

Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2

Monthly EM&A Report

August 2014

Submitted to

Environmental Protection Department

Prepared By

Meinhardt Infrastructure and Environment Ltd

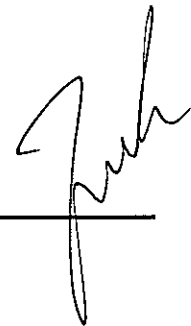
Meinhardt Infrastructure and Environment Limited

**Entrusted Portion of Widening of Tolo
Highway / Fanling Highway between Island
House Interchange and Fanling Stage 2**

Monthly EM&A Report

(August 2014)

Certified by: Fredrick Leong



Position: Environmental Team Leader

Date: 11 September 2014



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11 September 2014
By Fax (2805 5028) & Post

Dear Sir,

Attn: Mr. James Penny

**Environmental Monitoring and Audit (EM&A) for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling
Stage 2 (between Tai Hang to Wo Hop Shek Interchange) – Entrusted Works
Environmental Permit No. EP-324/2008/B
Condition 3.3 – Submission of Monthly EM&A Report – August 2014 for the portion of Stage 2 works entrusted to Civil Engineering and Development Department (CEDD) under Contract No. CV/2012/09**

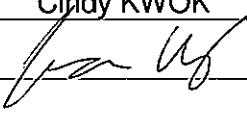
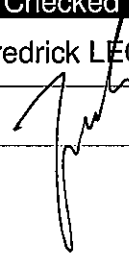
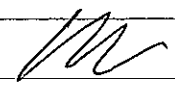
We refer to the revised Monthly EM&A Report – August 2014 received on 5 and 10 September 2014 submitted by the Environmental Team via email. Pursuant to Environmental Permit Condition 3.3, I hereby verify the Monthly EM&A Report – August 2014 (Rev. 0) for the portion of works under Stage 2 of the captioned Project which is entrusted to CEDD under Contract No. CV/2012/09.

Yours faithfully
for MOTT MACDONALD HONG KONG LIMITED

A handwritten signature in black ink, appearing to read 'Terence Kong', written in a cursive style.

Terence Kong
Independent Environmental Checker

c.c. HyD – Mr. Chung Lok Chin (Fax: 2714 5198) / Ms. Jackei Yin (Fax: 2761 4864)
CEDD/BCP – Mr. Chris Wong / Mr. Desmond Lam (Fax: 2714 0103)
AECOM – Mr. Alan Lee (Fax: 3922 9797)
Meinhardt Infrastructure and Environment Limited – Mr. Fredrick Leong (Fax: 2540 1580)

Date	Revision	Prepared By	Checked By	Approved By
11 Sep 2014	0	Ivan TING Cindy KWOK	Fredrick LEONG	Helen COCHRANE
				

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EXECUTIVE SUMMARY

The Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2 (hereafter called “the Project”) covers part of the construction of the widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling which aimed to widen Tolo Highway and Fanling Highway to dual 4-lane carriageway in order to alleviate the current traffic congestion problems and to cope with the increasing transport demands to and from the urban areas and also cross boundary traffic. The Project covers construction activities at Yuen Leng along the existing Fanling Highway.

The impact EM&A for the Project includes air quality, noise and water quality monitoring. The EM&A programme commenced on 5 November 2013.

This report documents the findings of EM&A works conducted in August 2014. As informed by the Contractor, the major activities in the reporting period were:

- Bored pile and bored pile wall construction;
- Cable detection and trial trenches;
- Local diversion of DN1400;
- Lay Dia.1050 storm drains;
- Mini pile construction;
- Noise barrier installation;
- Pile Cap;
- Piling works for Bridge E;
- Pre-drilling;
- Receiving & Jacking Pit;
- Retaining Structure;
- Road works at Fanling highway;
- Sewer works at TWSRW;
- Slope upgrading works
- Soil nail construction;
- Tree Felling Works;
- Water pipe installation;
- RC structure of new valve control & Telemetry House; and
- Demolition of Huts.

Breach of Action and Limit Levels for Air Quality

No exceedance of Action and Limit Level was recorded for 24-hour TSP monitoring at the monitoring location AM1(SR77) in the reporting month.

No exceedance of Action and Limit Level was recorded for 1-hour TSP monitoring at the monitoring location AM1(SR77) in the reporting month.

Breach of Action and Limit Levels for Noise

No noise complaint was received in the reporting month, so no Action Level exceedance was recorded. Also, no Limit Level exceedance of noise monitoring was recorded in the reporting month.

Breach of Action and Limit Levels for Water Quality

The box culvert works have been partially completed by the end of March 2014 except the last construction activity, installation of a base slab at Box Culvert ID4. Due to the loading requirement of a fresh water main under the box culvert, installation of the base slab at Box Culvert ID4 has to be scheduled to be carried out in November 2015 after the utilities diversions complete. The construction works are temporarily suspended until the utilities diversion works complete. The 4-week post construction water quality monitoring will be commenced after the installation of the base slab finishes, hence the completion of the box culvert works.

Impact monitoring for water quality was not necessary in the reporting month due to temporary suspension of the construction works and is anticipated to be resumed in November 2015 during the course of remaining box culvert works.

Complaint, Notification of Summons and Successful Prosecution

No complaint, notification of summons and successful prosecution was received in the reporting month.

Future Key Issues

The major construction works in the coming reporting month are anticipated to include:

- ADMS installation;
- Trim pile head & extension of piles for bored pile wall;
- Cable detection and trial trenches;
- Catch Fence installation;
- Diversion of DN600 & DN1400;
- Laying of concrete pipe works;
- Mini pile construction;
- Noise barrier works;
- Pier construction;

- Pile Cap;
- Piling works for Bridge E;
- Pre-drilling works and piling works for viaduct;
- Receiving & Jacking Pit;
- Retaining Structure;
- Road works at Fanling highway;
- Sewer works at TWSRW;
- Site formation;
- Slope upgrading works;
- Socket H-pile installation;
- Soil nail construction;
- Tree Felling Works;
- Trenchless excavation;
- Water pipe installation;
- RC structure of new valve control & Telemetry House;
- Traffic diversion for Fanling Highway;
- Demolition of central barrier at Fanling Highway; and
- Diversion of existing cycle track.

Potential environmental impacts arising from the above construction activities are anticipated to be mainly associated with construction dust, noise, water quality and waste management.

1 INTRODUCTION

1.1.1 Chun Wo Construction & Engineering Co Ltd (Chun Wo) was commissioned by the Civil Engineering and Development Department (CEDD) as the Civil Contractor for the Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2. Meinhardt Infrastructure & Environment Ltd (MIEL) has been appointed by Chun Wo as the Environmental Team (ET) to fulfill the corresponding EM&A requirements pursuant to Environmental Permit No. EP-324/2008/B in accordance with the Updated EM&A Manual (dated October 2013) for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling Stage 2. The EM&A programme commenced in 5 November 2013.

1.2 Purpose of the Report

1.2.1 This is the monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting month of August 2014.

1.3 Report Structure

1.3.1 This monthly EM&A Report comprises the following sections:

- Section 1: Introduction
- Section 2: Project Information
- Section 3: Status of Environmental Licenses, Notifications and Permits
- Section 4: Air Quality Monitoring
- Section 5: Noise Monitoring
- Section 6: Water Monitoring
- Section 7: Waste Management
- Section 8: Environmental Site Inspection and Audit
- Section 9: Implementation Status of Environmental Mitigation Measures
- Section 10: Environmental Non-conformance
- Section 11: Future Key Issues
- Section 12: Conclusions and Recommendations

2 PROJECT INFORMATION

2.1 Background

- 2.1.1 Tolo Highway and Fanling Highway are expressways in the North East New Territories connecting Sha Tin, Tai Po and Fanling. These highways form a vital part of the strategic Route 1, which links Hong Kong Island to Shenzhen. At present, this section of Route 1 is a dual 3-lane carriageway. However, at several major interchanges along this section of Route 1, the highway is only dual-2 lane. Severe congestion is a frequent occurrence during peak periods, particularly in the Kowloon bound direction.
- 2.1.2 The objective of the Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling is to widen Tolo Highway and Fanling Highway to dual 4-lane carriageway in order to alleviate the current traffic congestion problems and to cope with the increasing transport demands to and from the urban areas and also cross boundary traffic.
- 2.1.3 The construction works for the Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling are to be delivered in 2 stages:
- Stage 1 – Construction works between Island House Interchange and Tai Hang; and
 - Stage 2 – Construction works between Tai Hang and Wo Hop Shek Interchange.
- 2.1.4 The construction works of Stage 1 under the EP commenced in November 2009 and was planned to be completed in December 2013 tentatively. The works of Stage 2 was planned to commence in November 2013 and complete by end of 2016. Hyder-Arup-Black and Veatch Joint Venture (HABVJV) was appointed by the Highways Department (HyD) as the consultants for the design and construction assignment for the Project. Mott MacDonald Hong Kong Ltd is the Independent Environmental Checker (IEC) of both Stage 1 and Stage 2 works.
- 2.1.5 A portion of Stage 2 works of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling (hereafter called “the Project”) is entrusted to the contractor of Contract No. CV/2012/09 Liantang / Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works Contract 3, i.e. Chun Wo. AECOM Asia Co Ltd was appointed by the CEDD as the consultant for the design and construction assignment for the Liantang development.
- 2.1.6 The Project is a Designated Project under the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499). An Environmental Impact Assessment (EIA) Report together with an Environmental Monitoring and Audit (EM&A) Manual were approved on 14 July 2000 (Register Number: EIA-043/2000). The Project is governed by an Environmental Permit (EP) (EP-324/2008) which was granted on 23 December 2008. A variation of EP (VEP) was applied and the VEP (EP-324/2008/A) was subsequently granted on 31 January 2012. An additional VEP has been applied on 24 February 2014 and the VEP (EP-324/2008/B) was subsequently granted on 17 March 2014.

2.2 Site Description

- 2.2.1 The major construction activities under the Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2 include:

- At-Grade Road Works – Temporary and permanent road formation, pipe laying, road drainage, footpath and noise barrier construction;
- Demolition of existing Kiu Tau Footbridge and Footbridge Re-provision; and
- Box Culvert Extension – Flow diversion of existing stream, excavation, sub-base and blinding, base, wall and top slab construction.

2.2.2 **Figure 1** shows the works areas for the Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2.

2.3 Construction Programme and Activities

2.3.1 The major construction activities undertaken in the reporting month are summarized below:

- Bored pile and bored pile wall construction;
- Cable detection and trial trenches;
- Local diversion of DN1400;
- Lay Dia.1050 storm drains;
- Mini pile construction;
- Noise barrier installation;
- Pile Cap;
- Piling works for Bridge E;
- Pre-drilling;
- Receiving & Jacking Pit;
- Retaining Structure;
- Road works at Fanling highway;
- Sewer works at TWSRW;
- Slope upgrading works
- Soil nail construction;
- Tree Felling Works;
- Water pipe installation;
- RC structure of new valve control & Telemetry House; and
- Demolition of Huts.

2.3.2 The construction programme is presented in **Appendix A**.

2.4 Project Organisation

2.4.1 The project organization structure is shown in **Appendix B**. The key personnel contact names and numbers for the Project are summarised in **Table 2.1**.

Table 2.1 Contact Information of Key Personnel

Party	Role	Position	Name	Telephone	Fax
AECOM	Engineer's Representative	Senior Resident Engineer	Mr. Alan Lee	2171 3303	2171 3498
		Resident Engineer (Environmental)	Mr. Perry Yam	2171 3350	
Mott MacDonald	Independent Environmental Checker (IEC)	IEC	Mr. Terence Kong	2828 5919	2827 1823
Chun Wo	Contractor	Site Agent	Mr. Daniel Ho	2638 6144	2638 7077
		Senior Environmental Officer	Mr. Sam Lam	2638 6168	
		Environmental Officer	Mr. Victor Huang	2638 6181	
Meinhardt	Environmental Team (ET)	ET Leader	Mr. Fredrick Leong	2859 1739	2540 1580

3 STATUS OF ENVIRONMENTAL LICENSES, NOTIFICATION AND PERMITS

3.1.1 The relevant environmental licenses, permits and/or notifications on environmental protection for this Project and valid in the reporting month are summarized in **Table 3.1**.

Table 3.1 Status of Environmental Licenses, Notifications and Permits

Permit / License No. / Notification / Reference No.	Valid Period		Status	Remarks
	From	To		
<i>Environmental Permit</i>				
EP-324/2008/B	17 Mar 2014	--	Granted on 17/03/2014	--
<i>Construction Noise Permit</i>				
GW-RN0397-14	29 Jun 2014	28 Dec 2014	Valid	For tree felling / transplanting works
GW-RN0445-14	28 Jul 2014	25 Jan 2015	Valid	For operating water pump in Kiu Tau at night
GW-RN0485-14	5 Aug 2014	5 Feb 2015	Valid	For operating water pump in jacking pit at Nam Wah Po
GW-RN0511-14	31 Aug 2014	28 Sep 2014	Valid	For removing road marking along slow lane of Fanling Highway
GW-RN0513-14	24 Aug 2014	28 Sep 2014	Valid	For removing road marking along middle and fast lanes of Fanling Highway
<i>Wastewater Discharge License</i>				
WT00016832-2013	28 Aug 2013	31 Aug 2018	Valid	--
<i>Chemical Waste Producer Registration</i>				
5113-634-C3817-01	7 Oct 2013	--	Valid	--
<i>Billing Account for Construction Waste Disposal</i>				
7017914	2 Aug 2013	--	Account Active	--
<i>Notification Under Air Pollution Control (Construction Dust) Regulation</i>				
--	31 Jul 2013	30 Jul 2019	Notified	--

4 AIR QUALITY MONITORING

4.1 Monitoring Requirement

4.1.1 In accordance with the Updated EM&A Manual, 1-hr and 24-hr total suspended particulate (TSP) levels at the designated air quality monitoring station are required. Impact 24-hour TSP monitoring should be carried out for at least once every 6 days. For the 1-hr TSP impact monitoring, the sampling frequency of at least three times in every 6 days should be undertaken when the highest dust impact occurs.

4.2 Monitoring Equipment

4.2.1 The 1hr- TSP and 24-hr TSP air quality monitoring were performed using a High Volume Sampler (HVS), of which its location and operation satisfy, as far as practicable, all the requirements as specified in the Updated EM&A Manual. The brand and model of the equipment are given in **Table 4.1**.

Table 4.1 Air Quality Monitoring Equipment

Equipment	Brand and Model	Quantity	Serial Number
High Volume Sampler (1-hr TSP and 24-hr TSP)	Tisch Total Suspended Particulate Mass Flow Controlled High Volume Air Sampler (Model No. TE-5170 MFC)	1	2359

4.2.2 The HVS and its accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.

4.2.3 Calibration of the HVS (five point calibration) using Calibration Kit was carried out every two months. The HVS calibration orifice and the handheld TSP meter will be calibrated annually. Calibration certificate of the TE-5025A Calibration Kit, the handheld TSP meter and the HVS are provided in **Appendix C**.

4.3 Monitoring Location

4.3.1 Air quality monitoring was conducted at the location specified in the Updated EM&A Manual. **Table 4.2** describes the details of the air quality monitoring station with its location as shown in **Figure 2**.

Table 4.2 Location of Air Quality Monitoring

Air Monitoring Station ID	Monitoring Location	Description
AM1(SR77) *	Yuen Leng 2 *	Residential, Ground floor

Remark:

* Location and Station / ASR ID as identified in Updated EM&A Manual / EIA Report for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling

4.4 Monitoring Parameters, Frequency and Duration

4.4.1 **Table 4.3** summarizes the monitoring parameters, frequency and duration of impact TSP monitoring.

