

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

Quarterly EM&A Report

August 2017 to October 2017

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**

Quarterly EM&A Report
(August 2017 to October 2017)

Certified by: Fredrick Leong 

Position: Environmental Team Leader

Date: 16 November 2017

Hyder-Arup-Black & Veatch Joint Venture
c/o Arcadis
20/F, AXA Tower, Landmark East,
100 How Ming Street,
Kwun Tong, Hong Kong
Attn: Mr. James Penny

Your Reference

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)

Our Reference

JFP/EC/ST/p/I/T329380/22
.05/L-0191

**Environmental Permit No. EP-324/2008/E
Quarterly EM&A Summary Report for August 2017 to October 2017 for the portion of Stage 2 works under Contract No. HY/2012/06**

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15 November 2017

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We refer to the revised Quarterly EM&A Summary Report for August 2017 to October 2017 for the captioned Project received on 10 November 2017 submitted by ET via email. We confirm we have no comment.

Yours faithfully
for MOTT MACDONALD HONG KONG LIMITED






Steven Tang
Independent Environmental Checker

c.c.
HyD
AECOM

Mr. Ricky Yeung
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Date	Revision	Prepared By	Checked By	Approved By
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EXECUTIVE SUMMARY

This report documents the findings of EM&A works conducted in the quarter between 1 August 2017 and 31 October 2017.

The impact stage EM&A programme for the Project includes air quality and noise monitoring.

The EM&A programme was carried out by the ET in accordance with the EM&A Manual requirements. It is concluded from the environmental monitoring and audit works that adequate environmental mitigation measures have been implemented by the civil works contractors where appropriate in the reporting quarter.

In the reporting quarter, no exceedance events were recorded. No necessary remedial actions have been taken.

No environmental non-compliance was recorded in the reporting quarter. No environmental complaints were received in the reporting quarter. No environmental related prosecution or notification of summons was received in the reporting quarter.

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. The installation of the base slab at Box Culvert ID4 was commenced in December 2016 and has been completed in March 2017.

The 4-week post construction water quality monitoring has been commenced and completed in April 2017.

1 INTRODUCTION AND PROJECT INFORMATION

1.1 Background

1.1.1 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. Furthermore, an additional VEP has been applied on 9 March 2015 and the VEP (EP-324/2008/C) was subsequently granted on 27 March 2015. The previous VEP (EP-324/2008/D) was granted on 27 August 2015. The current VEP (EP-324/2008/E) was granted on 26 January 2017.

1.1.2 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/D in accordance with the Updated EM&A Manual (dated March 2015) for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling Stage 2. The EM&A programme commenced in 5 November 2013.

1.1.3 **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.

1.2 Construction Programme and Activities

1.2.1 The construction programme is presented in **Appendix A**. The major construction activities undertaken in the reporting quarter are summarized below:

- Boundary wall construction for DSD pumping station;
- Cable detection and trial trenches;
- Remaining Works on New Kiu Tau Footbridge;
- Noise barrier construction;
- Roadworks;
- Viaduct segment erection;
- Water main laying works;
- Installation of Noise barrier steel column & panel;
- Parapet Installation on bridge deck;

- Drainage Work;
- Mini-pile installation;
- Construction of profile barrier & Planter wall on Bridge deck;
- Stressing of external tendon;
- Construction of abutment wall; and
- Trenchless excavation.

1.3 Project Organisation

1.3.1 The project organization structure is shown in **Appendix B**. The key personnel contact names and numbers for the Project, together with the general enquiry hotline, are summarised in **Table 1.1**.

Table 1.1 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. Steven Tang	2828 5920	2827 1823
Chun Wo	Contractor	Site Agent	Mr. Daniel Ho	2638 6144	2638 7077
		Environmental Officer	Ms. Tiffany Tsang	2638 6150	
Meinhardt	Environmental Team (ET)	ET Leader	Mr. Fredrick Leong	2859 1739	2540 1580
Enquiry Hotline	General Enquiry	--	Ms Helena Mak	6355 1731	--

1.4 Purpose of the Report

1.4.1 This is the Quarterly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting period between 1 August 2017 and 31 October 2017.

2 SUMMARY OF EM&A REQUIREMENTS

2.1 Monitoring Requirements

2.1.1 In accordance with the Updated EM&A Manual, environmental parameters including Air Quality and Noise have been monitored. The specific parameters, monitoring frequency and the respective Action and Limit Levels are given in **Table 2.1** and the location of the monitoring station is shown in the **Figure 2**.

Table 2.1 Monitoring Parameter

Parameter	Unit	Action Level	Limit Level	Frequency
Air Quality				
1-hour TSP	µg/m ³	292.7	500	Three times every 6 days
24-hour TSP	µg/m ³	170.3	260	Once every 6 days
Construction Noise				
Leq 30min	dB(A)	When one documented valid complaint is received	75	Once every Week

Temporary Suspension of Box Culvert Works and Water Quality Monitoring

2.1.2 The box culvert works have been completed in the end of March 2017. The 4-week post construction water quality monitoring has been completed in the end of April 2017 in the same manner as the impact monitoring.

2.2 Environmental Mitigation Measures

2.2.1 Environmental mitigation measures have been recommended in the EM&A Manual and are given in **Appendix C**. The implementation status for the reporting quarter is also given in the Appendix.

3 SUMMARY OF EM&A MONITORING DATA

3.1 Monitoring Data

3.1.1 Monitoring has been conducted in accordance with the specification in the EM&A Manual in the reporting quarter. Meteorological data for the reporting quarter have been extracted from Hong Kong Observatory and are given in **Appendix D**. Monitoring data with graphical presentation for the reporting quarter have been given in **Appendix E**. A summary on the monitoring results has also been given in **Table 3.1**.

Table 3.1 Summary of Monitoring Data in the Reporting Quarter

Monitoring Location	Minimum	Maximum	Average
Air Quality			
1 hour Total Suspended Particulate			
SR77	91.2µg/m ³	235.4µg/m ³	140.7µg/m ³
24 hour Total Suspended Particulate			
SR77	49.1µg/m ³	138.4µg/m ³	79.6µg/m ³
Construction Noise			
SR77	64.0dB(A)	74.0dB(A)	69.0dB(A)

3.2 Summary of Monitoring Exceedances

3.2.1 The number of exceedances event recorded in the reporting quarter is summarized in **Table 3.2**.

Table 3.2 Summary of Exceedance Events in the Reporting Quarter

Parameter	Criteria	Number of Exceedances Events	Number of Project Related Exceedance Events
Air Quality			
1-hour Total Suspended Particulates	Action Level	0	0
	Limit Level	0	0
24-hour Total Suspended Particulates	Action Level	0	0
	Limit Level	0	0
Construction Noise			
Leq 30min	Action Level	0	0
	Limit Level	0	0
	Limit Level	0	0

3.2.2 No exceedance of air monitoring was recorded at SR77 in the reporting quarter.

3.2.3 No exceedance of noise monitoring was recorded at SR77 in the reporting quarter.

3.2.4 The Contractor has been reminded to strengthen the mitigation measures including:

Air Quality

- *Stockpiling shall be covered to avoid dust generation*

Water Quality

- Implement sufficient mitigation measures to avoid runoff leakage from road works areas and divert site effluent to wastewater treatment facilities

Waste / Chemical Management

- Housekeeping shall be enhanced and refuse shall be collected regularly

4 WASTE MANAGEMENT

4.1.1 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.

