



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.Q17
(August to October 2014)**

PREPARED FOR
**LEADER CIVIL ENGINEERING CORPORATION
LIMITED**

Quality Index Date	Reference No.	Prepared By	Certified By
29 December 2014	TCS00512/09/600/R0846 v1		
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Version	Date	Description
1	29 December 2014	First submission

URS CDM Joint Venture

Chief Engineer/Harbour Area Treatment
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Your reference:

Our reference: 05117/6/16/436930

Date: 26 January 2015

BY FAX ONLY

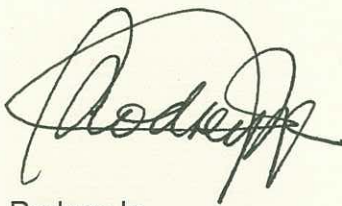
Attention: Mr. F.K. Pong

Dear Sir,

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. Q17 (Aug to Oct 2014)

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 report for the captioned project, dated 14 January 2015. We have no comment and have verified the captioned report.

Yours faithfully
URS CDM JOINT VENTURE



Rodney Ip
Independent Environmental Checker

ICWR/CKCH/wwsc

cc Leader Civil Engineering (Attn: Mr Ron Hung)
 AUES (Attn: Mr T.W. Tam)
 ER/LAMMA (Attn: Mr Kenneth Kwong)
 CDM (Attn: Mr Sylvester Hsu)

EXECUTIVE SUMMARY

ES.01 This is the 17th 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 26 July 2014 to 25 October 2014 (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	144
	24-hour TSP	37
Construction Noise	L _{eq(30min)} Daytime	52
Water Quality	Marine Water Sampling	0
Inspection / Audit	ET Regular Environmental Site Inspection	13

BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES.03 No exceedance of air quality, construction noise and marine water quality monitoring were recorded in this Reporting Period. The statistics of environmental exceedance, NOE issued and investigation of exceedance are summarized in the following table.

Environmental Issues	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
Air Quality	1-hour TSP	0	0	0	--	--
	24-hour TSP	0	0	0	--	--
Construction Noise	L _{eq(30min)} Daytime	0	0	0	--	--
Water Quality	DO	0	0	0	--	--
	Turbidity	0	0	0	--	--
	SS	0	0	0	--	--

Note: NOE – Notification of Exceedance

ES.04 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.

ENVIRONMENTAL COMPLAINT, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.05 No written or verbal environmental complaint, summons or successful prosecutions were recorded in this Reporting Period.

REPORTING CHANGE

ES.06 No reporting change was made in this Reporting Period.

FUTURE KEY ISSUES

ES.07 During wet season, muddy water and other water quality pollutants via site surface water runoff into the sea body within Fish culture zone at Picnic Bay and the Secondary recreation contact subzone at Mo Tat Wan is the key issue of the Project. Mitigation measures for water quality should be properly maintained to prevent any muddy or sandy runoff from the loose soil surface overflow on the site boundary.

ES.08 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 stead EP-281/2007 is EP for Sok Kwu Wan relevant Works.
- 1.02 The Project involves construction of sewage treatment works at Sok Kwu Wan and Yung Shue Wan with a capacity of 1,430m³/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 lying of underground sewerage pipeline. The site layout plan for the captioned work under the Project is showing in [Appendix A](#).
- 1.03 According to the Particular Specification (PS) and [Appendix 25](#) of the Project, Leader should establish an Environmental Team to implement the environmental monitoring and auditing works to fulfill the requirements as stipulated in the Environmental Monitoring and Audit (EM&A) 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 spilt to following two stand-alone parts:
- (a) Proposed EM&A Programme for Baseline and Impact Monitoring – Sok Kwu Wan (under EP No. 281/2007/A varied on 23 September 2009)
 - (b) Proposed EM&A Programme for Baseline and Impact Monitoring – Yung Shue Wan (under EP No. 282/2007)
- 1.05 This is the 17th Quarterly EM&A Summary Report for Sok Kwu Wan Portion Area presenting the monitoring results and inspection findings for the reporting period from **26 July 2014 to 25 October 2014**.

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:-

August, September and October 2014

- Excavation for utilities construction under EVA in SKWSTW
- Soil nailing in SKWSTW
- Finishing works in SKWSTW & PS2
- E&M installation in SKWSTW & PS2

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

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"> • $L_{eq(30min)}$ during normal working hours; and • $L_{eq(15min)}$ 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: $L_{eq(30min)}$ & $L_{eq(5min)}$, L10 and L90.

$L_{eq(15min)}$ & $L_{eq(5min)}$, 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 $L_{eq(30min)}$ during normal hours from 0700 to 1900 hours on normal weekdays, reduced to 70 dB(A) of $L_{eq(30min)}$ 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 In this Reporting Period, a total of **144** events of 1-hour TSP and **37** events of 24-hour TSP measurements were conducted at designated Location AM1, AM2 and AM3. Results of air quality monitoring at the identified locations during the Reporting Period are summarized in *Tables 4-1*.

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	245	17	73	71	4	27
Record Date	4-Oct-14	13-Aug-14	48 events	15-Oct-14	12-Aug-14	11 events
AM2	266	14	68	71	22	39
Record Date	4-Oct-14	13-Aug-14	48 events	22-Sep-14	12-Aug-14	13 events
AM3	233	16	68	84	11	36
Record Date	4-Oct-14	25-Aug-14	48 events	4-Sep-14	23-Aug-14	13 events

4.03 1-hour and 24-hour TSP results fluctuated well below the Action Level during the Reporting Period. No NOE was issued and therefore no corrective measures are required.

4.2 RESULTS OF CONSTRUCTION NOISE MONITORING

4.04 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 **52** 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	63.6	44.1
Record Date	13-Aug-14	11-Sep-14
NM2	66.5	53.8
Record Date	13-Aug-14	1-Aug-14
RNM3	66.6	58.7
Record Date	23-Sep-14	1-Aug-14
NM4	62.7	45.1
Record Date	13-Aug-14	5-Sep-14

4.3 RESULTS OF MARINE WATER QUALITY OF MONITORING

4.05 Marine water quality monitoring should be carried out during the course of marine work. As informed by the Contractor in April 2014, the marine works in Sok Kwu Wan has been completed in April 2014. Marine water quality monitoring was therefore terminated from May 2014 after consent was obtained with IEC. In this regards, an associated letter ref.

TCS00512/10/300/L0783 dated 19 May 2014 has been issued to EPD for approval and no comment was received.

4.4 ECOLOGICAL MONITORING

- 4.06 According to Clause 3.7 and Figure 4 in the Environmental Permit No. EP-281/2007/A, a total of 12 numbers *Celtis Timorensis* (uncommon species) in Chung Mei at Sok Kwu Wan, are identified to require labeling, fencing and protection. Out of these, four numbers located in the Pumping Station No.1 area are required to be transplanted in advance of pumping station construction and the transplantation proposal has been submitted to EPD previously.
- 4.07 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. In April 2012, CT_1A and CT_7A were damaged by the fell broken tree trunk due to tree decayed by white ants. Therefore, only 5 no. of additional *Celtis Timorensis*, namely CT_2A, CT_3A, CT4A, CT_5A and CT_6A were inspected since May 2012. Furthermore, during tree inspection on 30 July, CT4A was disappeared after typhoon No.10 on 24 July and it was certified as dead. Eventually, 4 no. of additional *Celtis Timorensis*, namely CT_2A, CT_3A, CT_5A and CT_6A were inspected in the remaining period.
- 4.08 Regular inspection of the transplanted tree was carried out by the landscaping sub-Contractor (Melofield Nursery and Landscape Contractor Limited) on **31 July, 15, 30 August, 15, 30 September, and 15 October 2014**. The copies of the inspection reports were attached in relevant Monthly EM&A Report (**August 2014, September 2014, and October 2014**).

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 14	Sep 14	Oct 14	
C&D Materials (Inert) ('000m ³)	0	0	0	-
Reused in the Contract (Inert) ('000m ³)	0	0	0	-
Reused in other Projects (Inert) ('000m ³)	0	0	0	-
Disposal as Public Fill (Inert) ('000m ³)	0	0	0	-

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

Type of Waste	Quantity			Disposal Location
	Aug 14	Sep 14	Oct 14	
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)	3.540	3.270	5.490	Outlying Islands Transfer Facilities (Sok Kwu Wan)

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, routine joint site inspections by RE, Leader and ET were carried out on **29 July, 5, 12, 19, 27 August, 2, 12, 17, 25 September, 7, 14, and 21 October 2014**.
- 6.02 Observations for the site inspections and monthly audit within this Reporting Period are summarized in *Table 6-1*.

Table 6-1 Site Observations

Date	Findings / Deficiencies	Follow-Up Status
29 July 2014	<ul style="list-style-type: none"> No environmental issue was observed during the site inspection 	NA
5 August 2014	<ul style="list-style-type: none"> No environmental issue was observed during the site inspection 	NA
12 August 2014	<ul style="list-style-type: none"> The Contractor should prevent the release of loose soil into the sea. 	The stockpile of loose soil has been removed.
19 August 2014	<ul style="list-style-type: none"> No environmental issue was observed during the site inspection 	NA
27 August 2014	<ul style="list-style-type: none"> No environmental issue was observed during the site inspection 	NA
2 September 2014	<ul style="list-style-type: none"> The Contractor was reminded to better cover the stockpile with tarpaulin sheet to reduce dust generation during dry and windy season. 	The stockpile has been better covered.
12 September 2014	<ul style="list-style-type: none"> No environmental issue was observed during the site inspection 	NA
17 September 2014	<ul style="list-style-type: none"> No environmental issue was observed during the site inspection 	
25 September 2014	<ul style="list-style-type: none"> No environmental issue was observed during the site inspection 	NA
30 September 2014	<ul style="list-style-type: none"> The Contractor was reminded to clean the stagnant water at drip tray for mosquito breeding prevention. 	Stagnant water was cleaned and the drip tray was better covered to prevent storing of stagnant water.
7 October 2014	<ul style="list-style-type: none"> No environmental issue was observed during the site inspection 	NA
14 October 2014	<ul style="list-style-type: none"> No environmental issue was observed during the site inspection 	NA
21 October 2014	<ul style="list-style-type: none"> No environmental issue was observed during the site inspection 	NA

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
27 July 2010 – 25 July 2014	1 (Nov 2011)	1 (Nov 2011)	Marine water quality
August 2014	0	1	NA
September 2014	0	1	NA
October 2014	0	1	NA

Table 7-2 Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
27 July 2010 – 25 July 2014	0	0	NA
August 2014	0	0	NA
September 2014	0	0	NA
October 2014	0	0	NA

Table 7-3 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
27 July 2010 – 25 July 2014	0	0	NA
August 2014	0	0	NA
September 2014	0	0	NA
October 2014	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:
- (a) Stockpiles of imported material kept on site should be contained within hoardings, dampened and / or covered during dry and windy weather;
 - (b) Material stockpiled alongside trenches should be covered with tarpaulins whenever works are close to village houses;
 - (c) Water sprays should be used during the delivery and handling of cement, sands, aggregates and the like.
 - (d) Any vehicle used for moving sands, aggregates and construction waste shall have properly fitting side and tail boards. Materials should not be loaded to a level higher than the side and tail boards, and should be covered by a clean tarpaulin.