Table 4.3 Air Quality Monitoring Parameters, Frequency and Duration

Parameter	Frequency and Duration
1-hour TSP	At least three times in every 6 days should be undertaken when the highest dust impact occur
24-hour TSP	Once every 6 days

4.5 Monitoring Methodology

1-hr and 24-hr TSP Monitoring

- 4.5.1 With the consideration of criteria stated in the Updated EM&A Manual, the HVS was installed in the vicinity of the air sensitive receivers.
- 4.5.2 The relevant data including temperature, pressure, weather conditions, elapsed-time meter reading for the start and stop of the sampler, identification and weight of the filter paper, and any special phenomena observed were recorded. The weather information was referenced from Hong Kong Observatory (<http://www.weather.gov.hk/wxinfo/pastwx/extractc.htm>).
- 4.5.3 A HOKLAS accredited laboratory with constant temperature and humidity control, and equipped with necessary measuring and conditioning instruments, to handle the 24-hr TSP samples, was employed for sample analysis.
- 4.5.4 Filter papers of size 8"x10" were labelled before sampling. They were inspected to be clean with no pin holes and conditioned in a humidity controlled chamber for over 24-hr and were pre-weighed before use for the sampling.
- 4.5.5 The 24-hr TSP levels were measured by following the standard high volume sampling method for TSP as set out in the Title 40 of the United States Code of Federal Regulations, Chapter 1 (Part 50), Appendix B. TSP was sampled by drawing air through a conditioned, pre-weighed filter paper inside the HVS at a controlled air flow rate. After 24-hr sampling, the filter papers loaded with dust were kept in a clean and tightly sealed plastic bag, and then returned to the laboratory for reconditioning in the humidity controlled chamber followed by accurate weighing by an electronic balance with a readout down to 0.1 mg.
- 4.5.6 All the collected samples were kept in a good condition for 6 months before disposal.
- 4.5.7 For 1-hr TSP monitoring, monitoring methodology is the same as 24-hr TSP monitoring which has been presented in **Section 4.5.1** to **Section 4.5.6**, but with sampling period changed to 1 hour.

4.6 Monitoring Schedule for the Reporting month

- 4.6.1 The schedule for environmental monitoring for the reporting month is provided in **Appendix D**. Meteorological data extracted from Hong Kong Observatory for the reporting month is provided in **Appendix E**.

4.7 Monitoring Results

- 4.7.1 The monitoring results for 1-hr and 24-hr TSP are summarised in **Table 4.4** and **Table 4.5** respectively. Detailed air quality monitoring results and the graphical presentation

of air quality monitoring data for the current and past three reporting months are presented in **Appendix F**.

Table 4.4 Summary of 1-hr TSP Monitoring Results

ASR ID	Average ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
AM1(SR77) *	76.0	57.7 – 99.3	292.7	500

Remark:

* Station / ASR ID as identified in Updated EM&A Manual / EIA Report for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling

Table 4.5 Summary of 24-hr TSP Monitoring Results

ASR ID	Average ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
AM1(SR77) *	86.9	78.0 – 103.2	170.3	260

Remark:

* Station / ASR ID as identified in Updated EM&A Manual / EIA Report for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling

- 4.7.2 No exceedance of Action and Limit Level was recorded for 24-hour TSP monitoring at the monitoring location AM1(SR77) in the reporting month.
- 4.7.3 No exceedance of Action and Limit Level was recorded for 1-hour TSP monitoring at the monitoring location AM1(SR77) in the reporting month.
- 4.7.4 The Event and Action Plan for the occurrence of non-compliance of the air quality criteria is annexed in **Appendix G**.
- 4.7.5 Meteorological data extracted from Hong Kong Observatory for the reporting month is provided in **Appendix E**.

5 NOISE MONITORING

5.1 Monitoring Requirements

5.1.1 In accordance with the Updated EM&A Manual, the impact noise monitoring frequency shall depend on the scale of the construction activities. An initial guide on the regular monitoring frequency should be at least once per week when noise generating activities are underway.

5.2 Monitoring Equipment

5.2.1 Noise monitoring was performed using a sound level meter at the monitoring station. The sound level meter deployed complies with the International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1) specifications. An acoustic calibrator was deployed to check the sound level meter at a known sound pressure level. The brand and model of the equipment is given in **Table 5.1**.

Table 5.1 Noise Monitoring Equipment

Equipment	Brand and Model	Quantity	Serial Number
Sound Level Calibrator	B&K (Model No. 4231)	1	2685684
Sound Level Meter	Rion (Model No. NL-52)	1	00220553

5.2.2 The sound level calibrator and sound level meter were verified by a certified laboratory once every two years. Calibration certificates of the sound level meter and acoustic calibrator are provided in **Appendix C**.

5.3 Monitoring Locations

5.3.1 Impact noise monitoring was conducted at the location specified in the Updated EM&A Manual. **Table 5.2** describes the details of the noise monitoring station with its location as shown in **Figure 2**.

Table 5.2 Location of Noise Monitoring

NSR ID	Monitoring Location	Description
M1(SR77) *	Yuen Leng 2 *	Residential, Ground floor

Remark:

* Location and Station / NSR ID as identified in Updated EM&A Manual / EIA Report for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling

5.4 Monitoring Parameters, Frequency and Duration

5.4.1 **Table 5.3** summarizes the monitoring parameters, frequency and duration of impact noise monitoring.

Table 5.3 Noise Monitoring Parameters, Frequency and Duration

Parameter and Duration	Frequency
30-mins measurement at between 0700 and 1900 on normal weekdays. Leq, L10 and L90 would be recorded.	At least once per week

5.5 Monitoring Methodology

5.5.1 The monitoring procedures are summarised as follows:

- The sound level meter was set on a tripod at a height of 1.2 m above the ground for free-field measurements at monitoring station SR77;
- The battery condition was checked to ensure good functioning of the meter;
- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
 - Frequency weighting: A
 - Time weighting: Fast
 - Parameters: Leq, L10 and L90
 - Time measurement: Leq(30-minutes) during non-restricted hours i.e. 07:00 – 19:00 hrs on normal weekdays
- Prior to and after each noise measurement, the meter was calibrated using the acoustic calibrator for 94dB(A) at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1dB(A), the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.
- At the end of the monitoring period, the Leq, L10 and L90 were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- A façade correction of +3dB (A) shall be made to the noise parameter obtained by free field measurement.

5.6 Monitoring Schedule for the Reporting Month

5.6.1 The schedule for environmental monitoring for the reporting month is provided in **Appendix D**. Meteorological data extracted from Hong Kong Observatory for the reporting month is provided in **Appendix E**.

5.7 Monitoring Results

5.7.1 The monitoring results for noise are summarized in **Table 5.4** and the monitoring results and the graphical presentation of noise level for the current and past three reporting months are presented in **Appendix H**.

Table 5.4 Summary of Noise Monitoring Results

Noise Monitoring Station ID	Average, dB(A), Leq (30min) ⁽²⁾	Range, dB(A), Leq (30min) ⁽²⁾	Action Level	Limit Level, dB(A)
M1(SR77) ⁽¹⁾	69.0	66.8 – 71.7	When one documented valid complaint is received	75

Remark:

(1) Station / NSR ID as identified in Updated EM&A Manual / EIA Report for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling

(2) +3dB(A) façade correction included

- 5.7.2 Major noise sources during the noise monitoring included construction activities of the Project and that along Tai Wo Service Road East, and nearby traffic noise.
- 5.7.3 No noise complaint was received in the reporting month, so no Action Level exceedance was recorded. Also, no Limit Level exceedance of noise monitoring was recorded in the reporting month.
- 5.7.4 The Event and Action Plan for the occurrence of non-compliance of the noise criteria is annexed in **Appendix G**.

6 WATER MONITORING

- 6.1.1 The box culvert works have been partially completed by the end of March 2014 except the last construction activity, installation of a base slab at Box Culvert ID4. Due to the loading requirement of a fresh water main under the box culvert, installation of the base slab at Box Culvert ID4 has to be scheduled to be carried out in November 2015 after the utilities diversions complete. The construction works are temporarily suspended until the utilities diversion works complete. The 4-week post construction water quality monitoring will be commenced after the installation of the base slab finishes, hence the completion of the box culvert works.
- 6.1.2 Impact monitoring for water quality was not necessary in the reporting month due to temporary suspension of the construction works and is anticipated to be resumed in November 2015 during the course of remaining box culvert works.

7 WASTE MANAGEMENT

- 7.1.1 The Contractor has registered as a chemical waste producer of the Project. The C&D materials and waste sorting were carried out on-site. Receptacles were provided for general refuse collection.
- 7.1.2 As advised by the Contractor, a total of 6,153m³ of excavated material has been generated. 4,772m³ of inert C&D materials was disposed of at public fill to Tuen Mun Area 38. 732m³ of inert C&D materials was reused on site. 220m³ of general refuse was disposed of at North East New Territories (NENT) Landfill. 5m³ of plastics, paper/cardboard packaging was collected, and no metals were collected by recycling contractor in the reporting month. No chemical waste was collected by licensed contractor in the reporting period. Details of the waste management data are presented in **Appendix K**.

8 ENVIRONMENTAL SITE INSPECTION AND AUDIT

8.1 Site Inspection

- 8.1.1 Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. A summary of the site inspection is provided in **Appendix L**.
- 8.1.2 In the reporting month, 4 site inspections were carried out on 4, 13, 18 and 25 August 2014. The one held on 25 August 2014 was a joint inspection with the IEC, ER, ET and Contractor. No site inspection was conducted by the EPD during the reporting month. No non-compliance was recorded during the site inspection. A summary of the reminders and observations recorded during the site inspections are presented in **Table 8.1**.

Table 8.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Water Quality	28 Jul 2014	Reminder: The contractor was reminded to provide sufficient sand bags to avoid site runoff at SA13.	The contractor has placed additional sand bags and tarpaulin sheet as observed during the ET site inspection on 18 Aug 2014.
	18 Aug 2014	Observation: Leakage of waste water from the pipe was observed near the AquaSed at ID5. The contractor is reminded to improve the condition and make sure the waste water undergo silt removal and pH adjustment before discharge.	The pipe has been removed as observed during the ET site inspection on 25 Aug 2014.
Air Quality	4 Aug 2014	Reminder: The contractor was reminded to implement proper mitigation measures to ensure no muddy materials left on the haul road outside the site entrance at SA16.	The road section has been cleared of muddy materials as observed during the site inspection on 13 Aug 2014.
	25 Aug 2014	Reminder: The contractor is reminded to provide workforce to ensure no dusty materials to be left on the public road at the site exit SA12.	The follow up action will be reviewed again in the next environmental site inspection.
	25 Aug 2014	Reminder: The contractor is reminded to provide sufficient watering for the working area when carrying out demolition work of existing structure at SA12.	The contractor had undertaken watering for the concerned working area when carrying out demolition work on the same day. Furthermore, the demolition work of existing structure at SA12 has already been finished as observed during the ET site inspection on 1 Sep 2014
Noise	N/A	N/A	N/A

Parameters	Date	Observations and Recommendations	Follow-up
Waste / Chemical Management	4 Aug 2014	Observation: General refuse was observed in the sedimentation tank at SA12. The contractor was reminded to provide enclosed bins.	The respective sedimentation tank at SA12 has been removed as observed during the site inspection on 13 Aug 2014.
Landscape & Visual	N/A	N/A	N/A
Permits / Licenses	N/A	N/A	N/A

9 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

- 9.1.1 The Contractor has implemented the relevant environmental mitigation measures as specified in the EIA Reports, EPs and updated EM&A Manual. The implementation status of environmental mitigation measures during the reporting period is summarized in **Appendix L**.

10 SUMMARY OF EP SUBMISSION IN THE REPORTING MONTH

10.1.1 The status of the required submission under the EP during the reporting period is summarized in **Table 10.1**.

Table 10.1 Status of Required Submission under Environmental Permit

EP Condition	Submission	Submission Date
Condition 3.3	Monthly EM&A Report	14 August 2014

11 ENVIRONMENTAL NON-CONFORMANCE

11.1 Summary of Monitoring Exceedances

- 11.1.1 No exceedance of Action and Limit Level was recorded for 24-hour TSP monitoring at the monitoring location AM1(SR77) in the reporting month.
- 11.1.2 No exceedance of Action and Limit Level was recorded for 1-hour TSP monitoring at the monitoring location AM1(SR77) in the reporting month.
- 11.1.3 No noise complaint was received in the reporting month, so no Action Level exceedance was recorded. Also, no Limit Level exceedance of noise monitoring was recorded in the reporting month.

11.2 Summary of Environmental Non-Compliance

- 11.2.1 No environmental non-compliance was recorded in the reporting month. The cumulative statistics are provided in **Appendix N**.

11.3 Summary of Environmental Complaints

- 11.3.1 No environmental complaint was received in the reporting month. The cumulative statistics are provided in **Appendix N**.

11.4 Summary of Environmental Summon and Successful Prosecutions

- 11.4.1 No environmental related prosecution or notification of summons was received in the reporting month. The cumulative statistics are provided in **Appendix N**.

12 FUTURE KEY ISSUES

12.1 Construction Programme for the Next Month

12.1.1 The major construction works in the coming reporting month are anticipated to include:

- ADMS installation;
- Trim pile head & extension of piles for bored pile wall;
- Cable detection and trial trenches;
- Catch Fence installation;
- Diversion of DN600 & DN1400;
- Laying of concrete pipe works;
- Mini pile construction;
- Noise barrier works;
- Pier construction;
- Pile Cap;
- Piling works for Bridge E;
- Pre-drilling works and piling works for viaduct;
- Receiving & Jacking Pit;
- Retaining Structure;
- Road works at Fanling highway;
- Sewer works at TWSRW;
- Site formation;
- Slope upgrading works;
- Socket H-pile installation;
- Soil nail construction;
- Tree Felling Works;
- Trenchless excavation;
- Water pipe installation;
- RC structure of new valve control & Telemetry House;

- Traffic diversion for Fanling Highway;
- Demolition of central barrier at Fanling Highway; and
- Diversion of existing cycle track.

12.2 Key Issues for the Coming Month

12.2.1 Key issues to be considered in the coming month are anticipated to include:

- Site discharges should be properly collected and treated prior to discharge;
- Properly maintain all drainage facilities and wheel washing facilities on site;
- Expose slopes and dusty stockpile should be covered up properly if no work will be conducted; and
- Operation of construction plant should be sequenced where practicable.

12.3 Monitoring Schedule for the Next Month

12.3.1 The tentative schedule for environmental monitoring for the coming month is provided in **Appendix D**.

13 CONCLUSIONS AND RECOMMENDATIONS

13.1 Conclusions

- 13.1.1 The construction phase EM&A programme of the Project commenced on 5 November 2013.
- 13.1.2 The 1-hr TSP, 24-hr TSP and noise monitoring were carried out in the reporting period.
- 13.1.3 No exceedance of Action and Limit Level was recorded for 24-hour TSP monitoring at the monitoring location AM1(SR77) in the reporting month.
- 13.1.4 No exceedance of Action and Limit Level was recorded for 1-hour TSP monitoring at the monitoring location AM1(SR77) in the reporting month.
- 13.1.5 No noise complaint was received in the reporting month, so no Action Level exceedance was recorded. Also, no Limit Level exceedance of noise monitoring was recorded in the reporting month.
- 13.1.6 Four (4) environmental site inspections were carried out in the reporting month. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site audit.

Temporary Suspension of Box Culvert Works and Water Quality Monitoring

- 13.1.7 The box culvert works have been partially completed by the end of March 2014 except the last construction activity, installation of a base slab at Box Culvert ID4. Due to the loading requirement of a fresh water main under the box culvert, installation of the base slab at Box Culvert ID4 has to be scheduled to be carried out in November 2015 after the utilities diversions complete. The construction works are temporarily suspended until the utilities diversion works complete. The 4-week post construction water quality monitoring will be commenced after the installation of the base slab finishes, hence the completion of the box culvert works.
- 13.1.8 Impact monitoring for water quality was not necessary in the reporting month due to temporarily suspension of the construction works and is anticipated to be resumed in November 2015 during the course of remaining box culvert works.

