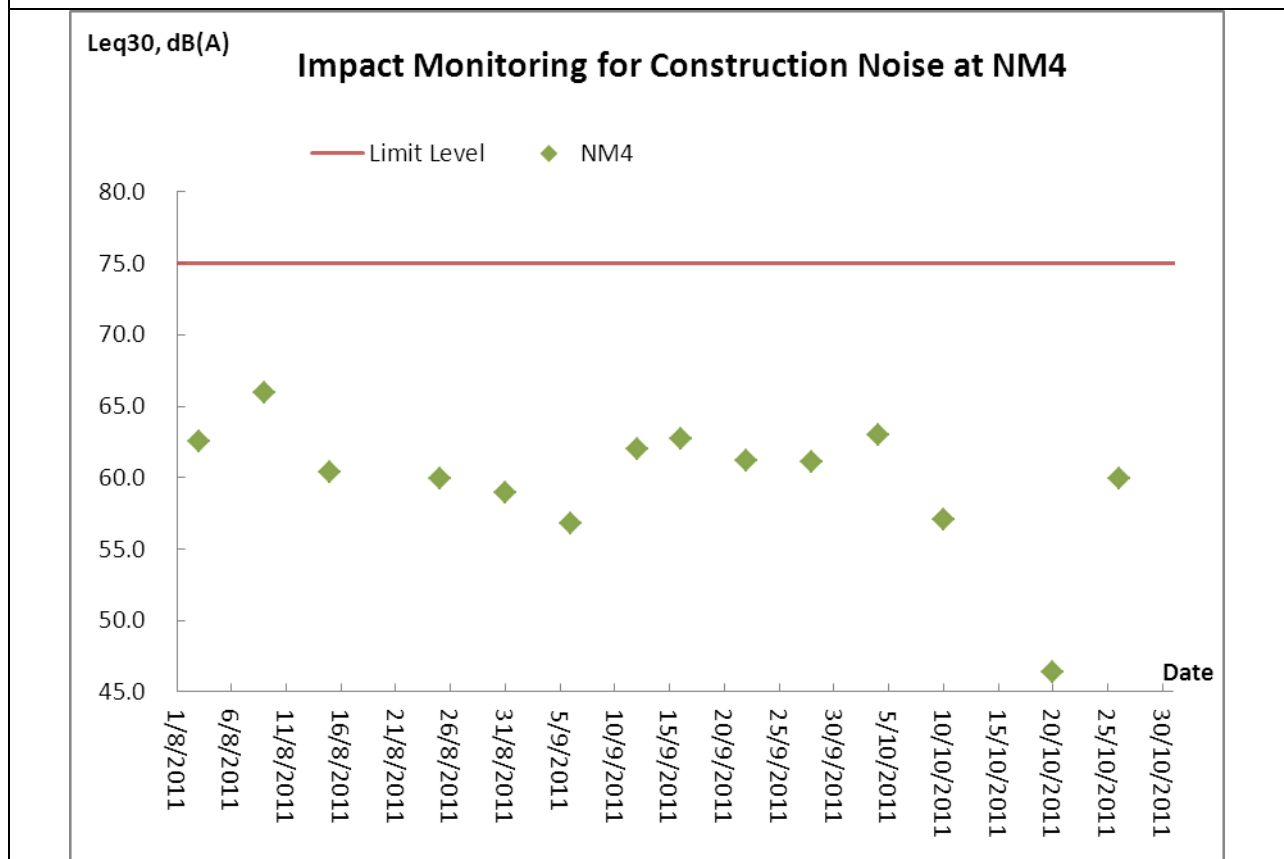