4.1.2 During the reporting quarter, a total of 5,901m³ of excavated material has been generated. 4,352m³ of inert C&D materials was disposed of at public fill to Tuen Mun Area 38, while 450m³ of inert C&D materials was reused on site. 335m³ of general refuse was disposed of at North East New Territories (NENT) Landfill. No plastics and no paper/cardboard packaging were collected by recycling contractor in the reporting quarter. No metals were collected by recycling contractor in the reporting quarter. No chemical waste was collected by licensed contractor in the reporting quarter. Details of the waste management data are presented in **Appendix F**.

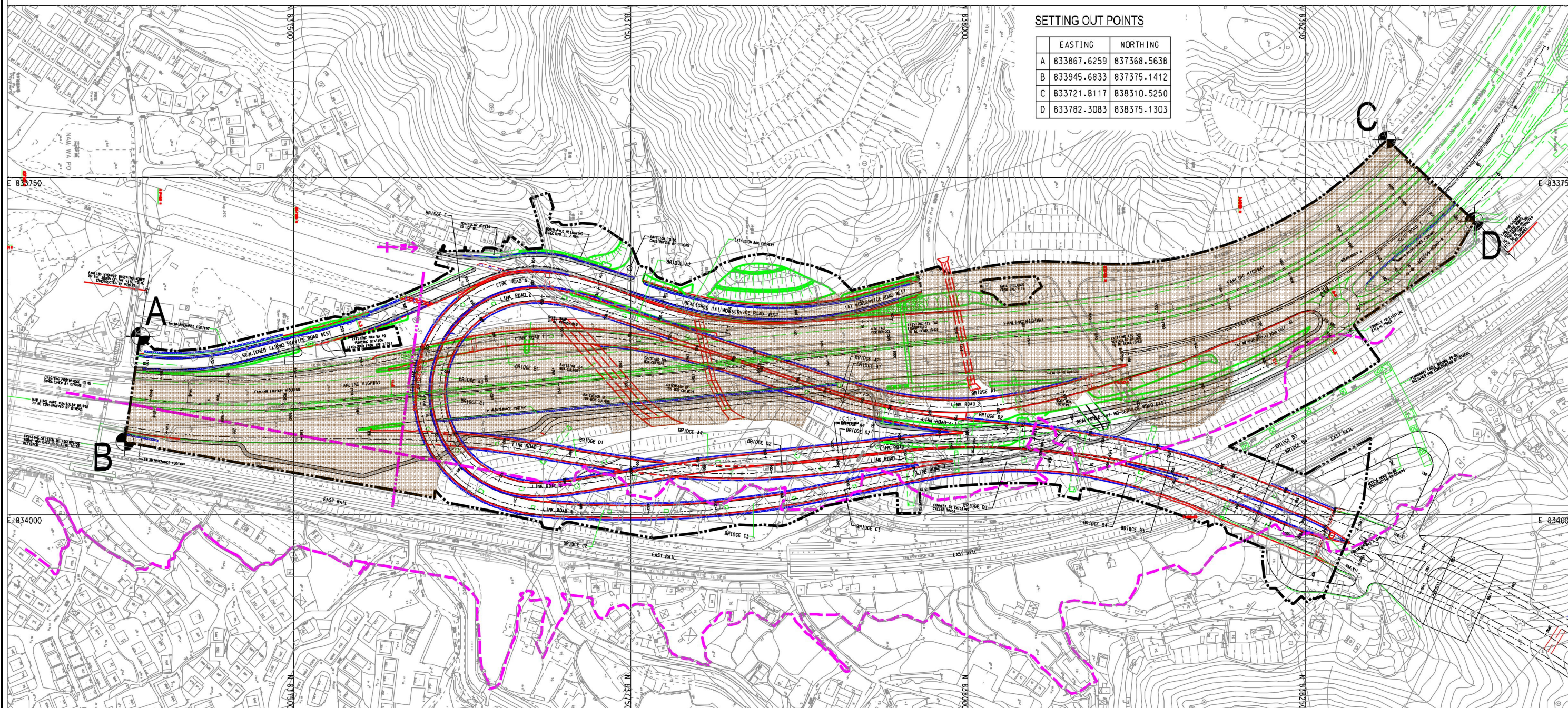
5 ENVIRONMENTAL NON-CONFORMANCE

5.1.1 No environmental non-compliance was recorded in the reporting quarter. No environmental complaint was received. No environmental related prosecution or notification of summons was received in the reporting quarter. The summary for the non-compliance, complaints and prosecutions is provided in **Appendix G**.

6 CONCLUSION, COMMENTS AND RECOMMENDATIONS

- 6.1.1 The EM&A programme was carried out by the ET in accordance with the EM&A Manual requirements. It is concluded from the environmental monitoring and audit works that adequate environmental mitigation measures have been implemented by the civil works contractors where appropriate in the reporting quarter.
- 6.1.2 In the reporting quarter, no exceedance events were recorded.
- 6.1.3 No environmental non-compliance was recorded in the reporting quarter. No environmental complaints were received in the reporting quarter. No environmental related prosecution or notification of summons was received in the reporting quarter.
- 6.1.4 The box culvert works have been completed in the end of March 2017. The 4-week post construction water quality monitoring has been completed in the end of April 2017 in the same manner as the impact monitoring