13.2 Recommendations

- 13.2.1 According to the environmental site inspections performed in the reporting month, the following recommendations were provided:

Air Quality

- Water spraying should be properly implemented whenever necessary for the unpaved roads, access roads and construction areas.
- All vehicles should be washed to remove any dusty materials before leaving the construction site.
- Wheel washing facilities should be properly maintained to ensure proper functioning.

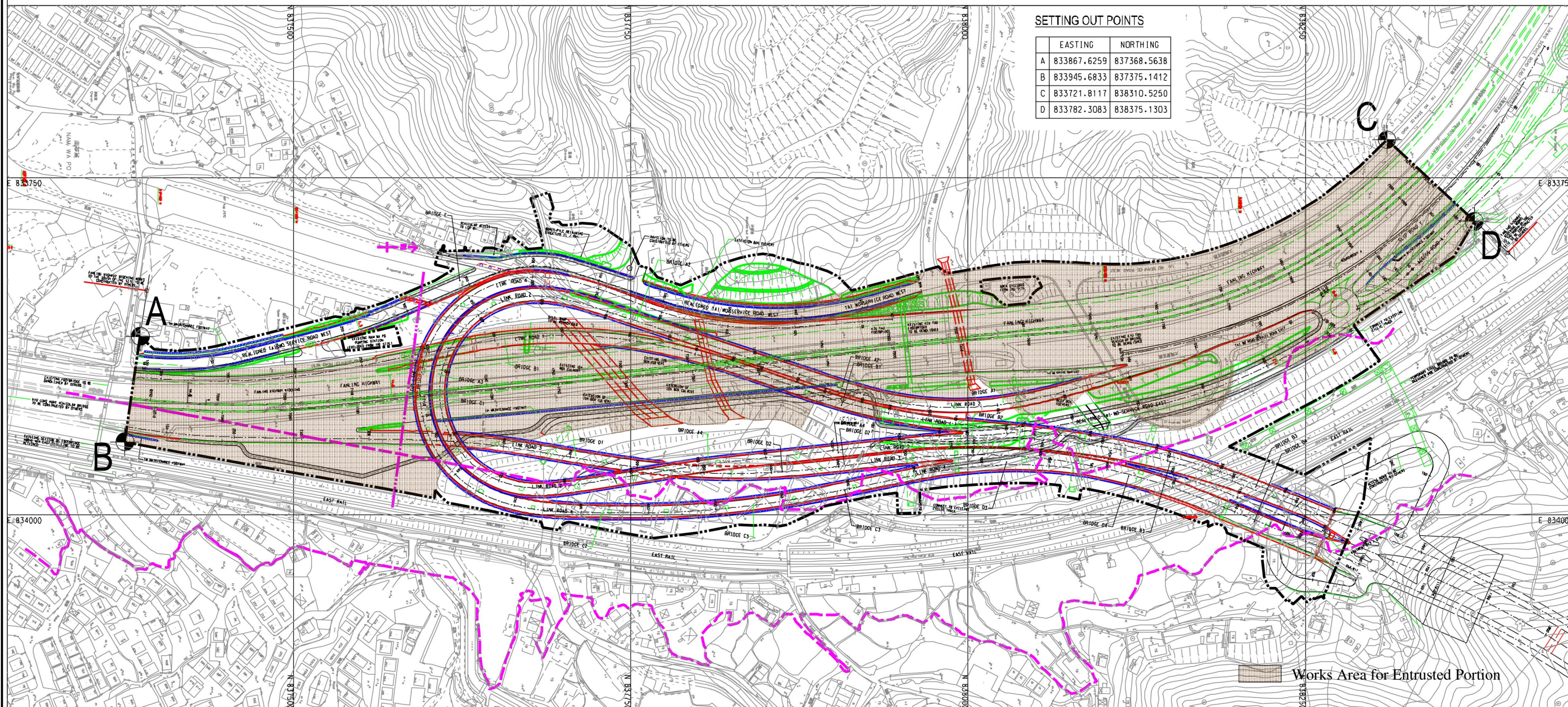
Water Quality

- Channels or earth bunds or sand bag barriers should be provided on site to prevent surface runoff and properly direct the stormwater to silt removal facilities.
- Silty effluent should be treated/desilted before discharged. Untreated effluent should be prevented from entering public drain channel.
- Stockpiles of dusty materials should be covered by tarpaulin or similar fabric during rainy seasons.

Chemical and Waste Management

- All chemicals stored on site should be provided with drip trays.
- All types of wastes, both on land and floating in the river stream, should be collected and sorted properly, and also be disposed timely and properly.

Figure



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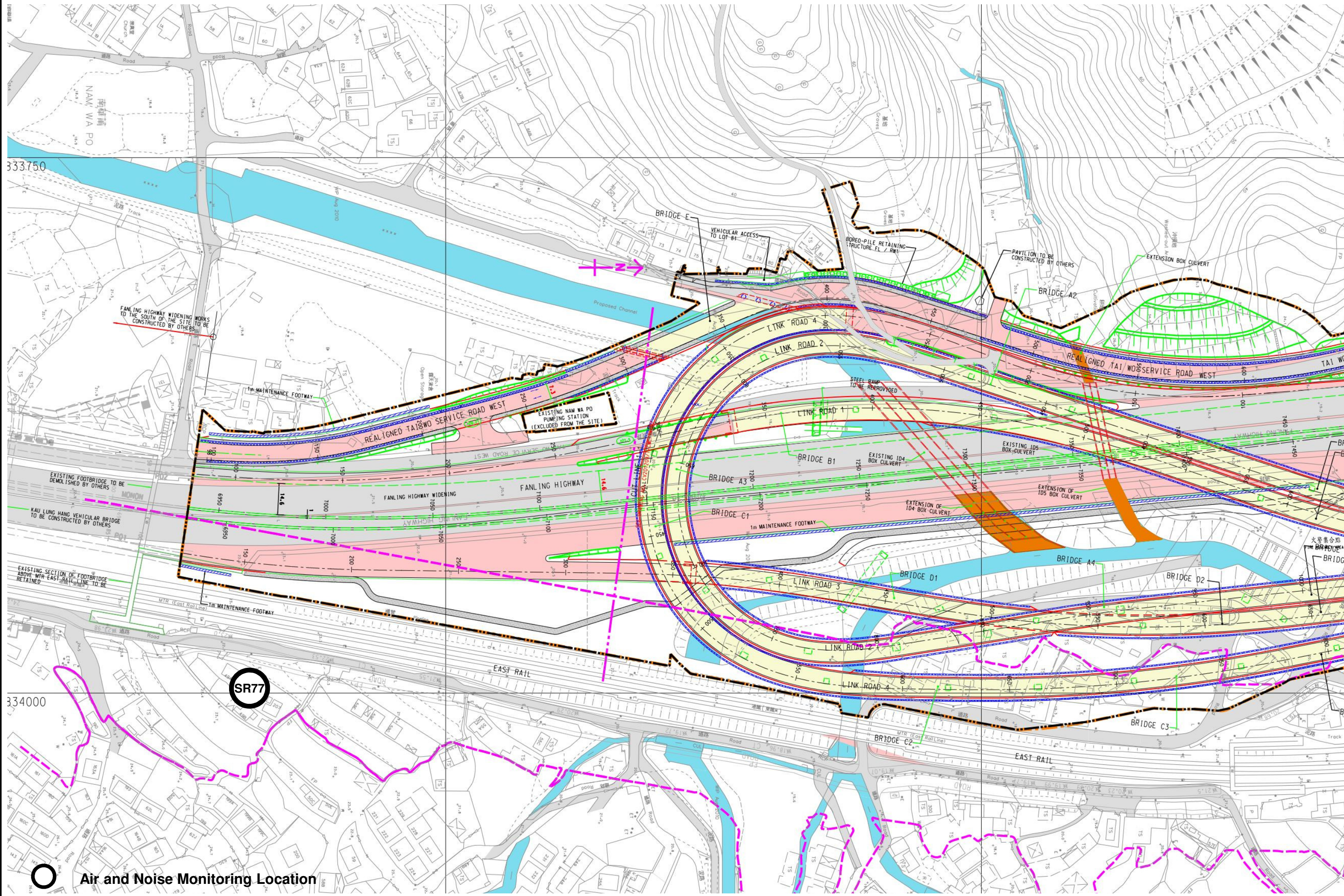
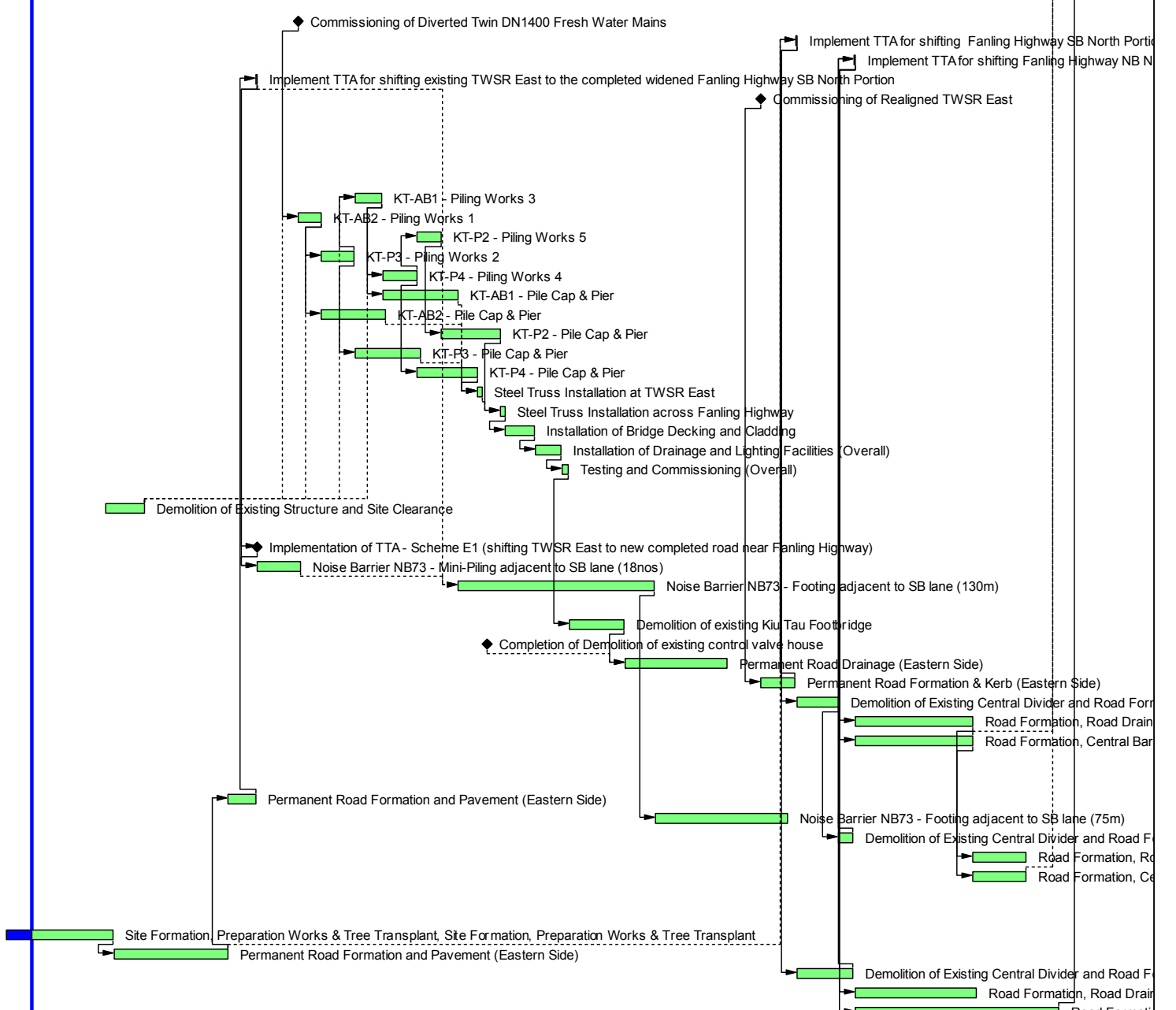


Figure 2: Air and Noise Monitoring Locations

Appendix A Construction Programme

Activity ID	Activity Name	OD	Start	Finish	Total Float	2014												2015												2016												2017												2018											
						A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J
CWP - Under Development (Postpone Pipe Jacking)																																																																	
Key Dates (Forecast)																																																																	
Major Works																																																																	
KD-0105	KD1: Complete Section 1A - all HyD's entrustment works in Zone3 and SBZ2 except for landscaping works	0		07-Dec-17	53																																																												
KD-0205	KD2: Complete Section 1B - all HyD's entrustment works in NBZ1 except for landscaping works	0		09-Jan-18	234																																																												
Major Milestones and Events																																																																	
MS-0220	Commissioning of Diverted Twin DN1400 Fresh Water Mains	0		14-Nov-14	132																																																												
MS-1000A	Implement TTA for shifting Fanling Highway SB North Portion (CH7470-7925) eastward to the completed road near TWSI	2	07-Dec-16	08-Dec-16	3																																																												
MS-1000B	Implement TTA for shifting Fanling Highway NB North Portion (CH7470-7925) eastward to the designed alignment	2	06-Mar-17	07-Mar-17	3																																																												
MS-3000	Implement TTA for shifting existing TWSR East to the completed widened Fanling Highway SB North Portion	2	11-Sep-14	12-Sep-14	7																																																												
MS-3010	Commissioning of Realigned TWSR East	0	15-Oct-16		3																																																												
Section IA & IB - Fanling Highway Widening (KD-1 & KD-2)																																																																	
Fanling Highway North Portion between CH7470 and CH7925																																																																	
Fanling Highway Zone 6 between CH7470 and CH7600 (Provision of Kiu Tau Footbridge)																																																																	
Kiu Tau Footbridge Re-provision (East)																																																																	
FHW-5000A	KT-AB1 - Piling Works 3	30	09-Feb-15	21-Mar-15	612																																																												
FHW-5000B	KT-AB2 - Piling Works 1	30	15-Nov-14	19-Dec-14	132																																																												
FHW-5000C	KT-P2 - Piling Works 5	30	14-May-15	18-Jun-15	612																																																												
FHW-5000D	KT-P3 - Piling Works 2	40	20-Dec-14	07-Feb-15	612																																																												
FHW-5000E	KT-P4 - Piling Works 4	40	23-Mar-15	13-May-15	612																																																												
FHW-5010A	KT-AB1 - Pile Cap & Pier	90	23-Mar-15	14-Jul-15	660																																																												
FHW-5010B	KT-AB2 - Pile Cap & Pier	75	20-Dec-14	27-Mar-15	745																																																												
FHW-5010C	KT-P2 - Pile Cap & Pier	75	19-Jun-15	16-Sep-15	612																																																												
FHW-5010D	KT-P3 - Pile Cap & Pier	75	09-Feb-15	19-May-15	705																																																												
FHW-5010E	KT-P4 - Pile Cap & Pier	75	14-May-15	12-Aug-15	635																																																												
FHW-5020	Steel Truss Installation at TWSR East	7	13-Aug-15	20-Aug-15	635																																																												
FHW-5030	Steel Truss Installation across Fanling Highway	7	17-Sep-15	24-Sep-15	612																																																												
FHW-5040	Installation of Bridge Decking and Cladding	35	25-Sep-15	07-Nov-15	612																																																												
FHW-5050	Installation of Drainage and Lighting Facilities (Overall)	35	09-Nov-15	18-Dec-15	612																																																												
FHW-5060	Testing and Commissioning (Overall)	7	19-Dec-15	29-Dec-15	612																																																												
At-Grade Road Works (130m)																																																																	
FHW-5100	Demolition of Existing Structure and Site Clearance	45	27-Jan-14	26-Mar-14	135																																																												
FHW-5110*	Pipe Laying & Connection - Twin DN1400 Watermains (CHE & CHG) adjacent to existing TWSRE (90m, 9m depth)	186	31-Mar-14	14-Nov-14	132																																																												
FHW-5120	Implementation of TTA - Scheme E1 (shifting TWSR East to new completed road near Fanling Highway)	0	13-Sep-14		573																																																												
FHW-5130	Noise Barrier NB73 - Mini-Piling adjacent to SB lane (18nos)	54	13-Sep-14	17-Nov-14	573																																																												
FHW-5140	Noise Barrier NB73 - Footing adjacent to SB lane (130m)	240	14-Jul-15	07-May-16	332																																																												
FHW-5150*	Pipe Laying - DN1200 & DN600 Watermains (CHB & CHC) along existing TWSRE (120m long, 3m depth)	240	04-Sep-15	02-Jul-16	373																																																												
FHW-5160	Demolition of existing Kiu Tau Footbridge	65	30-Dec-15	22-Mar-16	885																																																												
FHW-5170	Completion of Demolition of existing control valve house	0		28-Aug-15	1050																																																												
FHW-5180	Permanent Road Drainage (Eastern Side)	125	23-Mar-16	24-Aug-16	885																																																												
FHW-5190	Permanent Road Formation & Kerb (Eastern Side)	45	15-Oct-16	06-Dec-16	3																																																												
FHW-5200	Demolition of Existing Central Divider and Road Formation (Middle Part, Pavement Only)	45	09-Dec-16	09-Feb-17	3																																																												
FHW-5300	Road Formation, Road Drainage, Kerb, Noise Barrier (Western Side)	145	08-Mar-17	01-Sep-17	520																																																												
FHW-5400	Road Formation, Central Barrier (Remaining Works at Middle Part)	145	08-Mar-17	01-Sep-17	57																																																												
Fanling Highway Zone 7 between CH7600 and CH7660 (Existing Vehicular Bridge)																																																																	
At-Grade Roadworks (60m)																																																																	
FHW-6100	Permanent Road Formation and Pavement (Eastern Side)	35	31-Jul-14	10-Sep-14	7																																																												
FHW-6110	Noise Barrier NB73 - Footing adjacent to SB lane (75m)	166	09-May-16	24-Nov-16	332																																																												
FHW-6200	Demolition of Existing Central Divider and Road Formation (Middle Part, Pavement Only)	20	10-Feb-17	04-Mar-17	3																																																												
FHW-6300	Road Formation, Road Drainage, Kerb (Western Side)	65	02-Sep-17	20-Nov-17	520																																																												
FHW-6400	Road Formation, Central Barrier (Remaining Works at Middle Part)	65	02-Sep-17	20-Nov-17	57																																																												
Fanling Highway Zone 8 between CH7660 and CH7925																																																																	
At-Grade Roadworks (265m)																																																																	
FHW-7100	Site Formation, Preparation Works & Tree Transplant	127	30-Aug-13 A	07-Feb-14	7																																																												
FHW-7110	Permanent Road Formation and Pavement (Eastern Side)	140	08-Feb-14	30-Jul-14	7																																																												
FHW-7200	Demolition of Existing Central Divider and Road Formation (Middle Part, Pavement Only)	65	09-Dec-16	04-Mar-17	3																																																												
FHW-7300	Road Formation, Road Drainage, Kerb (Western Side)	150	08-Mar-17	07-Sep-17	3																																																												
FHW-7400	Road Formation, Central Barrier (Remaining Works at Middle Part)	250	08-Mar-17	09-Jan-18	187																																																												



