

**Contract No. HY/2017/10
Tuen Mun – Chek Lap Kok Link –
Northern Connection Tunnel
Buildings, Electrical and Mechanical
Works**

Eighth Monthly EM&A Report

18 February 2019

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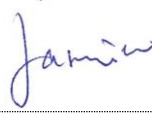


Contract No. HY/2017/10 Tuen Mun – Chek Lap Kok Link – Northern Connection Tunnel Buildings, Electrical and Mechanical Works

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Eighth Monthly EM&A Report

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Client: Gammon		Project No: 0463091			
Summary: This document presents the Eighth Monthly EM&A Report for Tuen Mun – Chek Lap Kok Link – Northern Connection Tunnel Buildings, Electrical and Mechanical Works.		Date: 18 February 2019			
		Approved by: 			
		<i>Mr Craig Reid Partner</i>			
		Certified by: 			
		<i>Dr Jasmine Ng ET Leader</i>			
	Eighth Monthly EM&A Report	CY	JN	CAR	18/1/19
Revision	Description	By	Checked	Approved	Date
<p>This report has been prepared by Environmental Resources Management the trading name of 'ERM Hong-Kong, Limited', with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.</p> <p>We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.</p>		<p>Distribution</p> <p><input type="checkbox"/> Internal</p> <p><input checked="" type="checkbox"/> Public</p> <p><input type="checkbox"/> Confidential</p>			
		 			

Ref.: HYDHZMBEEM00_0_7188L.19

19 February 2019

AECOM
Engineer's Representative's Office
No. 8 Mong Fat Street, Tuen Mun
New Territories, Hong Kong

By Fax (2783 0155) and By Post

Attention: Mr. Desmond Fung

Dear Mr. Fung,

**Re: Agreement No. CE 48/2011 (EP)
Environmental Project Office for the
HZMB Hong Kong Link Road, HZMB Hong Kong Boundary Crossing
Facilities, and Tuen Mun-Chek Lap Kok Link – Investigation**

**Contract No. HY/2017/10 TM-CLKL Northern Connection Tunnel
Buildings, Electrical and Mechanical Works
8th Monthly EM&A Report (January 2019)**

Reference is made to the Monthly Environmental Monitoring and Audit (EM&A) Report (Jan. 2019) (ET's ref.: "0463091_8th Monthly EM&A_2019 0218a.doc") certified by the ET Leader and provided to us via e-mail.

Please be informed that we have no adverse comments on the captioned Report. We write to verify the captioned submission in accordance with Condition 4.4 of EP-354/2009/D.

Thank you for your attention. Please do not hesitate to contact the undersigned or the ENPO Leader Mr. Y. H. Hui should you have any queries.

Yours sincerely,



F. C. Tsang
Independent Environmental Checker
Tuen Mun – Chek Lap Kok Link

c.c. HyD – Mr. Patrick Ng (By Fax: 3188 6614)
HyD – Mr. Tony Pang (By Fax: 3188 6614)
AECOM – Mr. Conrad Ng (By Fax: 3922 9797)
ERM – Dr. Jasmine Ng (By Fax: 2723 5660)
Gammon – Mr. Max Poon (By Fax: 3520 0486)

Internal: DY, YH, DF, ENPO Site

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EXECUTIVE SUMMARY

Under *Contract No. HY/2017/10*, Gammon Construction Limited (GCL) is commissioned by the Highways Department (HyD) to undertake Northern Connection Tunnel Buildings, Electrical and Mechanical Works of the Tuen Mun – Chek Lap Kok Link Project (TM-CLK Link Project) while AECOM Asia Company Limited was appointed by HyD as the Engineer. For implementation of the environmental monitoring and audit (EM&A) programme under the Contract, ERM-Hong Kong, Limited (ERM) has been appointed as the Environmental Team (ET) in accordance with *Environmental Permit No. EP-354/2009/A*. Ramboll Hong Kong Ltd. was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO). Subsequent applications for variation of environmental permits (VEP), *EP-354/2009/B*, *EP-354/2009/C* and *EP-354/2009/D*, were granted on 28 January 2014, 10 December 2014 and 13 March 2015, respectively.

The construction phase of the Project commenced on 7 June 2018 and will tentatively be completed by 2021. The impact monitoring of the EM&A programme, including air quality and environmental site inspections, were commenced on 7 June 2018.

This is the Eighth Monthly EM&A report presenting the EM&A works carried out during the period from 1 to 31 January 2019 for the *Contract No. HY/2017/10 Northern Connection Tunnel Buildings, Electrical and Mechanical Works* (the “Project”) in accordance with the Updated EM&A Manual of the TM-CLK Link Project. As informed by the Contractor, major activities in the reporting period included:

Land-based Works

- Bar bending, timber formwork and concreting and Architectural Builder's Work and Finishes at Toll Control Building;
- Electrical and Mechanical Works at Ventilation Plant Room;
- Electrical and Mechanical Works at North Ventilation Building;
- Building Structure at Administration Building;
- Building Structure at Maintenance Depot;
- Socket H-piling at Fire Services Department Building;
- Socket H-piling at Customs and Excise Department Building; and
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Kiosk N2.

A summary of monitoring and audit activities conducted in the reporting period is listed below ⁽¹⁾:

24-hour TSP Monitoring	10 sessions
1-hour TSP Monitoring	10 sessions
Landfill Gas Hazard Monitoring	6 days
Joint Environmental Site Inspection	4 sessions

Summary of Breaches of Action/Limit Levels

Breaches of Action and Limit Levels for Air Quality

Five (5) Action Level and One (1) Limit Level exceedances for 1-hour TSP were recorded by the Environmental Team of Contract No. HY/2012/08 during the reporting period.

Breaches of Action and Limit Levels for Landfill Gas Hazard Monitoring

No exceedance of Action and Limit Levels was recorded for landfill gas hazard monitoring in the reporting month.

Environmental Complaints, Non-compliance & Summons

There was no environmental complaint, notification of summons or successful prosecution recorded in the reporting period.

Reporting Change

There was no reporting change in the reporting period.

Upcoming Works for the Next Reporting Month

Works to be undertaken in the next monitoring period of February 2019 include the following:

Land-based Works

- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Toll Control Building;
- Electrical and Mechanical Works at Ventilation Plant Room;
- Electrical and Mechanical Works at North Ventilation Building;
- Building Structure at Administration Building;
- Building Structure at Maintenance Depot;

(1) ET justification on the Contract Specific Environmental Monitoring and Audit activities under this Project was submitted to ENPO on 11 September 2018

- Excavation at Fire Services Department Building;
- Excavation at Customs and Excise Department Building; and
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Kiosk N2.

Future Key Issues

Potential environmental impacts arising from the above upcoming construction activities in the next reporting month of February 2019 are mainly associated with dust and waste management issues.

According to the findings of the Northwest New Territories (NWNT) Traffic and Infrastructure Review conducted by the Transport Department, Tuen Mun Road, Ting Kau Bridge, Lantau Link and North Lantau Highway would be operating beyond capacity after 2016. This forecast has been based on the estimated increase in cross boundary traffic, developments in the Northwest New Territories (NWNT), and possible developments in North Lantau, including the Airport developments, the Lantau Logistics Park (LLP) and the Hong Kong – Zhuhai – Macao Bridge (HZMB). In order to cope with the anticipated traffic demand, two new road sections between NWNT and North Lantau – Tuen Mun – Chek Lap Kok Link (TM-CLKL) and Tuen Mun Western Bypass (TMWB) are proposed.

An Environmental Impact Assessment (EIA) of TM-CLKL (the Project) was prepared in accordance with the EIA Study Brief (No. ESB-175/2007) and the *Technical Memorandum of the Environmental Impact Assessment Process (EIAO-TM)*. The EIA Report was submitted under the Environmental Impact Assessment Ordinance (EIAO) in August 2009. Subsequent to the approval of the EIA Report (EIAO Register Number AEIAR-146/2009), an Environmental Permit (EP-354/2009) for TM-CLKL was granted by the Director of Environmental Protection (DEP) on 4 November 2009, and EP variation (VEP) (EP-354/2009/A) was issued on 8 December 2010. Subsequent applications for variation of environmental permits (VEPs), *EP-354/2009/B*, *EP-354/2009/C* and *EP-354/2009/D*, were granted on 28 January 2014, 10 December 2014 and 13 March 2015, respectively.

Under *Contract No. HY/2017/10*, Gammon Construction Limited (GCL) is commissioned by the Highways Department (HyD) to undertake the Northern Connection Tunnel Buildings, Electrical and Mechanical Works of TM-CLKL while AECOM Asia Company Limited was appointed by HyD as the Engineer. For implementation of the environmental monitoring and audit (EM&A) programme under the Contract, ERM-Hong Kong, Limited (ERM) has been appointed as the Environmental Team (ET). Ramboll Hong Kong Ltd. was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO).

The construction phase of the Contract commenced on 7 June 2018 and will be tentatively completed by 2021. The impact monitoring phase of the EM&A programme, including air quality and environmental site inspections, commenced on 7 June 2018.

The general layout plan of the Contract components is presented in *Figures 1.1 & 1.2a to c*.

Project Management Initials: Designer: KATH Checked: SYLC Approved: CWN ISO A1 594mm x 841mm

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AECOM

PROJECT
 TUEN MUN -
 CHEK LAP KOK LINK

CONTRACT TITLE
 TUEN MUN - CHEK LAP KOK LINK
 - NORTHERN CONNECTION TUNNEL
 BUILDINGS, ELECTRICAL AND
 MECHANICAL WORKS

CLIENT

 路政署
 HIGHWAYS DEPARTMENT
 港珠澳大橋香港工程管理有限公司
 Hong Kong - Zhuhai - Macao Bridge
 Hong Kong Project Management Office

CONSULTANT
 AECOM Asia Company Ltd.
 www.aecom.com

SUB-CONSULTANTS

Figure 1.1

ISSUE/REVISION

NO.	DATE	DESCRIPTION	CHK.
A	JAN.18	TENDER ADDENDUM NO.1	SYLC
-	DEC.17	TENDER DRAWING	SYLC

STATUS

SCALE
 A1 1:40000
 DIMENSION UNIT
 MILLIMETRES

KEY PLAN

PROJECT NO. 60240249
 CONTRACT NO. HY/2017/10

SHEET TITLE
 OVERALL SITE PLAN

SHEET NUMBER
 60240249/C4/7051A

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 Project Management Initials: Designer: WATH Chenweid SYLC Approved: CWN ISO A1 194mm x 147mm
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PROJECT
1.3

TUEN MUN - CHEK LAP KOK LINK

CONTRACT TITLE
TUEN MUN - CHEK LAP KOK LINK - NORTHERN CONNECTION TUNNEL BUILDINGS, ELECTRICAL AND MECHANICAL WORKS

CLIENT

HIGHWAYS DEPARTMENT
 路政署
 香港 - 珠海 - 澳門大橋
 Hong Kong - Zhuhai - Macao Bridge
 Hong Kong Project Management Office

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NET ENGINEERING

Figure 1.2a

ISSUE/REVISION

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A	JAN.18	TENDER ADDENDUM NO.1	SYLC
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STATUS

SCALE: 1:2500
DIMENSION UNIT: MILLIMETRES

KEY PLAN

PROJECT NO. 60240249
CONTRACT NO. HY/2017/10

SHEET TITLE
ZONING PLAN (SHEET 1)

SHEET NUMBER
60240249/C4/7061A

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PROJECT
 TUEN MUN - CHEK LAP KOK LINK

CONTRACT TITLE
 TUEN MUN - CHEK LAP KOK LINK - NORTHERN CONNECTION TUNNEL BUILDINGS, ELECTRICAL AND MECHANICAL WORKS

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Figure 1.2b

ISSUE/REVISION

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	DEC.17	TENDER DRAWING	SYLC

STATUS

SCALE 1:2500
 DIMENSION UNIT MILLIMETRES

KEY PLAN

PROJECT NO. 60240249
 CONTRACT NO. HY/2017/10

SHEET TITLE
 ZONING PLAN (SHEET 2)

SHEET NUMBER
 60240249/C4/7062A

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PROJECT
 TUEN MUN - CHEK LAP KOK LINK

CONTRACT TITLE
 TUEN MUN - CHEK LAP KOK LINK - NORTHERN CONNECTION TUNNEL BUILDINGS, ELECTRICAL AND MECHANICAL WORKS

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Figure 1.2c

ISSUE/REVISION

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	DEC. 17	TENDER DRAWING	SYLC

STATUS

SCALE: A1 1:2500
 DIMENSION UNIT: MILLIMETRES

KEY PLAN

PROJECT NO. 60240249
 CONTRACT NO. HY/2017/10

SHEET TITLE
 ZONING PLAN (SHEET 3)

SHEET NUMBER
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1.2 SCOPE OF REPORT

This is the Eighth Monthly EM&A Report under the *Contract No. HY/2017/10 Tuen Mun – Chek Lap Kok Link – Northern Connection Tunnel Buildings, Electrical and Mechanical Works*. This report presents a summary of the environmental monitoring and audit works in January 2019.

1.3 ORGANIZATION STRUCTURE

The organization structure of the Contract is shown in *Appendix A*. The key personnel contact names and contact details are summarized in *Table 1.1* below.

Table 1.1 *Contact Information of Key Personnel*

Party	Position	Name	Telephone	Fax
HyD (Highways Department)	Project Coordinator	Joseph Lee	2762 4958	3188 6614
	Senior Engineer	Cheng Pan	2762 3383	3188 6614
ER (AECOM Asia Company Limited)	Principle Resident Engineer	S. W. Fok	2293 6200	2293 6300
	Resident Engineer	Desmond Fung	2293 6200	2293 6300
ENPO / IEC (Ramboll Hong Kong Ltd.)	ENPO Leader	Y.H. Hui	3465 2850	3465 2899
	IEC	Dr. F.C. Tsang	3465 2851	3465 2899
Contractor (Gammon Construction Limited)	Site Agent	Kenneth Tai	9039 4723	-
	Environmental Officer	Max Poon	9103 6303	-
ET (ERM-HK)	ET Leader	Dr. Jasmine Ng	2271 3311	2723 5660

1.4 SUMMARY OF CONSTRUCTION WORKS

The construction phase of the Contract commenced on 7 June 2018. The three-month rolling construction programme is shown in *Appendix B*.