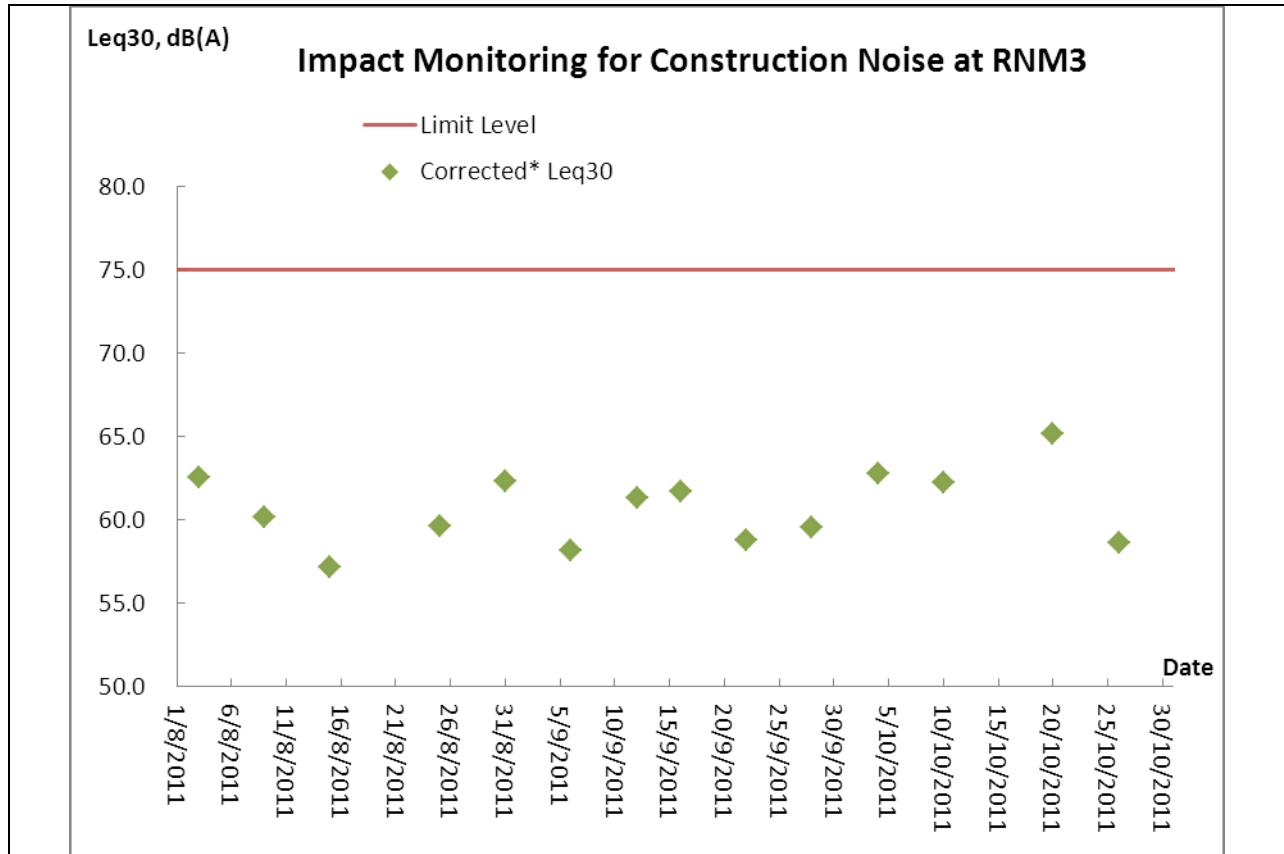