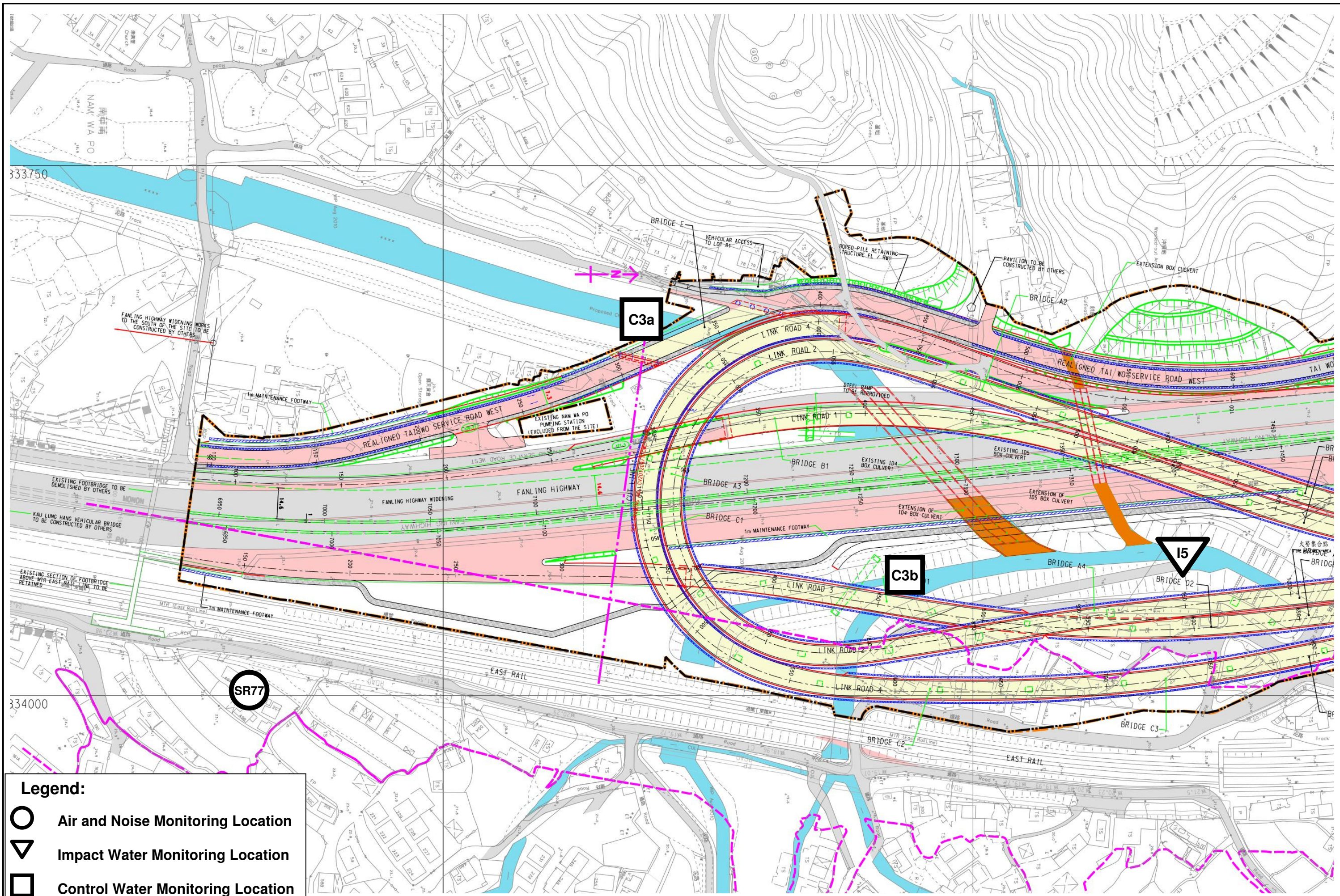
Figure



CV/201209-T-CWC-SK-001g_AD_edit.dgn 22/1/2014 17:10:34

Legend:

 Works Area for Entrusted Portion



- Legend:**
- Air and Noise Monitoring Location
 - Impact Water Monitoring Location
 - Control Water Monitoring Location

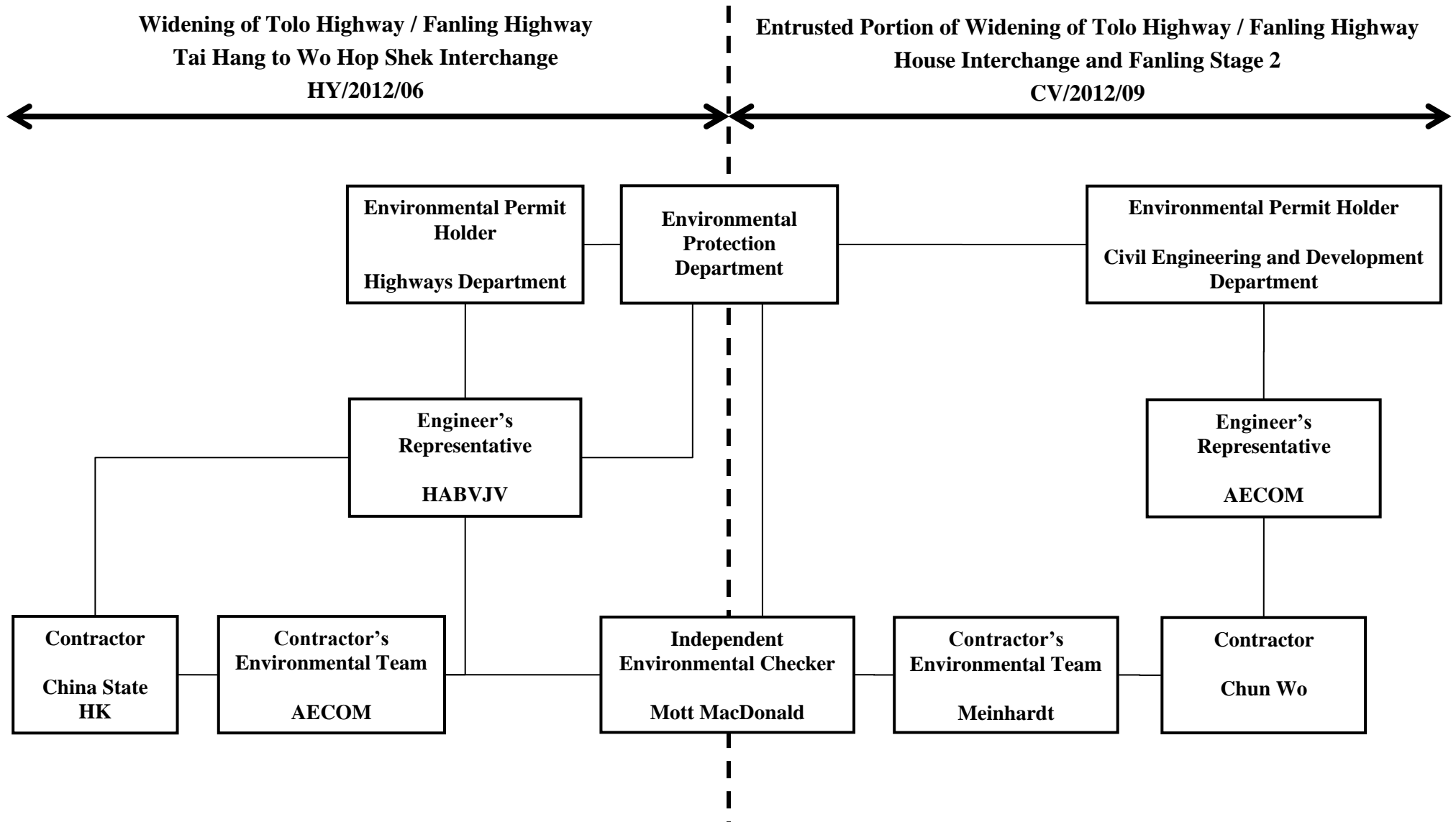
Figure 2: Environmental Monitoring Locations