As informed by the Contractor, details of the major works carried out in this reporting month are listed below:

Land-based Works

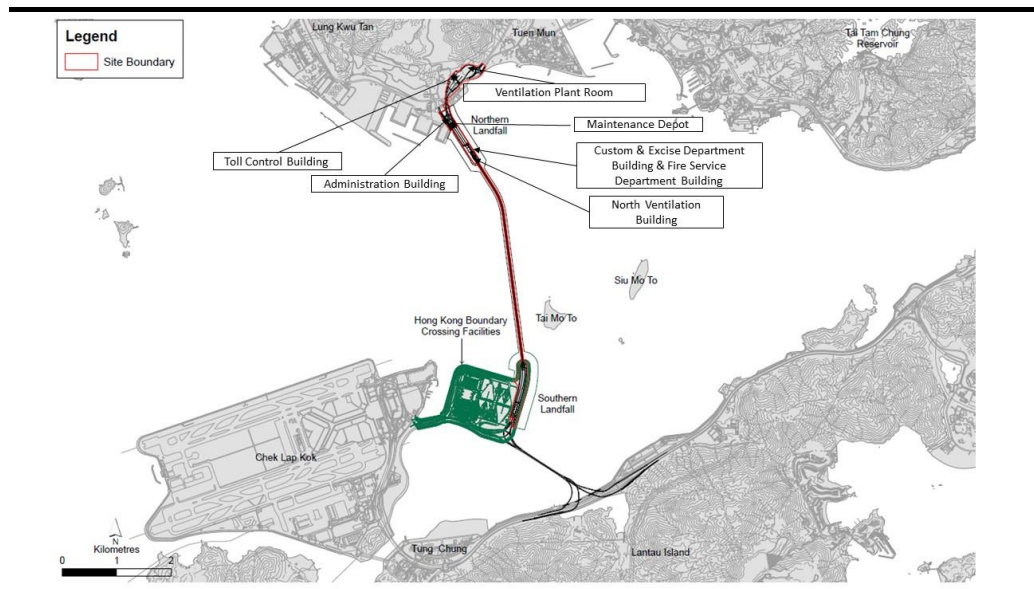
- Bar bending, timber formwork and concreting and Architectural Builder's Work and Finishes at Toll Control Building;
- Electrical and Mechanical Works at Ventilation Plant Room;
- Electrical and Mechanical Works at North Ventilation Building;

- Building Structure at Administration Building;
- Building Structure at Maintenance Depot;
- Socket H-piling at Fire Services Department Building;
- Socket H-piling at Customs and Excise Department Building; and
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Kiosk N2.

The locations of the construction activities are shown in *Figure 1.3*. The Environmental Sensitive Receivers in the vicinity of the Project are shown in *Figure 1.4*.

The implementation schedule of environmental mitigation measures is presented in *Appendix C*.

Figure 1.3 *Locations of Major Construction Activities in the Reporting Month*



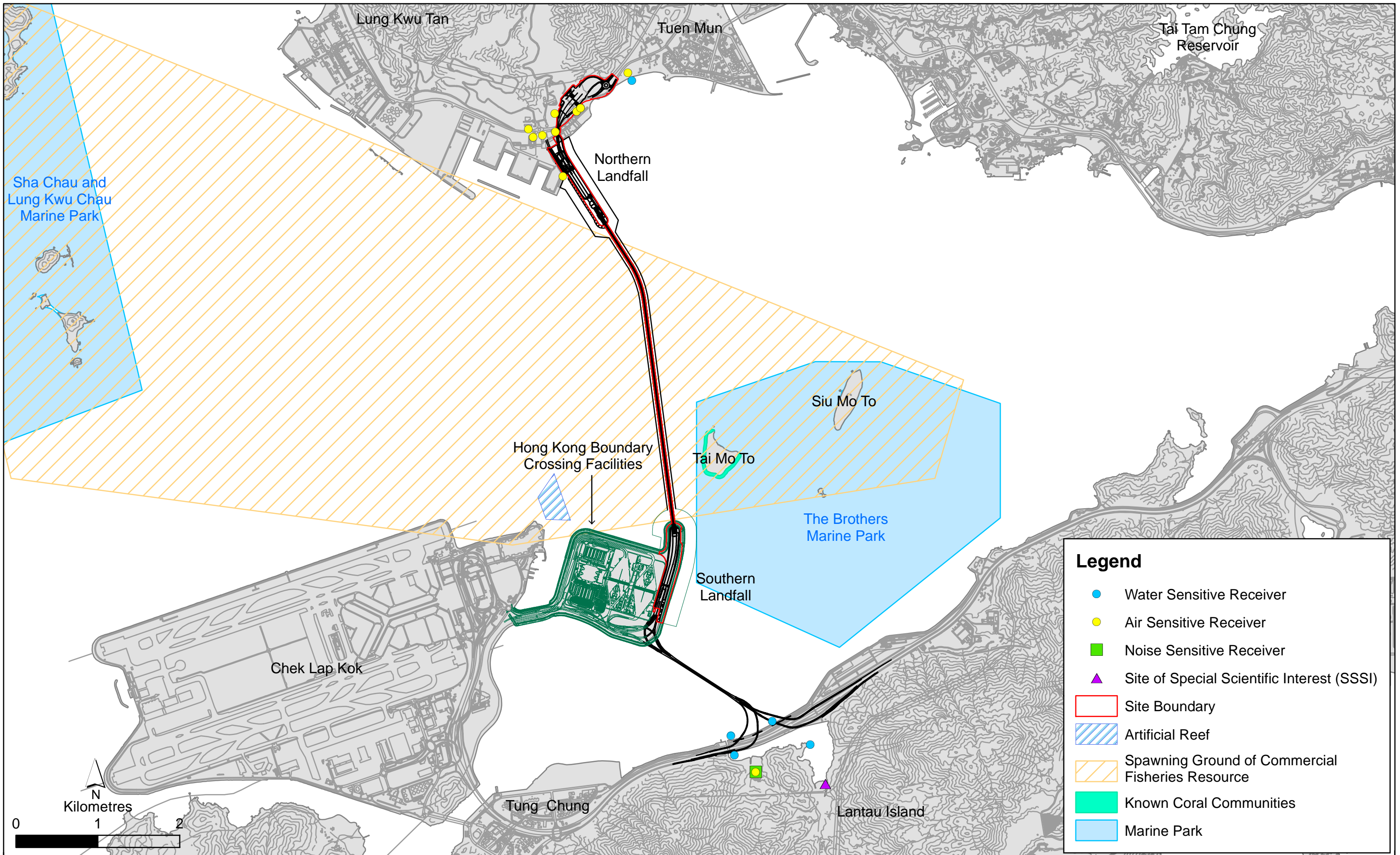


Figure 1.4

Environmental Sensitive Receivers in the Vicinity of the Project

The EM&A programme required environmental monitoring for air quality and environmental site inspections for air quality, water quality and waste management. The EM&A requirements and related findings for each component are summarized in the following sections

2.1 AIR QUALITY

2.1.1 Monitoring Requirements and Equipment

In accordance with the Updated EM&A Manual and the Enhanced TSP Monitoring Plan, impact 1-hour TSP monitoring was conducted three (3) times every six (6) days and impact 24-hour TSP monitoring was carried out once every six (6) days when the highest dust impact was expected. 1-hr and 24-hr TSP monitoring frequency was increased to three times per day every three days and daily every three days, respectively, as excavation works for launching shaft under *Contract No. HY/2012/08 Tuen Mun-Chek Lap Kok Link – Northern Connection Sub-sea Tunnel Section* commenced on 24 October 2014.

Results of air quality monitoring were adopted from the published EM&A data of *Contract No. HY/2012/08 Tuen Mun-Chek Lap Kok Link – Northern Connection Sub-sea Tunnel Section* ⁽¹⁾.

The Action and Limit Levels of the air quality monitoring were adopted from the published EM&A reports of *Contract No. HY/2012/08 Tuen Mun-Chek Lap Kok Link – Northern Connection Sub-sea Tunnel Section* ⁽²⁾. The Action and Limit Levels are provided in *Appendix D*.

The locations of the monitoring stations overlapped with Contract No. HY/2012/08 are shown in *Figure 2.1* and presented in *Table 2.1*.

Table 2.1 *Locations of Impact Air Quality Monitoring Stations and its Corresponding Monitoring Requirements*

Monitoring Station	Monitoring Dates	Location	Description	Parameters & Frequency
ASR1	2, 5, 8, 11, 14, 17, 20, 23, 26 and 29 January 2019	Tuen Mun Fireboat Station	Office	TSP monitoring
ASR5		Pillar Point Fire Station	Office	<ul style="list-style-type: none"> 1-hour Total Suspended Particulates (1-hour TSP, $\mu\text{g}/\text{m}^3$), 3 times in every 6 days 24-hour Total Suspended Particulates (24-hour TSP, $\mu\text{g}/\text{m}^3$), daily for 24-hour in every 6 days
AQMS1		Previous River Trade Golf	Bare ground	Enhanced TSP monitoring

(1) Published EM&A data for impact air quality monitoring by *Contract No. HY/2012/08* are available at: <http://www.hzmbenpo.com/>

(2) Published EM&A reports of *Contract No. HY/2012/08* are available at: <http://www.hzmbenpo.com/>

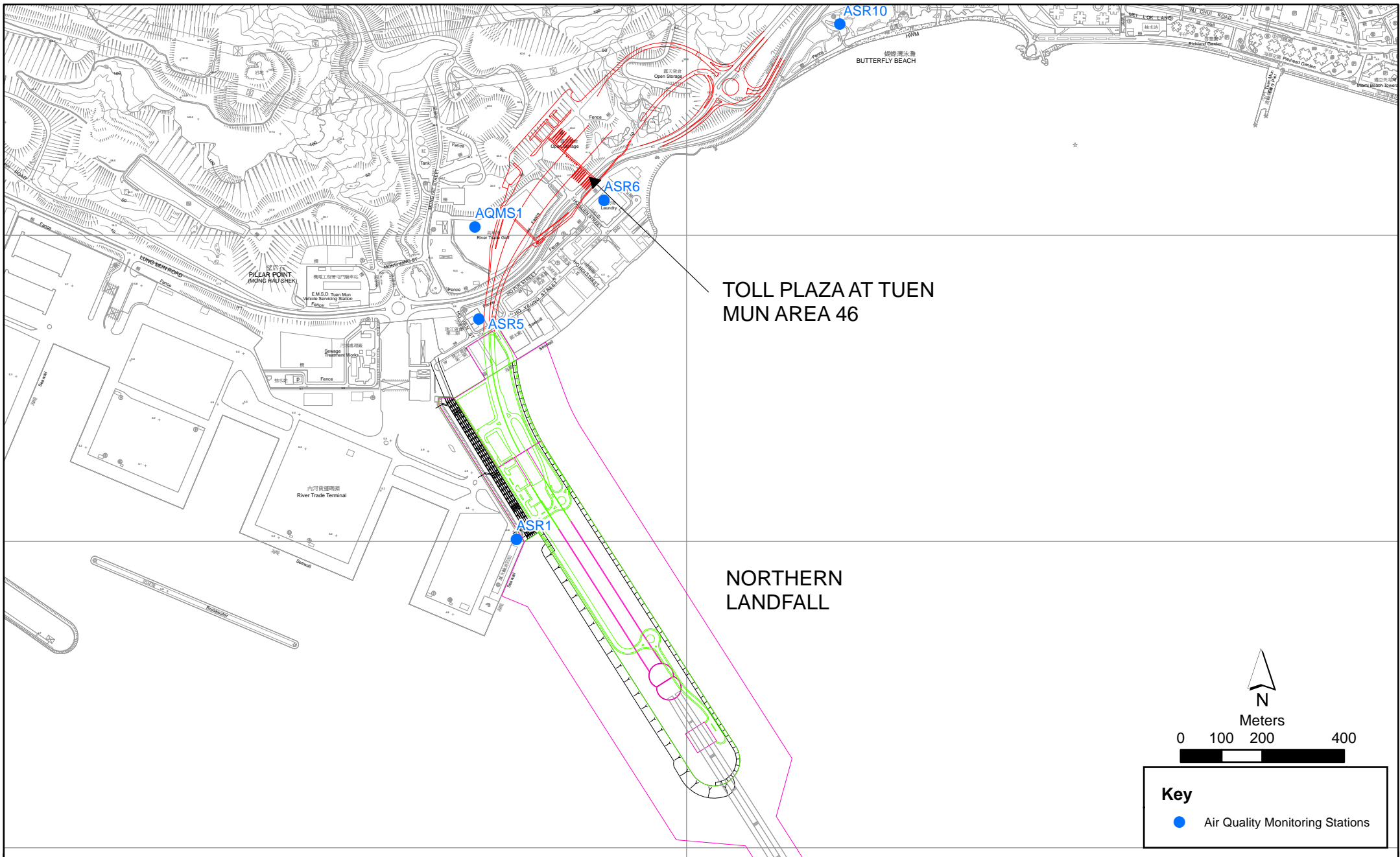


Figure 2.1

Air Quality Monitoring Stations for the Enhanced TSP Monitoring
 (Source: Adopted from Contract No. HY/2012/08 Tuen Mun-Chek Lap Kok Link -
 Northern Connection Sub-sea Tunnel Section)

Key
 ● Air Quality Monitoring Stations

**Environmental
 Resources
 Management**



Monitoring Station	Monitoring Dates	Location	Description	Parameters & Frequency
ASR6		Butterfly Beach Laundry	Office	(commenced on 24 October 2014 under <i>Contract No. HY/2012/08</i>) <ul style="list-style-type: none"> 1-hour Total Suspended Particulates (1-hour TSP, $\mu\text{g}/\text{m}^3$), 3 times in every 3 days
ASR10		Butterfly Beach Park	Recreational uses	<ul style="list-style-type: none"> 24-hour Total Suspended Particulates (24-hour TSP, $\mu\text{g}/\text{m}^3$), daily for 24-hour in every 3 days

2.1.2 *Results and Observations*

Results of air quality monitoring were adopted from the published EM&A data of *Contract No. HY/2012/08 Tuen Mun-Chek Lap Kok Link – Northern Connection Sub-sea Tunnel Section* ⁽¹⁾.

Five (5) Action Level and one (1) Limit Level exceedances for 1-hour TSP on 8, 11, 17 and 26 January 2019 were recorded by the Environmental Team of *Contract No. HY/2012/08* during the reporting period. The exceedances were considered not related to this Contract upon further investigation and the investigation report is presented in *Appendix G*. No action is required to be undertaken in accordance with the Event Action Plan as presented in *Appendix E*.

No exceedance of Action and Limit Levels for 24-hour TSP was recorded in the reporting month.

2.2 *LANDFILL GAS HAZARD MONITORING*

In accordance with the Updated EM&A Manual of the TM-CLK Link Project, landfill gas hazard monitoring should be performed to ensure that the works area at Pillar Point Valley (PPV) Landfill is free of landfill gas during any excavations works. A total of 6 days of landfill gas hazard monitoring was conducted at Toll Control Building prior to the excavation works during 3 to 9 January 2019 (*Appendix F*).

The landfill gas hazard monitoring was conducted in accordance to the Updated EM&A Manual with a Altair 5X Gas Detector. The calibration certificate for the equipment is presented in *Appendix G*.

The Action and Limit Levels of the landfill gas hazard monitoring were adopted from the Undated EM&A Manual of the TM-CLK Link Project and are provided in *Appendix D*.

2.2.1 *Results and Observations*

Results for landfill gas hazard monitoring are summarized in *Table 2.2* and the monitoring data is provided in *Appendix H*.

(1) Published EM&A data for impact air quality monitoring by *Contract No. HY/2012/08* are available at: <http://www.hzmbenpo.com/>

No exceedance of Action and Limit Levels for methane, oxygen and carbon dioxide was recorded in the reporting month.