- █ Actual Work
- █ Remaining Work
- █ Critical Remaining Work
- ◆ Milestone



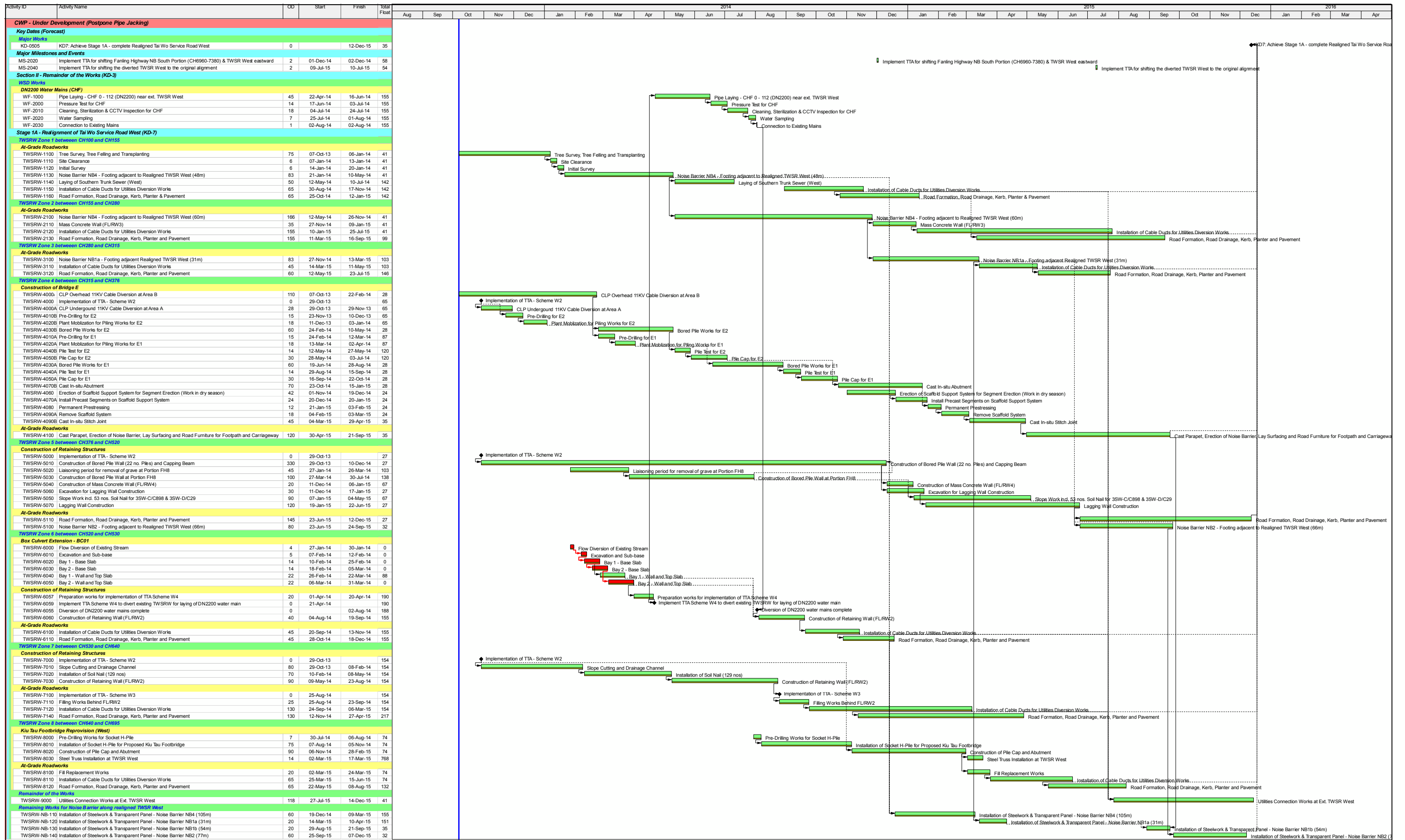
CEDD Contract No. CV/2012/09

Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3

Works Sequence for Fanling Highway North Portion

CWP004-1 _____ Page 1 of 1 _____ 11-Oct-13

Date	Revision	Checked	Approved
11-Oct-13		SL	



- █ Actual Work
- █ Remaining Work
- █ Critical Remaining Work
- ◆ Milestone
- Project Baseline Bar

CEDD Contract No. CV/2012/09

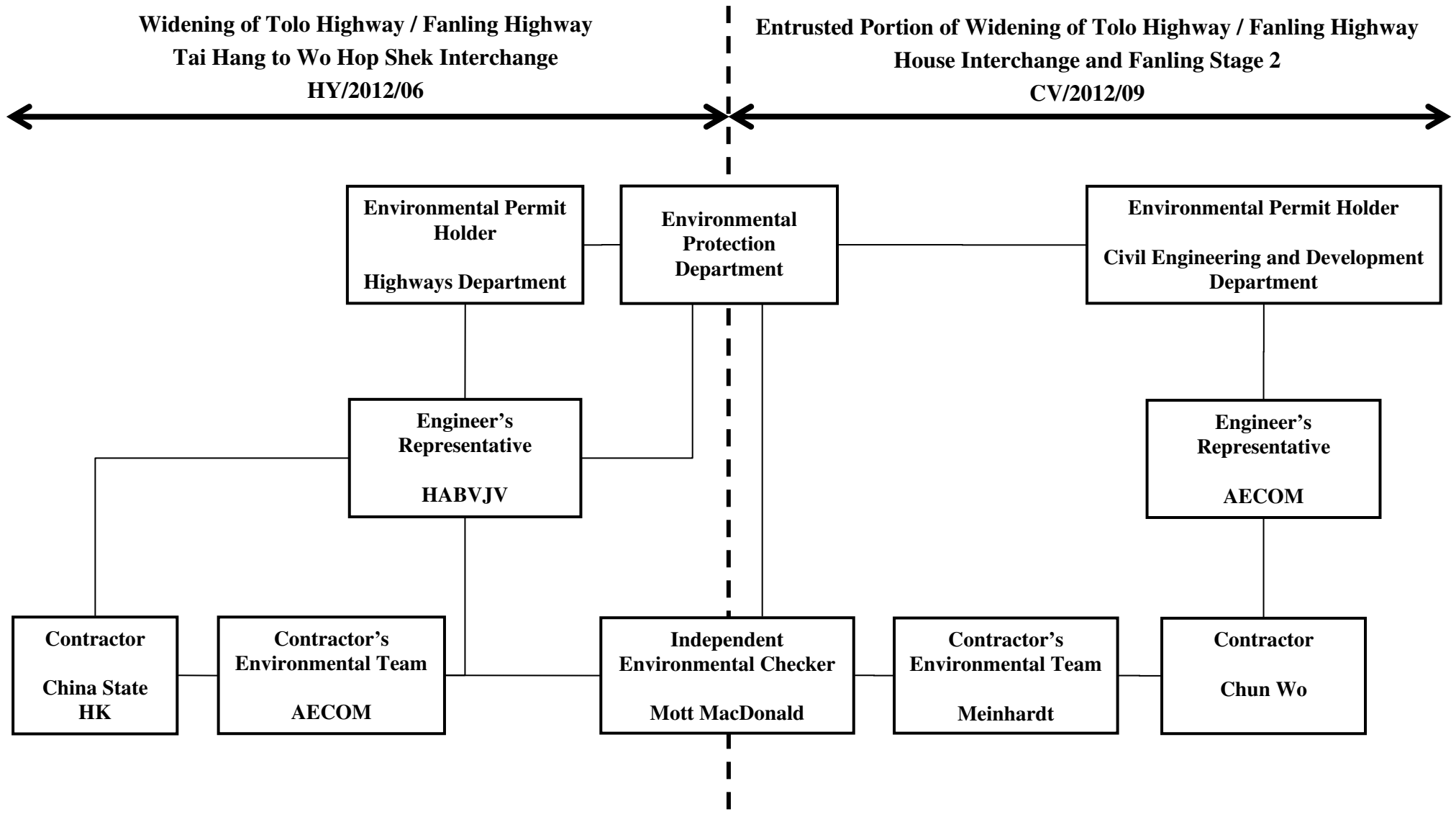
Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3

Works Sequence for TWSRW

Date	Revision	Checked	Approved
11-Sep-13		SL	

Appendix B

Project Organization Structure



Appendix C Calibration Certificates of Monitoring Equipment



TISCH ENVIRONMENTAL, INC.
 145 SOUTH MIAMI AVE
 VILLAGE OF CLEVELAND, OH
 45002
 513.467.9000
 877.263.7610 TOLL FREE
 513.467.9009 FAX

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Apr 07, 2014 Rootmeter S/N 0438320 Ta (K) - 294
 Operator Tisch Orifice I.D. - 1612 Pa (mm) - 742.95

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.3940	3.2	2.00
2	NA	NA	1.00	0.9790	6.4	4.00
3	NA	NA	1.00	0.8800	7.8	5.00
4	NA	NA	1.00	0.8350	8.8	5.50
5	NA	NA	1.00	0.6910	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
0.9866	0.7077	1.4077	0.9957	0.7142	0.8896
0.9823	1.0034	1.9908	0.9914	1.0127	1.2581
0.9804	1.1140	2.2258	0.9894	1.1243	1.4066
0.9791	1.1726	2.3345	0.9881	1.1834	1.4753
0.9739	1.4094	2.8155	0.9829	1.4224	1.7793
Qstd slope (m) = 2.00757			Qa slope (m) = 1.25710		
intercept (b) = -0.01628			intercept (b) = -0.01029		
coefficient (r) = 0.99989			coefficient (r) = 0.99989		
y axis = $\text{SQRT}[\text{H2O}(\text{Pa}/760)(298/\text{Ta})]$			y axis = $\text{SQRT}[\text{H2O}(\text{Ta}/\text{Pa})]$		

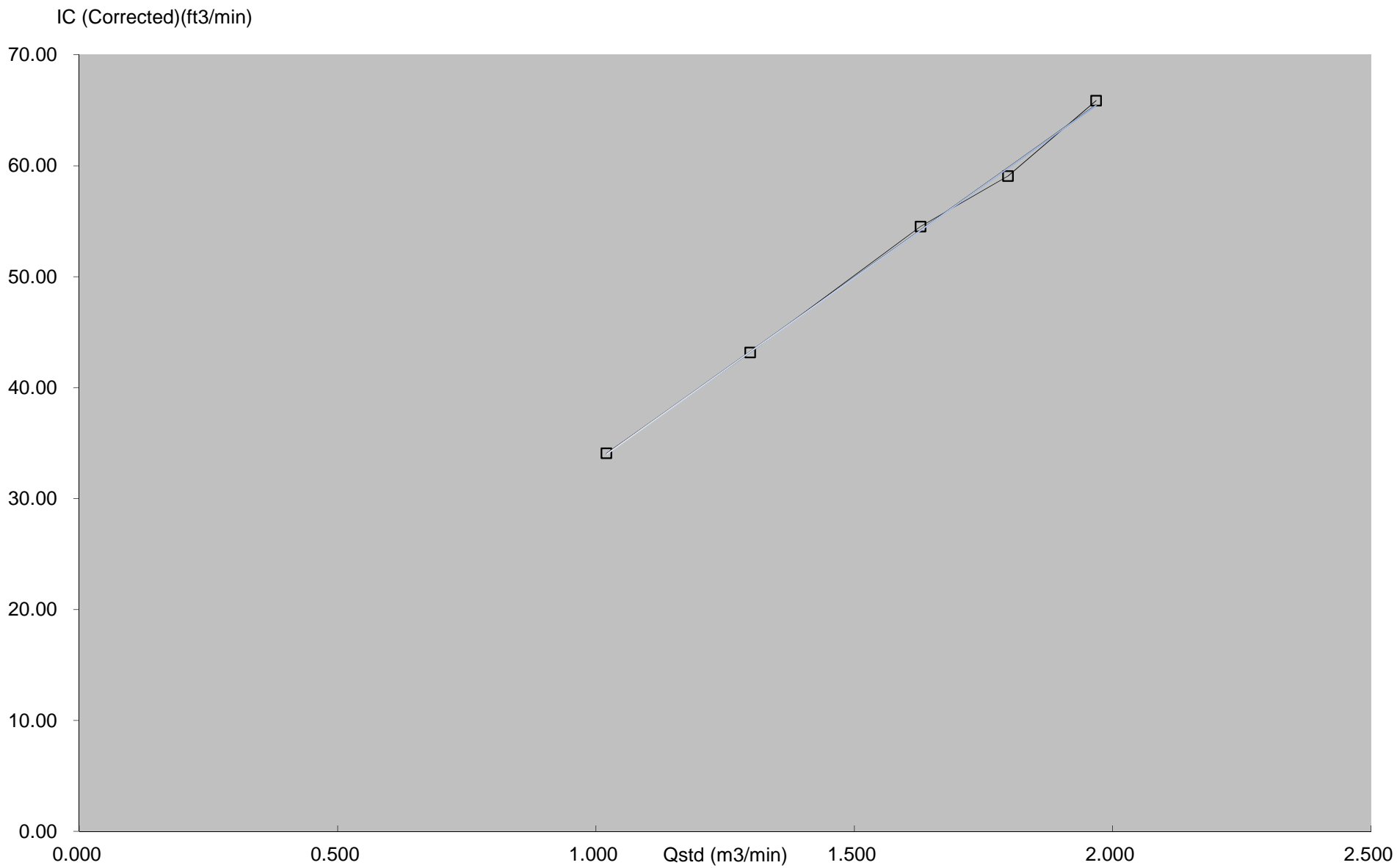
CALCULATIONS

$V_{std} = \text{Diff. Vol} [(\text{Pa} - \text{Diff. Hg}) / 760] (298 / \text{Ta})$
 $Q_{std} = V_{std} / \text{Time}$

$V_a = \text{Diff Vol} [(\text{Pa} - \text{Diff Hg}) / \text{Pa}]$
 $Q_a = V_a / \text{Time}$

For subsequent flow rate calculations:

$Q_{std} = 1/m \{ [\text{SQRT}(\text{H2O}(\text{Pa}/760)(298/\text{Ta}))] - b \}$
 $Q_a = 1/m \{ [\text{SQRT}(\text{H2O}(\text{Ta}/\text{Pa}))] - b \}$





Calibration Certificate

Certificate No. 37521

Page 1 of 2 Pages

Customer : Enovative Environmental Service Limited

Address : Room 3, 12/F., New City Centre, 2 Lei Yue Mun Road, Kwun Tong, Kowloon, H.K.