Appendix A

Construction Programme

Appendix B

Project Organization Structure



Appendix C 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 ✓ ✓ ✓ ✓ ✓ ✓
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. Sand traps, oil interceptors and other pollution prevention installations should be provided, properly cleaned and maintained. 	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 #
	<ul style="list-style-type: none"> • 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. 			✓ Obs ✓ ✓ ✓ ✓
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. <u>Demolition Wastes</u> <ul style="list-style-type: none"> • Segregation of materials to facilitate disposal. • Appropriate stockpile management. 	During Construction During Construction During Construction	Contractor Contractor 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"> 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	✓ ✓ ✓ ✓ ✓
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; 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 	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 #
	<ul style="list-style-type: none"> 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	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>
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) / LCSD* (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	<p>✓</p> <p>✓</p>

Impact	Environmental Protection Measures	Timing	Responsibility	Implementation Status #
	<p><u>Temporary Works Areas</u></p> <ul style="list-style-type: none"> 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><u>Hoarding</u></p> <ul style="list-style-type: none"> A hoarding would be erected where practicable in the most visually sensitive locations to screen the temporary construction works from the local VSRs. <p><u>Top Soils</u></p> <ul style="list-style-type: none"> 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><u>Protection of Important Landscape Features</u></p> <ul style="list-style-type: none"> Important features such as temples, Island House and kilns within the study area, although remote from the proposed works retained and adequately protected. 	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

Appendix D

Meteorological Data Extracted from Hong Kong Observatory

Daily Extract of Meteorological Observations , August 2017

Day	Hong Kong Observatory							King's Park	Waglan Island [^]		
	Mean Pressure (hPa)	Air Temperature			Mean Dew Point (deg. C)	Mean Relative Humidity (%)	Mean Amount of Cloud (%)	Total Rainfall (mm)	Total Bright Sunshine (hours)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
		Absolute Daily Max (deg. C)	Mean (deg. C)	Absolute Daily Min (deg. C)							
01	1001.4	33.2	30.5	28.3	26.7	80	88	5.9	4.6	***	***
02	1002.2	31.0	29.3	27.3	26.0	83	88	14.8	1.9	***	***
03	1001.8	29.8	27.8	25.3	25.6	88	90	66.7	0.9	***	***
04	1003.0	29.3	27.6	25.9	25.5	89	79	19.3	1.4	***	***
05	1005.5	34.0	30.0	27.1	26.1	80	46	0.9	8.9	***	***
06	1006.4	32.9	30.3	28.5	26.0	78	61	0.0	11.0	***	***
07	1006.3	33.0	30.5	27.3	25.9	77	66	6.9	10.3	***	***
08	1006.6	32.8	30.4	28.4	26.1	78	74	1.9	8.3	***	***
09	1006.1	31.0	29.6	26.3	25.9	81	85	14.3	1.6	***	***
10	1006.1	31.4	29.6	27.6	26.0	81	88	11.1	2.5	***	***
11	1007.6	31.6	30.0	28.9	26.1	79	82	3.5	5.0	***	***
12	1008.7	32.5	30.0	29.0	25.4	76	72	0.0	9.9	***	***
13	1009.1	32.4	29.8	28.6	25.1	76	59	0.0	8.6	***	***
14	1008.8	32.5	29.9	28.8	25.0	75	58	Trace	9.4	***	***
15	1008.4	32.9	29.8	28.1	24.6	74	66	0.2	9.6	***	***
16	1008.3	31.2	29.3	28.2	24.4	75	81	Trace	7.3	***	***
17	1009.1	33.0	29.9	27.9	24.5	73	71	0.0	10.3	***	***
18	1010.3	34.3	30.4	28.1	25.5	76	60	0.0	7.9	***	***
19	1009.8	34.0	30.6	28.4	24.5	71	61	0.0	10.2	***	***
20	1007.1	33.4	30.5	28.5	25.3	75	29	0.0	10.2	***	***
21	1003.2	34.5	31.3	28.6	25.5	72	42	0.0	10.1	***	***
22	999.7	36.6	30.9	28.0	26.1	76	74	2.0	7.3	***	***
23	996.9	29.5	26.9	25.4	24.8	89	93	67.1	0.1	***	***
24	1007.8	31.5	29.1	27.3	26.4	86	85	Trace	7.0	***	***
25	1008.3	32.7	29.2	27.8	25.6	81	81	0.1	5.9	***	***
26	1006.4	34.3	29.8	26.2	24.3	73	65	6.3	9.9	***	***
27	1004.3	26.9	25.6	24.0	24.6	95	89	165.3	0.0	***	***
28	1010.2	26.3	25.2	24.5	24.6	96	90	98.3	0.0	***	***
29	1010.1	31.4	28.2	24.6	24.0	79	34	0.0	11.1	***	***
30	1008.3	31.6	28.9	27.0	24.8	79	49	0.4	7.3	***	***
31	1007.3	32.8	28.9	26.2	24.3	77	80	4.1	6.9	***	***
Mean/Total	1006.3	32.1	29.3	27.3	25.3	80	70	489.1	205.4	***	***
Normal [§]	1005.2	31.1	28.6	26.6	25.0	81	69	432.2	188.9	230	19.4

*** unavailable

[^] Information of wind direction and wind speed for Waglan Island are based on automatic weather station data since January 1989

Trace means rainfall less than 0.05 mm

[§] 1981-2010 Climatological Normal, unless otherwise specified

Daily Extract of Meteorological Observations , September 2017

Day	Hong Kong Observatory							King's Park	Waglan Island [^]		
	Mean Pressure (hPa)	Air Temperature			Mean Dew Point (deg. C)	Mean Relative Humidity (%)	Mean Amount of Cloud (%)	Total Rainfall (mm)	Total Bright Sunshine (hours)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
		Absolute Daily Max (deg. C)	Mean (deg. C)	Absolute Daily Min (deg. C)							
01	1005.6	31.7	27.9	26.1	24.6	83	85	6.5	2.4	***	***
02	1004.5	30.4	27.9	26.4	24.8	83	88	1.0	1.1	***	***
03	1005.4	29.9	27.3	25.6	25.1	88	88	23.8	0.8	***	***
04	1006.7	27.6	26.4	25.3	24.4	89	90	32.8	0.2	***	***
05	1008.5	30.7	28.3	25.9	25.8	87	83	6.4	2.6	***	***
06	1007.5	32.3	29.1	27.3	25.6	82	82	Trace	7.2	***	***
07	1008.2	30.7	28.5	27.5	25.4	84	86	1.8	1.1	***	***
08	1009.3	30.9	28.4	26.9	25.2	83	64	1.1	6.5	***	***
09	1009.0	32.0	28.1	26.0	25.5	86	77	25.8	4.0	***	***
10	1010.1	32.2	29.1	26.7	25.3	81	68	Trace	8.3	***	***
11	1009.7	32.4	29.8	27.6	24.9	75	30	0.0	10.8	***	***
12	1009.3	32.8	29.9	27.9	25.5	77	51	0.6	5.8	***	***
13	1009.5	34.0	30.0	28.3	24.4	73	71	0.0	8.6	***	***
14	1008.5	31.5	29.0	27.6	21.5	64	76	0.0	6.8	***	***
15	1009.5	33.2	29.4	27.8	24.8	77	76	Trace	4.9	***	***
16	1009.9	32.6	29.9	27.7	24.3	73	52	0.0	10.6	***	***
17	1009.4	32.6	30.1	28.5	24.5	72	36	0.0	8.5	***	***
18	1009.8	32.9	29.7	27.8	24.8	75	30	0.0	10.9	***	***
19	1010.2	32.2	29.1	27.6	24.1	75	39	0.0	9.3	***	***
20	1009.3	32.0	29.3	27.6	25.1	78	73	0.2	6.8	***	***
21	1008.6	32.0	29.4	27.9	25.3	79	70	Trace	7.9	***	***
22	1009.9	32.0	29.1	26.1	25.9	83	72	17.9	6.9	***	***
23	1010.8	31.4	29.0	26.7	26.1	85	75	33.4	5.5	***	***
24	1008.8	30.5	28.8	27.1	25.7	84	81	5.6	2.4	***	***
25	1010.1	31.9	29.4	27.7	25.8	81	81	0.5	5.4	***	***
26	1011.0	32.9	29.7	27.8	25.4	78	41	0.0	9.6	***	***
27	1009.6	33.0	29.9	27.7	25.6	78	34	0.0	7.9	***	***
28	1009.2	34.1	30.3	28.2	24.6	72	25	0.0	10.9	***	***
29	1012.2	33.1	30.2	28.8	25.8	78	63	Trace	8.9	***	***
30	1013.7	30.3	28.3	25.9	25.6	86	72	35.0	4.5	***	***
Mean/Total	1009.1	31.9	29.0	27.2	25.0	80	65	192.4	187.1	***	***
Normal [§]	1008.9	30.1	27.7	25.8	23.4	78	66	327.6	172.3	090	22.6