Table 2.2 *Summary of Landfill Gas Hazard Monitoring Results in the Reporting Period*

	Average (%)	Range (%)	Action / Limit Level (%)
Methane	0	0	10 / 20
Oxygen	20.8	20.7-20.8	19 / 18
Carbon Dioxide	0.08	0.07-0.08	0.5 / 1.5

2.3 EM&A SITE INSPECTION

Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures under the Contract. In the reporting month, four (4) site inspections were carried out on 4, 11, 18 and 25 January 2019.

Key observations and recommendations during the site inspections in this reporting period are summarized in *Table 2.3*.

Table 2.3 *Specific Observations and Recommendations during the Weekly Site Inspection in this Reporting Month*

Inspection Date	Observations	Recommendations/ Remarks
4 January 2019	Fire Services Department Building & Customs and Excise Department Building <ul style="list-style-type: none"> Chemical containers should be placed in drip tray. Unnecessary pipes were observed connected to the Aqua Sed. 	Fire Services Department Building & Customs and Excise Department Building <ul style="list-style-type: none"> The Contractor was reminded to place chemical containers in drip tray. The Contractor was reminded to remove unnecessary pipes connected to the Aqua Sed.
11 January 2019	North Ventilation Building <ul style="list-style-type: none"> Accumulated waste was observed in the waste bin. 	North Ventilation Building <ul style="list-style-type: none"> The Contractor was reminded to clear accumulated refuse in waste bin.
18 January 2019	Fire Services Department Building <ul style="list-style-type: none"> Surface runoff was observed during piling. North Ventilation Building <ul style="list-style-type: none"> Oil leakage was observed under machinery. 	Fire Services Department Building <ul style="list-style-type: none"> The Contractor was reminded to prevent surface runoff during piling. North Ventilation Building <ul style="list-style-type: none"> The Contractor was reminded to provide drip tray under machinery.
25 January 2019	Custom and Excise Department Building <ul style="list-style-type: none"> Accumulated rubbish in the waste skip should be cleared regularly. 	Custom and Excise Department Building <ul style="list-style-type: none"> The Contractor was reminded to clear accumulated rubbish in the waste skip.

The Contractor has rectified all of the observations as identified during environmental site inspections in the reporting month.

2.4 WASTE MANAGEMENT STATUS

The Contractor had submitted application form for registration as chemical waste producer under the Contract. Sufficient numbers of receptacles were available for general refuse collection and sorting.

Wastes generated during this reporting period included mainly construction wastes (inert and non-inert). Reference has been made to the waste flow table prepared by the Contractor (*Appendix I*). The quantities of different types of wastes are summarized in *Table 2.4*.

Table 2.4 Quantities of Different Waste Generated in the Reporting Month

Month/Year	Inert C&D Materials ^(a) (m ³)	Inert Construction Waste Re-used (m ³)	Non-inert Construction Waste ^(b) (kg)	Imported Fill (m ³)	Recyclable Materials ^(c) (kg)	Chemical Wastes (kg)
January 2019	1,939	0	74,680	0	0	0

Notes:

- (a) Inert construction wastes include hard rock and large broken concrete, and materials disposed as public fill.
- (b) Non-inert construction wastes include general refuse disposed at landfill.
- (c) Recyclable materials include metals, paper, cardboard, plastics, timber and others.

The Contractor was advised to properly maintain on site C&D materials and waste collection, sorting and recording system, dispose of C&D materials and wastes at designated ground and maximize reuse/ recycle of C&D materials and wastes. The Contractor was also reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly.

For chemical waste containers, the Contractor was reminded to treat properly and store temporarily in designated chemical waste storage area on site in accordance with the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes*.

2.5 ENVIRONMENTAL LICENSES AND PERMITS

The status of environmental licensing and permit is summarized in *Table 2.5* below.

Table 2.5 Summary of Environmental Licensing and Permit Status

License/ Permit	License or Permit No.	Date of Issue	Date of Expiry	License/ Permit Holder	Remarks
Environmental Permit	EP-354/2009/D	13 March 2015	N/A	HyD	Tuen Mun- Chek Lap Kok Link
APCO Construction Dust Notification	433493	14 May 2018	N/A	GCL	For Tuen Mun working area
Construction Waste Billing Account	7030836	15 May 2018	N/A	GCL	N/A
Chemical Waste Producer Registration	5213-422-G2827-01	13 June 2018	N/A	GCL	N/A
WPCO Licence for Buildings at C2 area	WT00031783-2018	22 October 2018	31 October 2023	GCL	Sampling Frequency: Bimonthly
WPCO Licence for Buildings at C3 area	WT00032062-2018	30 October 2018	31 October 2023	GCL	Sampling Frequency: Quarterly
Construction Noise Permit	GW-RW0560-18	28 December 2018	18 June 2019	GCL	For Toll Control Building, Administration Building, Maintenance Depot and WA18
Construction Noise Permit	GW-RW0037-19	28 January 2019	23 July 2019	GCL	For Toll Control Building, Administration Building, Maintenance Depot and WA18

2.6 *IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES*

In response to the site audit findings, the Contractors carried out all corrective actions.

A summary of the Implementation Schedule of Environmental Mitigation Measures (EMIS) is presented in *Appendix C*. The necessary mitigation measures relevant to this Contract were implemented properly.

The landscape and visual (L&V) mitigation measures were also monitored on weekly basis in the reporting period. The monitoring status is summarized in *Appendix C*.

2.7 *SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT*

Five (5) Action Level and one (1) Limit Level exceedances for 1-hour TSP were recorded by the Environmental Team of Contract No. *HY/2012/08* during the reporting period. The exceedances were considered not related to this Contract upon further investigation and the investigation report is presented in *Appendix J*. No action is required to be undertaken in accordance with the Event Action Plan as presented in *Appendix E*.

No exceedance of 24-hour TSP was recorded in this reporting month.

Cumulative statistics are provided in *Appendix J*.

2.8 *SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS*

The Environmental Complaint Handling Procedure is provided in *Figure 2.2*.

There was no environmental complaint, notification of summons or successful prosecution recorded in the reporting period.

Statistics on complaints, notifications of summons, successful prosecutions are summarized in *Appendix J*.

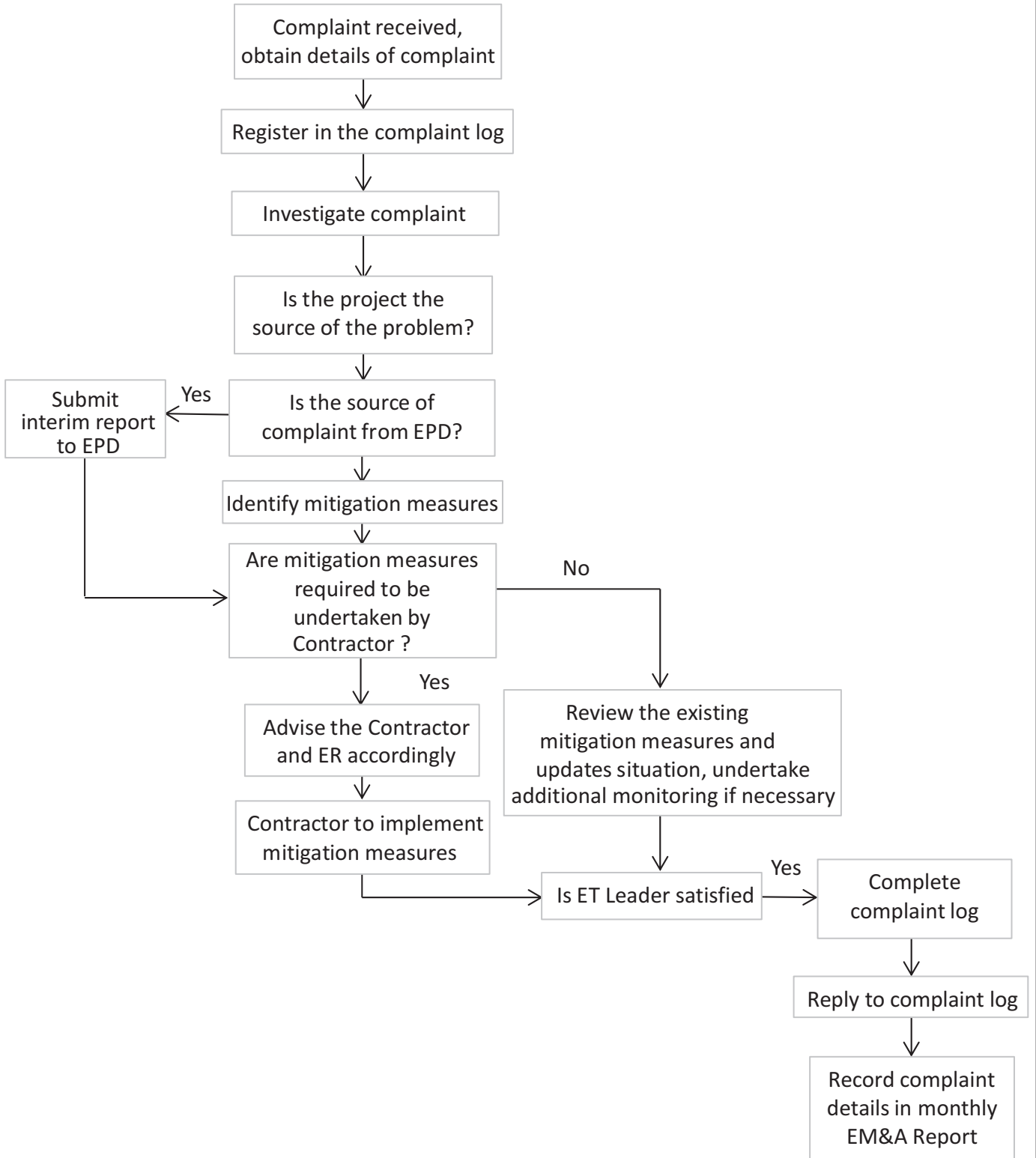


Figure 2.2

Environmental Complaint Handling Procedure

3 *FUTURE KEY ISSUES*

3.1 *CONSTRUCTION ACTIVITIES FOR THE COMING MONTH*

As informed by the Contractor, the major works for the Project in February 2019 will be:

Land-based Works

- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Toll Control Building;
- Electrical and Mechanical Works at Ventilation Plant Room;
- Electrical and Mechanical Works at North Ventilation Building;
- Building Structure at Administration Building;
- Building Structure at Maintenance Depot;
- Excavation at Fire Services Department Building;
- Excavation at Customs and Excise Department Building; and
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Kiosk N2.

3.2 *KEY ISSUES FOR THE COMING MONTH*

Potential environmental impacts arising from the above upcoming construction activities in the next reporting month of February 2019 are mainly associated with dust and waste management issues.

4.1 CONCLUSIONS

This Eighth Monthly EM&A Report presents the findings of the EM&A activities undertaken during the period from 1 to 31 January 2019, in accordance with the Updated EM&A Manual and the requirements of EP-354/2009/D.

Air quality (including 1-hour TSP and 24-hour TSP) was carried out in this reporting month.

Five (5) Action Level and one (1) Limit Level exceedances for 1-hour TSP were recorded by the Environmental Team of Contract No. *HY/2012/08* during the reporting period. The exceedances were considered not related to this Contract upon further investigation and the investigation report is presented in *Appendix G*. No action is required to be undertaken in accordance with the Event Action Plan as presented in *Appendix E*.

No exceedance of Action and Limit Levels for 24-hour TSP was recorded in the reporting month.

No exceedance of Action and Limit Levels was recorded for landfill gas hazard monitoring in the reporting month.

Environmental site inspection was carried out four (4) times in January 2019. Remedial actions recommended for the deficiencies identified during the site audits were properly implemented by the Contractor.

There was no environmental complaint, notification of summons or successful prosecution recorded in the reporting period.

The ET will keep track on the construction works to confirm compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

Appendix A

Project Organization for Environmental Works



↔ Line of Communication

Appendix B

Construction Programme

ID	Activity	Days	Start	Finish	2019																			
					2018				January				February				March				April			
					Dec	31	07	14	21	28	04	11	18	25	04	11	18	25	01	08	15			
Three Monthly Programme 20/01/19 - 20/04/19																								
Contract Dates																								
Key Dates																								
KD04A	KD4A - C&ED & FSD Substructure, Boundary Wall, ELS Removal	0		30-Mar-19*																				
Portion Access Dates																								
P230	Access to Portion X (Day 240)	0	01-Jan-19 A																					
P240	Access to Portion I (Day 329)	0	31-Mar-19																					
Portion Possession Dates																								
P225	Possession to Portion XVa (Day 236)	0	28-Dec-18 A																					
P235	Possession to Portion XVIa (Day 236)	0	28-Dec-18 A																					
Method Statements																								
Maintenance Depot																								
MS1220	ICE & ER Approval of MS for Maintenance Depot (E&M)	12	12-Dec-18 A	28-Dec-18 A																				
Custom & Excise Department Building																								
MS1230	Prepare & Submit MS for C&ED Building (E&M)	24	12-Dec-18 A	12-Jan-19 A																				
MS1240	ICE & ER Approval of MS for C&ED Building (E&M)	12	14-Jan-19 A	26-Jan-19																				
Fire Services Department Building																								
MS1110	Prepare & Submit MS for Fire Services Building (Civil)	24	28-Nov-18 A	28-Dec-18 A																				
MS1120	ICE & ER Approval of MS for Fire Services Building (Civil)	12	29-Dec-18 A	12-Jan-19 A																				
MS1250	Prepare & Submit MS for Fire Services Building (E&M)	24	14-Jan-19 A	13-Feb-19																				
MS1260	ICE & ER Approval of MS for Fire Services Building (E&M)	12	14-Feb-19	27-Feb-19																				
Satellite Control Building																								
MS1130	Prepare & Submit MS for Satellite Control Building (Civil)	24	29-Dec-18 A	26-Jan-19																				
MS1140	ICE & ER Approval of MS for Satellite Control Building (Civil)	12	28-Jan-19	13-Feb-19																				
MS1270	Prepare & Submit MS for Satellite Control Building (E&M)	24	14-Feb-19	13-Mar-19																				
MS1280	ICE & ER Approval of MS for Satellite Control Building (E&M)	12	14-Mar-19	27-Mar-19																				
E&M Design																								
Section A - Tunnel Ventilation System																								
A025	Tunnel Ventilation Fan Pressure Calculations - Approval	28	28-Nov-18 A	25-Dec-18 A																				
A030	Acoustic Calculations	60	28-Nov-18 A	26-Jan-19																				
A035	Acoustic Calculations - Approval	28	27-Jan-19	23-Feb-19																				

THREE MONTHLY ROLLING PROGRAMME

HY/2017/10 TM-CLKL - Northern Connection Tunnel Buildings, Electrical and Mechanical Works