Order No. : Q32432

Date of receipt : 16-Oct-13

Item Tested

Description : Sound Level Calibrator

Manufacturer : B&K

Model : Type 4231

Serial No. : 2685684

Test Conditions

Date of Test : 31-Oct-13

Supply Voltage : --

Ambient Temperature : (23 ± 3)°C

Relative Humidity : (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure : F21, Z02.

Test Results

All results were within the IEC 942 Class 1 specification.

The results are shown in the attached page(s).

Main Test equipment used:

<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Traceable to</u>
S014	Spectrum Analyzer	35730	NIM-PRC & SCL-HKSAR
S205	Ref. Sound Level Calibrator	PHCO40002	SCL-HKSAR
S041	Universal Counter	34621	SCL-HKSAR
S206	Sound Level Meter	36203	SCL-HKSAR
S031	6½ dgt. Multimeter	30128	NIM-PRC

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

The test equipment used for calibration are traceable to International System of Units (SI).

The test results apply to the above Unit-Under-Test only

Calibrated by : 
Dorothy Cheuk

Approved by : 
Steve Kwan

This Certificate is issued by:

Hong Kong Calibration Ltd.

Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.

Tel: 2425 8801 Fax: 2425 8646

Date: 31-Oct-13



Calibration Certificate

Certificate No. 37521

Page 2 of 2 Pages

Results :

1. Level Accuracy

UUT Nominal Value (dB)	Measured Value (dB)	IEC 942 Class 1 Spec.
94	94.08	± 0.3 dB
114	114.07	

Uncertainty : ± 0.1 dB

2. Frequency

UUT Nominal Value	Measured Value	IEC 942 Class 1 Spec.
1 kHz	1.002 kHz	± 2 %

Uncertainty : ± 3.6 x 10⁻⁶

- 3. Level Stability** : 0.0 dB
IEC 942 Class 1 Spec. : ± 0.1 dB
Uncertainty : ± 0.01 dB

- 4. Total Harmonic Distortion** : < 0.7 %
IEC 942 Class 1 Spec. : < 3 %
Uncertainty : ± 2.3 % of reading

- Remark : 1. UUT : Unit-Under-Test
2. The uncertainty claimed is for a confidence probability of not less than 95%.
3. Atmospheric Pressure : 1014 hPa.

----- END -----



Calibration Certificate

Certificate No. **36604**

Page 1 of 4 Pages

Customer : Enovative Environmental Service Limited

Address : Room 3, 12/F., New City Centre, 2 Lei Yue Mun Road, Kwun Tong, Kowloon, H.K.

Order No. : Q32395

Date of receipt : 4-Sep-13

Item Tested

Description : Sound Level Meter (N12-RION-004)

Manufacturer : Rion

Model : NL-52

Serial No. : 00220553

Test Conditions

Date of Test : 10-Sep-13

Supply Voltage : --

Ambient Temperature : (23 ± 3)°C

Relative Humidity : (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure: Z01.

Test Results

All results were within the IEC 61672 Type1 specification.

The results are shown in the attached page(s).

Main Test equipment used:

<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Traceable to</u>
S017	Multi-Function Generator	C127181	SCL-HKSAR
S205	Ref. Sound Level Calibrator	PHCO40002	SCL-HKSAR

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

The test equipment used for calibration are traceable to International System of Units (SI).

The test results apply to the above Unit-Under-Test only

Calibrated by : 
Dorothy Cheuk

Approved by : 
Steve Kwan

Date: 16-Sep-13

This Certificate is issued by:
Hong Kong Calibration Ltd.
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.
Tel: 2425 8801 Fax: 2425 8646



Calibration Certificate

Certificate No. 36604

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Results :

1. Self-generated noise: 16.4 dBA (Mfr's Spec ≤ 17 dBA)
2. Acoustical signal test

UUT Setting			Applied Value (dB)	UUT Reading (dB)
Level Range (dB)	Weight	Response		
30 – 130	L _A	Fast	94.0	94.0
		Slow		94.0
	L _C	Fast		94.0
	L _Z	Fast		94.0
	L _A	Fast	114.0	114.0
		Slow		114.0
	L _C	Fast		114.0
	L _Z	Fast		114.0

IEC 61672 Type 1 Spec. : ± 1.1 dB

Uncertainty : ± 0.1 dB

3 Electrical signal tests of frequency weightings (A weighting)

Frequency	Attenuation (dB)	IEC 61672 Type 1 Spec.
31.5 Hz	-39.8	- 39.4 dB, ± 2 dB
63 Hz	-26.4	- 26.2 dB, ± 1.5 dB
125 Hz	-16.3	- 16.1 dB, ± 1.5 dB
250 Hz	-8.7	- 8.6 dB, ± 1 dB
500 Hz	-3.3	- 3.2 dB, ± 1.4 dB
1 kHz	0.0 (Ref)	0 dB, ± 1.1 dB
2 kHz	+1.2	+ 1.2 dB, ± 1.6 dB
4 kHz	+0.9	+ 1.0 dB, ± 1.6 dB
8 kHz	-1.1	- 1.1 dB, + 2.1 dB \sim -3.1 dB
16 kHz	-8.0	- 6.6 dB, + 3.5 dB \sim - 17.0 dB

Uncertainty : ± 0.1 dB



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4. Frequency & Time weightings at 1 kHz

4.1 Frequency Weighting (Fast)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
A	94.0	94.0 (Ref.)	--	± 0.4 dB
C	94.0	94.0	0.0	
Z	94.0	94.0	0.0	

4.2 Time Weighting (A-weighted)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
Fast	94.0	94.0 (Ref.)	--	± 0.3 dB
Slow	94.0	94.0	0.0	
Time-averaging	94.0	94.0	0.0	

Uncertainty : ± 0.1 dB

5. Level linearity on the reference level range

UUT Range	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
130 dB (Ref Level)	129.0	129.0	0.0	± 1.1 dB
	124.0	124.0	0.0	
	119.0	119.0	0.0	
	114.0	114.0	0.0	
	109.0	109.0	0.0	
	104.0	104.0	0.0	
	99.0	99.0	0.0	
	94.0	94.0 (Ref)	--	
	89.0	89.0	0.0	
	84.0	84.0	0.0	
	79.0	79.0	0.0	
	74.0	74.0	0.0	
	69.0	69.0	0.0	
	64.0	64.0	0.0	
	59.0	59.0	0.0	
	54.0	54.0	0.0	
	49.0	49.0	0.0	
44.0	44.0	0.0		

Uncertainty : ± 0.1 dB



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6. Toneburst response (4kHz)

UUT Setting	Tone Burst Duration(ms)	UUT Reading(dB)	Difference (dB)	IEC 61672 Type 1 Spec.
Fast	Steady	127.0(Ref)	--	--
	200	126.0	-1.0	-1.0 ± 0.8dB
	2	108.9	-18.1	-18.0, +1.3 dB ~ -1.8 dB
	0.25	99.9	-27.1	-27.0, +1.3 dB ~ -3.3 dB
Slow	Steady	127.0(Ref)	--	--
	200	120.2	-6.8	-7.4 ± 0.8dB
	2	100.6	-26.4	-27.0, +1.3 dB ~ -3.3 dB
Time averaging	Steady	127.0(Ref)	--	--
	200	120.1	-6.9	-7.0±0.8dB
	2	99.5	-27.5	-27.0, +1.3 dB ~ -1.8 dB
	0.25	91.7	-35.3	-36.0, +1.3 dB ~ -3.3 dB

Uncertainty : ± 0.1 dB

7. Overload indication (130 dB range, A-weighted, Time-average, 4kHz)

UUT Reading at overload (dB)		Difference (dB)	IEC 61672 Type 1 Spec.
+ ve one half cycle	- ve one half cycle		
138.4	138.2	0.2	< 1.8 dB

The overload indicator latched on until reset

Uncertainty : ± 0.1 dB

Remarks : 1. UUT : Unit-Under-Test

2. The uncertainty claimed is for a confidence probability of not less than 95%.

3. Atmospheric Pressure : 996 hPa.

4. Preamplifier model : NH-25 , S/N : 10553

5. Firmware Version: 1.2

6. Power Supply Check: OK

7. The UUT was adjusted with the laboratory's sound calibrator at the reference sound pressure level before the calibration.

----- END -----

Appendix D

EM&A Monitoring Schedules

**Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2
Impact Monitoring & Site Auditing Schedule for August 2014**

August 2014						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4 24-hour TSP + 3 x 1-hour TSP, Noise (SR77) ET Site Walk(09:30 – 11:00) with Liantang Project-wide ET and IEC	5	6	7	8	9 24-hour TSP + 3 x 1-hour TSP
10	11	12	13 ET Site Walk(09:30 – 11:00) with Liantang Project-wide ET and IEC + SSEMC	14	15 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	16
17	18 ET Site Walk(09:30 – 11:00) with Liantang Project-wide ET and IEC	19	20	21 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	22	23
24	25 ET Site Walk(09:30 – 11:00) with Fanling Stage 2 IEC & Liantang Project-wide ET and IEC	26	27 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	28	29	30
31						

**Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2
Impact Monitoring & Site Auditing Schedule for September 2014**

September 2014						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1 ET Site Walk(09:30 – 11:00) with Liantang Project-wide ET and IEC	2 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	3	4	5	6
7	8 24-hour TSP + 3 x 1-hour TSP, Noise (SR77) ET Site Walk(09:30 – 11:00) with Liantang Project-wide ET and IEC	9 The day following the Chinese Mid-Autumn Festival	10	11	12	13 24-hour TSP + 3 x 1-hour TSP
14	15	16	17 ET Site Walk(09:30 – 11:00) with Liantang Project-wide ET and IEC + SSEMC	18	19 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	20
21	22 ET Site Walk(09:30 – 11:00) with Liantang Project-wide ET and IEC	23	24	25 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)	26	27
28	29 ET Site Walk(09:30 – 11:00) with Fanling Stage 2 IEC & Liantang Project- wide ET and IEC	30 24-hour TSP + 3 x 1-hour TSP, Noise (SR77)				

Appendix E Meteorological Data Extracted from Hong Kong Observatory

Extract of Meteorological Observations for Sheung Shui Automatic Weather Station, August 2014 (Table 1)

Date	Mean Pressure at M.S.L. (hPa)	Air Temperature			Mean Dew Point Temperature (deg C)	Relative Humidity		
		Max. (deg C)	Mean (deg C)	Min. (deg C)		Max. (%)	Mean (%)	Min. (%)
Aug 1	1000.7	36.6	30.4	25.3	25.0	98	74	48
Aug 2	1001.2	35.2	29.7	24.9	25.2	98	79	51
Aug 3	1001.6	34.2	29.4	25.2	25.5	96	81	58
Aug 4	1002.2	34.2	28.9	27.1	26.1	94	85	60
Aug 5	1003.2	33.5	29.5	26.2	25.8	96	81	61
Aug 6	1003.3	31.3	28.5	26.4	26.0	97	87	71
Aug 7	1003.0	32.1	28.3	26.6	25.9	96	87	66
Aug 8	1002.6	34.4	30.0	26.3	25.3	96	77	55
Aug 9	1004.0	34.9	30.0	27.1	25.5	92	78	54
Aug 10	1004.3	34.6	30.5	28.2	25.0	86	73	50
Aug 11	1002.9	33.9	30.0	27.2	25.9	93	79	56
Aug 12	1001.6	33.7	29.2	26.3	26.0	97	84	60
Aug 13	1003.2	26.8	25.9	24.7	25.4	99	97	89
Aug 14	1007.7	31.7	28.0	25.3	25.5	99	87	70
Aug 15	1009.7	34.1	29.3	25.6	25.0	96	79	56
Aug 16	1008.1	34.7	29.8	26.4	24.9	95	76	54
Aug 17	1006.8	35.1	30.0	25.9	24.8	94	75	52
Aug 18	1007.8	34.8	30.4	26.9	24.6	90	73	49
Aug 19	1008.3	34.2	28.0	24.9	25.0	98	85	55
Aug 20	1010.1	27.6	25.0	23.8	24.0	98	94	83
Aug 21	1010.3	32.1	27.5	24.5	24.2	97	83	61
Aug 22	1010.3	32.0	27.7	25.0	24.8	100	85	63
Aug 23	1009.6	32.1	27.4	24.6	25.0	96	87	68
Aug 24	1009.4	34.8	28.7	24.3	24.5	96	80	52
Aug 25	1009.9	35.4	29.1	24.8	24.6	96	78	52
Aug 26	1010.4	35.1	29.9	25.7	24.5	96	75	50
Aug 27	1010.2	32.5	29.8	27.8	24.4	89	74	60
Aug 28	1012.0	33.8	29.7	27.4	25.1	93	77	57
Aug 29	1012.2	36.4	30.3	26.3	24.4	95	73	46
Aug 30	1010.8	35.6	30.2	26.5	24.0	90	71	46
Aug 31	1009.5	32.6	29.4	26.8	25.1	92	78	62
Mean	1006.7	33.5	29.0	25.9	25.1	95	80	59
Maximum	1012.2	36.6	30.5	28.2	26.1	100	97	89
Minimum	1000.7	26.8	25.0	23.8	24.0	86	71	46

Extract of Meteorological Observations for Sheung Shui Automatic Weather Station, August 2014 (Table 2)

Date	Total Rainfall (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
Aug 1	15.5	***	*****
Aug 2	1.0	***	*****
Aug 3	1.0	***	*****
Aug 4	3.5	***	*****
Aug 5	0.0	***	*****
Aug 6	13.0	***	*****
Aug 7	0.0	***	*****
Aug 8	0.0	***	*****
Aug 9	6.0	***	*****
Aug 10	0.0	***	*****
Aug 11	1.5	***	*****
Aug 12	6.0	***	*****
Aug 13	40.5	***	*****
Aug 14	1.0	***	*****
Aug 15	0.0	***	*****
Aug 16	0.0	***	*****
Aug 17	0.0	***	*****
Aug 18	0.0	***	*****
Aug 19	9.0	***	*****
Aug 20	13.5	***	*****
Aug 21	0.0	***	*****
Aug 22	12.5	***	*****
Aug 23	7.0	***	*****
Aug 24	0.0	***	*****
Aug 25	0.0	***	*****
Aug 26	0.0	***	*****
Aug 27	1.5	***	*****
Aug 28	1.5	***	*****
Aug 29	0.0	***	*****
Aug 30	0.0	***	*****
Aug 31	2.5	***	*****
Mean	-----	***	*****
Total	136.5	---	-----
Maximum	40.5	---	*****
Minimum	0.0	---	*****