Noise Mitigation Measure

- 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:
- (a) Use of quiet equipment for the construction activities of the Pumping Stations and sewer alignment;
 - (b) Use of temporary noise barrier around the site boundary of Pumping Station P1a;
 - (c) Use of kick ripper (saw and lift) method to replace the breaker for pavement removal during sewer alignment construction;
 - (d) Restriction on the number of plant during sewer alignment construction;
 - (e) Use of noise screening structures in the form of acoustic shed or movable barrier wherever practicable and feasible in areas with sufficient clearance and headroom during the construction of sewer alignment;
 - (f) Adoption of manual working method wherever practicable and feasible in areas where the worksites of the proposed sewer alignment are located less than 20m from the residential noise sensitive receivers and less than 30m from the temple and the public library; and
 - (g) Implementation of the following good site practices:
 - Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program.
 - Mobile plant, if any, should be sited as far away from NSRs as possible.
 - Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.
 - Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs.
 - Material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities.

Water Quality Mitigation Measure

- 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 200m) should be maintained on barges to ensure that decks are not washed by wave action;
 - all barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; and
 - loading of barges and hoppers should be controlled to prevent splashing of dredged material to the surrounding water, and barges and hoppers should not be filled to a level which would cause the overflow of materials or sediment laden water during loading or transportation; and
 - the decks of all vessels should be kept tidy and free of oil or other substances that might be accidentally or otherwise washed overboard.

Construction Run-off and Drainage

- 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

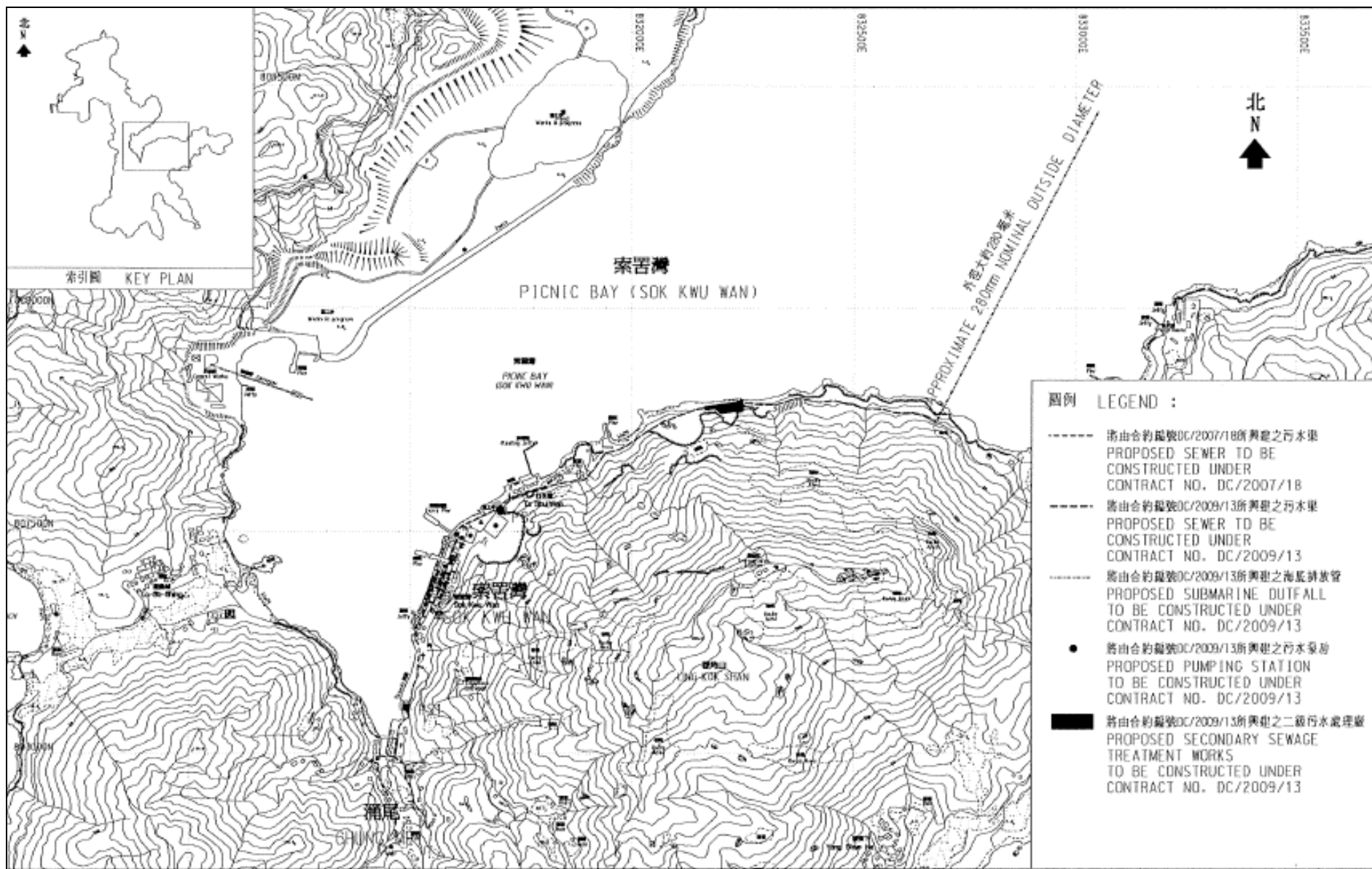
- 9.01 This is the 17th Quarterly EM&A Summary Report for Sok Kwu Wan Portion Area under the Project covering the construction period from **26 July 2014 to 25 October 2014**.
- 9.02 No 1-hour and 24-hour TSP results were found to be triggered the Action or Limit Level in this Reporting Period.
- 9.03 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.
- 9.04 No notification of summons or successful prosecution was received in this Reporting Period.
- 9.05 **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.

9.2 RECOMMENDATIONS

- 9.06 During wet season, muddy water and other water quality pollutants via site surface water runoff into the sea body within Fish culture zone at Picnic Bay and the Secondary recreation contact subzone at Mo Tat Wan is the key issue of the Project. Mitigation measures for water quality should be properly maintained to prevent any muddy or sandy runoff from the loose soil surface overflow on the site boundary.
- 9.07 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.

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. F K Pong	2159-3550	2833-9162
UCJV	Engineer's Representative	Mr. Kenneth WK Kwong	2982 0240	2982 4129
URS	Independent Environmental Checker	Mr. Rodney Ip	2410 3750	2428 9922
Leader	Director	Mr. Wilfred So	2982 1750	2982 1163
Leader	Contracts Manager	Mr. Vincent Chan	2982 1750	2982 1163
Leader	Site Agent	Mr. Ron Hung	2982 1750	2982 1163
Leader	Environmental Officer	Mr. Leung Man Kin	2982 8652	2982 8650
Leader	Environmental Supervisor	Mr. Chan Chi Kau	2982 8652	2982 8650
Leader	Sub-Agent	Mr. Leung Man Kin	2982 1750	2982 1163
Leader	Safety Officer	Ms. Vanessa Chan	2982 1750	2982 1163
AUES	Environmental Team Leader	Mr. T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Ms. Nicola Hon	2959 6059	2959 6079
AUES	Team Supervisor	Mr. Ben Tam	2959 6059	2959 6079

Legend:

DSD (Employer) – Drainage Services Department

URS CDM JV (Engineer) – URS- CDM Joint Venture

Leader (Main Contractor) – Leader Civil Engineering Corporation Limited

URS (IEC) – URS Hong Kong 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	2014																							
									OCT				NOV				DEC				2015											
									28	05	12	19	26	02	09	16	23	30	07	14	21	28	04	11	18	25	01	08	15	22		
Project Key Date																																
KD0040	Section W2 - YSW STW & Submarine Outfall (1370d)	0	0		31/10/14 *		31/10/14 *	0 *	◆ Section W2 - YSW STW & Submarine Outfall (1370d)																							
KD0050	Section W3 - Footpath Diversion in Ptn G	0	0		31/10/14 *		31/10/14 *	0 *	◆ Section W3 - Footpath Diversion in Ptn G																							
KD0060	Section W4 - Slope Works in Portios H & I	0	0		31/10/14 *		31/10/14 *	0 *	◆ Section W4 - Slope Works in Portios H & I																							
KD0070	Section W5 - P.S. No. 1 in Portion D	0	0		31/10/14 *		31/10/14 *	0 *	◆ Section W5 - P.S. No. 1 in Portion D																							
KD0080	Section W6 - Sewer & PS No2 in Ptn. E & F	0	0		31/10/14 *		31/10/14 *	0 *	◆ Section W6 - Sewer & PS No2 in Ptn. E & F																							
KD0090	Section W7 - SKW STW, RM & Sm. Outfall	0	0		02/03/15 *		02/03/15 *	0 *																								
KD0100	Section W8 - Landscape Softworks	0	0		11/11/14 *		11/11/14 *	0 *	◆ Section W8 - Landscape Softworks																							
KD0110	Section W9 - Establishment Works	0	0		24/05/15 *		24/05/15 *	0 *																								
KD0125	Project Completion	0	0		24/05/15		24/05/15	0 *																								
KD0130	Completion of Maintenance Period of W1	1	100	13/10/12 A	13/10/12 A	13/10/12 A	13/10/12 A																									
KD0132	Completion of Maintenance Period of W2	1	0	15/06/15	15/06/15 *	15/06/15	15/06/15 *	0																								
KD0135	Completion of Maintenance Period of W4	1	0	01/11/14	01/11/14 *	01/11/14	01/11/14 *	0	▶ Completion of Maintenance Period of W4																							
KD0145	Completion of Maintenance Period of W5	1	0	01/11/14	01/11/14 *	01/11/14	01/11/14 *	0	▶ Completion of Maintenance Period of W5																							
KD0155	Completion of Maintenance Period of W6	1	0	01/11/14	01/11/14 *	01/11/14	01/11/14 *	0	▶ Completion of Maintenance Period of W6																							
KD0165	Completion of Maintenance period of W7	1	0	06/10/15	06/10/15 *	06/10/15	06/10/15 *	0 *																								
Preliminary (Civil)																																
PRE0020	Pre-condition Survey	60	100	17/05/10 A	15/07/10 A	17/05/10 A	15/07/10 A																									
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																									
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																									
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																									
PRE0090	Working Group Meeting for Outfall Construction	120	100	17/05/10 A	13/09/10 A	17/05/10 A	13/09/10 A																									
PRE0100	Application & Consent of XP from HyD (Mo Tat Rd)	120	100	17/05/10 A	13/09/10 A	17/05/10 A	13/09/10 A																									
PRE0130	Setup Web-site for EM&A Reporting	90	100	17/05/10 A	14/08/10 A	17/05/10 A	14/08/10 A																									
Preliminary (E&M)																																
Technical Submission																																
YSW0820	ABWF installation	90	100	15/01/13 A	05/09/14 A	15/01/13 A	05/09/14 A																									
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																									
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&M0030	Revision and Resubmission	125	100	15/07/10 A	16/11/10 A	15/07/10 A	16/11/10 A																									
E&M0080	Approval from the Engineer	14	100	17/11/10 A	30/11/10 A	17/11/10 A	30/11/10 A																									
Hydraulic Design																																
E&M0040	Submission	21	100	15/07/10 A	04/08/10 A	15/07/10 A	04/08/10 A																									
E&M0050	Vetting and Comment by ER	14	100	05/08/10 A	18/08/10 A	05/08/10 A	18/08/10 A																									
E&M0060	Revision and Resubmission	97	100	19/08/10 A	10/10/10 A	19/08/10 A	10/10/10 A																									
E&M0430	Approval from the Engineer	7	100	24/11/10 A	30/11/10 A	24/11/10 A	30/11/10 A																									
YSW1536	Water tightness test	40	100	12/08/13 A	26/08/13 A	12/08/13 A	26/08/13 A																									
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																									
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&M0100	Revision and Resubmission	14	100	20/07/10 A	24/02/11 A	20/07/10 A	24/02/11 A																									
E&M0101	Submission of Equipment	90	100	05/08/10 A	30/11/11 A	05/08/10 A	30/11/11 A																									
E&M0102	Vetting and Comment by ER	60	100	03/11/10 A	30/11/11 A	03/11/10 A	30/11/11 A																									
E&M0103	Revision and Resubmission	60	100	01/02/11 A	30/11/11 A	01/02/11 A	30/11/11 A																									
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&M0120	Approval on Fine Screens	30	100	12/09/11 A	12/09/11 A	12/09/11 A	12/09/11 A																									
E&M0130	Approval on Pumps	30	100	23/06/11 A	23/06/11 A	23/06/11 A	23/06/11 A																									
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&M0150	Approval on Grit Removal Equipment	30	100	10/10/11 A	10/10/11 A	10/10/11 A	10/10/11 A																									
E&M0160	Approval on MBR Membrane Modules (M.M.)	105	100	03/08/10 A	24/02/11 A	03/08/10 A	24/02/11 A																									
E&M0170	Approval on Sludge Dewatering Equipment	30	100	01/09/11 A	01/09/11 A	01/09/11 A	01/09/11 A																									