20/01/19 - 20/04/19

P1

Date	Revision	Checked	Approved
20-Jan-			

ID	Activity	Days	Start	Finish	2018	2019																	
					er	January			February			March			April								
					7	24	31	07	14	21	28	04	11	18	25	04	11	18	25	01	08	15	
A070	Design Proposal of Power Loading Assessment of TVS	60	02-Dec-18 A	30-Jan-19																			
A075	Design Proposal of Power Loading Assessment of TVS - Approval	28	31-Jan-19	27-Feb-19																			
A100	TVS -Cable Sizing and Voltage Drop for TVFs	60	18-Dec-18 A	15-Feb-19																			
A105	TVS -Cable Sizing and Voltage Drop for TVFs - Approval	28	16-Feb-19	15-Mar-19																			
A110	TVS -Structural Calculation -Fan Support	60	15-Jan-19 A	15-Mar-19																			
A115	TVS -Structural Calculation -Fan Support - Approval	28	16-Mar-19	12-Apr-19																			
A120	TVS -Structural Calculation -Duct Support	60	15-Jan-19 A	15-Mar-19																			
A125	TVS -Structural Calculation -Duct Support - Approval	28	16-Mar-19	12-Apr-19																			
A130	TVS -Structural Calculation -Ceiling Mounted Fan Supports	60	15-Jan-19 A	15-Mar-19																			
A135	TVS -Structural Calculation -Ceiling Mounted Fan Supports - Approval	28	16-Mar-19	12-Apr-19																			
A140	TVS -Structural Calculation -Vertical Fan Supports	60	15-Jan-19 A	15-Mar-19																			
A145	TVS -Structural Calculation -Vertical Fan Supports - Approval	28	16-Mar-19	12-Apr-19																			
A150	TVS -Structural Calculation -Horizontal Air Duct Supports	60	15-Jan-19 A	15-Mar-19																			
A155	TVS -Structural Calculation -Horizontal Air Duct Supports - Approval	28	16-Mar-19	12-Apr-19																			
A165	Tunnel Cable Sizing and Voltage Drop Verification - Approval	30	05-Dec-18 A	03-Jan-19 A																			
A170	Tunnel Cable Containment Calculation	60	03-Nov-18 A	01-Jan-19 A																			
A175	Tunnel Cable Containment Calculation - Approval	30	02-Jan-19 A	31-Jan-19																			
Section B - Tunnel Lighting and Road Lighting System																							
B055	Design Proposal of Road / Street Lighting System - Approval	30	26-Nov-18 A	25-Dec-18 A																			
B060	Road Lighting Lux Calculation	60	17-Nov-18 A	15-Jan-19 A																			
B065	Road Lighting Lux Calculation - Approval	30	16-Jan-19 A	14-Feb-19																			
Section C - Building Services of MVAC System																							
TCB																							
C035	TCB -Pump head calculation - Approval	28	02-Dec-18 A	29-Dec-18 A																			
C065	TCB -Acoustic Performance Calculation - Approval	28	29-Nov-18 A	26-Dec-18 A																			
ADB																							
C120	ADB -Acoustic Performance Calculation	60	08-Nov-18 A	06-Jan-19 A																			
C125	ADB -Acoustic Performance Calculation - Approval	28	07-Jan-19 A	03-Feb-19																			
NVB																							
C150	NVB -Fan Static Pressure Calculation	60	25-Oct-18 A	23-Dec-18 A																			
C155	NVB -Fan Static Pressure Calculation - Approval	28	24-Dec-18 A	20-Jan-19																			

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Date	Revision	Checked	Approved
20-Jan-			

ID	Activity	Days	Start	Finish	2019																				
					2018			January					February					March				April			
					Dec	Jan	Feb	07	14	21	28	04	11	18	25	04	11	18	25	01	08	15			
F080	ADB - Pump Head Calculation	60	09-Nov-18 A	07-Jan-19 A	7	24	31	07	14	21	28	04	11	18	25	04	11	18	25	01	08	15			
F085	ADB - Pump Head Calculation - Approval	30	08-Jan-19 A	06-Feb-19				07	14	21	28	04	11	18	25	04	11	18	25	01	08	15			
F090	ADB - Pressure Vessel Calculation	60	09-Nov-18 A	07-Jan-19 A	7	24	31	07	14	21	28	04	11	18	25	04	11	18	25	01	08	15			
F095	ADB - Pressure Vessel Calculation - Approval	30	08-Jan-19 A	06-Feb-19				07	14	21	28	04	11	18	25	04	11	18	25	01	08	15			
F105	ADB - Rainwater Analysis and Pipe Work Calculation - Approval	30	06-Dec-18 A	04-Jan-19 A	7	24	31	07	14	21	28	04	11	18	25	04	11	18	25	01	08	15			
F135	ADB - Drainage Sump Pumps and Pump Pits Calculation - Approval	30	17-Dec-18 A	15-Jan-19 A	7	24	31	07	14	21	28	04	11	18	25	04	11	18	25	01	08	15			
NVB																									
F145	NVB - Pump Head Calculation - Approval	30	17-Dec-18 A	15-Jan-19 A	7	24	31	07	14	21	28	04	11	18	25	04	11	18	25	01	08	15			
F155	NVB - Pressure Vessel Calculation - Approval	30	17-Dec-18 A	15-Jan-19 A	7	24	31	07	14	21	28	04	11	18	25	04	11	18	25	01	08	15			
SVB																									
F220	SVB - Hydraulic Analysis of Waste Water Systems	60	17-Apr-19*	15-Jun-19																					
CEDB																									
F230	CEDB - Pump Head Calculation	60	27-Mar-19*	25-May-19																					
F240	CEDB - Pressure Vessel Calculation	60	27-Mar-19*	25-May-19																					
F250	CEDB - Rainwater Analysis and Pipe Work Calculation	60	22-Feb-19*	22-Apr-19																					
F260	CEDB - Hydraulic Analysis of Waste Water Systems	60	24-Dec-18 A	21-Feb-19	7	24	31	07	14	21	28	04	11	18	25	04	11	18	25	01	08	15			
F265	CEDB - Hydraulic Analysis of Waste Water Systems - Approval	30	22-Feb-19	23-Mar-19																					
FSDB																									
F270	FSDB - Pump Head Calculation	60	28-Mar-19*	26-May-19																					
F280	FSDB - Pressure Vessel Calculation	60	28-Mar-19*	26-May-19																					
F290	FSDB - Rainwater Analysis and Pipe Work Calculation	60	22-Feb-19*	22-Apr-19																					
F300	FSDB - Hydraulic Analysis of Waste Water Systems	60	24-Dec-18 A	21-Feb-19	7	24	31	07	14	21	28	04	11	18	25	04	11	18	25	01	08	15			
F305	FSDB - Hydraulic Analysis of Waste Water Systems - Approval	30	22-Feb-19	23-Mar-19																					
MD																									
F310	MD - Drainage Sump Pumps and Pump Pits Calculation	60	19-Dec-18 A	16-Feb-19	7	24	31	07	14	21	28	04	11	18	25	04	11	18	25	01	08	15			
F315	MD - Drainage Sump Pumps and Pump Pits Calculation - Approval	30	17-Feb-19	18-Mar-19																					
F320	MD - Pump Head Calculation	60	19-Dec-18 A	16-Feb-19	7	24	31	07	14	21	28	04	11	18	25	04	11	18	25	01	08	15			
F325	MD - Pump Head Calculation - Approval	30	17-Feb-19	18-Mar-19																					
F330	MD - Pressure Vessel Calculation	60	19-Dec-18 A	16-Feb-19	7	24	31	07	14	21	28	04	11	18	25	04	11	18	25	01	08	15			
F335	MD - Pressure Vessel Calculation - Approval	30	17-Feb-19	18-Mar-19																					
F340	MD - Rainwater Analysis and Pipe Work Calculation	60	09-Nov-18 A	07-Jan-19 A	7	24	31	07	14	21	28	04	11	18	25	04	11	18	25	01	08	15			

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20/01/19 - 20/04/19

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Date	Revision	Checked	Approved
20-Jan-			

ID	Activity	Days	Start	Finish	2018	2019															
					er	January				February				March				April			
					7	24	31	07	14	21	28	04	11	18	25	04	11	18	25	01	08
VU180	Dampers installation in Ventilation Duct	24	21-Feb-19	20-Mar-19																	
Key Date 2 - Administration Building, Maintenance Depot, Kiosk N2, TCSS Provision																					
Administration Building (ADB)																					
Building Structure																					
ADB170	Foundation and Backfill	14	28-Dec-18 A	14-Feb-19																	
ADB180	Ground Floor	14	31-Jan-19	19-Feb-19																	
ADB190	First Floor	21	20-Feb-19	15-Mar-19																	
ADB200	Roof Slab	28	16-Mar-19	18-Apr-19																	
Provision for TCSS Installation																					
ADB230	Blockwork Walls and Plaster	70	30-Mar-19	26-Jun-19																	
Maintenance Depot																					
Depot Structure																					
MD155	Foundation and Backfill	14	15-Jan-19 A	31-Jan-19																	
MD160	Ground Floor	14	14-Jan-19 A	20-Feb-19																	
MD170	Roof Slab	24	21-Feb-19	20-Mar-19																	
MD180	Top Roof	18	21-Mar-19	11-Apr-19																	
Provision for TCSS Installation																					
MD190	Blockwork Walls and Plaster	60	12-Apr-19	26-Jun-19																	
Kiosk N2																					
N2-130	ABWF Works to enable TCSS installation	18	20-Dec-18 A	14-Jan-19 A																	
N2-140	E&M Works to enable TCSS installation	18	21-Jan-19	13-Feb-19																	
Key Date 6 - E&M Works for Administration Building, Maintenance Depot, North Vent Building, Kiosk N2																					
E&M Works for Administration Building (Structure Completed under KD2)																					
EADB11	ADB First Floor Completed with Scaffolding Removed	0		29-Mar-19																	
EADB12	ABWF Works	133	30-Mar-19	09-Sep-19																	
EADB13	E&M Installation	133	11-Apr-19	20-Sep-19																	
E&M Works for Maintenance Depot (Structure Completed under KD2)																					
EMD110	Maintenance Depot Structure Completed	0		11-Apr-19																	
EMD120	ABWF Works	104	12-Apr-19	17-Aug-19																	
E&M Works for North Ventilation Building																					
E&M Works																					

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Date	Revision	Checked	Approved
20-Jan-			

ID	Activity	Days	Start	Finish	2019																			
					2018				January				February				March				April			
					Dec	Jan	Feb	Mar	07	14	21	28	04	11	18	25	04	11	18	25	01	08	15	
ENVB1:	E&M Installation - G/F	150	01-Nov-18 A	08-May-19	[Blue bar]				[Green bar]															
ENVB1:	E&M Installation - 1/F	150	03-Dec-18 A	10-Jun-19	[Blue bar]				[Green bar]															
ENVB1:	E&M Installation - B2/F	150	22-Dec-18 A	12-Jul-19	[Blue bar]				[Green bar]															
ENVB1:	E&M Installation - B1/F	150	28-Jan-19	01-Aug-19	[Blue bar]				[Green bar]															
ENVB1:	E&M Installation - 2/F	150	04-Mar-19	02-Sep-19	[Blue bar]				[Green bar]															
ENVB1:	TVF Installation	68	09-Jan-19 A	01-Apr-19	[Blue bar]				[Green bar]															
Power On and Statutory Inspections (except FSD)																								
ENVB2:	Liaison with CLP	12	20-Dec-18 A	07-Jan-19 A	[Blue bar]																			
ENVB2:	E&M Installation in Transformer Room	24	08-Jan-19 A	04-Feb-19	[Blue bar]				[Green bar]															
ENVB2:	CLP Installation Works	82	08-Feb-19	20-May-19	[Blue bar]				[Green bar]															
Remaining E&M Works for Kiosk N2 (Structure Completed under KD2)																								
EN2120	ABWF Works (Door, windows, tiles)	30	20-Dec-18 A	28-Jan-19	[Blue bar]				[Green bar]															
EN2130	E&M Works	30	29-Jan-19	07-Mar-19	[Blue bar]				[Green bar]															
EN2140	Testing & Commissioning	12	08-Mar-19	21-Mar-19	[Blue bar]				[Green bar]															
Key Date 5 - E&M Works for TCB, Toll Area, Kiosk N1, Underpass, Plant Rm, and Approach Roads																								
E&M Works for TCB																								
ETCB12	Remaining Blockwork Walls	12	18-Dec-18 A	04-Jan-19 A	[Blue bar]																			
ETCB12	Remaining Plaster	12	05-Jan-19 A	18-Jan-19 A	[Blue bar]																			
ETCB13	Remaining ABWF Works	210	05-Jan-19 A	19-Sep-19	[Blue bar]				[Green bar]															
ETCB14	Remaining E&M Installations	210	06-Mar-19	16-Nov-19	[Blue bar]				[Green bar]															
Power On and Statutory Inspections (except FSD)																								
ETCB1:	Liaison with CLP	12	20-Dec-18 A	07-Jan-19 A	[Blue bar]																			
ETCB1:	E&M Installation in Transformer Room - 1st Fix	12	08-Jan-19 A	21-Jan-19	[Blue bar]																			
ETCB1:	E&M Installation in Transformer Room - 2nd Fix	12	22-Jan-19	04-Feb-19	[Blue bar]				[Green bar]															
ETCB2:	CLP Installation Works	82	08-Feb-19	20-May-19	[Blue bar]				[Green bar]															
Kiosk N1																								
EN131	Trim Formation	2	20-Dec-18 A	21-Dec-18 A	[Blue bar]																			
EN132	Cast Concrete Base	6	22-Dec-18 A	02-Jan-19 A	[Blue bar]																			
EN133	Steel Structure - Columns	11	03-Jan-19 A	15-Jan-19 A	[Blue bar]																			
EN134	Steel Structure - Roof	11	16-Jan-19 A	28-Jan-19	[Blue bar]				[Green bar]															
EN135	Steel Structure - Panels	12	29-Jan-19	14-Feb-19	[Blue bar]				[Green bar]															

THREE MONTHLY ROLLING PROGRAMME

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20-Jan-			

Appendix C

Environmental Mitigation and Enhancement Measure Implementation Schedules

(In reference to CINOTECH (2011) Agreement No.
CE35/2011 EP Baseline Environmental Monitoring for
Hong Kong-Zhuhai-Macao Bridge Tuen Mun-Chek Lap
Kok Link - Investigation. Updated EM&A Manual for
Tuen Mun-Chek Lap Kok Link)

Contract No. HY/2017/10
Tuen Mun – Chek Lap Kok Link
Northern Connection Tunnel Buildings, Electrical and Mechanical Works
Environmental Mitigation and Enhancement Measure Implementation Schedule

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
Air Quality									
4.8.1	3.8	Watering of the construction sites in Lantau for 8 times/day and in Tuen Mun for 12 times/day to reduce dust emissions by 87.5% and 91.7% respectively and shall be undertaken.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	The Contractor shall, to the satisfaction of the Engineer, install effective dust suppression measures and take such other measures as may be necessary to ensure that at the Site boundary and any nearby sensitive receiver, dust levels are kept to acceptable levels.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	The Contractor shall not burn debris or other materials on the works areas.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	In hot, dry or windy weather, the watering programme shall maintain all exposed road surfaces and dust sources wet.	All unpaved haul roads / throughout construction period in hot, dry or windy weather	Contractor	TMEIA Avoid smoke impacts and disturbance		Y		✓
4.8.1	3.8	Where breaking of oversize rock/concrete is required, watering shall be implemented to control dust. Water spray shall be used during the handling of fill material at the site and at active cuts, excavation and fill sites where dust is likely to be created.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	Open dropping heights for excavated materials shall be controlled to a maximum height of 2m to minimise the fugitive dust arising from unloading.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	During transportation by truck, materials shall not be loaded to a level higher than the side and tail boards, and shall be dampened or covered before transport.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	Materials having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin. The tarpaulin shall be properly secured and shall extend at least 300mm over the edges of the side and tail boards.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	No earth, mud, debris, dust and the like shall be deposited on public roads. Wheel washing facility shall be usable prior to any earthworks excavation activity on the site.	All site exits / throughout construction period	Contractor	TMEIA Avoid dust		Y		✓
4.8.1	3.8	Areas of exposed soil shall be minimised to areas in which works have been completed shall be restored as soon as is practicable.	All exposed surfaces / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	All stockpiles of aggregate or spoil shall be enclosed or covered and water applied in dry or windy condition.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.11	Section 3	EM&A in the form of 1 hour and 24 hour dust monitoring and site audit.	All representative existing ASRs / throughout construction period	Contractor	EM&A Manual		Y		n/a (Results adopted from published EM&A data of Contract No.