Air Quality Monitoring – 24 hour TSP Monitoring

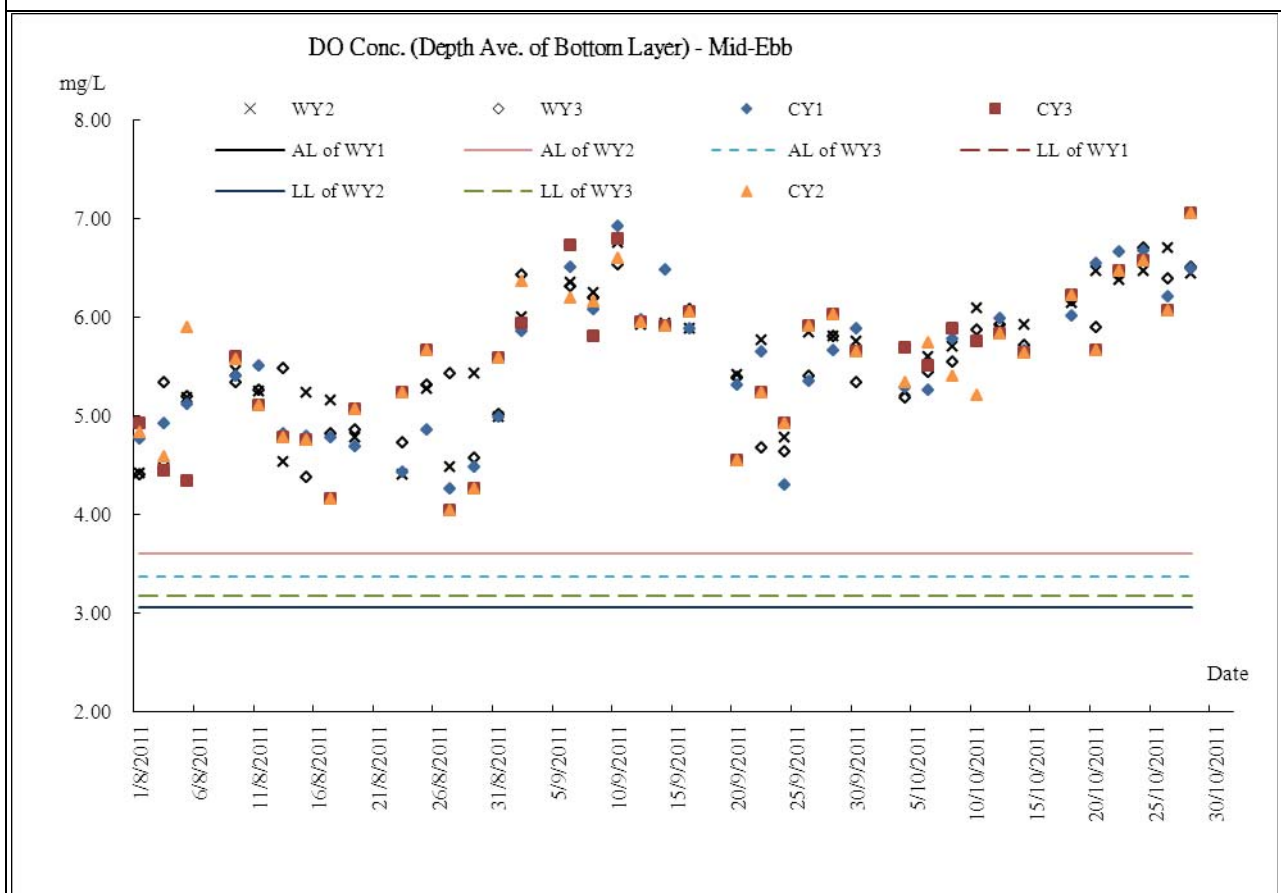
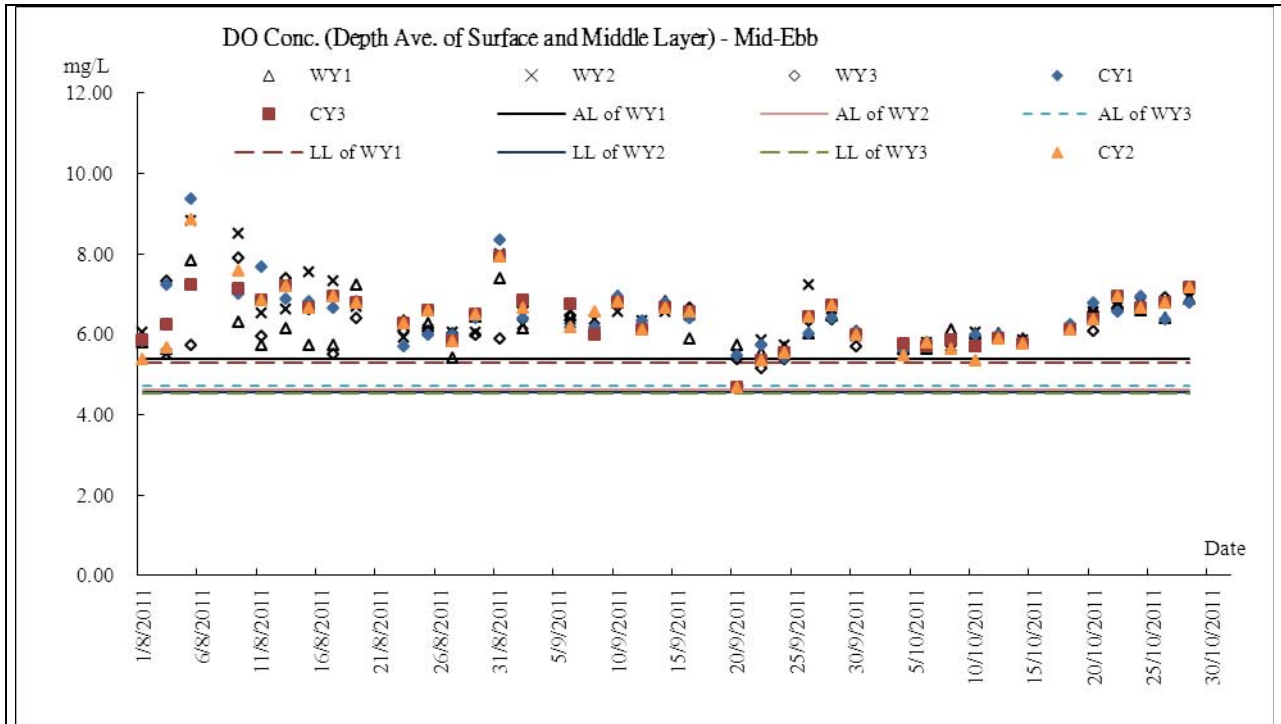