*** unavailable

[^] Information of wind direction and wind speed for Waglan Island are based on automatic weather station data since January 1989

Trace means rainfall less than 0.05 mm

[§] 1981-2010 Climatological Normal, unless otherwise specified

Daily Extract of Meteorological Observations , October 2017

Day	Hong Kong Observatory								King's Park	Waglan Island [^]	
	Mean Pressure (hPa)	Air Temperature			Mean Dew Point (deg. C)	Mean Relative Humidity (%)	Mean Amount of Cloud (%)	Total Rainfall (mm)	Total Bright Sunshine (hours)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
		Absolute Daily Max (deg. C)	Mean (deg. C)	Absolute Daily Min (deg. C)							
01	1011.7	30.1	28.4	27.6	25.9	86	80	6.6	***	***	***
02	1011.1	32.7	29.2	26.4	26.0	83	66	3.6	***	***	***
03	1012.3	33.5	30.1	28.3	25.8	78	52	0.0	***	***	***
04	1014.0	31.0	28.7	27.5	25.3	82	78	9.5	***	***	***
05	1013.3	30.3	28.5	27.5	23.8	76	76	Trace	***	***	***
06	1013.1	31.1	28.9	27.4	23.9	75	83	0.2	***	***	***
07	1013.0	31.7	29.3	27.9	24.2	74	76	0.0	***	***	***
08	1011.8	31.5	28.9	27.3	23.9	75	82	0.0	***	***	***
09	1010.1	30.9	29.4	28.1	23.6	71	85	Trace	***	***	***
10	1010.8	32.3	29.8	28.6	24.5	74	69	Trace	***	***	***
11	1011.2	32.5	29.8	28.3	24.4	73	43	0.2	***	***	***
12	1009.9	32.7	29.5	27.6	23.1	69	69	0.0	***	***	***
13	1007.9	30.6	27.0	24.5	19.5	64	59	0.0	***	***	***
14	1004.5	25.6	24.5	21.9	18.1	68	88	0.4	***	***	***
15	1000.3	26.9	23.3	20.4	21.3	89	89	20.7	***	***	***
16	1008.1	27.5	26.7	25.6	25.0	91	88	17.1	***	***	***
17	1012.2	27.6	25.8	24.7	23.4	87	89	41.3	***	***	***
18	1013.0	29.5	26.2	24.0	21.1	74	67	Trace	***	***	***
19	1011.9	27.9	25.4	23.4	19.7	71	70	0.0	***	***	***
20	1012.1	27.8	24.1	22.3	18.1	69	72	0.0	***	***	***
21	1012.1	27.2	23.6	21.6	16.2	64	33	0.0	***	***	***
22	1012.4	26.3	22.9	20.2	14.7	60	9	0.0	***	***	***
23	1015.6	27.7	23.7	20.8	15.9	62	6	0.0	***	***	***
24	1018.5	27.3	24.4	22.5	17.3	65	14	0.0	***	***	***
25	1018.8	26.4	24.1	22.7	18.1	69	18	Trace	***	***	***
26	1016.3	28.1	24.4	22.1	18.7	71	18	0.0	***	***	***
27	1013.9	28.6	24.9	22.1	16.4	60	40	0.0	***	***	***
28	1014.8	28.0	24.8	22.5	14.9	54	21	0.0	***	***	***
29	1018.0	27.0	24.1	21.7	13.9	53	31	0.0	***	***	***
30	1020.9	25.0	22.7	20.5	13.0	55	55	Trace	***	***	***
31	1019.7	25.0	22.0	19.0	14.1	61	51	Trace	***	***	***
Mean/Total	1012.7	29.0	26.3	24.4	20.4	71	57	99.6	***	***	***
Normal [§]	1014.1	27.8	25.5	23.7	20.2	73	58	100.9	193.9	080	27.4

*** unavailable

[^] Information of wind direction and wind speed for Waglan Island are based on automatic weather station data since January 1989