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Contract No. HY/2017/10
Tuen Mun – Chek Lap Kok Link
Northern Connection Tunnel Buildings, Electrical and Mechanical Works
Environmental Mitigation and Enhancement Measure Implementation Schedule

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
									HY/2012/08)
WATER QUALITY (LAND WORKS)									
6.10	-	Wastewater from temporary site facilities should be controlled to prevent direct discharge to surface or marine waters.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Sewage effluent and discharges from on- site kitchen facilities shall be directed to Government sewer in accordance with the requirements of the WPCO or collected for disposal offsite. The use of soakaways shall be avoided.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Storm drainage shall be directed to storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins. Channels, earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Silt removal facilities, channels and manholes shall be maintained and any deposited silt and grit shall be removed regularly, including specifically at the onset of and after each rainstorm.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Temporary access roads should be surfaced with crushed stone or gravel.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Measures should be taken to prevent the washout of construction materials, soil, silt or debris into any drainage system.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Open stockpiles of construction materials (e.g. aggregates and sand) on site should be covered with tarpaulin or similar fabric during rainstorms.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	5.8	Manholes (including any newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Discharges of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	All vehicles and plant should be cleaned before they leave the construction site to ensure that no earth, mud or debris is deposited by them on roads. A wheel washing bay should be provided at every site exit.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
6.10	-	Wheel wash overflow shall be directed to silt removal facilities before being discharged to the storm drain.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Section of construction road between the wheel washing bay and the public road should be surfaced with crushed stone or coarse gravel.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Wastewater generated from concreting, plastering, internal decoration, cleaning work and other similar activities, shall be screened to remove large objects.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Vehicle and plant servicing areas, vehicle wash bays and lubrication facilities shall be located under roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor in accordance with the requirements of the WPCO or collected for off site disposal.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		N/A
6.10	-	The Contractor shall prepare an oil / chemical cleanup plan and ensure that leakages or spillages are contained and cleaned up immediately.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Waste oil should be collected and stored for recycling or disposal, in accordance with the Waste Disposal Ordinance.	All areas/ throughout construction period	Contractor	TM-EIAO Waste Disposal Ordinance		Y		✓
6.10	-	All fuel tanks and chemical storage areas should be provided with locks and be sited on sealed areas. The storage areas should be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Surface run-off from bunded areas should pass through oil/grease traps prior to discharge to the stormwater system.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		<>
6.10	-	Roadside gullies to trap silt and grit shall be provided prior to discharging the stormwater into the marine environment. The sumps will be maintained and cleaned at regular intervals.	Roadside/design and operation	Design Consultant/ Contractor	TM-EIAO	Y		Y	✓
6.10	Section 11	All construction works shall be subject to routine audit to ensure implementation of all EIA recommendations and good working practice.	All areas/ throughout construction period	Contractor	EM&A Manual		Y		✓
WASTE									
12.6		The Contractor shall identify a coordinator for the management of waste.	Contract mobilisation	Contractor	TMEIA		Y		✓
12.6		The Contractor shall prepare and implement a Waste Management Plan which specifies procedures such as a ticketing system, to facilitate tracking of loads and to ensure that illegal disposal of wastes does not occur, and protocols for the maintenance of records of the quantities of wastes generated, recycled and disposed. A recording system for the amount of waste generated, recycled and disposed (locations) should be established.	Contract mobilisation	Contractor	TMEIA, Works Branch Technical Circular No. 5/99 for the Trip-ticket System for Disposal of Construction and Demolition Material		Y		✓

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
12.6		The Contractor shall apply for and obtain the appropriate licenses for the disposal of public fill, chemical waste and effluent discharges.	Contract mobilisation	Contractor	TMEIA, Land (Miscellaneous Provisions) Ordinance (Cap 28); Waste Disposal Ordinance (Cap 354); Dumping at Sea Ordinance (Cap 466); Water Pollution Control Ordinance.		Y		✓
12.6	8.1	Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures including waste reduction, reuse and recycling.	Contract Mobilisation	Contractor	TMEIA		Y		✓
12.6	8.1	The extent of cutting operation should be optimised where possible. Earth retaining structures and bored pile walls should be proposed to minimise the extent of cutting.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	The site and surroundings shall be kept tidy and litter free.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	No waste shall be burnt on site.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	The Contractor shall be prohibited from disposing of C&D materials at any sensitive locations. The Contractor should propose the final disposal sites in the EMP and WMP for approval before implementation.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Stockpiled material shall be covered by tarpaulin and /or watered as appropriate to prevent windblown dust/ surface run off.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Excavated material in trucks shall be covered by tarpaulins to reduce the potential for spillage and dust generation.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Wheel washing facilities shall be used by all trucks leaving the site to prevent transfer of mud onto public roads.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Standard formwork or pre-fabrication should be used as far as practicable so as to minimise the C&D materials arising. The use of more durable formwork/plastic facing for construction works should be considered. The use of wooden hoardings should be avoided and metal hoarding should be used to facilitate recycling. Purchasing of construction materials should avoid over-ordering and wastage.	All areas / throughout construction period	Contractor	TMEIA		Y		✓

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
12.6	8.1	The Contractor should recycle as many C&D materials (this is a waste section) as possible on-site. The public fill and C&D waste should be segregated and stored in separate containers or skips to facilitate the reuse or recycling of materials and proper disposal. Where practicable, the concrete and masonry should be crushed and used as fill materials. Steel reinforcement bar should be collected for use by scrap steel mills. Different areas of the sites should be considered for segregation and storage activities.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	All falsework will be steel instead of wood.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Chemical waste producers should register with the EPD. Chemical waste should be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes as follows: <i>f</i> suitable for the substance to be held, resistant to corrosion, maintained in good conditions and securely closed; <i>f</i> Having a capacity of <450L unless the specifications have been approved by the EPD; and <i>w</i> Chinese according to the instructions prescribed in Schedule 2 of the Regulations. <i>f</i> Clearly labelled and used solely for the storage of chemical wastes; <i>f</i> Enclosed with at least 3 sides; <i>f</i> Impermeable floor and bund with capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in the area, whichever is greatest; <i>f</i> Adequate ventilation; <i>f</i> Sufficiently covered to prevent rainfall entering (water collected within the bund must be tested and disposed of as chemical waste, if necessary); and <i>f</i> Incompatible materials are adequately separated.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Waste oils, chemicals or solvents shall not be disposed of to drain,	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Adequate numbers of portable toilets should be provided for on-site workers. Portable toilets should be maintained in reasonable states, which will not deter the workers from utilising them.	All areas / throughout construction period	Contractor	TMEIA		Y		✓

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
12.6	8.1	Night soil should be regularly collected by licensed collectors.	All areas / throughout construction period	Contractor	TMEIA		Y		N/A
12.6	8.1	General refuse arising on-site should be stored in enclosed bins or compaction units separately from C&D and chemical wastes. Sufficient dustbins shall be provided for storage of waste as required under the Public Cleansing and Prevention of Nuisances By-laws. In addition, general refuse shall be cleared daily and shall be disposed of to the nearest licensed landfill or refuse transfer station. Burning of refuse on construction sites is prohibited.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	All waste containers shall be in a secure area on hardstanding;	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Office wastes can be reduced by recycling of paper if such volume is sufficiently large to warrant collection. Participation in a local collection scheme by the Contractor should be advocated. Waste separation facilities for paper, aluminium cans, plastic bottles, etc should be provided on-site.	Site Offices/ throughout construction period	Contractor	TMEIA		Y		✓
12.6	Section 8	EM&A of waste handling, storage, transportation, disposal procedures and documentation through the site audit programme shall be undertaken.	All areas / throughout construction period	Contractor	EM&A Manual		Y		✓
LANDSCAPE AND VISUAL									
10.9	7.6	Existing trees on boundary of the Project Area shall be carefully protected during construction. Detailed Tree Protection Specification shall be provided in the Contract Specification. Under this specification, the Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in contractor's works areas (Tree protection measures will be detailed at Tree Removal Application Stage) (CM1)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
10.9	7.6	Trees unavoidably affected by the works shall be transplanted where practical. Trees will be transplanted straight to their final receptor site and not held in a temporary nursery. A detailed Tree Transplanting Specification shall be provided in the Contract Specification. Sufficient time for necessary tree root and crown preparation periods shall be allowed in the project programme (CM2)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Hillside and roadside screen planting to proposed roads, associated structures and slope works (CM3)	All areas/detailed design/ during construction/post construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Hydroseeding or sheeting of soil stockpiles with visually unobtrusive material (in earth tone) (CM4)	All areas/detailed design/ during construction/post construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Screening of construction works by hoardings around works area in visually unobtrusive colours, to screen works (CM5)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Control night-time lighting and glare by hooding all lights (CM6)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Ensure no run-off into water body adjacent to the Project Area (CM7)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Avoidance of excessive height and bulk of buildings and structures (CM8)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Recycle/ Reuse all felled trees and vegetation, e.g. mulching (CM9)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Compensatory tree planting shall be provided to the satisfaction of relevant Government departments. Required numbers and locations of compensatory trees shall be determined and agreed separately with Government during the Tree Felling Application process under ETWBTC 3/2006 (CM10)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Re-vegetation of affected woodland/shrubland with native species (OM1)	All areas/detailed design/ during construction/ during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	n/a. To be implemented by AFCD/HyD/L CSD
10.9	7.6	Tall buffer screen tree / shrub / climber planting should be incorporated to soften hard engineering structures and facilities (OM2)	All areas/detailed design/ during construction/ during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	n/a. To be implemented by AFCD/HyD/L CSD
10.9	7.6	Streetscape elements (e.g. paving, signage, street furniture, lighting etc.) shall be sensitively designed in a manner that responds to the local context, and minimises potential negative landscape and visual impacts. Lighting units should be directional and minimise unnecessary light spill (OM3)	All areas/detailed design/ during construction / during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	n/a. To be implemented by HyD/LCSD

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
10.9	7.6	Structure, ornamental tree / shrub / climber planting should be provided along roadside amenity strips, central dividers and newly formed slopes to enhance the townscape quality and further greenery enhancement (OM4)	All areas/detailed design/ during construction / during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	n/a. To be implemented by HyD/LCSD
10.9	7.6	Aesthetically pleasing design (visually unobtrusive and non-reflective) as regard to the form, material and finishes	All areas/detailed design/ during construction / during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	n/a. To be implemented by HyD

*** Remarks:**

- ✓ Compliance of Mitigation Measures
- <> Compliance of Mitigation but need improvement
- x Non-compliance of Mitigation Measures
- ▲ Non-compliance of Mitigation Measures but rectified by Contractor
- Δ Deficiency of Mitigation Measures but rectified by Contractor
- N/A Not Applicable in Reporting Period

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Appendix D

Summary of Action and Limit Levels

Table D1 *Action and Limit Levels for 1-hour and 24-hour TSP*

Parameters	Action	Limit
24 Hour TSP Level in $\mu\text{g}/\text{m}^3$	ASR1 = 213 ASR5 = 238 AQMS1 = 213 ASR6 = 238 ASR10 = 214	260
1 Hour TSP Level in $\mu\text{g}/\text{m}^3$	ASR1 = 331 ASR5 = 340 AQMS1 = 335 ASR6 = 338 ASR10 = 337	500

Table D2 *Actions in the Event of Landfill Gas being Detected in Excavation / Confined Area*

Parameter	Measurement	Action
Oxygen	< 19%	- Ventilate to restore oxygen to > 19%
	< 18%	- Stop work - Evacuate personnel / prohibit entry - Increase ventilation to restore to > 19%
Methane	> 10% LEL (> 0.5% v/v)	- Prohibit hot work - Ventilate to restore methane to < 10% LEL
	> 20% LEL (>1% v/v)	- Stop work - Evacuate personnel / prohibit entry - Increase ventilation to restore to < 10%
Carbon Dioxide	> 0.5%	- Ventilate to restore oxygen to < 0.5%
	> 1.5%	- Stop work - Evacuate personnel / prohibit entry - Increase ventilation to restore to < 0.5%

Appendix E

Event Action Plan

Appendix E1 Event/ Action Plan for Air Quality

EVENT	ET ⁽¹⁾	ACTION		
		IEC ⁽¹⁾	ER ⁽¹⁾	Contractor
Action Level				
1. Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify the source. 2. Inform the IEC and the 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 the 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
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Identify the source. 2. Inform the IEC and the ER. 3. Repeat measurements to confirm findings. 4. Increase monitoring frequency to daily. 5. Discuss with the IEC and the Contractor on remedial actions required. 6. If exceedance continues, arrange meeting with the IEC and the ER. 7. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the ET. 2. Check the Contractor's working method. 3. Discuss with the ET and the 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 the 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 ⁽¹⁾	IEC ⁽¹⁾	ER ⁽¹⁾	Contractor
Limit Level				
1. Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify the source. 2. Inform the ER and the DEP. 3. Repeat measurement to confirm finding. 4. Increase monitoring frequency to daily. 5. Assess effectiveness of Contractor's remedial actions and keep the IEC, the DEP and the ER informed of the results. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the ET. 2. Check Contractor's working method. 3. Discuss with the ET and the 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 the Contractor. 3. Ensure remedial measures are 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
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Notify the IEC, the ER, the DEP and the Contractor. 2. Identify the source. 3. Repeat measurements to confirm findings. 4. Increase monitoring frequency to daily. 5. Carry out analysis of the Contractor's working procedures to determine possible mitigation to be implemented. 6. Arrange meeting with the IEC and the ER to discuss the remedial actions to be taken. 7. Assess effectiveness of the Contractor's remedial actions 	<ol style="list-style-type: none"> 1. Discuss amongst the ER, ET and the Contractor on the potential remedial actions. 2. Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise the 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. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented. 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.

and keep the IEC, the DEP and
the ER informed of the results.