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		◆ Start milestone point
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Leader Civil Engineering Corp. Ltd.
Contract No. DC/2009/13
Construction of Sewage Treatment Works at YSW & SKW
3-month Rolling Programme (Nov 2014 - Jan 2015)

Date	Revision	Checked	Approved
31/10/14	Revision 0	RH	VC

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish	Total Float	2014 2015																											
									OCT					NOV					DEC					JAN					FEB							
									28	05	12	19	26	02	09	16	23	30	07	14	21	28	04	11	18	25	01	08	15	22						
SKW0501	Concreting for no-fine concrete	10	0	26/12/14	04/01/15	15/02/15	24/02/15	51d	Concreting for no-fine concrete																											
SKW0511	Wall Tie & Stone Facing	20	0	05/01/15	24/01/15	25/02/15	16/03/15	51d	Wall Tie & Stone Facing																											
SKW0521	Gabion Wall & Geotextile	20	0	25/01/15	13/02/15	17/03/15	05/04/15	51d	Gabion Wall & Geotextile																											
SKW0531	Installation of Flower Pot	7	0	14/02/15	20/02/15	06/04/15	12/04/15	51d	Installation of Flower Pot																											
SKW0541	Completion of Outstanding Works	42	0	21/02/15	03/04/15	13/04/15	24/05/15	51d	Completion of Outstanding Works																											
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																													
SKW0590	Site Clearance for Slope	100	100	15/07/10 A	22/10/10 A	15/07/10 A	22/10/10 A																													
SKW0591	Initial Survey for Slope	28	100	21/09/10 A	18/10/10 A	21/09/10 A	18/10/10 A																													
SKW0592	Temporary Rockfall fence at ex. Footpath	43	100	31/08/10 A	12/10/10 A	31/08/10 A	12/10/10 A																													
SKW05931	Construction of Haul Road (To +30mPD)	50	100	03/09/10 A	22/10/10 A	03/09/10 A	22/10/10 A																													
SKW05932	Construction of Haul Road (To +42.5mPD)	68	100	23/10/10 A	29/12/10 A	23/10/10 A	29/12/10 A																													
SKW059321	Removal of Boulders (IBG 1 - 119, SI No. 11B)	121	100	03/11/10 A	03/03/11 A	03/11/10 A	03/03/11 A																													
SKW059322	Add. Site Invest. Works (VO. No. 9,12 &16)	174	100	11/01/11 A	03/07/11 A	11/01/11 A	03/07/11 A																													
SKW059323	Revised Profile at West Slope (+56 to +42.5mPD)	1	100	17/03/11 A	17/03/11 A	17/03/11 A	17/03/11 A																													
SKW059324	Construction of Haul Road (+42.5 to +56mPD)	12	100	18/03/11 A	29/03/11 A	18/03/11 A	29/03/11 A																													
SKW059325	Removal of Boulders (IBG 120-139, SI No. 11C)	17	100	30/03/11 A	15/04/11 A	30/03/11 A	15/04/11 A																													
SKW05933	West Slope Cutting (+56mPD to +42.5mPD)	2	100	16/04/11 A	17/04/11 A	16/04/11 A	17/04/11 A																													
SKW059331	Removal of Boulders (IBG 140-189, SI No. 11D)	45	100	18/04/11 A	01/06/11 A	18/04/11 A	01/06/11 A																													
SKW05934	West Slope Cutting (+42.5mPD to +35mPD)	32	100	02/06/11 A	03/07/11 A	02/06/11 A	03/07/11 A																													
SKW059341	Revised Profile at West Slope (+20 to +4.8mPD)	1	100	04/07/11 A	04/07/11 A	04/07/11 A	04/07/11 A																													
SKW05935	West Slope Cutting (+35mPD to +27.5mPD)	83	100	08/07/11 A	28/09/11 A	08/07/11 A	28/09/11 A																													
SKW05936	West Slope Cutting (+27.5mPD to +20mPD)	61	100	29/09/11 A	28/11/11 A	29/09/11 A	28/11/11 A																													
SKW05937	West Slope Cutting (+20mPD to +12.5mPD)	39	100	29/11/11 A	06/01/12 A	29/11/11 A	06/01/12 A																													
SKW05938	West Slope Cutting (+12.5mPD to +4.8mPD)	90	100	07/01/12 A	27/03/12 A	07/01/12 A	27/03/12 A																													
SKW05941	Slope Stormwater Drainage	300	100	28/03/12 A	25/05/12 A	28/03/12 A	25/05/12 A																													
SKW059411	East Slope Cutting (+50mPD to +42.5mPD)	72	100	04/03/11 A	14/05/11 A	04/03/11 A	14/05/11 A																													
SKW059412	East Slope Cutting (+42.5mPD to +35mPD)	82	100	15/05/11 A	04/08/11 A	15/05/11 A	04/08/11 A																													
SKW059413	East Slope Cutting (+35mPD to +27.5mPD)	55	100	05/08/11 A	28/09/11 A	05/08/11 A	28/09/11 A																													
SKW059414	East Slope Cutting (+27.5mPD to +20mPD)	61	100	29/09/11 A	28/11/11 A	29/09/11 A	28/11/11 A																													
SKW059415	East Slope Cutting (+20mPD to +12.5mPD)	39	100	29/11/11 A	06/01/12 A	29/11/11 A	06/01/12 A																													
SKW059416	East Slope Cutting (+12.5mPD to +4.8mPD)	81	100	07/01/12 A	27/03/12 A	07/01/12 A	27/03/12 A																													
SKW05942	Slope Miscellaneous Works	61	100	26/05/12 A	31/07/12 A	26/05/12 A	31/07/12 A																													
SKW05943	Buttress & surface Protection (SI No. 31)	60	100	03/07/12 A	31/07/12 A	03/07/12 A	31/07/12 A																													
SKW05944	Slope Treatment (SI. No. 36)	60	100	03/07/12 A	31/07/12 A	03/07/12 A	31/07/12 A																													
SKW05945	Rock Slope Treatment (SI. No. 68)	60	100	01/08/12 A	30/09/12 A	01/08/12 A	30/09/12 A																													
SKW05946	Rock Slope Treatment (SI. No. 98)	60	100	10/09/12 A	28/02/13 A	10/09/12 A	28/02/13 A																													
SKW05947	Rock Slope Treatment (SI. No. 115)	60	100	01/11/12 A	28/02/13 A	01/11/12 A	28/02/13 A																													
SKW05948	Soil Nailing Works (VO. No. 52)	300	100	10/02/12 A	28/02/13 A	10/02/12 A	28/02/13 A																													
SKW0595	Rock Meshing	60	80	01/07/14 A	12/11/14	01/07/14 A	05/10/15	327d	Rock Meshing																											
SKW05963	Determine Alignment & Foundation Design of RFB	120	100	10/02/12 A	08/06/12 A	10/02/12 A	08/06/12 A																													
SKW059631	GEO Approval of Foundation Design	70	100	09/06/12 A	31/07/12 A	09/06/12 A	31/07/12 A																													
SKW05964	Fabrication & Shipping of RFB Material	180	100	09/06/12 A	30/11/12 A	09/06/12 A	30/11/12 A																													
SKW05965	Site clearance & Formation of access	62	100	09/06/12 A	31/07/12 A	09/06/12 A	31/07/12 A																													
SKW05967	Plant mobilization	14	100	02/01/13 A	15/01/13 A	02/01/13 A	15/01/13 A																													
SKW05968	Construction of anchors & pull out test	180	100	16/01/13 A	17/08/13 A	16/01/13 A	17/08/13 A																													
SKW05969	Construction of Foundation	120	100	11/07/13 A	23/08/13 A	11/07/13 A	23/08/13 A																													
SKW05970	Proof Load Test	60	100	31/07/13 A	28/09/13 A	31/07/13 A	28/09/13 A																													
SKW05971	Transportation of Material (To the slope crest)	30	100	31/07/13 A	29/08/13 A	31/07/13 A	29/08/13 A																													
SKW05972	Installation of Flexible barrier	90	100	31/07/13 A	28/10/13 A	31/07/13 A	28/10/13 A																													
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																													
SKW0652	Initial Survey	7	100	24/05/10 A	30/05/10 A	24/05/10 A	30/05/10 A																													