*** unavailable

missing (less than 24 hourly observations a day)

Rainfall measured in increment of 0.5 mm. Amount of < 0.5 mm cannot be detected

Appendix F Air Quality Monitoring Results and their Graphical Presentation

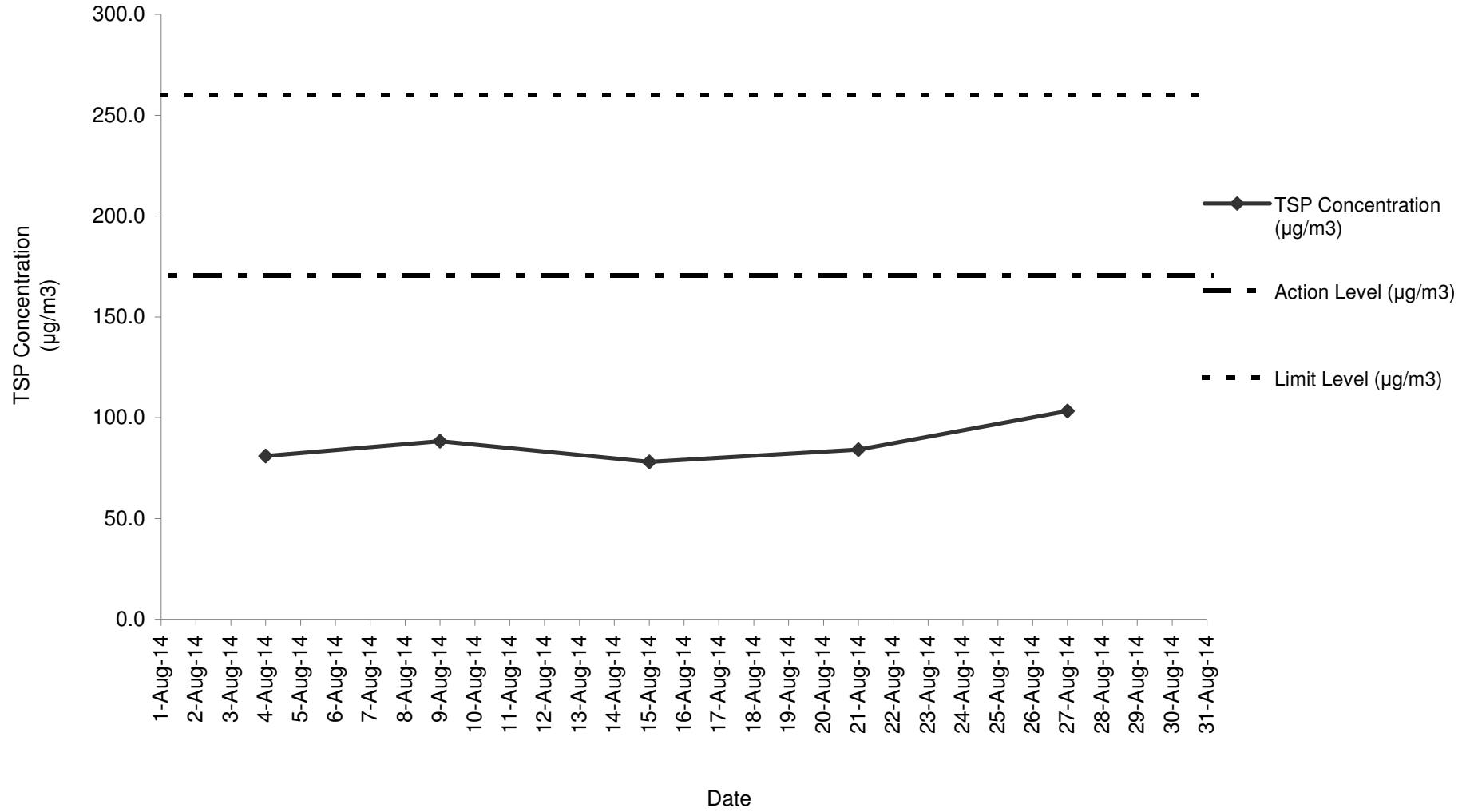
Appendix F
 Air Quality Monitoring Results and their Graphical Presentation

24-Hour TSP Monitoring Result at Station: SR77

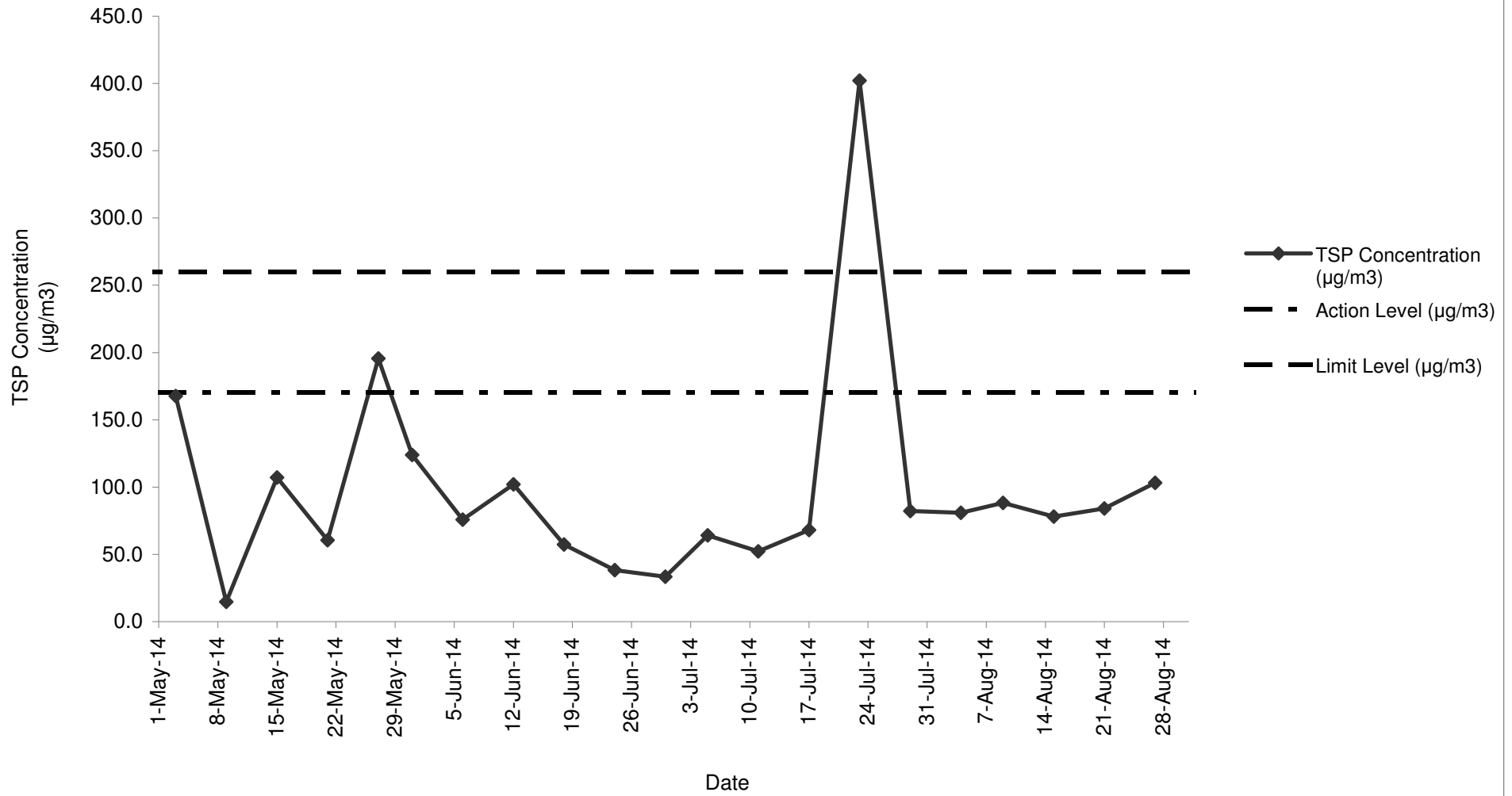
Sampling Date	Weather Condition	Paper No.	Wt. of paper (g)			Elapse Time			Flow Rate (CFM)			Flow Rate (m ³ /min)			Total Volume (m ³)	TSP Concentration (µg/m ³)	Action Level (µg/m ³)	Limit Level (µg/m ³)	Wind speed m/s	Wind direction
			Initial Wt.	Final Wt.	Wt. of Dust	Initial	Final	Sampling Hour	Initial	Final	Avg Flow Rate	Initial	Final	Avg Flow Rate						
4-Aug-14	Sunny	72	2.6718	2.8402	0.1684	0.00	24.00	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	81.0	170.3	260.0	<5	N
9-Aug-14	Fine	62	2.7200	2.9037	0.1837	0.00	24.00	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	88.3	170.3	260.0	<5	N
15-Aug-14	Fine	64	2.7060	2.8683	0.1623	0.00	24.00	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	78.0	170.3	260.0	<5	N
21-Aug-14	Fine	69	2.6983	2.8733	0.1750	0.00	24.00	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	84.2	170.3	260.0	<5	N
27-Aug-14	Sunny	68	2.6756	2.8903	0.2147	0.00	24.00	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	103.2	170.3	260.0	<5	N
																Average	86.9			
																Min	78.0			
																Max	103.2			

Note: No major dust source observed during the monitoring period

24-Hour TSP Monitoring Result at Station: SR77



24-Hour TSP Monitoring Result at Station: SR77 (May - August 2014)



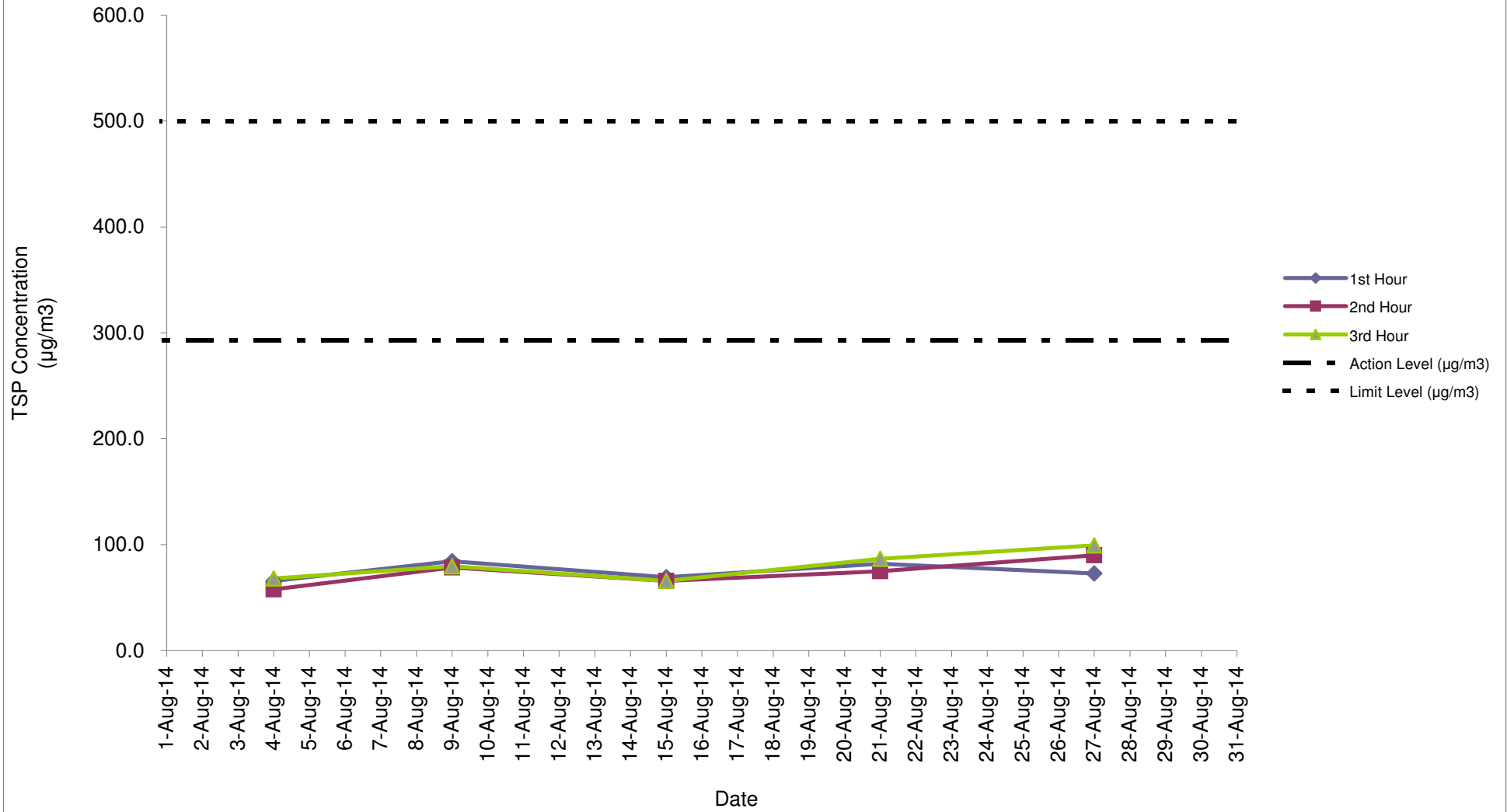
Appendix F
Air Quality Monitoring Results and their Graphical Presentation