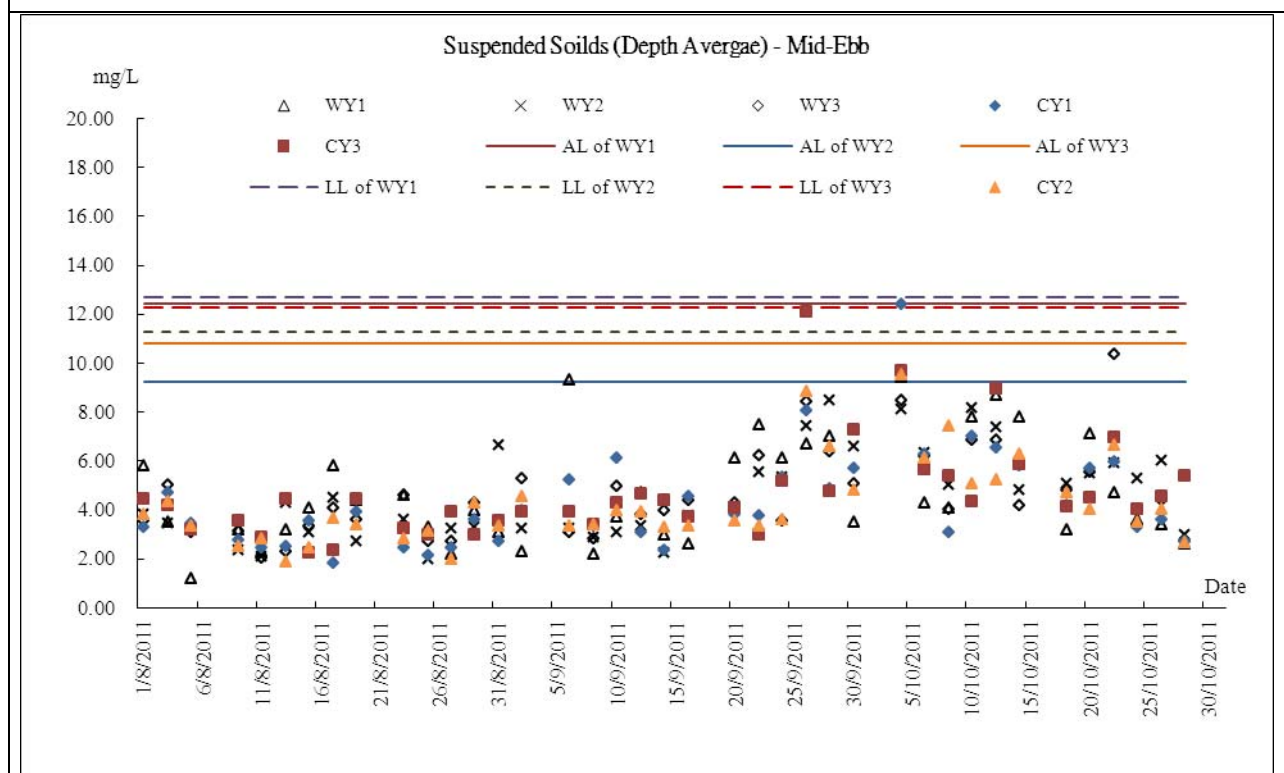
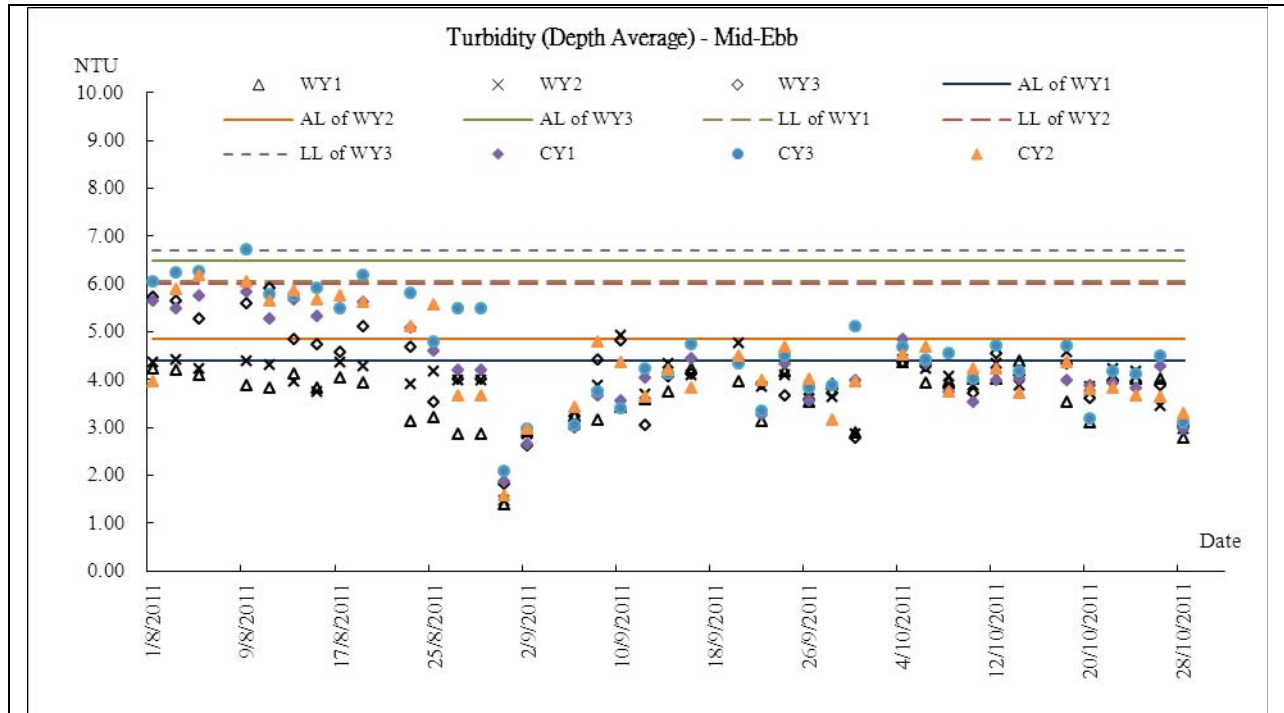
Construction Noise Monitoring