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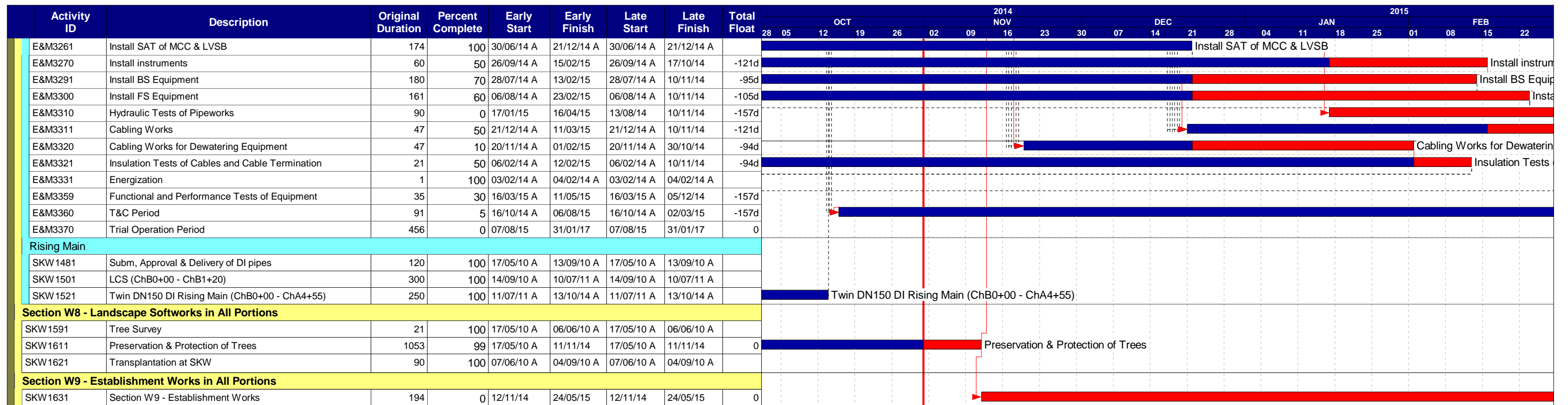
Date	Revision	Checked	Approved
31/10/14	Revision 0	RH	VC

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish	Total Float	2014																							
									OCT						NOV						DEC						2015					
									28	05	12	19	26	02	09	16	23	30	07	14	21	28	04	11	18	25	01	08	15	22		
SKW STW																																
Submission & Delivery (E&M)																																
E&M3010	Delivery of MBR M.M. - 1st shipment for Temp STP	150	100	24/02/11 A	17/10/11 A	24/02/11 A	17/10/11 A																									
E&M3030	Delivery of Grit Removal Equipment	180	100	10/10/11 A	29/12/11 A	10/10/11 A	29/12/11 A																									
E&M3060	Delivery of Fine Screens	136	100	12/09/11 A	30/11/11 A	12/09/11 A	30/11/11 A																									
E&M3070	Delivery of Pumps	136	100	23/06/11 A	05/09/11 A	23/06/11 A	05/09/11 A																									
E&M3080	Delivery of Submersible Mixers	180	100	26/07/11 A	17/11/11 A	26/07/11 A	17/11/11 A																									
E&M3090	Delivery of Sludge Dewatering Equipment	210	100	01/09/11 A	03/03/14 A	01/09/11 A	03/03/14 A																									
E&M3100	Delivery of Valves, Pipes & Fittings	180	100	30/08/11 A	06/07/14 A	30/08/11 A	06/07/14 A																									
E&M3110	Delivery of Penstocks	180	100	12/08/11 A	24/12/11 A	12/08/11 A	24/12/11 A																									
E&M3130	Delivery of instruments	180	100	21/06/11 A	03/11/11 A	21/06/11 A	03/11/11 A																									
E&M3140	Delivery of MCC LVSB	180	100	01/01/14 A	30/06/14 A	01/01/14 A	30/06/14 A																									
E&M3150	Delivery of BS Equipment	180	100	03/07/12 A	20/07/14 A	03/07/12 A	20/07/14 A																									
E&M3160	Delivery of FS Equipment	180	100	30/06/12 A	06/08/14 A	30/06/12 A	06/08/14 A																									
Construction of Grid A-G																																
SKW1261	Excavate for SKW STW Structure (Grid A-G)	164	100	28/03/12 A	31/08/12 A	28/03/12 A	31/08/12 A																									
SKW1271	55 M3 Fire Sprinkle Water Tank (FL +0.9 mPD)	36	100	03/07/12 A	31/07/12 A	03/07/12 A	31/07/12 A																									
SKW1281	Ground Floor Slab (Grid A-G)	46	100	03/07/12 A	31/07/12 A	03/07/12 A	31/07/12 A																									
SKW1291	Columns & Walls to 1/F & 1/F Slab (Grid A-G)	50	100	03/07/12 A	31/07/12 A	03/07/12 A	31/07/12 A																									
SKW1301	Columns & Walls to R/F & R/F Slab (Grid A-G)	50	100	01/09/12 A	31/01/13 A	01/09/12 A	31/01/13 A																									
SKW1411	ABWF Works	105	97	01/02/13 A	05/11/14 *	01/02/13 A	05/11/14 *	0	ABWF Works																							
Construction of Grid G-N																																
SKW1311	Excavate for SKW STW Structure (Grid G-N)	90	100	28/03/12 A	25/06/12 A	28/03/12 A	25/06/12 A																									
SKW1321	Equalization Tank no.1 & 2 with base slabs (-2.1)	42	100	26/06/12 A	30/09/12 A	26/06/12 A	30/09/12 A																									
SKW1331	Columns & Walls from B/S to G/F Slab (Grid G-N)	35	100	01/09/12 A	30/09/12 A	01/09/12 A	30/09/12 A																									
SKW1341	Ground Floor Slab (Grid G-N)	35	100	01/09/12 A	17/12/12 A	01/09/12 A	17/12/12 A																									
SKW1351	Columns & Walls to 1/F & 1/F Slab (Grid G-N)	28	100	01/11/12 A	15/01/13 A	01/11/12 A	15/01/13 A																									
SKW1361	Columns & Walls to R/F & R/F Slab (Grid G-N)	35	100	01/11/12 A	03/08/13 A	01/11/12 A	03/08/13 A																									
SKW1451	ABWF Works	54	97	05/06/13 A	03/11/14 *	05/06/13 A	03/11/14 *	0	ABWF Works																							
Construction of Grid N-T																																
SKW1371	Excavate for SKW STW Structure (Grid N-T)	97	100	03/07/12 A	25/01/13 A	03/07/12 A	25/01/13 A																									
SKW1381	Ground Floor Slabs include MBR Tank (Grid N-T)	58	100	02/10/12 A	31/01/13 A	02/10/12 A	31/01/13 A																									
SKW1391	Columns & Walls to 1/F & 1/F Slab (Grid N-T)	35	100	31/05/13 A	05/07/13 A	31/05/13 A	05/07/13 A																									
SKW1401	Columns & Walls to R/F & R/F Slab (Grid N-T)	35	100	03/07/13 A	15/09/13 A	03/07/13 A	15/09/13 A																									
SKW1421	ABWF Works	60	97	06/08/13 A	10/11/14 *	06/08/13 A	10/11/14 *	0	ABWF Works																							
Road and Drainage at Internal EVA																																
SKW1551	Drainage (SSMH1-Outfall)	35	100	15/07/14 A	27/10/14 A	15/07/14 A	27/10/14 A		Drainage (SSMH1-Outfall)																							
SKW15611	Sewer (SMFH10-11, SMFH9-4)	22	100	27/03/14 A	10/10/14 A	27/03/14 A	10/10/14 A		Sewer (SMFH10-11, SMFH9-4)																							
SKW156111	Underground FS pipes	20	50	11/11/14 A	20/11/14	11/11/14 A	20/11/14	-10d	Underground FS pipes																							
SKW15612	Sewer (SFMH9-10, SFMH11-12, SFMH4-6)	17	30	21/11/14 A	02/12/14	21/11/14 A	02/12/14	-10d	Sewer (SFMH9-10, SFMH11-12, SFMH4-6)																							
SKW15613	300UC at EVA (GL K to T)	20	0	03/11/14 *	22/11/14	03/11/14	22/11/14	0	300UC at EVA (GL K to T)																							
SKW15614	300UC at EVA (GL A to K)	20	0	23/11/14	12/12/14	13/12/14	01/01/15	20d	300UC at EVA (GL A to K)																							
SKW15615	EVA pavement and road kerb (GL K to T)	20	0	03/12/14	22/12/14	23/11/14	12/12/14	-10d	EVA pavement and road kerb (GL K to T)																							
SKW15616	EVA pavement and road kerb (GL A to K)	20	0	23/12/14	11/01/15	02/01/15	21/01/15	10d	EVA pavement and road kerb (GL A to K)																							
SKW15617	Slope toe UC at 1.2m high (GL K to T)	40	0	23/12/14	31/01/15	13/12/14	21/01/15	-10d	Slope toe UC at 1.2m high (GL K to T)																							
SKW15618	Slope toe UC at 1.2m high (GL A to K)	40	0	01/02/15	12/03/15	22/01/15	02/03/15	-10d	Slope toe UC at 1.2m high (GL A to K)																							
SKW STW - E&M Works																																
E&M3170	Install Membrane Modules in MBR Tank No. 1 to 2	100	100	14/01/14 A	08/10/14 A	14/01/14 A	08/10/14 A		Install Membrane Modules in MBR Tank No. 1 to 2																							
E&M3190	Install Grit Removal Equipment	60	100	15/03/14 A	15/10/14 A	15/03/14 A	15/10/14 A		Install Grit Removal Equipment																							
E&M3210	Install Fine Screens	60	100	14/01/14 A	09/10/14 A	14/01/14 A	09/10/14 A		Install Fine Screens																							
E&M3220	Install Pumps	75	60	15/03/14 A	03/12/14	15/03/14 A	29/06/14	-157d	Install Pumps																							
E&M3230	Install Submersible Mixers	45	60	29/05/14 A	21/12/14	29/05/14 A	17/07/14	-157d	Install Submersible Mixers																							
E&M3240	Install Sludge Dewatering Equipment	74	60	04/03/14 A	10/12/14	04/03/14 A	18/09/14	-83d	Install Sludge Dewatering Equipment																							
E&M3250	Install Valves, Pipes & Fittings	75	65	13/07/14 A	16/01/15	13/07/14 A	12/08/14	-157d	Install Valves, Pipes & Fittings																							
E&M3260	Install Penstocks	135	100	05/03/14 A	15/10/14 A	05/03/14 A	15/10/14 A		Install Penstocks																							