Detailed Calculation of 1-Hour TSP Monitoring Result at Station: SR77

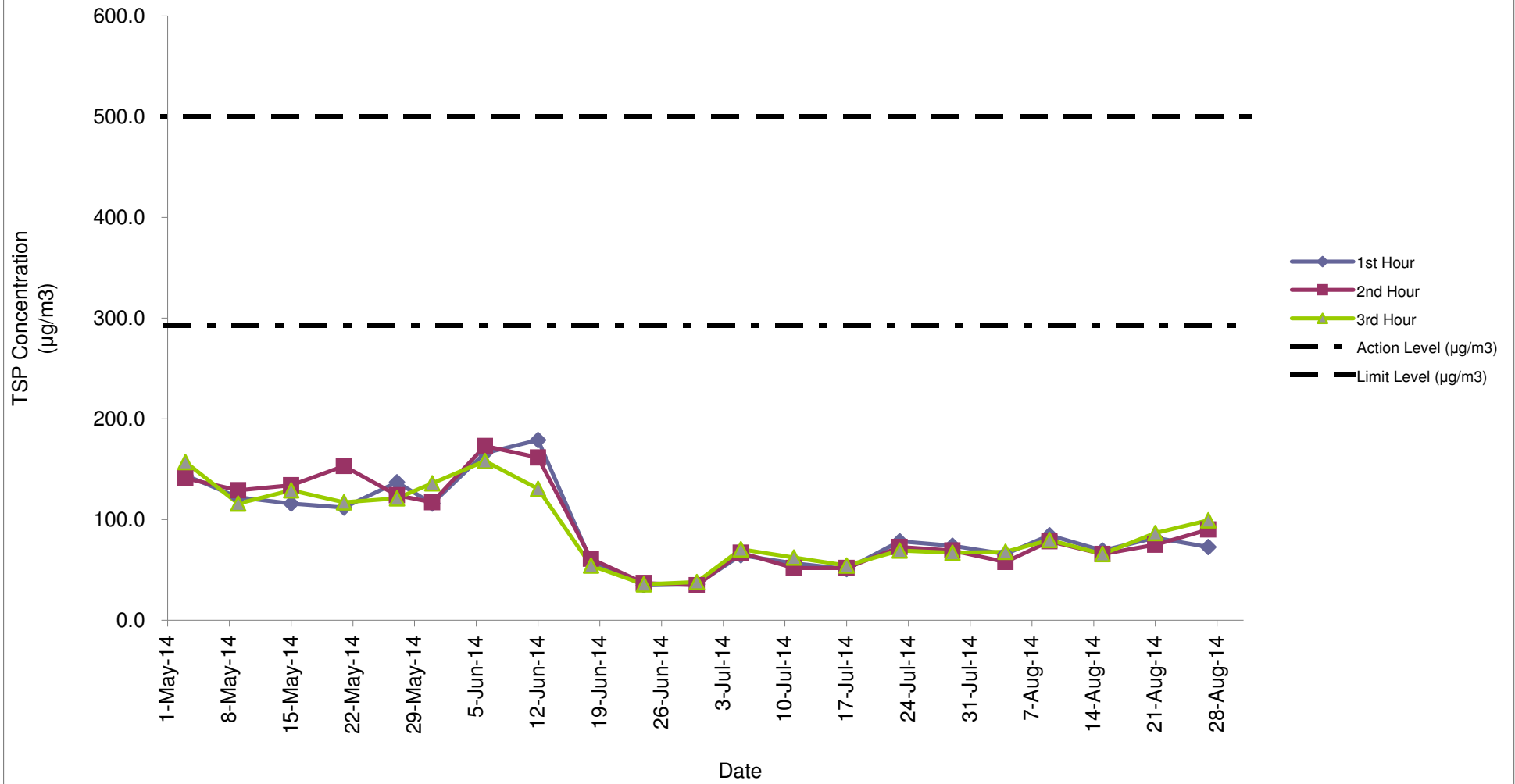
Sampling Date	Weather Condition	Paper No.	Wt. of paper (g)			Elapse Time			Flow Rate (CFM)			Flow Rate (m ³ /min)			Total Volume (m ³)	TSP Concentration (µg/m ³)	Action Level (µg/m ³)	Limit Level (µg/m ³)	Wind speed m/s	Wind direction
			Initial Wt.	Final Wt.	Wt. of Dust	Initial	Final	Sampling Hour	Initial	Final	Avg Flow Rate	Initial	Final	Avg Flow Rate						
4-Aug-14	Sunny	73A	2.7189	2.7246	0.0057	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	65.8	292.7	500.0	<5	N
		73B	2.7111	2.7161	0.0050	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	57.7	292.7	500.0	<5	N
		73C	2.7090	2.7149	0.0059	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	68.1	292.7	500.0	<5	N
9-Aug-14	Fine	71A	2.6088	2.6161	0.0073	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	84.2	292.7	500.0	<5	N
		71B	2.7141	2.7209	0.0068	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	78.5	292.7	500.0	<5	N
		71C	2.7098	2.7167	0.0069	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	79.6	292.7	500.0	<5	N
15-Aug-14	Fine	63A	2.7051	2.7111	0.0060	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	69.2	292.7	500.0	<5	N
		63B	2.7009	2.7066	0.0057	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	65.8	292.7	500.0	<5	N
		63C	2.7091	2.7148	0.0057	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	65.8	292.7	500.0	<5	N
21-Aug-14	Fine	65A	2.7080	2.7151	0.0071	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	81.9	292.7	500.0	<5	N
		65B	2.6944	2.7009	0.0065	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	75.0	292.7	500.0	<5	N
		65C	2.7015	2.7090	0.0075	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	86.6	292.7	500.0	<5	N
27-Aug-14	Sunny	70A	2.7131	2.7194	0.0063	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	72.7	292.7	500.0	<5	N
		70B	2.7033	2.7111	0.0078	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	90.0	292.7	500.0	<5	N
		70C	2.7102	2.7188	0.0086	0.00	1.00	1.00	51	51	51.0	1.44	1.44	1.44	86.65	99.3	292.7	500.0	<5	N
															Average	76.0				
															Min	57.7				
															Max	99.3				

Note: No major dust source observed during the monitoring period
Data in **Bold** denotes exceedance of respective Action Level
Data in **Bold Underline** denotes exceedance of respective Limit Level

1-Hour TSP Monitoring Result at station: SR77



1-Hour TSP Monitoring Result at station: SR77 (May - August 2014)



Appendix G

Summary of Event and Action Plan

Event and Action Plan for Air Quality

Event	Action			
	ET Leader	IEC	ER	Contractor
Action level being exceeded by one sampling day	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method. 	<ol style="list-style-type: none"> 1. Notify Contractor. 	<ol style="list-style-type: none"> 1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
Action level being exceeded by two or more consecutive sampling days	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC and ER; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency to daily; 5. Discuss with IEC and Contractor on remedial actions required; 6. If exceedance continues, arrange meeting with IEC and ER; 7. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Submit proposals for remedial actions to IEC within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

Event	Action			
	ET Leader	IEC	ER	Contractor
Limit level being exceeded by one sampling day	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC, ER, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
Limit level being exceeded by two or more consecutive sampling days	<ol style="list-style-type: none"> 1. Notify IEC, ER, Contractor, and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase frequency to daily; 5. Analyse Contractor's working procedures to determine possible mitigation to be; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise ER accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by ER until the exceedance is abated.

Event and Action Plan for Noise Quality

Event	Action			
	ET Leader	IEC	ER	Contractor
Action Level	<ol style="list-style-type: none"> 1. Notify IEC and the Contractor. 2. Carry out investigation. 3. Report the results of investigation to IEC and the Contractor. 4. Discuss with the Contractor and formulate remedial measures. 5. Increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Review with analysed results submitted by ET. 2. Review the proposed remedial measures by the Contractor and advise ER accordingly. 3. Supervise the implement of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. Require the Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC. 2. Implement noise mitigation proposals.
Limit Level	<ol style="list-style-type: none"> 1. Notify IEC, ER, EPD and the Contractor. 2. Identify the source. 3. Repeat measurement to confirm findings. 4. Increase monitoring frequency. 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented. 6. Inform IEC, ER, and EPD the causes & actions taken for the exceedances. 7. Assess effectiveness of the Contractor's remedial actions and keep IEC, EPD and ER informed of the results. 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET Leader and the Contractor on the potential remedial actions. 2. Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise ER accordingly. 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. Require the Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented. 5. If exceedance continues, consider what activity of the work is responsible and instruct the Contractor to stop that activity of work until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to IEC within 3 working days of notification. 3. Implement the agreed proposals. 4. Resubmit proposals if problem still not under control. 5. Stop the relevant activity of works as determined by the ER until the exceedance is abated.

Event and Action Plan for Water Quality

Event	Action			
	ET Leader	IEC	ER	Contractor
Action level being exceeded by one sampling day	<ol style="list-style-type: none"> 1. Repeat in-situ measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor & ER; 4. Check monitoring data, all plant, equipment & contractor's working methods; 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET & Contractor's working methods; 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; Notify, Contractor 	<ol style="list-style-type: none"> 1. Inform the ER & confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Amend working methods if appropriate.
Action level being exceeded by two or more consecutive sampling days	<ol style="list-style-type: none"> 1. Repeat measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor, ER & EPD; 4. Check monitoring data, all plant, equipment & Contractor's working methods; 5. Discuss mitigation measures with IEC, ER & Contractor; 6. Ensure mitigation measures are implemented; 7. Increase monitoring to daily until no exceedance of Action level. 	<ol style="list-style-type: none"> 1. Checking monitoring data submitted by ET & Contractor's working method; 2. Discuss with ET & Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor & advise the ER accordingly; 4. Supervise the implementation of mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with IEC on the proposed mitigation measures; 2. Ensure mitigation measures properly implemented; 3. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Inform the Engineer & confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant & equipment & consider changes of working methods; 4. Submit proposal of mitigation measures to ER within 3 working days of notification & discuss with ET, IEC & ER; 5. Implement the agreed mitigation measures.

Event	Action			
	ET Leader	IEC	ER	Contractor
Limit level being exceeded by one sampling day	<ol style="list-style-type: none"> 1. Repeat measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor, ER & EPD; 4. Check monitoring data, all plant, equipment & contractor's working methods; 5. Discuss mitigation measures with IEC, Contractor & ER. 	<ol style="list-style-type: none"> 1. Checking monitoring data submitted by ET & Contractor's working method; 2. Discuss with ET & Contractor on the possible mitigation measures; 3. Review the proposed mitigation measures submitted by Contractor & advise the ER accordingly. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Discuss with IEC, ET & Contractor on the proposed mitigation measures; 3. Request Contractor to review the working methods. 	<ol style="list-style-type: none"> 1. Inform the ER & confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant & equipment & consider changes of working methods; 4. Submit proposal of mitigation measures to ER within 3 working days of notification & discuss with ET, IEC & ER.
Limit level being exceeded by two or more consecutive sampling days	<ol style="list-style-type: none"> 1. Repeat measurement on the next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor, ER & EPD; 4. Check monitoring data, all plant, equipment & Contractor's working methods; 5. Discuss mitigation measures within IEC, Contractor & ER; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days. 	<ol style="list-style-type: none"> 1. Checking monitoring data submitted by ET & Contractor's working method; 2. Discuss with ET & Contractor on potential remedial actions; 3. Review Contractor's mitigation measures whenever necessary to assure their effectiveness & advise the ER accordingly; 4. Supervise the implementation of mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with IEC, ET & Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Ensure mitigation measures are properly implemented; 5. Consider & instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit level. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposal of mitigation measures to ER within 3 working days of notification & discuss with ET, IEC & ER; 3. Implement the agreed mitigation measures; 4. Resubmit proposals of mitigation measures if problem still not under control; 5. As directed by the Engineer, to slow down or to stop all or part of the construction activities until no exceedance of Limit level.

Appendix H Noise Monitoring Results and their Graphical Presentation

Appendix H
Noise Monitoring Results and their Graphical Presentation

Noise Monitoring Result at SR77

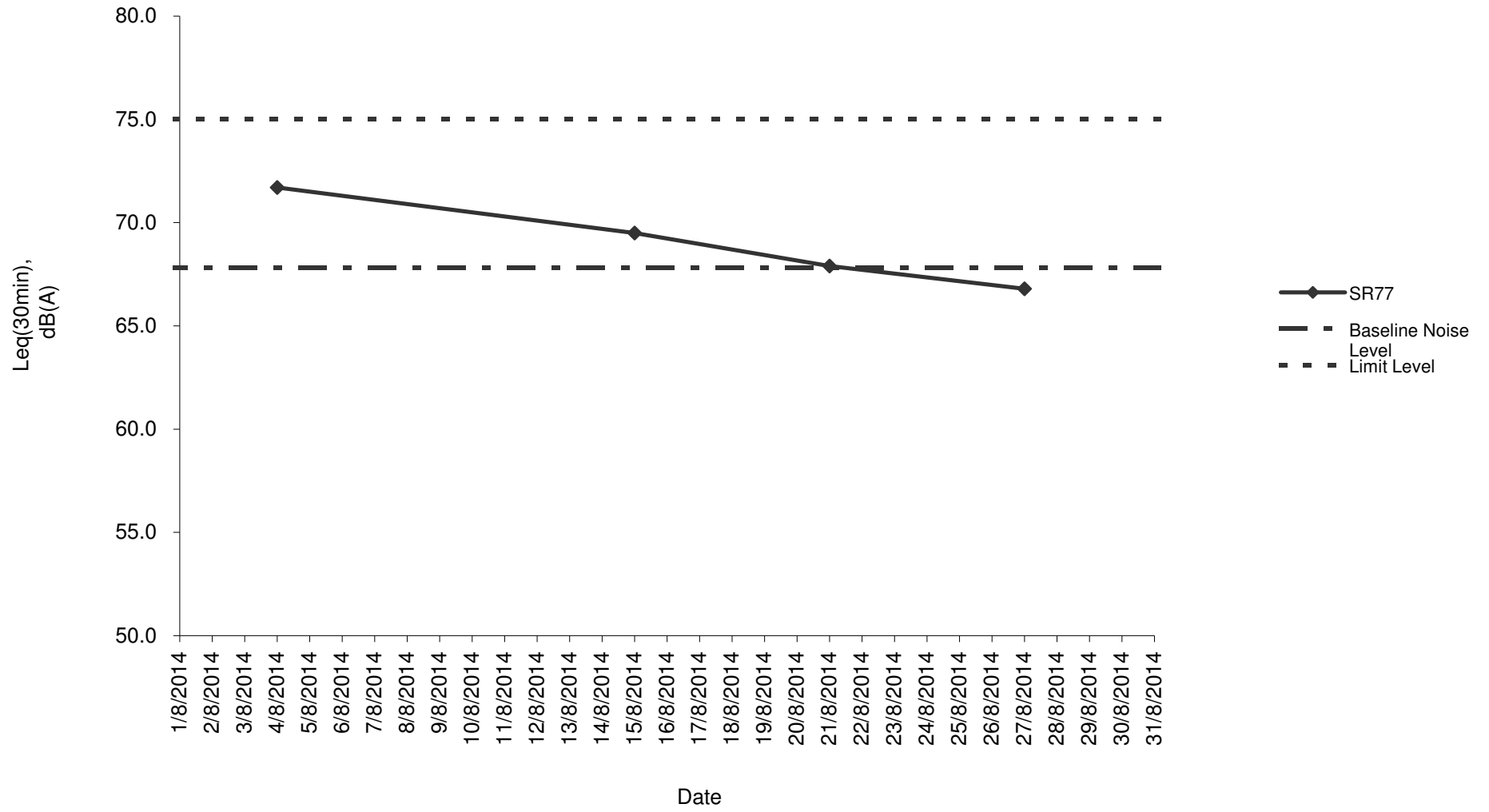
Date	Weather Condition	Start Time	End Time	Measured Noise Level (dB(A))*			Baseline Corrected Level, dB(A)**	Baseline Noise Level (dB(A)), Leq(30min)	Limit Level dB(A)	Exceedance (Y / N)
				L10(30min)	L90(30min)	Leq(30min)				
2014/08/04	Sunny	10:00	10:30	73.7	63.4	71.7	-	67.8	75.0	N
2014/08/15	Fine	15:00	15:30	73.5	63.0	69.5	-	67.8	75.0	N
2014/08/21	Fine	14:30	15:00	72.4	62.0	67.9	-	67.8	75.0	N
2014/08/27	Sunny	11:00	11:30	71.6	61.5	66.8	-	67.8	75.0	N
						Average	69.0			
						Minimum	66.8			
						Maximum	71.7			