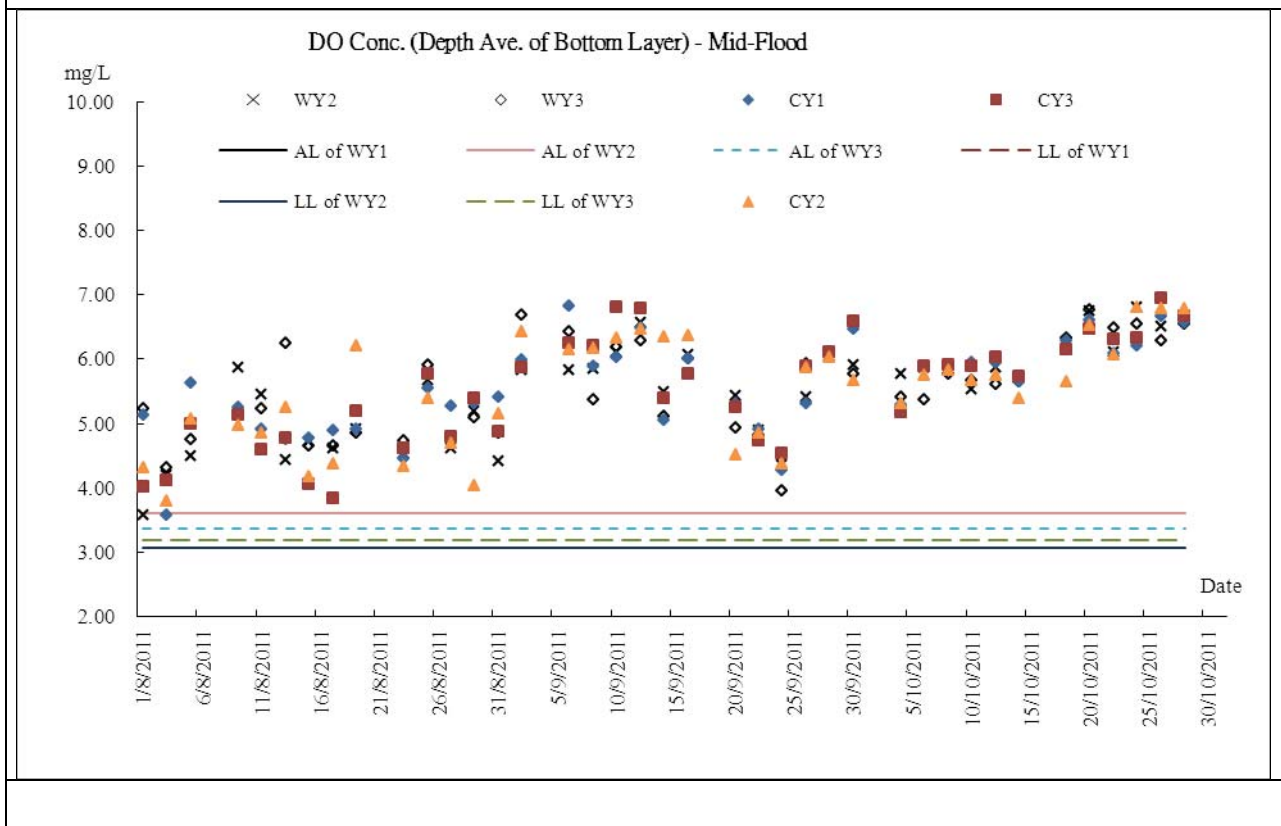
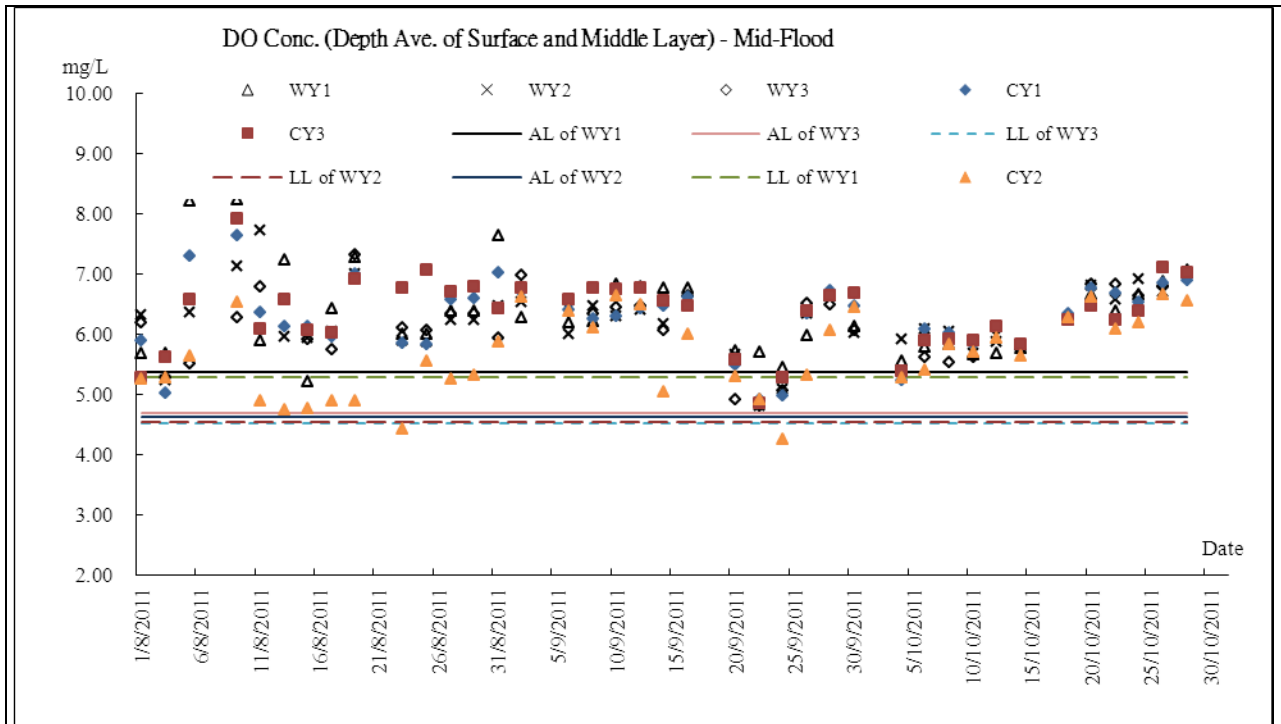