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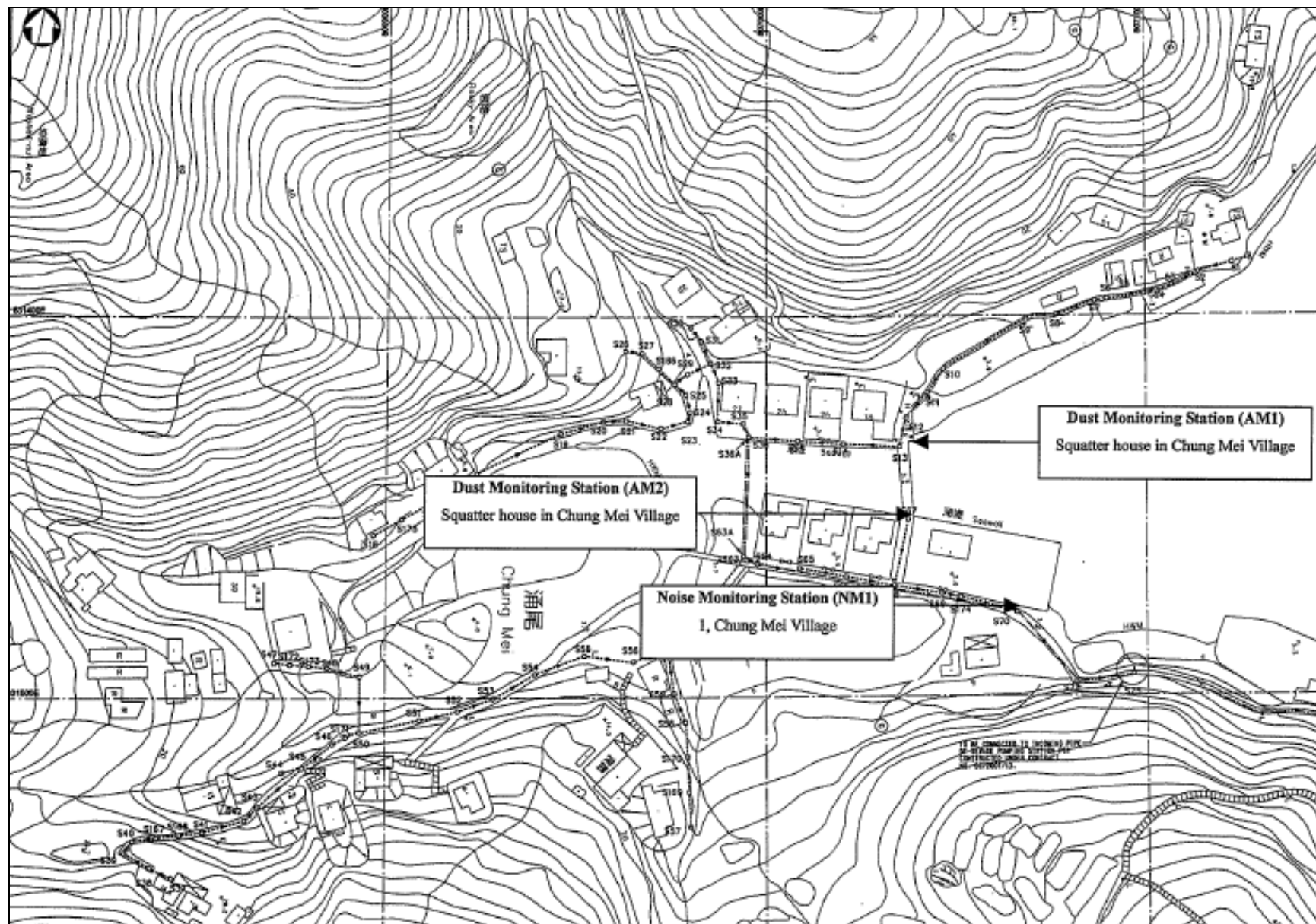
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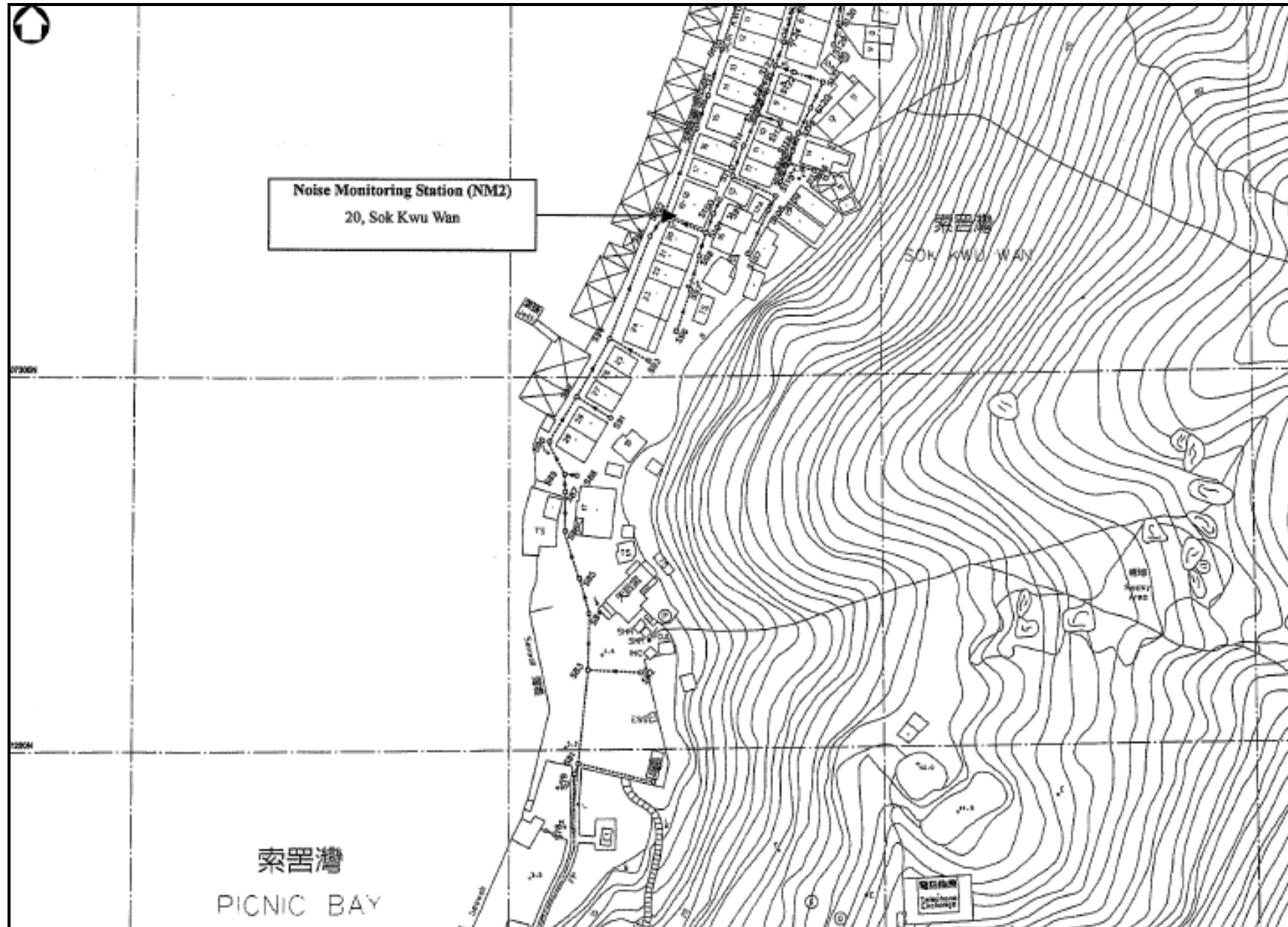
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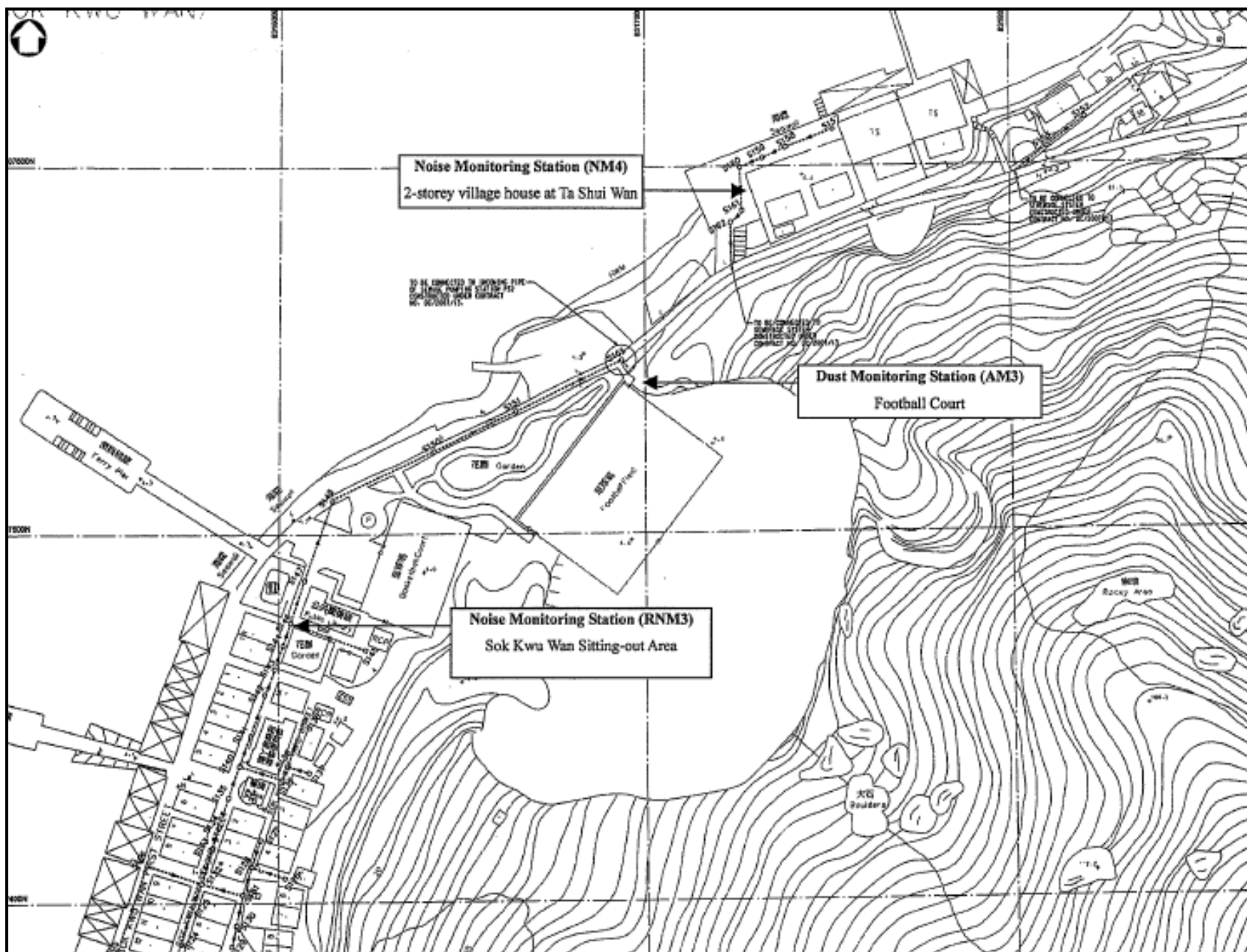
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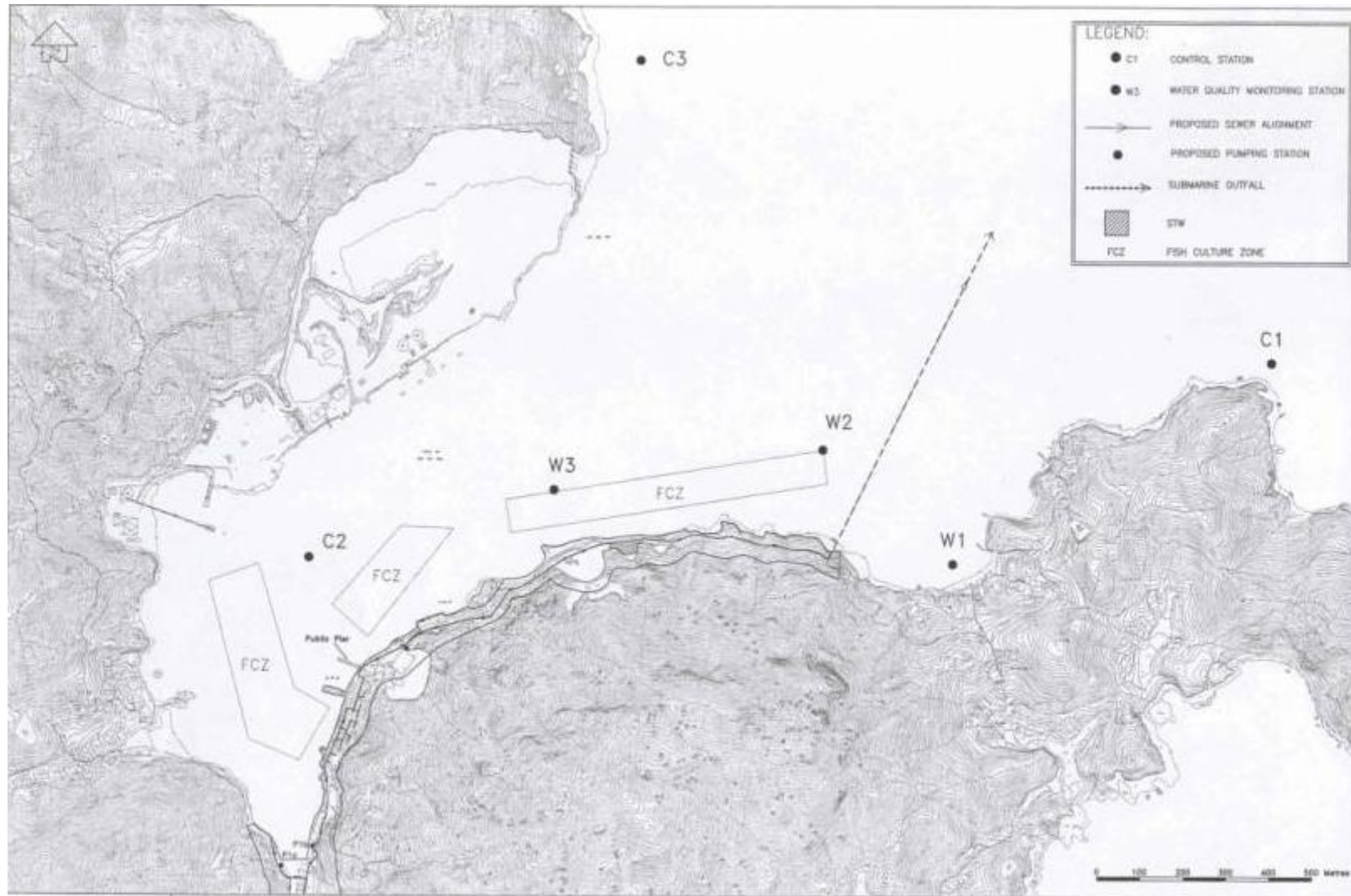
Appendix D