8. If the exceedance stops, cease
additional monitoring.

Abbreviations: ET - Environmental Team, IEC - Independent Environmental Checker, ER - Engineer's Representative, DEP - Director of Environmental Protection

Appendix F

EM&A Monitoring Schedule

HY/2017/10 Tuen Mun - Chek Lap Kok Link - Northern Tunnel Connection Buildings, E&M Works Landfill Gas Monitoring Schedule (1 to 31 January 2019)

Alternative Air Quality Monitoring at WA4 and MTRC Depot Entrance

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		01-Jan	02-Jan	03-Jan	04-Jan	05-Jan
				LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)
06-Jan	07-Jan	08-Jan	09-Jan	10-Jan	11-Jan	12-Jan
	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)			
13-Jan	14-Jan	15-Jan	16-Jan	17-Jan	18-Jan	19-Jan
20-Jan	21-Jan	22-Jan	23-Jan	24-Jan	25-Jan	26-Jan
27-Jan	28-Jan	29-Jan	30-Jan	31-Jan		

The schedule is subject to excavation work at Toll Control Building. The schedule will be revised after reviewing the progress of the construction works or due to adverse (safety, weather etc) conditions.

Appendix G

Calibration Certificate of Monitoring Equipment



The Safety Company

MSA Corporate Center • 1000 Cranberry Woods Drive • Cranberry Township, PA 16066

www.msasafety.com

Telephone: (800) MSA-2222

ALTAIR5X CERTIFICATE OF CALIBRATION

Serial Number: 145986

Part Number: A-ALT5X-B-N-K-0-0-B-0-T-0-0-0



Factory Calibration Date: 11/26/18

Set Points

	METHANE 0-100.00 %LEL	O2 0-30.00 %VOL				CO2 0-9.99 %VOL
↓ (Low)	10.00 %LEL	19.50 %VOL				0.50 %VOL
↑ (High)	20.00 %LEL	23.00 %VOL				1.50 %VOL
STEL						0.50 %VOL
TWA						1.50 %VOL
Calibrated Value	Methane 1.457 %VOL	O2 15.00 %VOL				CO2 2.502 %VOL
Cylinder Lot #	122- 401167301-1	122- 401167301-1				141- 401019452- 1N461052

Calibration Certification

All applicable inspections, testing, and calibrations were performed using NIST traceable equipment, where available, in accordance with MSA's ISO 9001 Certified Quality System. Each material, component, and/or instrument must be installed, operated and maintained in strict accordance with its labels, cautions, warnings, instructions, and within the limitations stated in the supplied instruction manual. Routine calibration checks, equipment inspections, and applicable preventative maintenance measures must be performed to verify that the materials, components, and/or instruments are operating properly. Failure to perform these tasks on a routine basis, or suggested intervals, with specified equipment or methods, may result in inaccurate readings.

Conformance Statement

MSA certifies that the materials, components, and/or instruments delivered in this shipment conform to all applicable specifications. The items delivered have been processed through the appropriate approved document controlled procedures for Receiving, Manufacturing and Inspection. The materials, components, and/or instruments were inspected, tested, and calibrated, as applicable, per the associated drawings, standards requirements, and/or specifications, and were deemed acceptable by appropriate authorized personnel.

Process Certified By:

Calibrated By: Ca. Mccandless

JIM HOFFMAN
QUALITY ENGINEER

Appendix H

Landfill Gas Monitoring
Results and Graphical
Presentation

Landfill Gas Monitoring Results on Methane Level

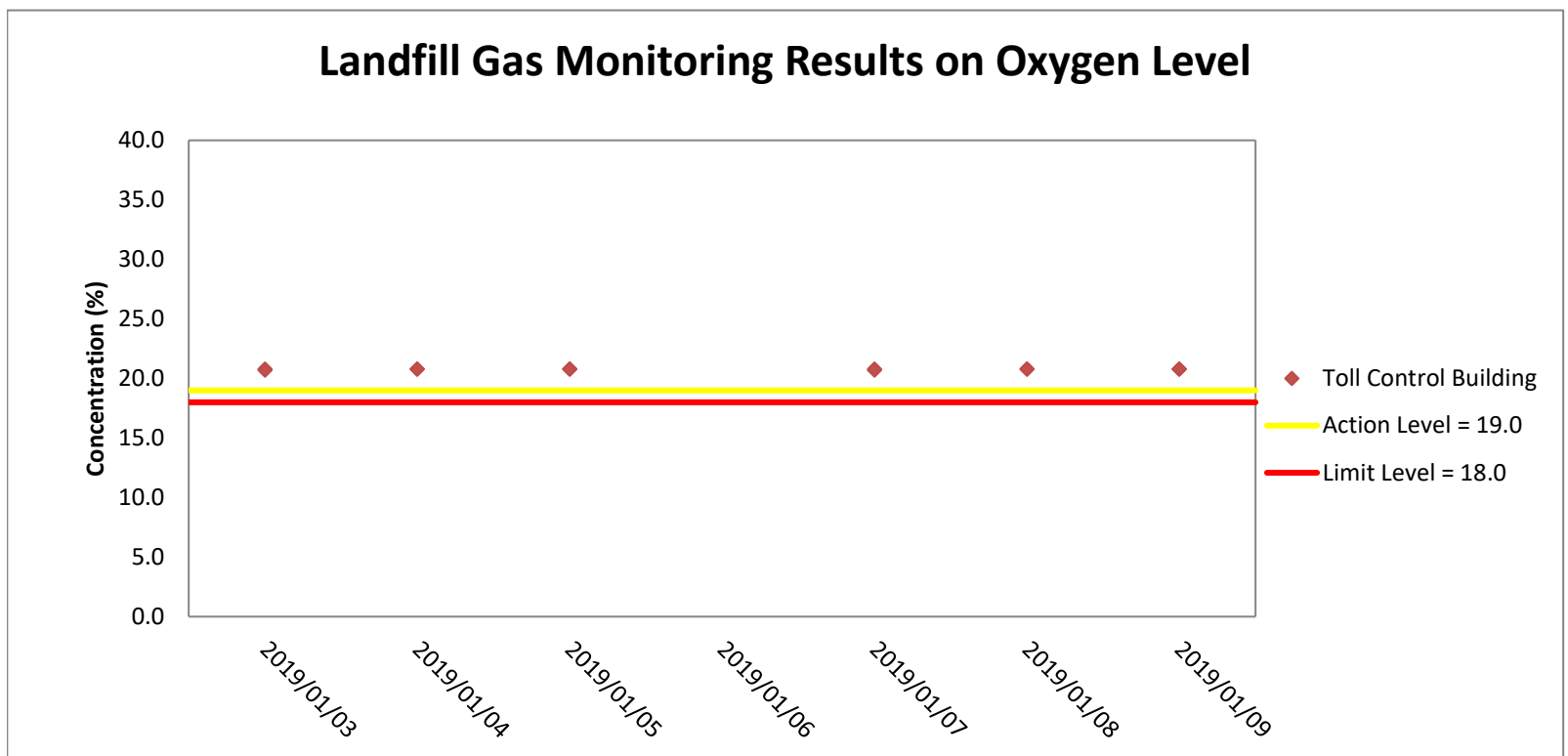
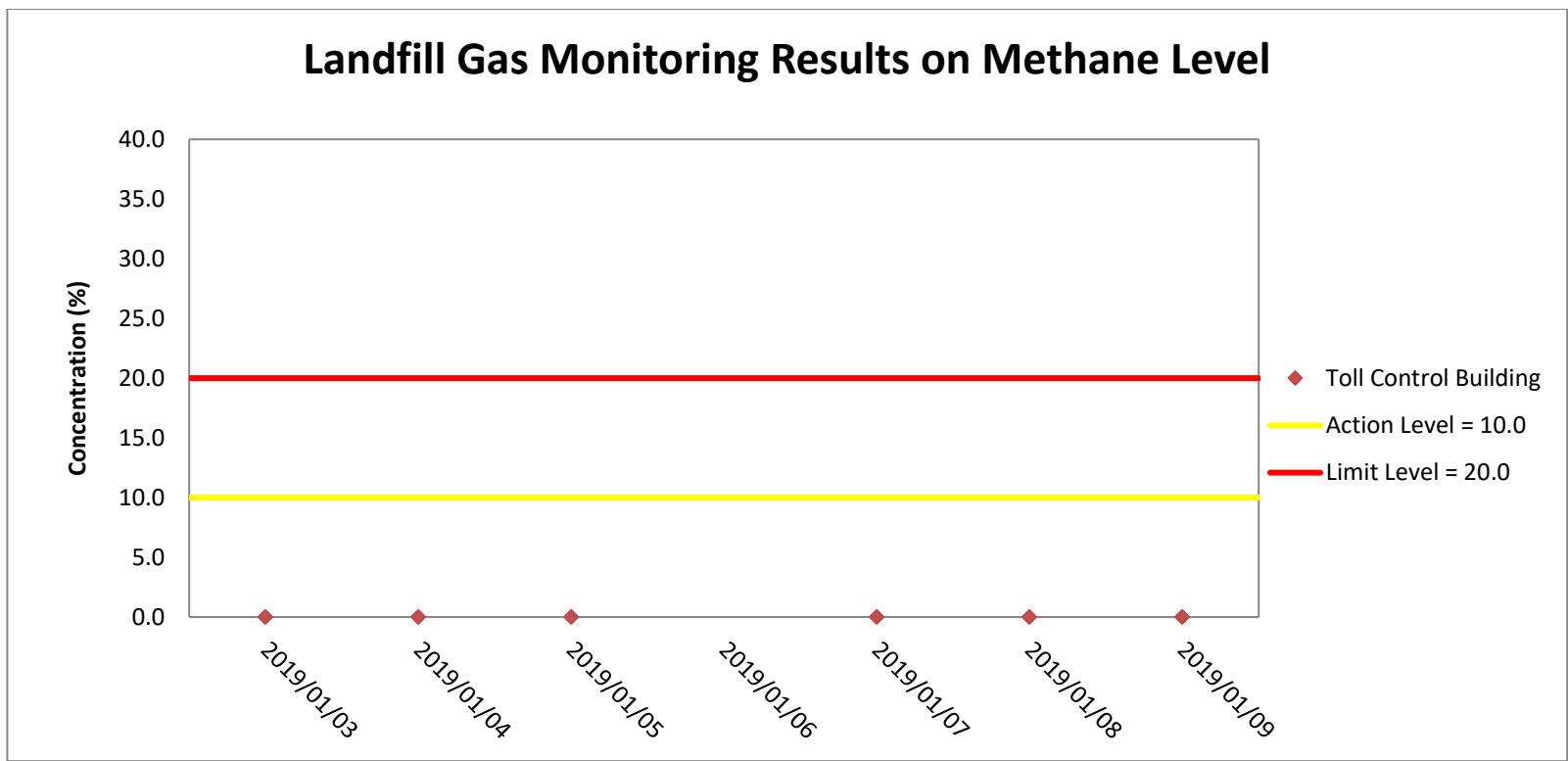
Project	Works	Date(yyyy-mm-dd)	Monitoring Location	Time (hh:mm, 24hour)	Results (%)	Action Level (%)	Limit Level (%)	
TMCLKL	HY/2017/10	2019/01/03	Toll Control Building	8:15	0	10.0	20.0	
TMCLKL	HY/2017/10	2019/01/03	Toll Control Building	13:15	0			
TMCLKL	HY/2017/10	2019/01/04	Toll Control Building	8:15	0			
TMCLKL	HY/2017/10	2019/01/04	Toll Control Building	13:15	0			
TMCLKL	HY/2017/10	2019/01/05	Toll Control Building	8:15	0			
TMCLKL	HY/2017/10	2019/01/05	Toll Control Building	13:15	0			
TMCLKL	HY/2017/10	2019/01/07	Toll Control Building	8:15	0			
TMCLKL	HY/2017/10	2019/01/07	Toll Control Building	13:15	0			
TMCLKL	HY/2017/10	2019/01/08	Toll Control Building	8:15	0			
TMCLKL	HY/2017/10	2019/01/08	Toll Control Building	13:15	0			
TMCLKL	HY/2017/10	2019/01/09	Toll Control Building	8:15	0			
TMCLKL	HY/2017/10	2019/01/09	Toll Control Building	13:15	0			
					Average			0
					Min.			0
					Max.	0		

Landfill Gas Monitoring Results on Oxygen Level

Project	Works	Date(yyyy-mm-dd)	Station	Time (hh:mm, 24hour)	Results (%)	Action Level (%)	Limit Level (%)	
TMCLKL	HY/2017/10	2019/01/03	Toll Control Building	8:15	20.8	19.0	18.0	
TMCLKL	HY/2017/10	2019/01/03	Toll Control Building	13:15	20.7			
TMCLKL	HY/2017/10	2019/01/04	Toll Control Building	8:15	20.8			
TMCLKL	HY/2017/10	2019/01/04	Toll Control Building	13:15	20.8			
TMCLKL	HY/2017/10	2019/01/05	Toll Control Building	8:15	20.8			
TMCLKL	HY/2017/10	2019/01/05	Toll Control Building	13:15	20.8			
TMCLKL	HY/2017/10	2019/01/07	Toll Control Building	8:15	20.7			
TMCLKL	HY/2017/10	2019/01/07	Toll Control Building	13:15	20.8			
TMCLKL	HY/2017/10	2019/01/08	Toll Control Building	8:15	20.8			
TMCLKL	HY/2017/10	2019/01/08	Toll Control Building	13:15	20.8			
TMCLKL	HY/2017/10	2019/01/09	Toll Control Building	8:15	20.8			
TMCLKL	HY/2017/10	2019/01/09	Toll Control Building	13:15	20.8			
					Average			20.8
					Min.			20.8
					Max.	20.8		