Trace means rainfall less than 0.05 mm

[§] 1981-2010 Climatological Normal, unless otherwise specified

Appendix E Environmental Monitoring Data for Air, Noise and Water Quality

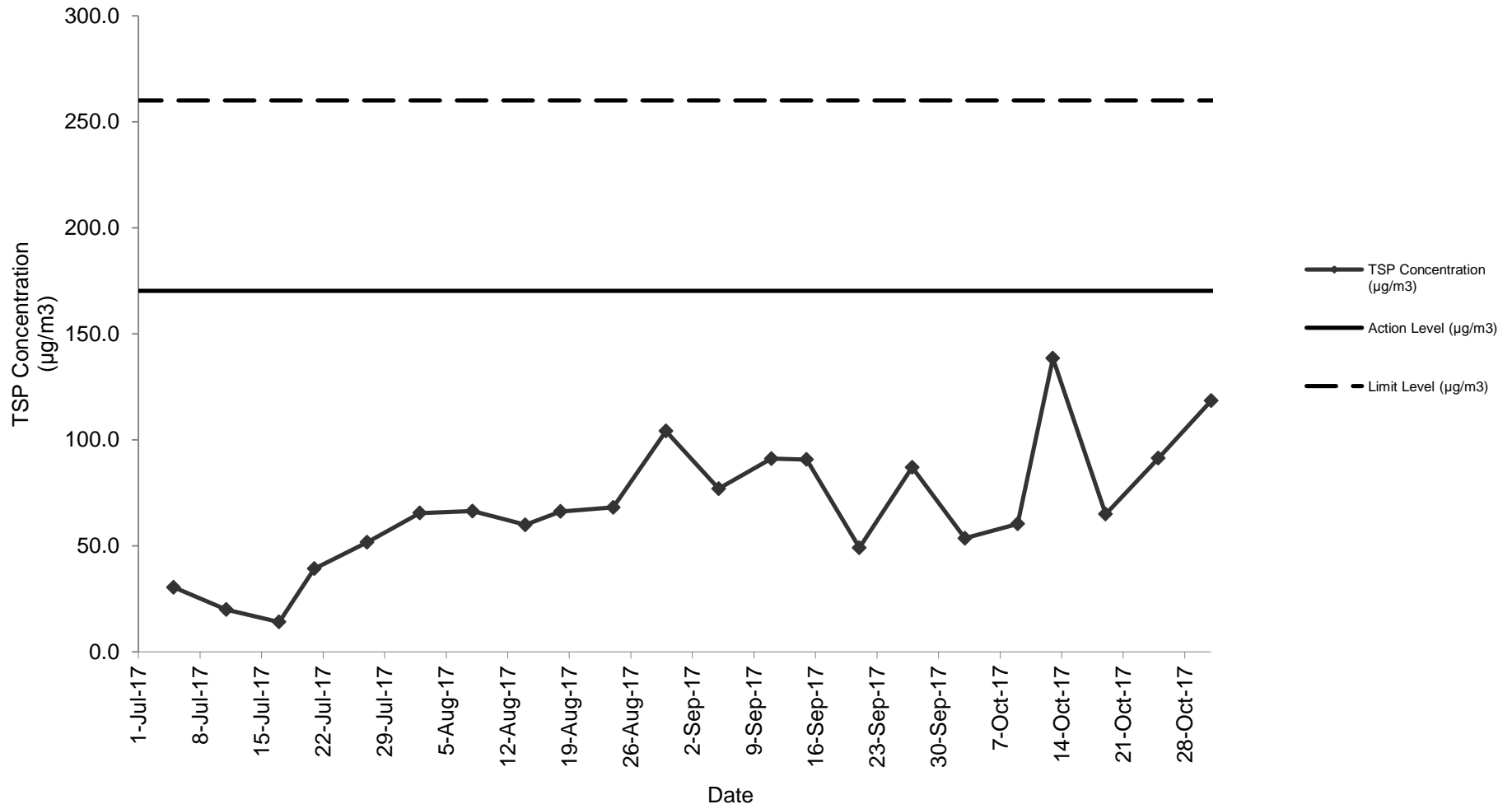
Appendix E
Air Quality Monitoring Results and their Graphical Presentation

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						
5-Jul-17	Cloudy	CC62	2.8226	2.8859	0.0633	6736.67	6760.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	30.4	170.3	260.0	<5	N
11-Jul-17	Cloudy	CC64	2.8430	2.8845	0.0415	6763.67	6787.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	20.0	170.3	260.0	<5	N
17-Jul-17	Rainy	CC66	2.8421	2.8715	0.0294	6790.67	6814.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	14.1	170.3	260.0	<5	N
21-Jul-17	Fine	CC68	2.8264	2.9080	0.0816	6817.67	6841.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	39.2	170.3	260.0	<5	N
27-Jul-17	Fine	CC70	2.8542	2.9617	0.1075	6844.67	6868.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	51.7	170.3	260.0	<5	N
2-Aug-17	Fine	CC72	2.8640	3.0001	0.1361	6871.67	6895.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	65.4	170.3	260.0	<5	N
8-Aug-17	Sunny	CC74	2.8523	2.9904	0.1381	6898.67	6922.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	66.4	170.3	260.0	<5	N
14-Aug-17	Sunny	CC76	2.8575	2.9821	0.1246	6925.67	6949.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	59.9	170.3	260.0	<5	N
18-Aug-17	Sunny	CC78	2.8599	2.9976	0.1377	6952.67	6976.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	66.2	170.3	260.0	<5	N
24-Aug-17	Sunny	CC80	2.8262	2.9679	0.1417	6979.67	7003.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	68.1	170.3	260.0	<5	N
30-Aug-17	Fine	CC82	2.8299	3.0465	0.2166	7006.67	7030.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	104.2	170.3	260.0	<5	N
5-Sep-17	Fine	CC84	2.8574	3.0175	0.1601	7033.67	7057.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	77.0	170.3	260.0	<5	N
11-Sep-17	Sunny	CC86	2.8448	3.0344	0.1896	7060.67	7084.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	91.2	170.3	260.0	<5	N
15-Sep-17	Fine	CC88	2.8430	3.0316	0.1886	7087.67	7111.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	90.7	170.3	260.0	<5	N
21-Sep-17	Fine	CC90	2.8425	2.9447	0.1022	7114.67	7138.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	49.1	170.3	260.0	<5	N
27-Sep-17	Fine	CC92	2.8518	3.0328	0.1810	7141.67	7165.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	87.0	170.3	260.0	<5	N
3-Oct-17	Sunny	CC94	2.8702	2.9816	0.1114	7168.67	7192.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	53.6	170.3	260.0	<5	N
9-Oct-17	Cloudy	CC96	2.8471	2.9727	0.1256	7195.67	7219.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	60.4	170.3	260.0	<5	N
13-Oct-17	Sunny	CC98	2.8352	3.1231	0.2879	7222.67	7246.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	138.4	170.3	260.0	<5	N
19-Oct-17	Fine	CC100	2.8611	3.0131	0.1520	7249.67	7276.67	27.00	51	51	51.0	1.44	1.44	1.44	2339.54	65.0	170.3	260.0	<5	N
25-Oct-17	Sunny	CC102	2.8584	3.0483	0.1899	7279.67	7303.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	91.3	170.3	260.0	<5	N
31-Oct-17	Sunny	CC104	2.8589	3.1052	0.2463	7306.67	7330.67	24.00	51	51	51.0	1.44	1.44	1.44	2079.59	118.4	170.3	260.0	<5	N

Summary For the Reporting Quarter (August 2017 - October 2017)	
Average	79.6
Minimum	49.1
Maximum	138.4

24-Hour TSP Monitoring Result at Station: SR77 (July 2017 - October 2017)