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







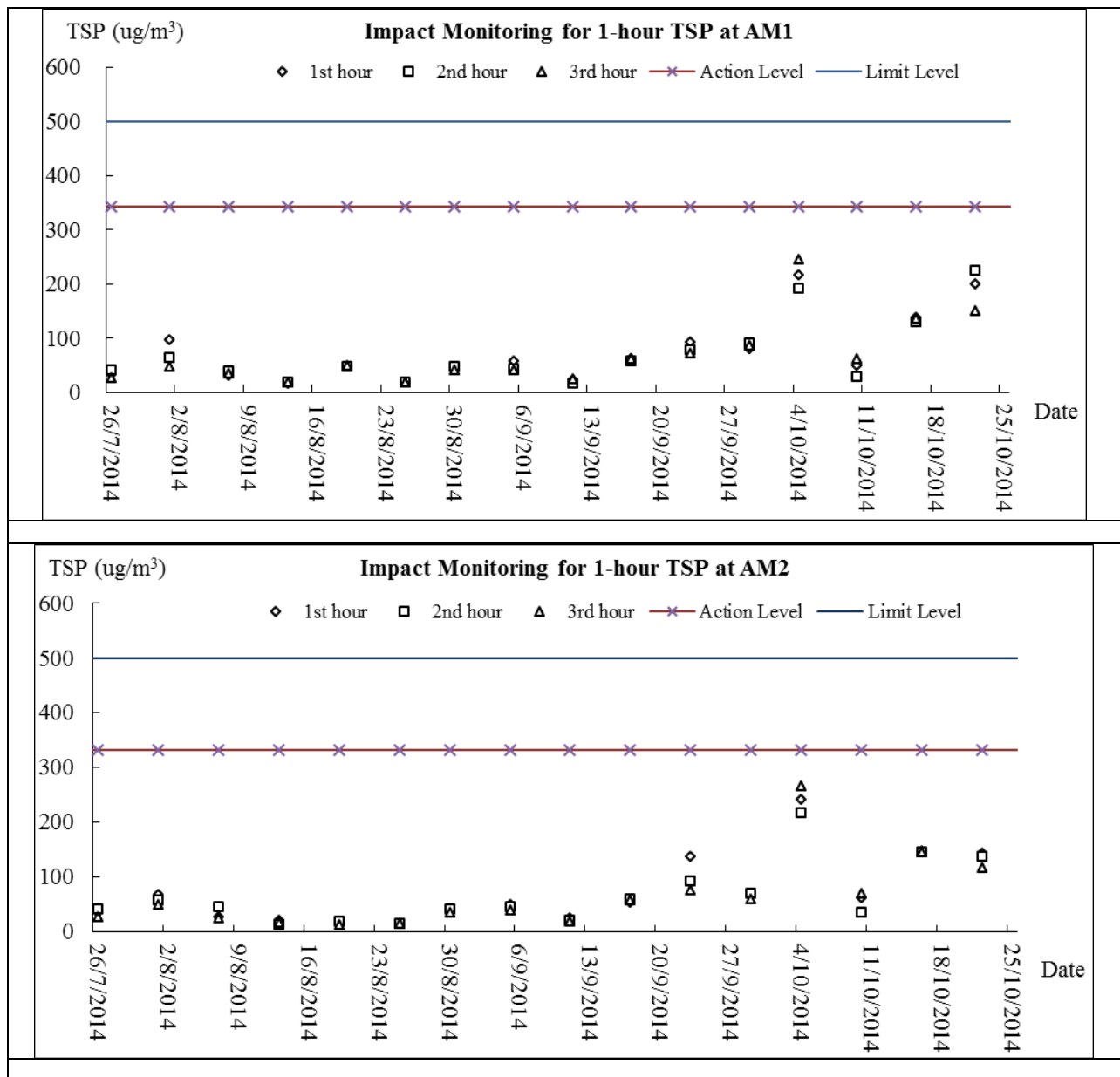


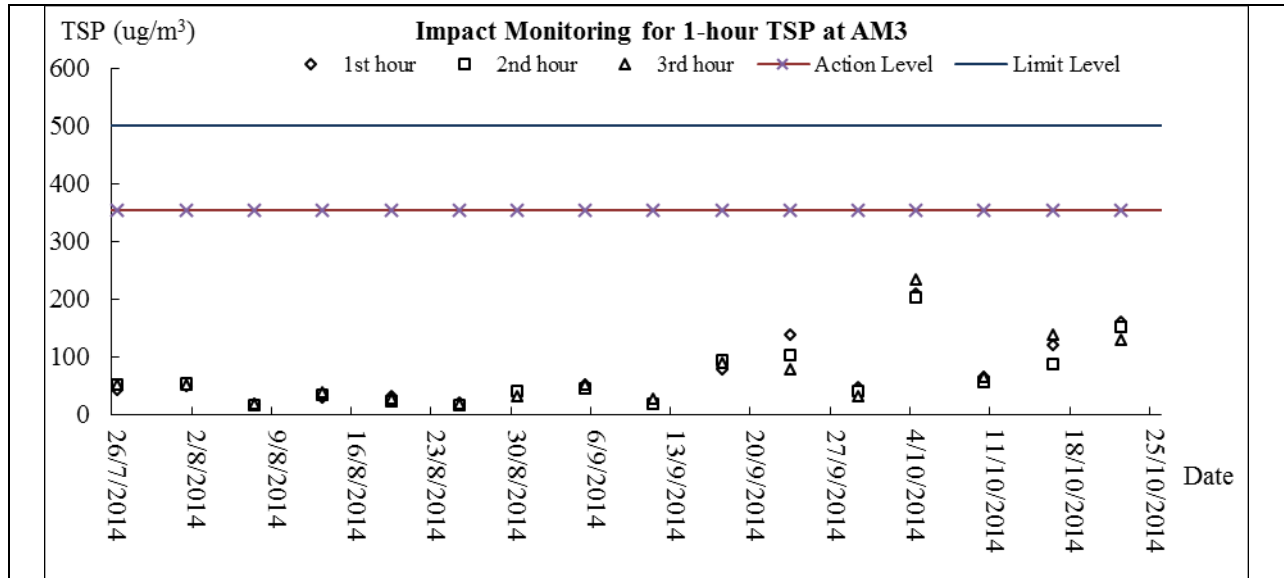
Appendix E

Graphical Plots of Impact Monitoring

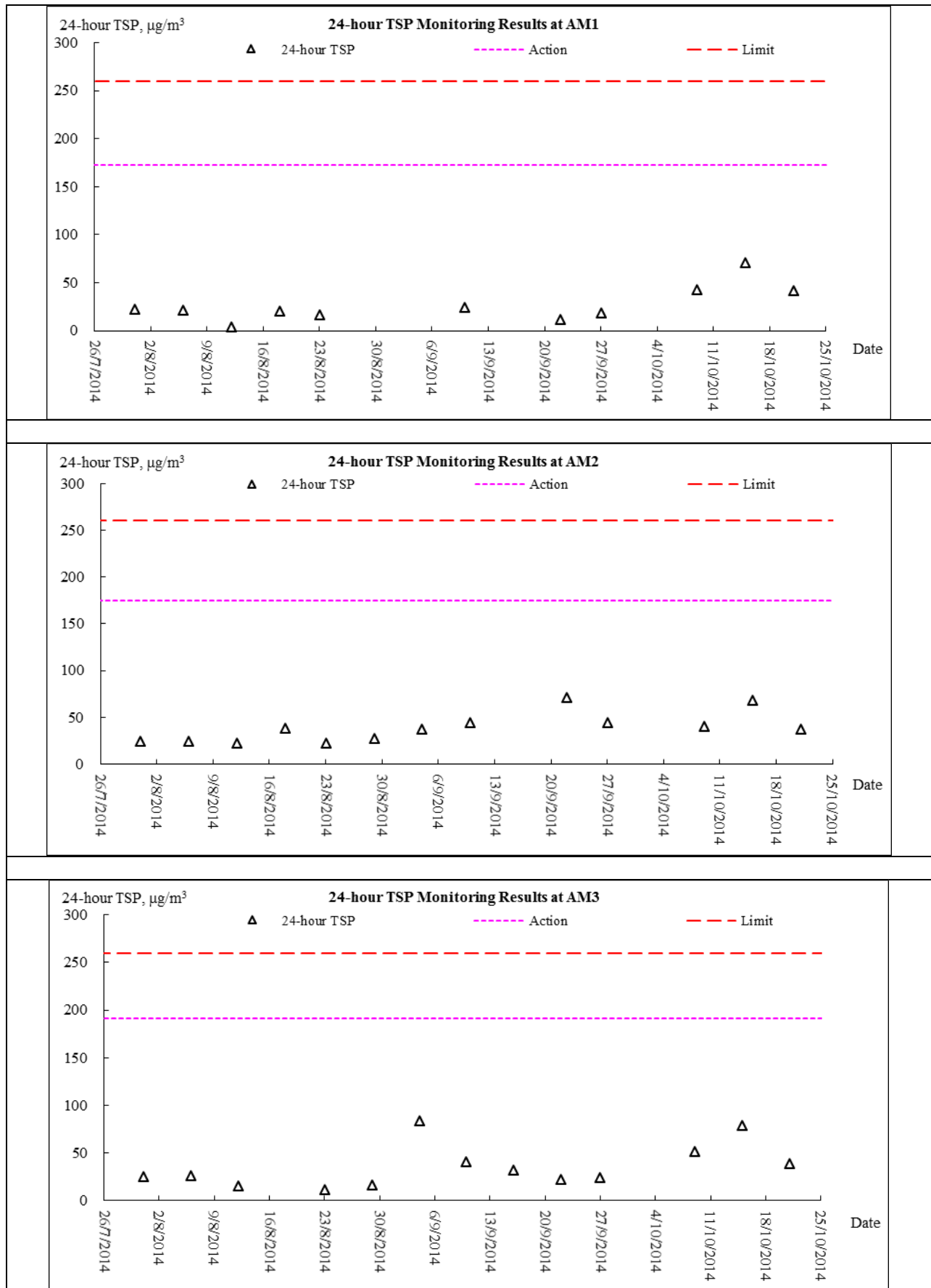