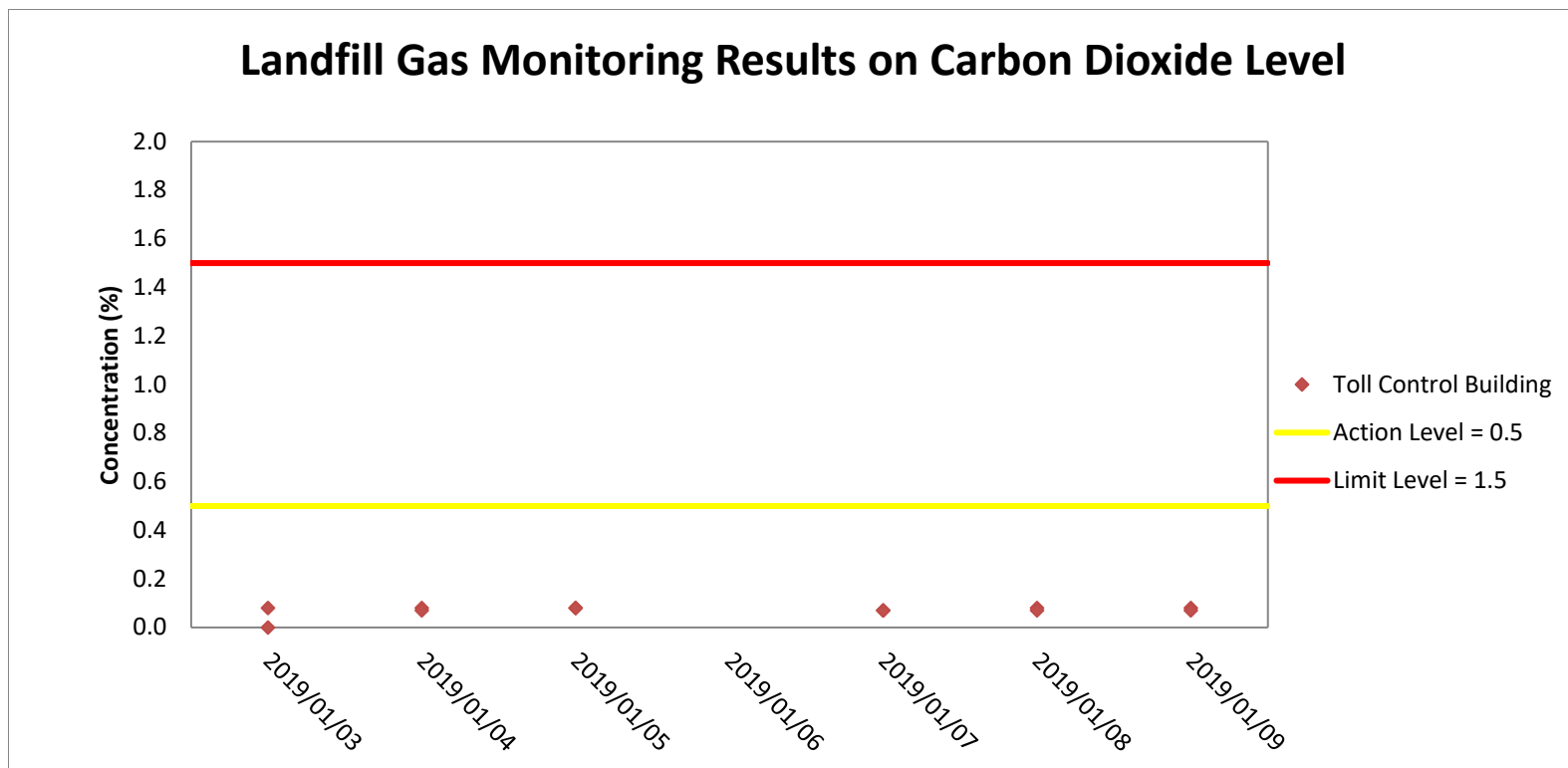
Landfill Gas Monitoring Results on Carbon Dioxide Level

Project	Works	Date(yyyy-mm-dd)	Station	Time (hh:mm, 24hour)	Results (%)	Action Level (%)	Limit Level (%)
TMCLKL	HY/2017/10	2019/01/03	Toll Control Building	8:15	mon TMCLKL North T	0.5	1.5
TMCLKL	HY/2017/10	2019/01/03	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019/01/04	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019/01/04	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019/01/05	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019/01/05	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019/01/07	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019/01/07	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019/01/08	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019/01/08	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019/01/09	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019/01/09	Toll Control Building	13:15	0		
				Average	0		
				Min.	0		
				Max.	0		



Weather condition within the reporting period was cloudy.

Major construction works undertaken within the reporting period include bar bending, timber formwork and concreting and Architectural Builder's Work and Finishes at Toll Control Building; electrical and Mechanical works at Ventilation Plant Room and North Ventilation Building, Building Structure at Administration Building and Maintenance Depot; Socket H-piling at Fire Services Department Building and Customs and Excise Department Building and Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Kiosk N2.



Weather condition within the reporting period was cloudy.

Major construction works undertaken within the reporting period include bar bending, timber formwork and concreting and Architectural Builder's Work and Finishes at Toll Control Building; electrical and Mechanical works at Ventilation Plant Room and North Ventilation Building, Building Structure at Administration Building and Maintenance Depot; Socket H-piling at Fire Services Department Building and Customs and Excise Department Building and Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Kiosk N2.

Appendix I

Monthly Summary of Waste Flow Table

Contract No. : HY/2017/10

Tuen Mun Chek Lap Kok Link – Northern Connection Tunnel Buildings, Electrical and Mechanical Works

Monthly Summary Waste Flow Table for 2019 (Year)

Month/Material	Actual Quantities of Inert C&D Materials Generation						Actual Quantities of C&D wastes Generation		Actual Quantities of Recyclables Generation			
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fills	Imported Fill	Chemical Waste	General Refuse	Metals	Felled trees	Paper/ cardboard packaging	Plastics
Unit	('000m ³)	('000m ³)	('000m ³)	('000m ³)	('000m ³)	('000m ³)	('000Kg)	('000Kg)	('000Kg)	('000Kg)	('000Kg)	('000Kg)
Jan	1.939	-	-	-	1.939	-	-	74.680	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-
Mar	-	-	-	-	-	-	-	-	-	-	-	-
Apr	-	-	-	-	-	-	-	-	-	-	-	-
May	-	-	-	-	-	-	-	-	-	-	-	-
Jun	-	-	-	-	-	-	-	-	-	-	-	-
SUB-TOTAL	1.939	0.000	0.000	0.000	1.939	0.000	0.000	74.680	0.000	0.000	0.000	0.000
Jul	-	-	-	-	-	-	-	-	-	-	-	-
Aug	-	-	-	-	-	-	-	-	-	-	-	-
Sep	-	-	-	-	-	-	-	-	-	-	-	-
Oct	-	-	-	-	-	-	-	-	-	-	-	-
Nov	-	-	-	-	-	-	-	-	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	1.939	0.000	0.000	0.000	1.939	0.000	0.000	74.680	0.000	0.000	0.000	0.000

Notes :

- 1 - The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
- 2 - Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
- 3 - Broken concrete for recycling into aggregates.
- 4 - Assumed 5 kg per damaged water-filled barrier.
- 5 - Disposed as Public Fills includes Hard Rock and Large Broken Concrete.

Appendix J

Cumulative Statistics on
Exceedances, Complaints,
Notifications of Summons
and Successful Prosecutions

Appendix G1 Cumulative Statistics on Exceedances

		Total No. recorded in this reporting month	Total No. recorded since project commencement
1-Hr TSP	Action	5	21
	Limit	1	2
24-Hr TSP	Action	0	0
	Limit	0	0

Appendix G2 Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

Reporting Period	Cumulative Statistics		
	Complaints	Notifications of Summons	Successful Prosecutions
This Reporting Month (January 2018)	0	0	0
Total No. received since project commencement	0	0	0

Email
message

Environmental
Resources
Management

To Ramboll Hong Kong Limited (ENPO)

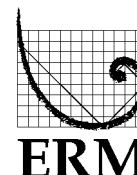
From ERM- Hong Kong, Limited

Ref/Project number Contract No. HY/2017/10
Tuen Mun – Chek Lap Kok Link – Northern
Connection Tunnel Buildings, Electrical and
Mechanical Works

Subject Notification of Exceedance for Air Quality
Impact Monitoring

Date 18 January 2019

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com



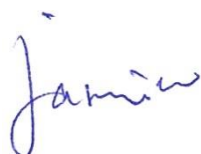
Dear Sir/ Madam,

Please find attached the Notification of Exceedance (NOE) of the following
Log no.:

Action Level Exceedance
0463091_8January2019_1hrTSP_Station ASR5

One (1) exceedance was recorded on 8 January 2019.

Regards,



Dr Jasmine Ng
Environmental Team Leader

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ERM-Hong Kong, Limited

CONTRACT NO. HY/2017/10
 TUEN MUN – CHEK LAP KOK LINK –
 NORTHERN CONNECTION TUNNEL BUILDINGS,
 ELECTRICAL AND MECHANICAL WORKS

Air Quality Impact Monitoring

Notification of Exceedance

Log No.	<u>Action Level Exceedance</u> 0463091_8January2019_1hrTSP_Station ASR5 [Total No. of Exceedances = 1]	
Date	8 January 2019 (Measured) 18 January 2019 (Results obtained from ENPO Website)	
Monitoring Station	ASR1, ASR5, ASR6, ASR10, AQMS1	
Parameter(s) with Exceedance(s)	1-hr TSP	
Action Levels	1-hr TSP ($\mu\text{g}/\text{m}^3$)	ASR1 = 331 ASR5 = 340 ASR6 = 338 ASR10 = 335 AQMS1 = 337
Limit Levels	1-hr TSP ($\mu\text{g}/\text{m}^3$)	500
Measured Levels	Refer to the attached data sheet.	
Works Undertaken (at the time of monitoring event)	Works undertaken under this Contract on 8 January 2019 included: <ul style="list-style-type: none"> ▪ Rebar fixing at Administration Building and Maintenance Depot (<i>refer to Contractor's photo</i>) 	
Possible Reason for Action or Limit Level Exceedance(s)	<p>The exceedances are unlikely to be due to the Contract, in view of the following:</p> <ul style="list-style-type: none"> • Apart from exceedances of 1 hour-TSP (13:20 – 14:20) at ASR5, other 1hr-TSP levels and all 24-hr TSP at all monitoring stations were in compliance with the Action and Limit Levels on the same day. • Watering record provided by the Contractor was reviewed. Watering was maintained on unpaved and dry road on 8 January 2019 (<i>refer to Contractor's Photo and Watering Record</i>). • With reference to the recorded wind direction (ranged between 204° to 221°, blowing from a south westerly direction) during the period of the observed 1-hr TSP exceedances, station ASR5 is located downstream of the Administration Building and Maintenance Depot. However, rebar fixing was conducted at the Administration Building and Maintenance Depot which are not major dust generating works. <p>Based on the above, the exceedances are unlikely to be due to the Contract.</p>	
Actions Taken / To Be Taken	The Contractor has been reminded to ensure all dust suppression measures are implemented at the site area including water spraying at unpaved road. The ET will monitor for future trends in exceedances.	
Remarks	The monitoring results on 8 January 2019 and locations of air quality monitoring stations are attached. The location of the works area under this Contract is attached. The attached wind data on 8 January 2019 is sourced from <i>Contract No. HY/2012/08</i> for reference.	

Results of Air Quality Monitoring

Project	Works	Date (yyyy-mm-dd)	Station	Time (hh:mm, 24hour)	Parameter	Results	Unit
TMCLKL	HY/2012/08	2019-01-08	AQMS1	13:41	1-hour TSP	179	ug/m3
TMCLKL	HY/2012/08	2019-01-08	AQMS1	14:43	1-hour TSP	192	ug/m3
TMCLKL	HY/2012/08	2019-01-08	AQMS1	15:45	1-hour TSP	193	ug/m3
TMCLKL	HY/2012/08	2019-01-08	ASR1	13:30	1-hour TSP	184	ug/m3
TMCLKL	HY/2012/08	2019-01-08	ASR1	14:32	1-hour TSP	281	ug/m3
TMCLKL	HY/2012/08	2019-01-08	ASR1	15:34	1-hour TSP	193	ug/m3
TMCLKL	HY/2012/08	2019-01-08	ASR10	13:00	1-hour TSP	162	ug/m3
TMCLKL	HY/2012/08	2019-01-08	ASR10	14:02	1-hour TSP	189	ug/m3
TMCLKL	HY/2012/08	2019-01-08	ASR10	15:04	1-hour TSP	192	ug/m3
TMCLKL	HY/2012/08	2019-01-08	ASR5	13:20	1-hour TSP	354	ug/m3
TMCLKL	HY/2012/08	2019-01-08	ASR5	14:22	1-hour TSP	292	ug/m3
TMCLKL	HY/2012/08	2019-01-08	ASR5	15:24	1-hour TSP	275	ug/m3
TMCLKL	HY/2012/08	2019-01-08	ASR6	13:10	1-hour TSP	239	ug/m3
TMCLKL	HY/2012/08	2019-01-08	ASR6	14:12	1-hour TSP	231	ug/m3
TMCLKL	HY/2012/08	2019-01-08	ASR6	15:14	1-hour TSP	197	ug/m3
TMCLKL	HY/2012/08	2019-01-08	AQMS1	16:47	24-hour TSP	97	ug/m3
TMCLKL	HY/2012/08	2019-01-08	ASR1	16:36	24-hour TSP	135	ug/m3
TMCLKL	HY/2012/08	2019-01-08	ASR10	16:06	24-hour TSP	90	ug/m3
TMCLKL	HY/2012/08	2019-01-08	ASR5	16:26	24-hour TSP	175	ug/m3
TMCLKL	HY/2012/08	2019-01-08	ASR6	16:16	24-hour TSP	119	ug/m3

Note: Indicates Exceedance of Action Level
Indicates Exceedance of Limit Level

Meteorological Data for Impact Monitoring in the reporting period*			
Date (yy-mm-dd)	Time (24hrs)	Average of Wind Speed (m/s)	Average of Wind Director (degree)
19/01/08	0:00	0.0	-
19/01/08	1:00	0.0	-
19/01/08	2:00	0.0	-
19/01/08	3:00	0.4	47
19/01/08	4:00	0.9	44
19/01/08	5:00	1.3	93
19/01/08	6:00	0.9	111
19/01/08	7:00	1.3	95
19/01/08	8:00	0.4	88
19/01/08	9:00	0.9	113
19/01/08	10:00	0.4	163
19/01/08	11:00	0.9	159
19/01/08	12:00	1.3	228
19/01/08	13:00	0.9	210
19/01/08	14:00	0.9	204
19/01/08	15:00	0.9	221
19/01/08	16:00	0.4	250
19/01/08	17:00	0.9	182
19/01/08	18:00	1.8	345
19/01/08	19:00	1.3	309
19/01/08	20:00	1.3	295
19/01/08	21:00	0.9	299
19/01/08	22:00	1.3	297
19/01/08	23:00	0.4	346

*Wind data is sourced from Contract No. HY/2012/08 Tuen Mun - Chek Lap Kok Link - Northern Connection Sub-sea Tunnel Section

Photo 1 - Rebar fixing conducted at works area of Administration Building and Maintenance Depot



Photo 2- Watering of unpaved roads near Administration Building and Maintenance Depot