Remarks

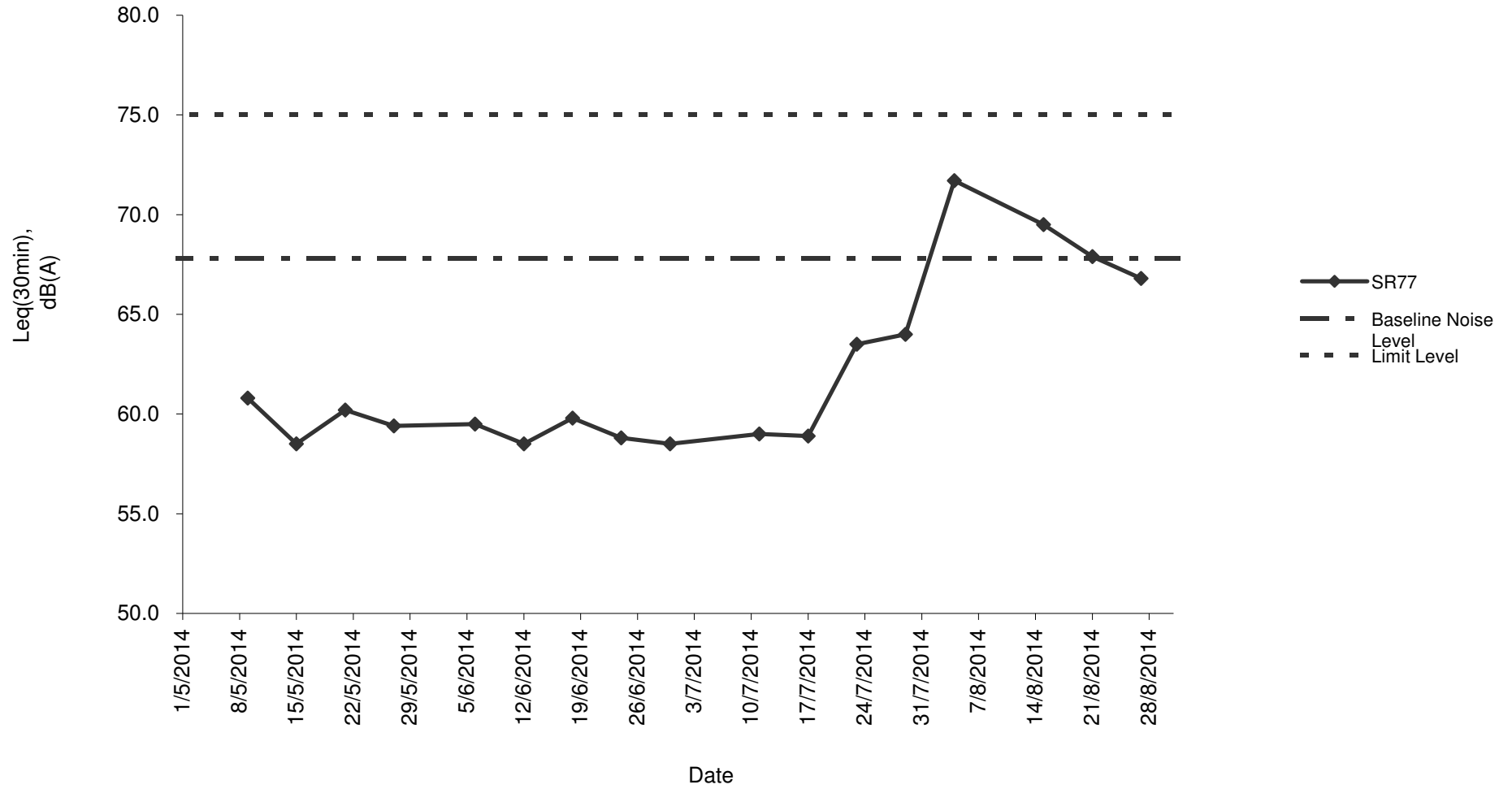
* +3dB(A) Façade effect correction included

** Baseline corrected level is only calculated when measured noise level (Leq) > limit level.

Noise monitoring result: SR77



**Noise monitoring result: SR77
(May - August 2014)**



Appendix K Waste Flow Table

Monthly Summary Waste Flow Table

Month	Actual Quantities of Inert C&D Materials Generated Monthly							Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Soil	Soil Reused in the Contract	Soil Reused in other Projects	Soil Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging (Note 3)	Plastics	Chemical Waste	General Refuse (Note 2)
Unit	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)
Jan-14	0.493	0.084	0.409	-	-	0.409	0.200	-	-	0.010	-	0.110
Feb-14	2.209	0.356	1.853	0.380	-	1.473	-	0.002	-	-	0.019	0.040
Mar-14	4.460	0.506	3.954	1.092	-	2.862	-	-	-	-	-	0.265
Apr-14	1.654	0.054	1.600	0.672	-	0.928	0.200	-	-	-	0.020	0.135
May-14	3.190	0.450	2.740	0.192	-	2.548	0.500	-	-	-	0.020	0.195
Jun-14	2.473	0.258	2.215	0.675	-	1.540	1.075	-	-	-	0.001	0.180
Sub-Total	14.479	1.708	12.771	3.011	-	9.760	1.975	0.002	-	0.010	0.060	0.925
Jul-14	3.829	0.233	3.596	0.502	-	3.094	0.747	-	-	0.005	-	0.165
Aug-14	6.153	0.649	5.504	0.732	-	4.772	1.200	-	-	0.005	-	0.220
Sep-14	-	-	-	-	-	-	-	-	-	-	-	-
Oct-14	-	-	-	-	-	-	-	-	-	-	-	-
Nov-14	-	-	-	-	-	-	-	-	-	-	-	-
Dec-14	-	-	-	-	-	-	-	-	-	-	-	-
Total	24.461	2.590	21.871	4.245	-	17.626	3.922	0.002	-	0.020	0.060	1.310

- Note:
1. Assume the density of soil fill is 2 ton/m3.
 2. Assume the density of rock and broken concrete is 2.5 ton/m3.
 3. Assume each truck of C&D wastes is 5m3.
 4. The inert C&D materials except slurry and bentonite are disposed at Tuen Mun 38.
 5. The slurry and bentonite are disposed at Tseung Kwun O 137.
 6. The non-inert C&D wastes are disposed at NENT.
 7. Assume the density of metal is 7,850 kg/m3.

Appendix L Implementation Schedule of Environmental Mitigation Measures (EMIS)

Impact	Environmental Protection Measures	Timing	Responsibility	Implementation Status #
Air Quality				
Air Quality during Construction	<ul style="list-style-type: none"> Restricting heights from which materials are dropped, as far as practicable to minimize the fugitive dust arising from unloading/loading. All stockpiles of excavated materials or spoil of more than 50m³ shall be enclosed, covered or dampened during dry or windy conditions. Effective water sprays shall be used to control potential dust emission sources such as unpaved haul roads and active construction areas. All spraying of materials and surfaces shall avoid excessive water usage. Vehicles that have the potential to create dust while transporting materials shall be covered, with the cover properly secured and extended over the edges of the side and tail boards. Materials shall be dampened, if necessary, before transportation. Travelling speeds shall be controlled to reduce traffic induced dust dispersion and re-suspension within the site from the operating haul trucks. Vehicle washing facilities shall be provided to minimise the quantity of material deposited on public roads. 	During Construction	Contractor	✓ ✓ Rem ✓ ✓ ✓ ✓ Rem
Air Quality during Operation	Not required	N/A	N/A	N/A
Noise				
Noise during Construction	<ul style="list-style-type: none"> Use of silenced plant or plant equipped with mufflers or dampers in substitute of ordinary plant. Reduce the number of equipment and their percentage on-time. 	During Construction	Contractor	✓ ✓
Noise during Operation	Not required	N/A	N/A	N/A
Water Quality				
Water Quality during Construction	<u>Road Widening Works, Earthworks and Culvert Extension Works</u> <ul style="list-style-type: none"> Wastewater generated from any concrete batching washdown of equipment or similar activities should be discharged into foul sewers, after the removal of settleable solids, and pH adjustment as necessary. All sewage discharges from the study area should meet the TM standards and approval from EPD through the licensing process is required. 	During Construction	Contractor	Obs

Notes (#): ✓ – Compliance; Rem – Reminder; Obs – Observation; N/C – Non Compliance; N/A – Not Applicable;

Impact	Environmental Protection Measures	Timing	Responsibility	Implementation Status #
	<ul style="list-style-type: none"> • Sand traps, oil interceptors and other pollution prevention installations should be provided, properly cleaned and maintained. • Runoff from exposed working areas, unfinished slopes and from unlined temporary channels should be directed to stilling basins and/or silt traps before discharging to the drainage outfalls. • Regular inspections of stilling basins and/or silt traps is required to ensure that sediment is not conveyed into the existing drainage system. • Open stockpiles should be covered with a tarpaulin cover. • During the wet season, any exposed top soils should be covered with a tarpaulin, shotcreted or hydroseeded. • Sand and silt from wash-water from vehicle washing should be settled out before discharging into storm drains. • Fuels should be stored in bunded areas such that spillage can be easily collected. 			✓ Rem ✓ ✓ ✓ ✓
Water Quality during Operation	Not required	N/A	N/A	N/A
Waste Management				
Waste Management during Construction	<u>General Waste</u> <ul style="list-style-type: none"> • Transport of wastes off site as soon as possible. • Maintenance of accurate waste records. • Minimisation of waste generation for disposal (via reduction/recycling/re-use). • No on-site burning will be permitted. • Use of re-useable metal hoardings/signboards. <u>Vegetation from site clearance</u> <ul style="list-style-type: none"> • Segregation of materials to facilitate disposal. • Mulching to reduce bulk and where possible review opportunities for the possible beneficial use within landscaping areas. 	During Construction During Construction	Contractor Contractor	✓ ✓ ✓ ✓ ✓ ✓ ✓

Notes (#): ✓ – Compliance; Rem – Reminder; Obs – Observation; N/C – Non Compliance; N/A – Not Applicable;

Impact	Environmental Protection Measures	Timing	Responsibility	Implementation Status #
	<p><u>Demolition Wastes</u></p> <ul style="list-style-type: none"> • Segregation of materials to facilitate disposal. • Appropriate stockpile management. <p><u>Excavated Materials</u></p> <ul style="list-style-type: none"> • Segregation of materials to facilitate disposal / reuse. • Appropriate stockpile management. • Re-use of excavated material on or off site (where possible). • Special handling and disposal procedures in the event that contaminated materials are excavated. <p><u>Construction Wastes</u></p> <ul style="list-style-type: none"> • Segregation of materials to facilitate recycling/reuse (within designated area in appropriate containers/stockpiles). • Appropriate stockpile management. • Planning to reduce over ordering and waste generation. • Recycling and re-use of materials where possible (e.g. metal, wood from formwork) • For material which cannot be re-used/recycled, collection should be carried out by an approved waste contractor for landfill disposal. <p><u>Bentonite Slurries</u></p> <ul style="list-style-type: none"> • Bentonite slurries should be reused as far as possible. • Disposal in accordance with Practice Note For Professional Persons ProPECC PN 1/94. <p><u>Chemical Wastes</u></p> <ul style="list-style-type: none"> • Storage within locked, covered and bunded area. • The storage area shall not be located adjacent to sensitive receivers e.g. drains. 	<p>During Construction</p> <p>During Construction</p> <p>During Construction</p> <p>During Construction</p>	<p>Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>Contractor</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>N/A</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>N/A</p> <p>N/A</p> <p>✓</p> <p>✓</p>

Notes (#): ✓ – Compliance; Rem – Reminder; Obs – Observation; N/C – Non Compliance; N/A – Not Applicable;

Impact	Environmental Protection Measures	Timing	Responsibility	Implementation Status #
	<ul style="list-style-type: none"> Minimise waste production and recycle oils/solvents where possible. A spill response procedure shall be in place and absorption material available for minor spillages. Use appropriate and labelled containers. Educate site workers on site cleanliness/waste management procedures. If chemical wastes are to be generated, the contractor must register with EPD as a chemical waste producer. The chemical wastes shall be collected by a licensed chemical waste collector. <p><u>Municipal Wastes</u></p> <ul style="list-style-type: none"> Waste shall be stored within a temporary refuse collection facility, in appropriate containers prior to collection and disposal. Regular, daily collections are required by an approved waste collector. 	During Construction	Contractor	✓ ✓ ✓ ✓ ✓ ✓ Obs ✓
Waste Management during Operation	Not required.	N/A	N/A	N/A
Ecology				
Ecology during Construction	<p><u>Accurate Delineation of Works Area</u></p> <ul style="list-style-type: none"> Boundaries of proposed works areas shall be clearly identified and separated from external areas by a physical barrier to prevent encroachment of adjacent habitats. Individual trees which fall within the works areas but which work plans show do not require removal are to be retained and fenced off to maximise protection. <p><u>Dust generation</u></p> <p>There are a number of measures which shall be taken as specified in the Air Pollution Control (Construction Dust) Regulation on 'Dust Control Requirements, including the following key measures to be applied during construction:</p> <ul style="list-style-type: none"> vehicle washing facilities to be provided at every discernible or designated vehicle exit point; 	During Construction	Contractor	✓ ✓
		During Construction	Contractor	Rem

Notes (#): ✓ – Compliance; Rem – Reminder; Obs – Observation; N/C – Non Compliance; N/A – Not Applicable;

Impact	Environmental Protection Measures	Timing	Responsibility	Implementation Status #
	<ul style="list-style-type: none"> • all temporary site access roads shall be sprayed with water to suppress dust as necessary; • all dusty materials should be sprayed with water immediately prior to any handling; and • all debris should be covered entirely by impervious sheeting or stored in a sheltered debris collection area. <p><u>Surface Run-off</u></p> <p>In general, mitigation measures shall be in accordance with ProPECC PN1/94 on 'Construction Site Drainage'. Key measures include:</p> <ul style="list-style-type: none"> • Bund and cover stockpiles to avoid run-off; • Channel any run-off through a system of oil, grease and sediment / silt traps and reuse water on site where ever practical; • All vehicle maintenance to be undertaken within a bunded area; and • Maximise vegetation retention on-site to maximise absorption (minimise transport). 	During Construction	Contractor	✓ Rem ✓ ✓ N/A ✓
Ecology during Operation	<ul style="list-style-type: none"> • To conduct compensatory ecological planting as specified in the latest landscape plans approved by EPD (Clause 2.6 of the Environmental Permit refers). 	During Construction and operation	Contractor (during construction) / LCS D* (during operation) (Note: * The division of vegetation planting and maintenance responsibilities shall follow the guidelines stipulated in ETWB TCW No. 2/2004.)	N/A
Landscape and Visual				
Landscape and Visual during Construction	<p><u>Preservation of Existing Vegetation</u></p> <ul style="list-style-type: none"> • Trees identified for retention within the project limit would be protected during the works • The tree transplanting and planting works shall be implemented by approved Landscape Contractors 	During Construction	Contractor	✓ ✓

Notes (#): ✓ – Compliance; Rem – Reminder; Obs – Observation; N/C – Non Compliance; N/A – Not Applicable;

Impact	Environmental Protection Measures	Timing	Responsibility	Implementation Status #
	<p><u>Temporary Works Areas</u> Where feasible the works areas would be screened using hoarding and existing vegetation would be retained where possible to reduce the landscape and visual impacts arising from the construction activity. The landscape of these works areas would be restored following the completion of the construction phase.</p> <p><u>Hoarding</u> A hoarding would be erected where practicable in the most visually sensitive locations to screen the temporary construction works from the local VSRs.</p> <p><u>Top Soils</u> The works will result in disturbance to extensive areas of topsoil. Topsoil worthy of retention should be stockpiled for use following completion of the civil engineering works. It should either be temporarily vegetated with hydroseeded grass or turned over on a regular basis.</p> <p><u>Protection of Important Landscape Features</u> Important features such as temples, Island House and kilns within the study area, although remote from the proposed works retained and adequately protected.</p>	During Construction	Contractor	✓
		During Construction	Contractor	✓
		During Construction	Contractor	N/A
		During Construction	Contractor	N/A
Landscape and Visual during Operation	Not required.	N/A	N/A	N/A

Notes (#): ✓ – Compliance; Rem – Reminder; Obs – Observation; N/C – Non Compliance; N/A – Not Applicable;

Appendix N Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

Cumulative Complaint Log

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
C131126	November 26, 2013	Mr. Tony Hung from WWF	Mat Wat River (works sites for box culvert extension)	Suspected unauthorised discharge of water from a construction site to Ma Wat River, Tai Wo Service Road East, Tai Po	<ol style="list-style-type: none"> 1) It was found that the water leaving the end of the steel pipes was the diverted water from the upstream of the existing box culverts, instead of being discharged from the construction works sites. 2) An EM&A Programme is being undertaken to monitoring the environmental performance of the construction works, and the Contractor has also implemented appropriate mitigation measures to avoid silt-laden runoff discharging from the works sites into the river. 3) The complaint is considered an invalid complaint under this Project. 	Completed

Cumulative Log for Notifications of Summons

Log No.	Date/Location	Subject	Status	Total Received in this reporting month	Total no. Received since project commencement

Cumulative log for Successful Prosecutions

Log No.	Date/Location	Subject	Status	Total Received in this reporting month	Total no. Received since project commencement



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