- 1. Air Quality**
- 2. Construction Noise**
- 3. Marine Water Quality**

Air Quality Monitoring – 1 hour TSP Monitoring

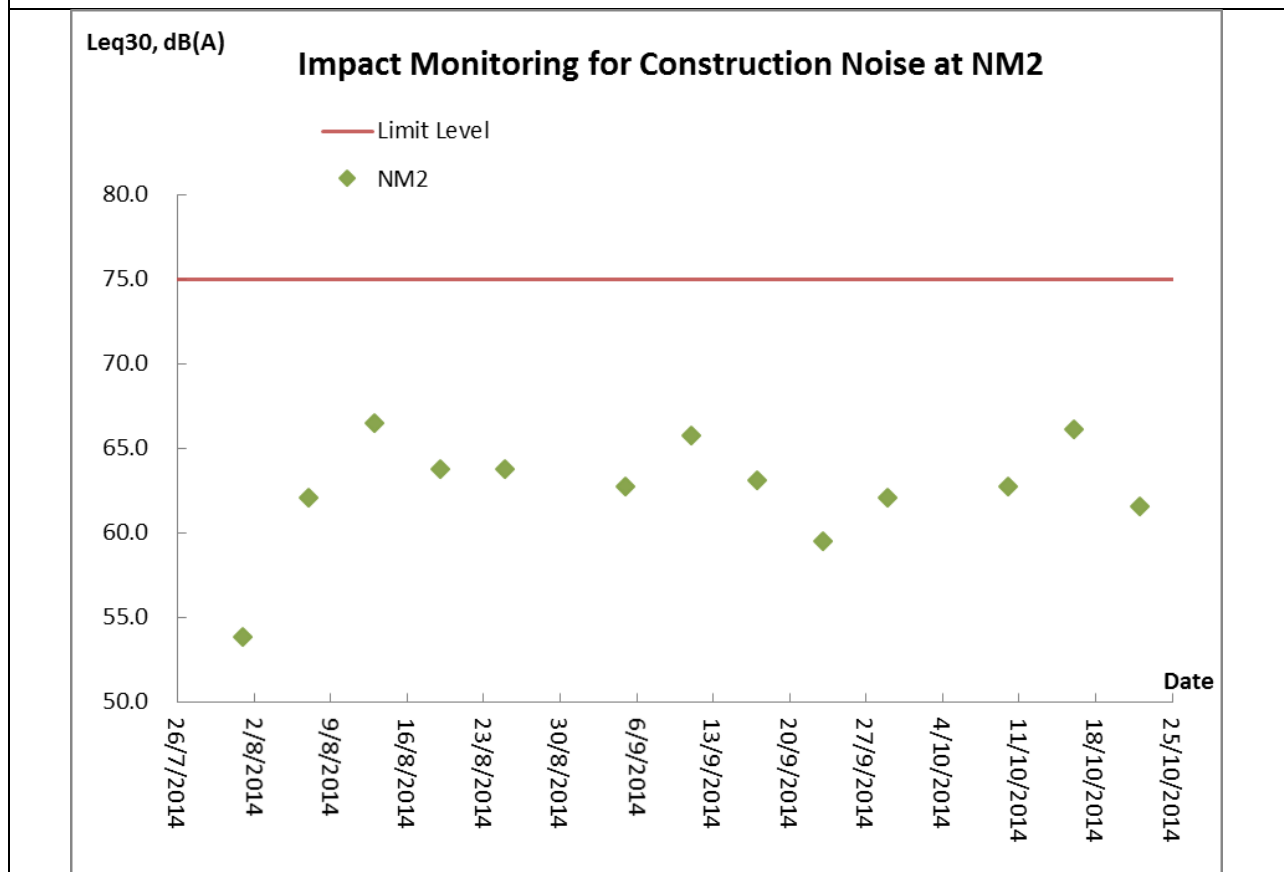
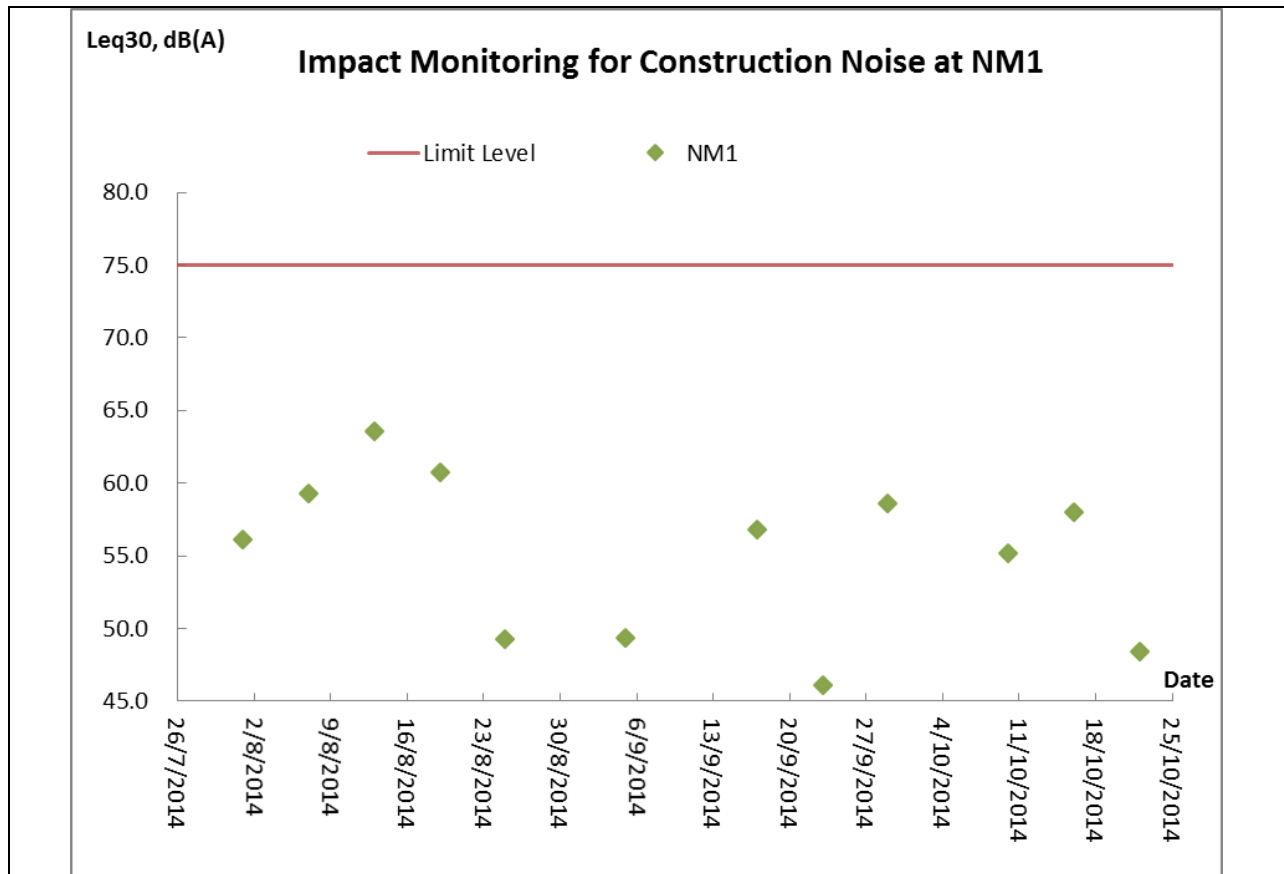