Appendix E

Air Quality Monitoring Results and their Graphical Presentation

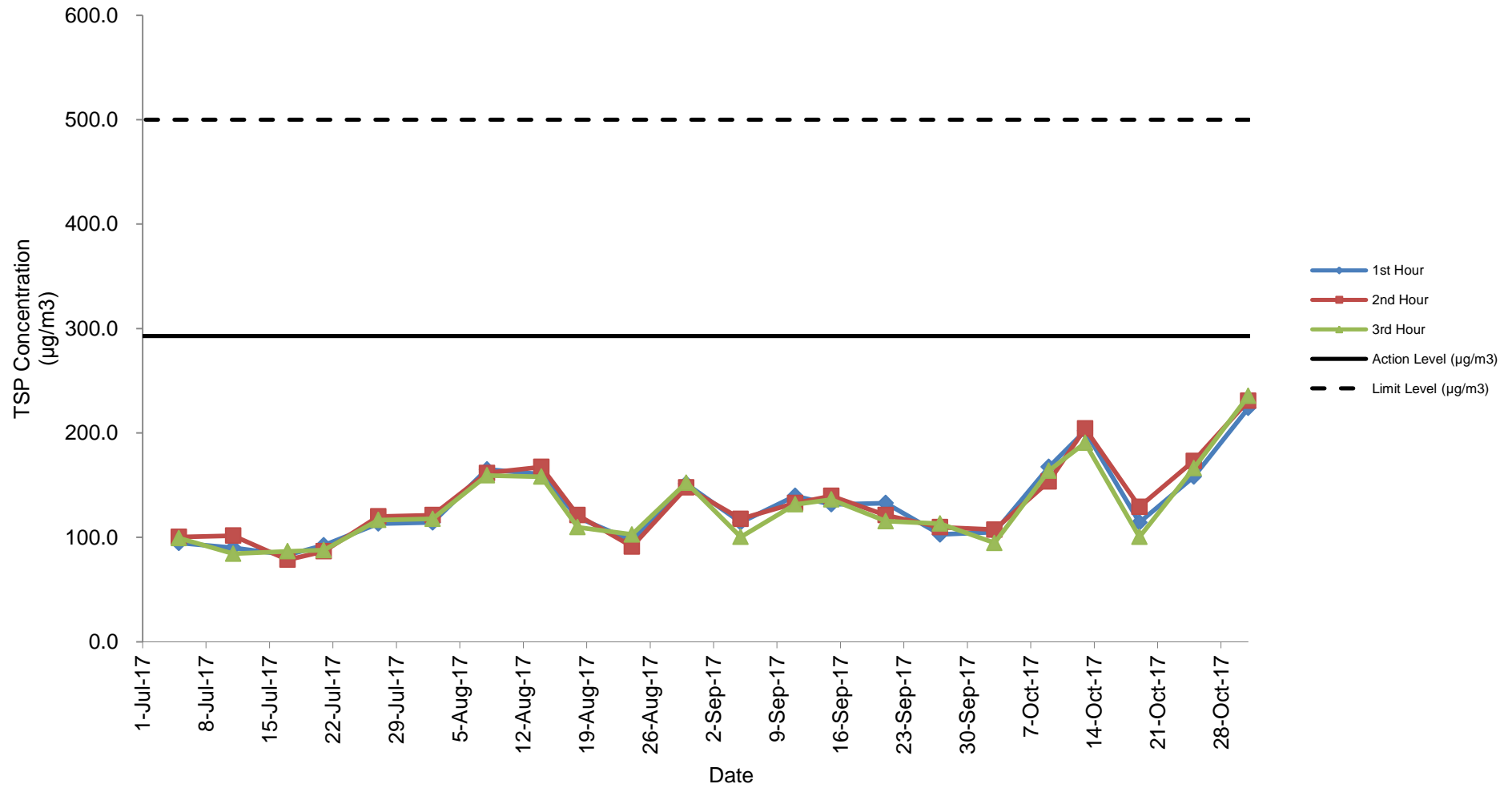
1-Hour TSP Monitoring Result at Station: SR77

Date	Weather Condition	Time	Conc.(µg/m ³)			Action Level (µg/m ³)	Limit Level (µg/m ³)
			1 st Hour	2 nd Hour	3 rd Hour		
5-Jul-17	Cloudy	9:00 - 12:07	94.6	100.4	99.3	292.7	500.0
11-Jul-17	Cloudy	9:00 - 12:08	90.0	101.6	84.2	292.7	500.0
17-Jul-17	Rainy	9:00 - 12:08	83.1	78.5	86.6	292.7	500.0
21-Jul-17	Fine	9:00 - 12:07	92.3	86.6	87.7	292.7	500.0
27-Jul-17	Fine	9:00 - 12:08	113.1	120.0	116.6	292.7	500.0
2-Aug-17	Fine	9:00 - 12:07	114.3	121.2	117.7	292.7	500.0
8-Aug-17	Sunny	9:00 - 12:07	165.0	161.6	159.3	292.7	500.0
14-Aug-17	Sunny	9:00 - 12:08	160.4	167.3	158.1	292.7	500.0
18-Aug-17	Sunny	9:00 - 12:07	118.9	121.2	109.6	292.7	500.0
24-Aug-17	Sunny	9:00 - 12:05	96.9	91.2	102.7	292.7	500.0
30-Aug-17	Fine	9:00 - 12:07	151.2	147.7	152.3	292.7	500.0
5-Sep-17	Fine	9:00 - 12:07	114.3	117.7	100.4	292.7	500.0
11-Sep-17	Sunny	9:00 - 12:07	139.6	132.7	131.6	292.7	500.0
15-Sep-17	Fine	9:00 - 12:07	131.6	139.6	136.2	292.7	500.0
21-Sep-17	Fine	9:00 - 12:07	132.7	121.2	115.4	292.7	500.0
27-Sep-17	Fine	9:00 - 12:07	102.7	109.6	113.1	292.7	500.0
3-Oct-17	Sunny	9:00 - 12:07	105.0	107.3	94.6	292.7	500.0
9-Oct-17	Cloudy	9:00 - 12:06	167.3	153.5	163.9	292.7	500.0
13-Oct-17	Sunny	9:00 - 12:08	202.0	204.3	190.4	292.7	500.0
19-Oct-17	Fine	9:00 - 12:08	114.3	129.3	100.4	292.7	500.0
25-Oct-17	Sunny	9:00 - 12:08	158.1	173.1	166.2	292.7	500.0
31-Oct-17	Sunny	9:00 - 12:08	223.9	230.8	235.4	292.7	500.0

Summary For the Reporting Quarter (August 2017 - October 2017)	
Average	140.7
Minimum	91.2
Maximum	235.4

Note: No major dust source observed during the monitoring period

1-Hour TSP Monitoring Result at station: SR77 (July 2017 - October 2017)