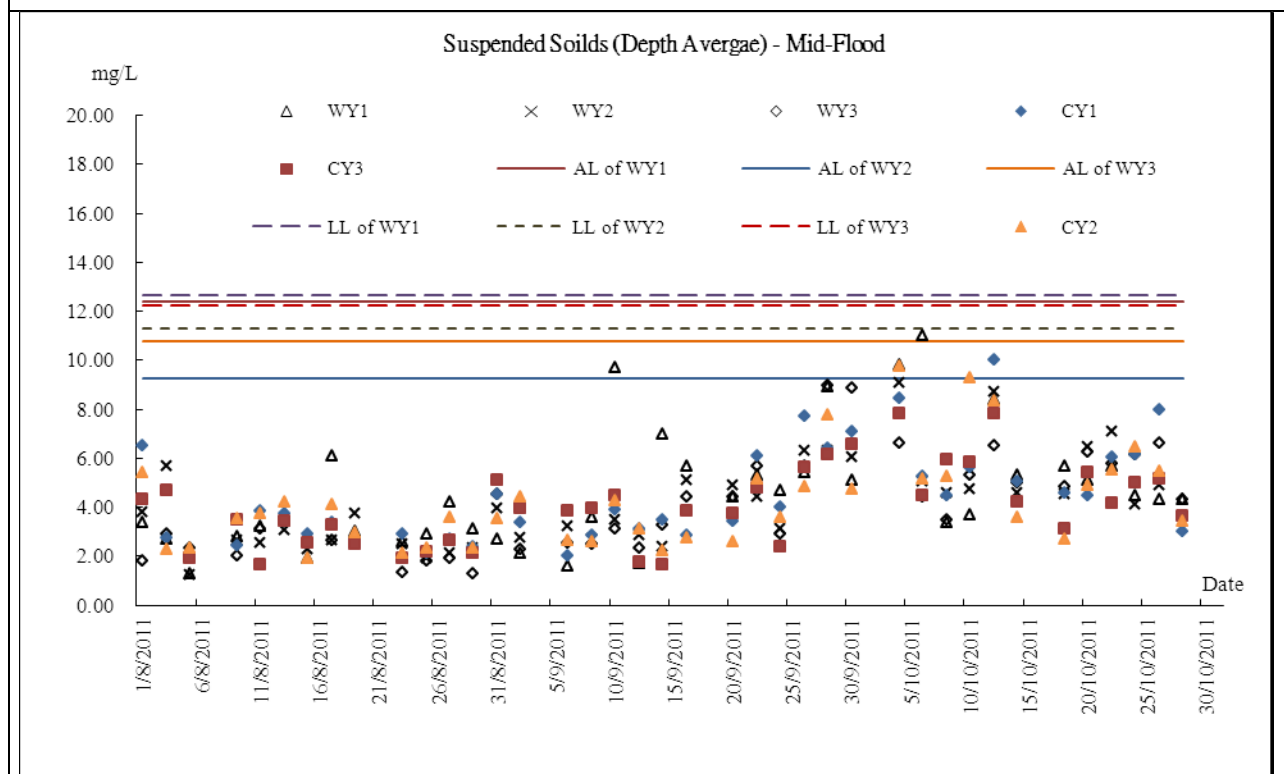
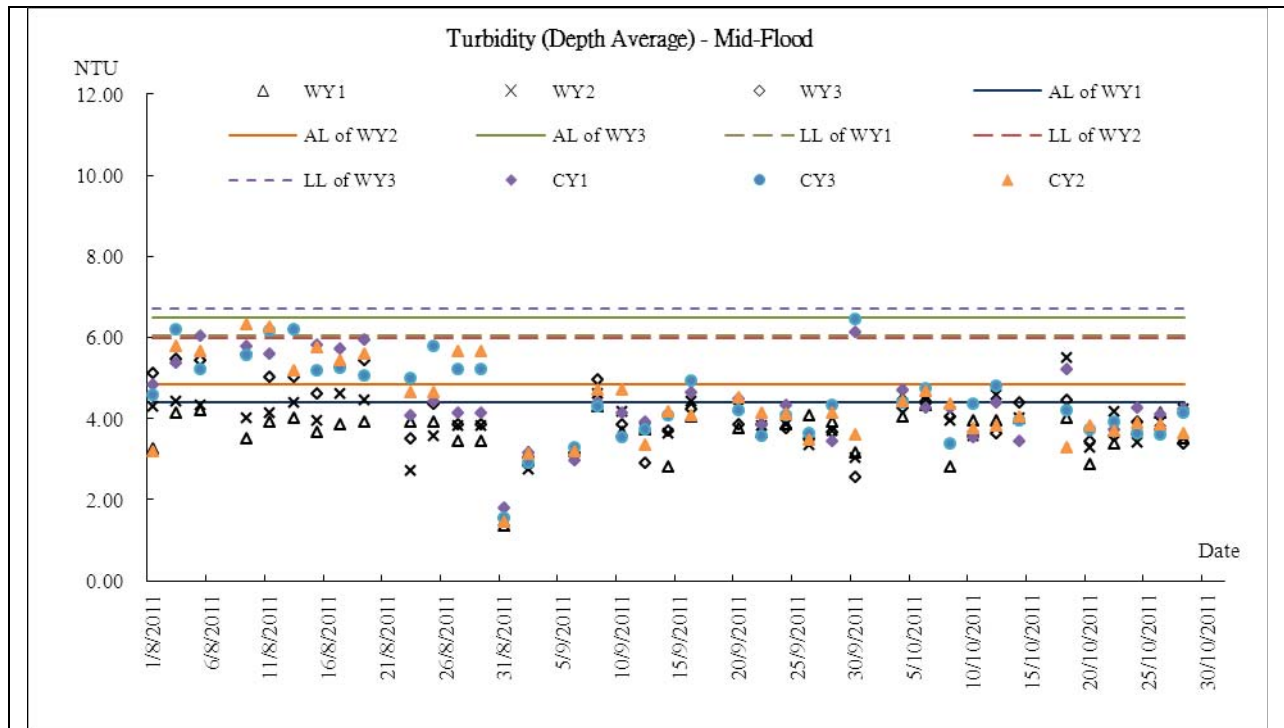
Marine Water Quality Monitoring - Mid-Ebb Tide