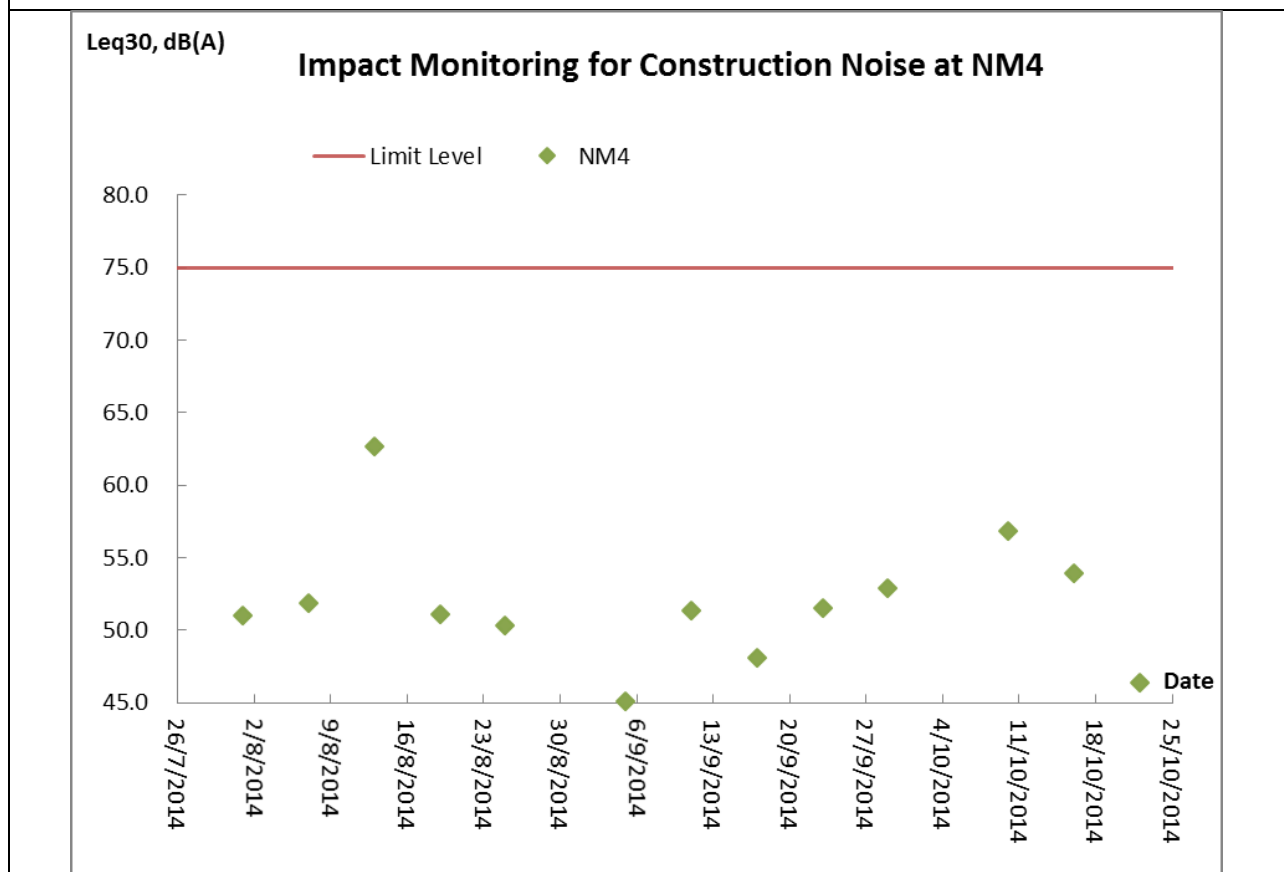
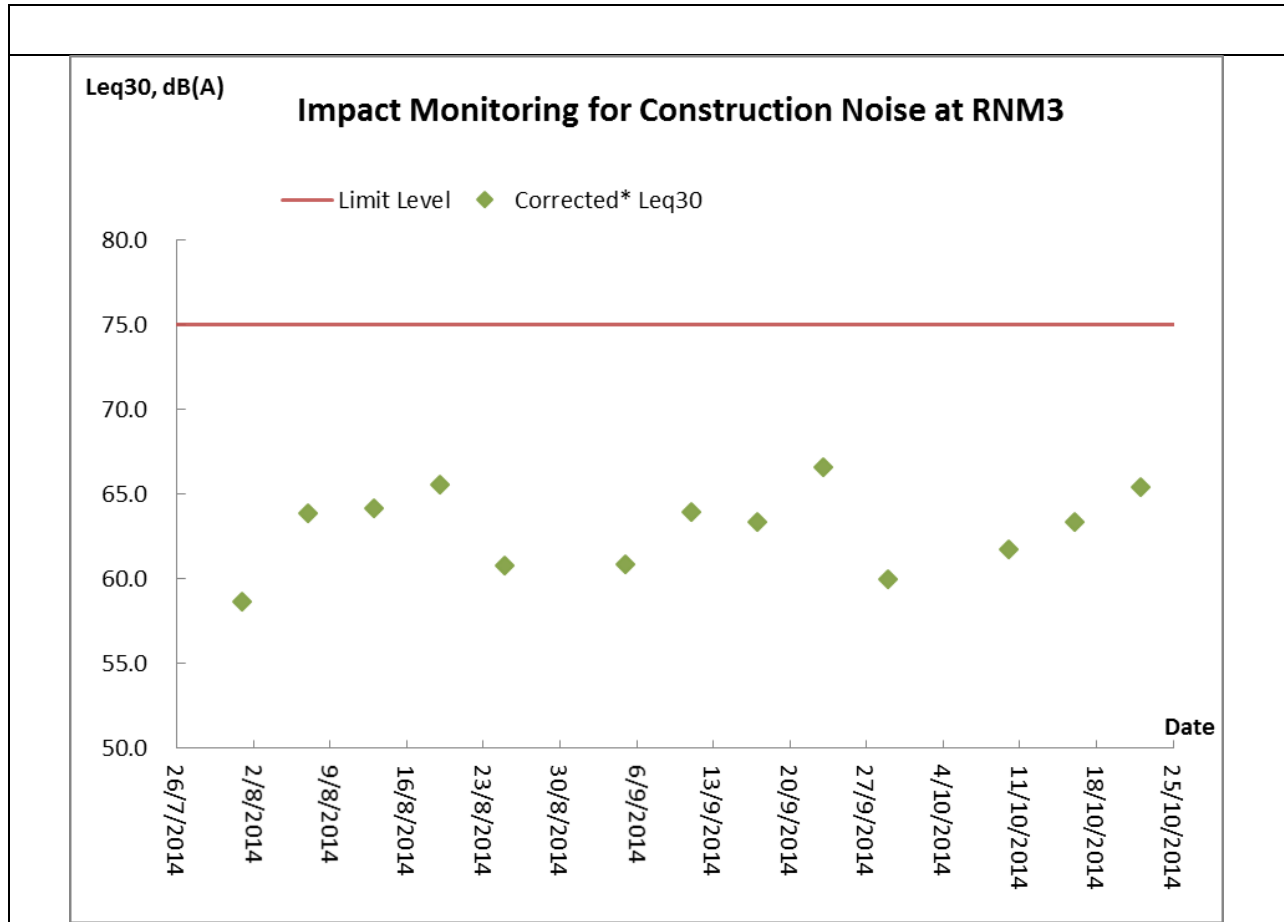


Air Quality Monitoring – 24 hour TSP Monitoring



Construction Noise Monitoring





Appendix F

Meteorological Information

Weather Condition –August 2014

The weather of August 2014 was hotter than usual due to prolonged spells of fine and sunny weather during the month. The monthly mean temperature of 29.0 degrees was 0.4 degree higher than the normal figure of 28.6 degrees, while the monthly duration of bright sunshine of 212.0 hours was about 12 percent above the normal figure of 188.9 hours. With two heavy rain episodes around mid-August, the month was also wetter than usual with a monthly rainfall amount of 548.2 millimetres, about 27 percent above the August normal of 432.2 millimetres. The accumulated rainfall since 1 January was 2312.1 millimetres, about 21 percent above the normal of 1905.5 millimetres for the same period.

Weather Condition – September 2014

Under the dominance of the subtropical ridge over southern China, September 2014 was the hottest September on record. The monthly mean minimum temperature of 27.0 degrees and mean temperature of 29.0 degrees were respectively the highest and one of the highest for September since record began in 1884. The month was also drier than usual with a monthly total rainfall amount of 140.6 millimetres, only about 43 percent of the September normal of 327.6 millimetres. The accumulated rainfall since 1 January was 2452.7 millimetres, about 10 percent above the normal of 2233.1 millimetres for the same period.

Weather Condition– October 2014

Under the dominance of a relatively dry northeast monsoon, October 2014 was much warmer and sunnier than usual. The mean temperature for the month was 26.2 degrees, 0.7 degrees above the normal figure of 25.5 degrees and also the one of the fifth highest for October since record began in 1884. The monthly total duration of sunshine was 222.9 hours, about 15 percent above the normal figure of 193.9 hours.

The details meteorological data for each successive day could be referred to the Monthly EM&A Report (August 2014, September 2014, and October 2014).

Appendix G

Monthly Summary Waste Flow Table

Monthly Summary Waste Flow Table for October 2014

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
2014	15.933	50.762	0.160	0.432	0.740	2.802	0.000	0.000	15.194	47.960	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	487.580	290.030
Jan	0.342	0.325	0.000	0.005	0.000	0.000	0.000	0.000	0.342	0.325	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.480	4.820
Feb	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	18.110	4.300
Mar	0.305	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.305	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.150	4.340
Apr	0.000	0.000	0.000	0.005	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	0.000	0.000	0.000	4.030	3.900
May	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	35.810	4.180
Jun	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	33.060	5.880
Sub-total	16.581	51.087	0.160	0.442	0.740	2.802	0.000	0.000	15.841	48.285	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	588.220	317.450
Jul	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	21.980	11.520
Aug	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	22.250	3.540
Sep	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	19.610	3.270
Oct	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	28.860	5.490
Nov																						
Dec																						
Total	16.581	51.087	0.160	0.442	0.740	2.802	0.000	0.000	15.841	48.285	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	680.920	341.270
	67.668		0.602		3.542		0.000		64.126		0.000		0.000		0.000		0.000		0.000		1022.190	

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

YSW: Yung Shue Wan

SKW: Sok Kwu Wan