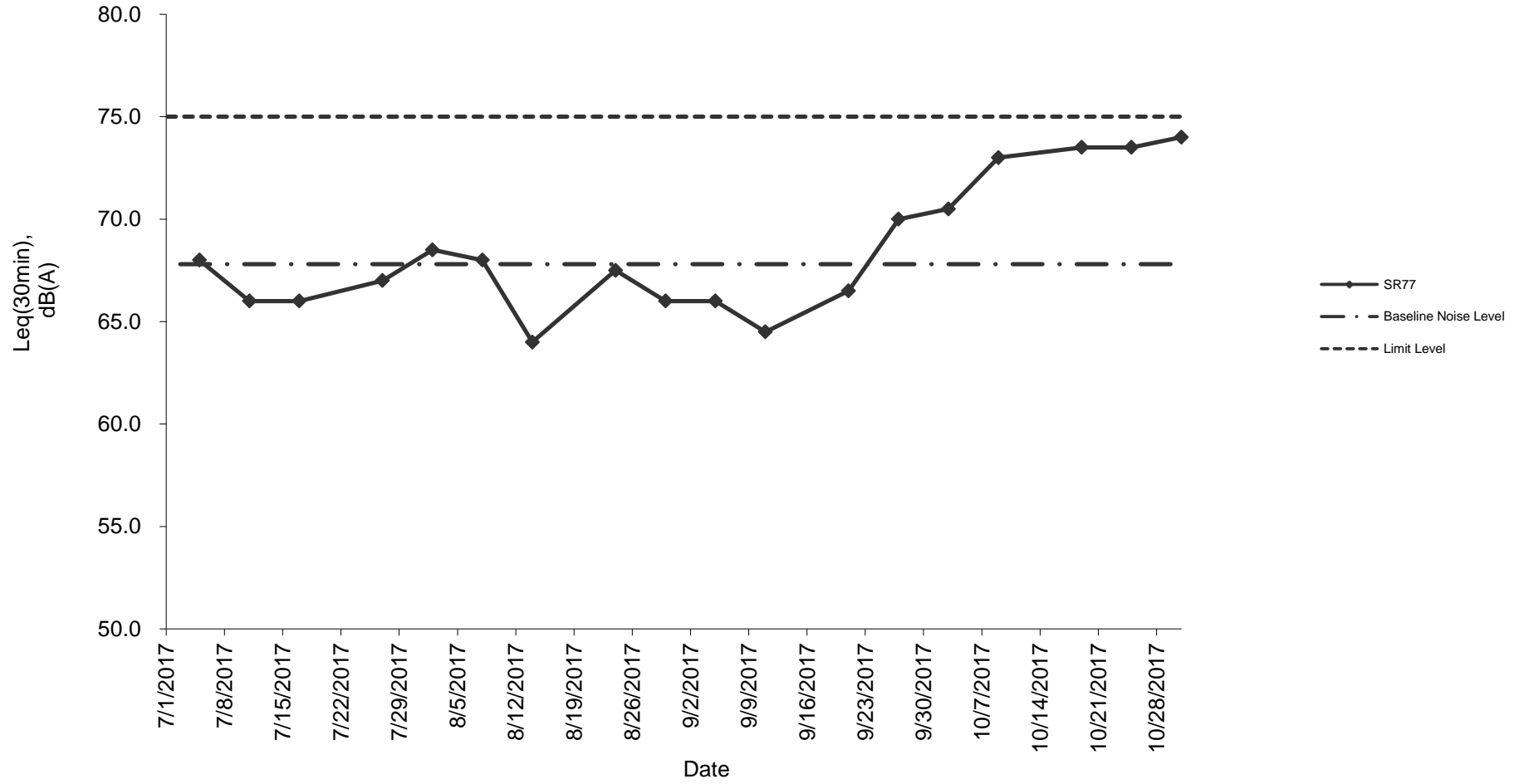


Noise Monitoring Result at SR77

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)				
2017/07/05	Cloudy	11:30	12:00	89.0	57.0	68.0	-	67.8	75.0	N
2017/07/11	Cloudy	11:30	12:00	90.0	62.0	66.0	-	67.8	75.0	N
2017/07/17	Cloudy	11:30	12:00	93.0	60.0	66.0	-	67.8	75.0	N
2017/07/27	Fine	11:30	12:00	93.5	57.0	67.0	-	67.8	75.0	N
2017/08/02	Fine	11:30	12:00	97.0	61.0	68.5	-	67.8	75.0	N
2017/08/08	Sunny	11:00	11:30	95.0	56.0	68.0	-	67.8	75.0	N
2017/08/14	Sunny	11:30	12:00	95.0	55.0	64.0	-	67.8	75.0	N
2017/08/24	Sunny	11:30	12:00	92.5	56.5	67.5	-	67.8	75.0	N
2017/08/30	Fine	11:30	12:00	99.0	58.0	66.0	-	67.8	75.0	N
2017/09/05	Fine	11:30	12:00	92.5	57.5	66.0	-	67.8	75.0	N
2017/09/11	Sunny	11:30	12:00	91.0	55.0	64.5	-	67.8	75.0	N
2017/09/21	Fine	11:30	12:00	92.0	57.0	66.5	-	67.8	75.0	N
2017/09/27	Fine	11:30	12:00	76.0	62.0	70.0	-	67.8	75.0	N
2017/10/03	Sunny	11:30	12:00	74.5	61.5	70.5	-	67.8	75.0	N
2017/10/09	Cloudy	11:30	12:00	89.0	64.5	73.0	-	67.8	75.0	N
2017/10/19	Fine	11:30	12:00	93.5	62.0	73.5	-	67.8	75.0	N
2017/10/25	Sunny	11:30	12:00	92.5	59.5	73.5	-	67.8	75.0	N
2017/10/31	Sunny	11:30	12:00	93.0	59.0	74.0	-	67.8	75.0	N

Summary For the Reporting Quarter (August 2017 - October 2017)	
Average	69.0
Minimum	64.0
Maximum	74.0

Noise monitoring result: SR77 (July 2017 - October 2017)



Appendix F

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 '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in m ³)	(in '000m ³)
Aug-17	1.297	0.118	1.179	0.120	-	1.059	0.099	-	-	-	-	0.130
Sep-17	2.448	0.437	2.011	0.090	-	1.921	0.291	-	-	-	-	0.115
Oct-17	2.156	0.544	1.612	0.240	-	1.372	0.939	-	-	-	-	0.090
Total	5.901	1.099	4.802	0.450	-	4.352	1.329	-	-	-	-	0.335

- 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 G 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	26, November, 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	<p>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.</p> <p>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.</p> <p>The complaint is considered an invalid complaint under this Project.</p>	Completed

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
C141120	20 November, 2014	EPD	Ng Tung River and Ma Wat River nearby the site of the Liantang/ Heung Yuen Wai BCP Project (Contract Number CV/2012/09)	At Bridge NF426 in Fanling, the whole Ng Tung River showed milky and suspected illegal discharge by nearby factory has undertaken. (粉嶺近天橋編號 NF426 梧桐河整條河河水呈奶白色懷疑附近有工廠非法排放污水)	<p>Water Supplies Department (WSD) conducted a washout procedure on 20 November 2014 at about 9:30am to flush the newly installed water pipe of diameter of 1400mm which has recently finished disinfection. It is understood that the procedure has lasted for about 1 hour and large amount of freshwater has been discharged into the Ma Wat River through a washout port.</p> <p>Although water was observed seeping from the gantry switch and flew into the works sites, the area is a sump pit and the water was unlikely to run off and entered the river directly. As such, it is anticipated that only freshwater has been discharged into Ma Wat River through the washout port.</p> <p>Both site inspections conducted by the ET before the complaint (19 November 2014), and after the complaint (24 November 2014) did not identify any deficiencies on environmental mitigation measures. Also, there were no rains during the period and the risk of construction site run-off is considered minimal.</p>	Completed

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
					<p>The water from the Ma Wat Channel adjoins the Ng Tung River before passing through the complaint location, so other pollution sources may also occur at upstream of Ng Tung River</p> <p>The complaint is considered unlikely due to the construction works of this project.</p>	