Marine Water Quality Monitoring - Mid-Flood Tide





Appendix F

Meteorological Information

Weather Condition – August 2011

Under the prolonged dominance of the sub-tropical ridge, Hong Kong experienced one of the hottest August since records began in 1884. The monthly mean temperature soared to 29.5 degrees, equaling the record set in 1990 and 1998 and was 1.1 degrees above normal. The month was sunnier than usual. The monthly total duration of bright sunshine was 242.0 hours, 52.3 hours higher than normal. The month was also dry with a total rainfall of 157.6 millimetres, only 35 percent of the normal figure and the accumulated rainfall since 1 January of 1092.3 millimetres suffered a deficit of 42 percent compared to the normal figure of 1873.7 millimetres for the same period

Weather Condition – September 2011

In spite of a major tropical cyclone affecting Hong Kong during September 2011, the total rainfall recorded for the month was only 123.1 millimetres or 43 percent of the normal figure. The accumulated rainfall since 1 January of 1215.4 millimetres still suffers a deficit of 44 percent compared to the normal figure of 2161.2 millimetres for the same period. The month was also warmer than usual with a monthly mean temperature of 28.0 degrees which was 0.4 degrees above normal.

Weather Condition – October 2011

October 2011 started off gloomy and wet with mostly fine and dry weather prevailing in the latter half of the month. On the whole, the month was cooler and wetter than usual. The mean temperature of the month of 24.8 degree was 0.5 degrees below the normal figure of 25.3 degrees. The total rainfall recorded in the month was 172.4 millimetres, about 13 percent above normal. However, the accumulated rainfall since 1 January of 1387.8 millimetres still suffered a deficit of 40 percent compared to the normal figure of 2313.1 millimetres for the same period.

The details meteorological data for each successive day could be referred to the Monthly EM&A Report (August, September and October 2011).

Appendix G

Monthly Summary Waste Flow Table

Monthly Summary Waste Flow Table for October 2011

| 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 | |
| 2010 | 4.522 | 0.030 | 0.068 | 0.104 | 0.488 | 0.000 | 0.000 | 0.000 | 0.000 | 4.033 | 0.030 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 18.460 |
| Jan | 0.985 | 3.045 | 0.003 | 0.013 | 0.120 | 0.419 | 0.000 | 2.626 | 0.865 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 2.240 |
| Feb | 0.377 | 0.000 | 0.000 | 0.043 | 0.000 | 0.000 | 0.000 | 0.000 | 0.377 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.350 |
| Mar | 0.758 | 1.175 | 0.002 | 0.106 | 0.006 | 0.000 | 0.000 | 1.175 | 0.752 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.360 |
| Apr | 1.135 | 1.339 | 0.017 | 0.025 | 0.112 | 0.180 | 0.000 | 1.159 | 1.023 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 2.830 | 5.160 |
| May | 0.614 | 1.362 | 0.030 | 0.036 | 0.014 | 0.400 | 0.000 | 0.962 | 0.600 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 3.150 | 0.860 |
| Jun | 0.505 | 1.014 | 0.000 | 0.022 | 0.000 | 0.060 | 0.000 | 0.954 | 0.505 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 9.610 | 1.510 |
| Sub-total | 8.8954 | 7.9653 | 0.1184 | 0.3497 | 0.7397 | 1.0590 | 0.0000 | 6.8760 | 8.1558 | 0.0303 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 15.5900 | 28.9400 |
| Jul | 0.824 | 1.077 | 0.000 | 0.004 | 0.000 | 0.000 | 0.000 | 1.077 | 0.824 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 5.000 | 0.510 |
| Aug | 0.491 | 3.519 | 0.004 | 0.006 | 0.000 | 0.000 | 0.000 | 3.519 | 0.491 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 7.990 | 1.830 |
| Sep | 0.074 | 1.473 | 0.037 | 0.004 | 0.000 | 0.000 | 0.000 | 1.473 | 0.074 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 23.030 | 2.420 |
| Oct | 0.145 | 1.674 | 0.000 | 0.007 | 0.000 | 0.000 | 0.000 | 1.674 | 0.145 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 16.330 | 6.850 |
| Nov | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | |
| Total | 10.4296 | 15.7083 | 0.1596 | 0.3710 | 0.740 | 1.059 | 0.000 | 14.619 | 9.6899 | 0.0303 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 67.94 | 40.55 |
| | 26.138 | | 0.531 | | 1.799 | | 14.619 | | 9.720 | | 0.000 | | 0.000 | | 0.000 | | 0.000 | | 0.000 | | 108.49 | | |

Remark: Assume 1.0 m³ vehicle dump load = 1.6 tonnes C&D materials

YSW: Yung Shue Wan

SKW: Sok Kwu Wan