WATERING RECORD ON 8 JANUARY 2019

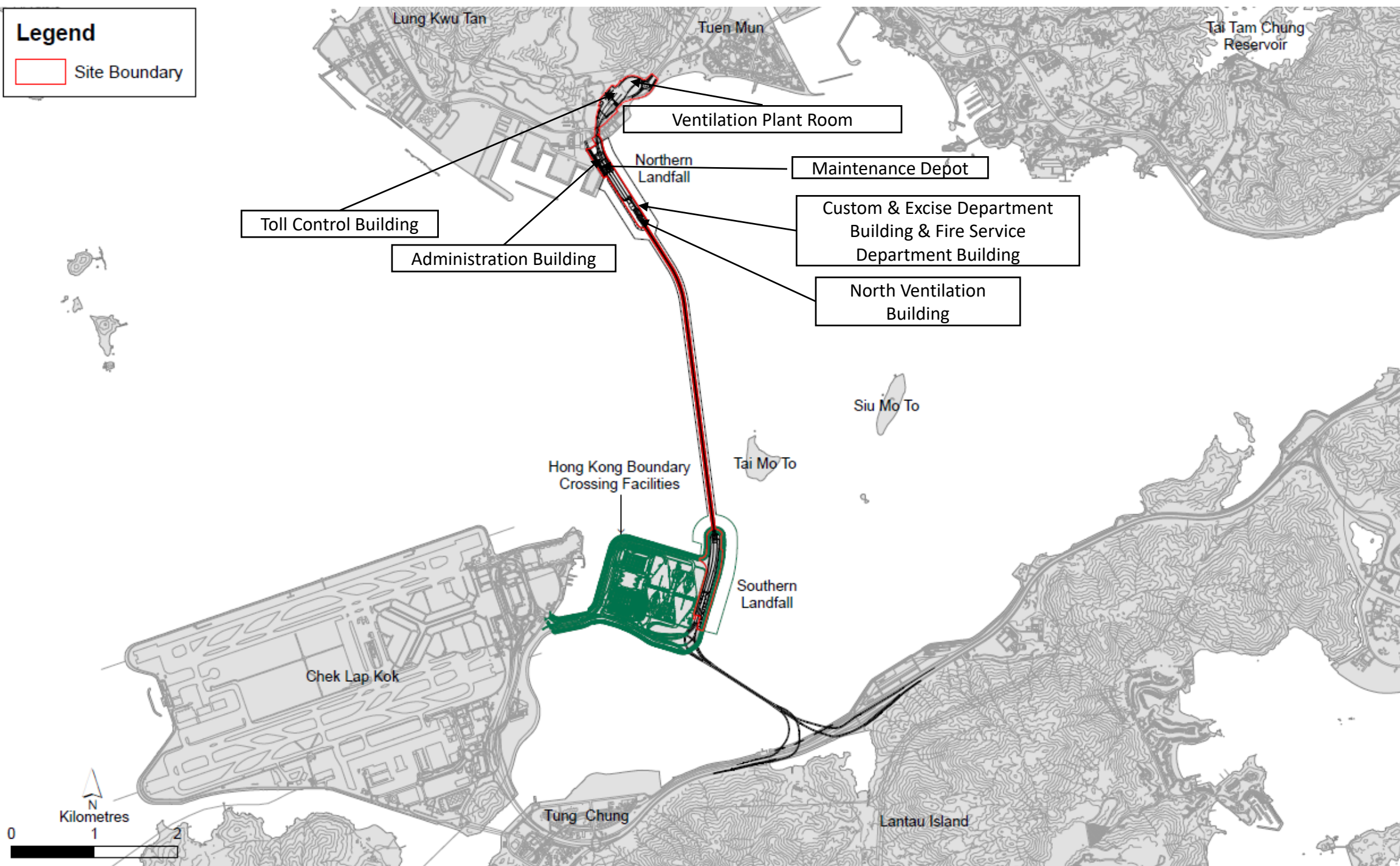
Location =

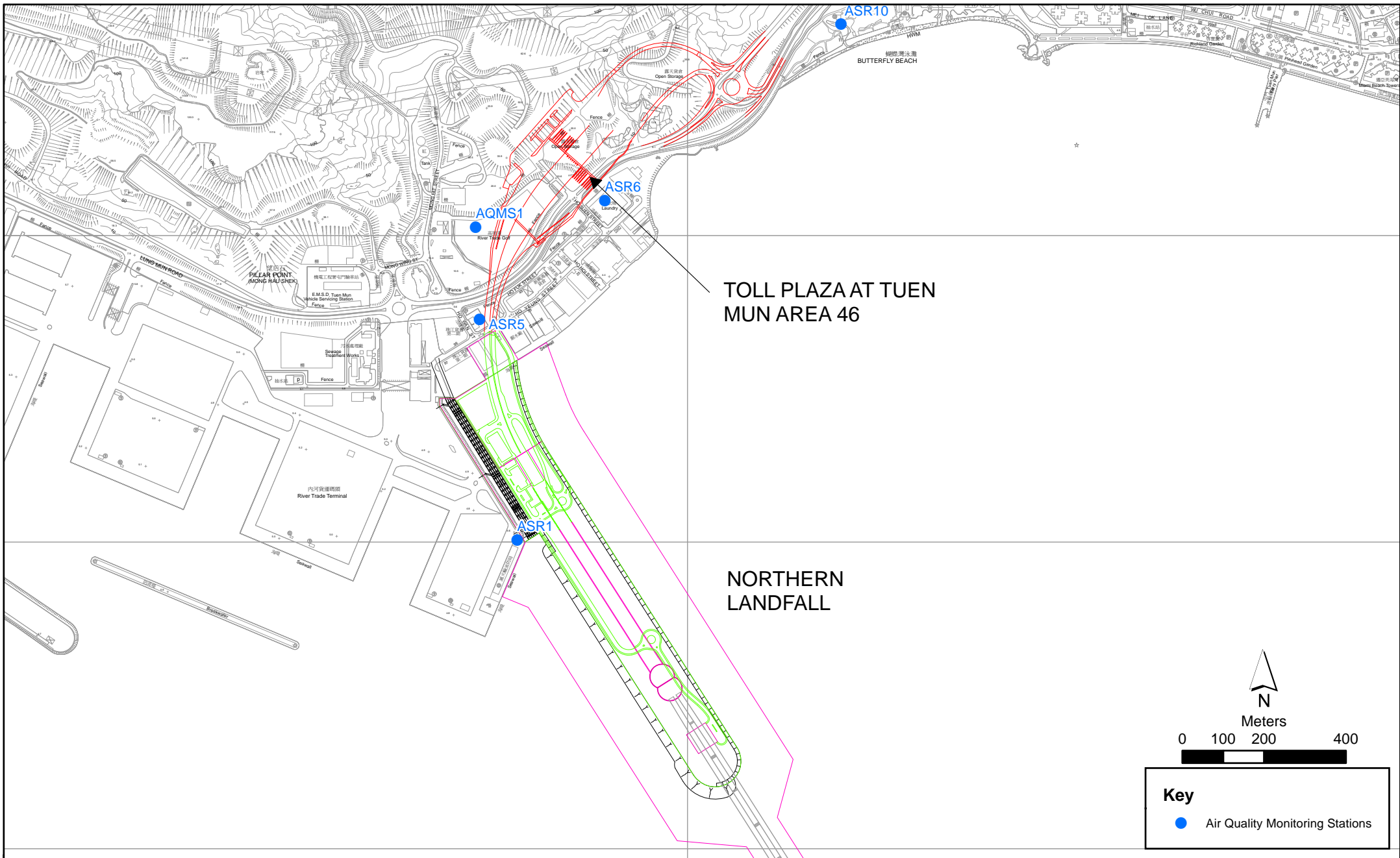
8th Jan AdB & MD

Period		Watering time	Sign.
7-8			
8-9	/	8:09	D26
9-10	/	9:13	D26
10-11	/	10:10	D26
11-12	/	11:04	D26
12-13	/	12:01 & 12:59	D26
13-14	/	13:38	D26
14-15	/	14:29	D26
15-16	/	15:04	D26
16-17	/	16:00 & 16:54	D26
17-18	/	17:48	D26
18-19			

Legend

Site Boundary



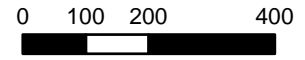


TOLL PLAZA AT TUEN MUN AREA 46

NORTHERN LANDFALL



Meters



Key

- Air Quality Monitoring Stations

Air Quality Monitoring Stations for the Enhanced TSP Monitoring
 (Source: Adopted from Contract No. HY/2012/08 Tuen Mun-Chek Lap Kok Link -
 Northern Connection Sub-sea Tunnel Section)

**Environmental
 Resources
 Management**



Email
message

Environmental
Resources
Management

To Ramboll Hong Kong Limited (ENPO)

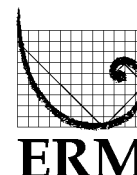
From ERM- Hong Kong, Limited

Ref/Project number Contract No. HY/2017/10
Tuen Mun – Chek Lap Kok Link – Northern
Connection Tunnel Buildings, Electrical and
Mechanical Works

Subject Notification of Exceedance for Air Quality
Impact Monitoring

Date 18 January 2019

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com



Dear Sir/ Madam,

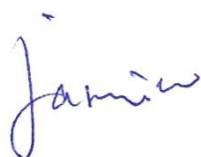
Please find attached the Notification of Exceedance (NOE) of the following
Log no.:

Action Level Exceedance

0463091_11January2019_1hrTSP_Station ASR1
0463091_11January2019_1hrTSP_Station ASR5

Two (2) exceedances were recorded on 11 January 2019.

Regards,



Dr Jasmine Ng
Environmental Team Leader

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ERM-Hong Kong, Limited

**CONTRACT NO. HY/2017/10
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION TUNNEL BUILDINGS,
ELECTRICAL AND MECHANICAL WORKS**

Air Quality Impact Monitoring

Notification of Exceedance

Log No.	<u>Action Level Exceedance</u> 0463091_11January2019_1hrTSP_Station ASR1 0463091_11January2019_1hrTSP_Station ASR5 [Total No. of Exceedances = 2]	
Date	11 January 2019 (Measured) 18 January 2019 (Results obtained from ENPO Website)	
Monitoring Station	ASR1, ASR5, ASR6, ASR10, AQMS1	
Parameter(s) with Exceedance(s)	1-hr TSP	
Action Levels	1-hr TSP ($\mu\text{g}/\text{m}^3$)	ASR1 = 331 ASR5 = 340 ASR6 = 338 ASR10 = 335 AQMS1 = 337
Limit Levels	1-hr TSP ($\mu\text{g}/\text{m}^3$)	500
Measured Levels	Refer to the attached data sheet.	
Works Undertaken (at the time of monitoring event)	Works undertaken under this Contract on 11 January 2019 included: ▪ Rebar fixing at Administration Building and Maintenance Depot (<i>refer to Contractor's photo</i>)	
Possible Reason for Action or Limit Level Exceedance(s)	<p>The exceedances are unlikely to be due to the Contract, in view of the following:</p> <ul style="list-style-type: none"> • Apart from exceedances of 1 hour-TSP at ASR1 during 13:39 to 14:39 and at ASR5 during 13:27 to 14:27, other 1hr-TSP levels and all 24-hr TSP at all monitoring stations were in compliance with the Action and Limit Levels on the same day. • Watering record provided by the Contractor was reviewed. Watering was maintained on unpaved and dry road on 11 January 2019 (<i>refer to Contractor's Photo and Watering Record</i>). • Works conducted at Administration Building and Maintenance Depot during the time when 1-hour TSP exceedances was recorded was rebar fixing which not dust generating. • With reference to the recorded wind direction (ranged between 112° and 155°, blowing from a south-easterly direction) during the period of the observed 1-hr TSP exceedances, stations ASR1 and ASR5 are located downstream of the Administration Building and Maintenance Depot. However, rebar fixing was conducted at the Administration Building and Maintenance Depot which are not major dust generating works. <p>Based on the above, the exceedances are unlikely to be due to the Contract.</p>	
Actions Taken / To Be Taken	The Contractor has been reminded to ensure all dust suppression measures are implemented at the site area including water spraying at unpaved road. The ET will monitor for future trends in exceedances.	
Remarks	The monitoring results on 11 January 2019 and locations of air quality monitoring stations are attached. The location of the works area under this Contract is attached. The attached wind data on 11 January 2019 is sourced from <i>Contract No. HY/2012/08</i> for reference.	

Results of Air Quality Monitoring

Project	Works	Date (yyyy-mm-dd)	Station	Time (hh:mm, 24hour)	Parameter	Results	Unit
TMCLKL	HY/2012/08	2019-01-11	AQMS1	13:50	1-hour TSP	214	ug/m3
TMCLKL	HY/2012/08	2019-01-11	AQMS1	14:52	1-hour TSP	90	ug/m3
TMCLKL	HY/2012/08	2019-01-11	AQMS1	15:54	1-hour TSP	108	ug/m3
TMCLKL	HY/2012/08	2019-01-11	ASR1	13:39	1-hour TSP	335	ug/m3
TMCLKL	HY/2012/08	2019-01-11	ASR1	14:41	1-hour TSP	129	ug/m3
TMCLKL	HY/2012/08	2019-01-11	ASR1	15:43	1-hour TSP	120	ug/m3
TMCLKL	HY/2012/08	2019-01-11	ASR10	13:05	1-hour TSP	116	ug/m3
TMCLKL	HY/2012/08	2019-01-11	ASR10	14:07	1-hour TSP	155	ug/m3
TMCLKL	HY/2012/08	2019-01-11	ASR10	15:09	1-hour TSP	95	ug/m3
TMCLKL	HY/2012/08	2019-01-11	ASR5	13:27	1-hour TSP	398	ug/m3
TMCLKL	HY/2012/08	2019-01-11	ASR5	14:29	1-hour TSP	327	ug/m3
TMCLKL	HY/2012/08	2019-01-11	ASR5	15:31	1-hour TSP	243	ug/m3
TMCLKL	HY/2012/08	2019-01-11	ASR6	13:16	1-hour TSP	214	ug/m3
TMCLKL	HY/2012/08	2019-01-11	ASR6	14:18	1-hour TSP	125	ug/m3
TMCLKL	HY/2012/08	2019-01-11	ASR6	15:20	1-hour TSP	153	ug/m3
TMCLKL	HY/2012/08	2019-01-11	AQMS1	16:56	24-hour TSP	127	ug/m3
TMCLKL	HY/2012/08	2019-01-11	ASR1	16:45	24-hour TSP	120	ug/m3
TMCLKL	HY/2012/08	2019-01-11	ASR10	16:11	24-hour TSP	137	ug/m3
TMCLKL	HY/2012/08	2019-01-11	ASR5	16:33	24-hour TSP	196	ug/m3
TMCLKL	HY/2012/08	2019-01-11	ASR6	16:22	24-hour TSP	191	ug/m3

Note: Indicates Exceedance of Action Level
Indicates Exceedance of Limit Level

Meteorological Data for Impact Monitoring in the reporting period*			
Date (yy-mm-dd)	Time (24hrs)	Average of Wind Speed (m/s)	Average of Wind Director (degree)
19/01/11	0:00	0.0	-
19/01/11	1:00	0.0	-
19/01/11	2:00	0.0	-
19/01/11	3:00	0.0	-
19/01/11	4:00	0.9	89
19/01/11	5:00	0.4	113
19/01/11	6:00	1.3	51
19/01/11	7:00	1.8	71
19/01/11	8:00	0.9	137
19/01/11	9:00	0.9	284
19/01/11	10:00	0.9	162
19/01/11	11:00	1.3	223
19/01/11	12:00	0.9	160
19/01/11	13:00	0.9	112
19/01/11	14:00	1.3	155
19/01/11	15:00	2.2	69
19/01/11	16:00	1.8	55
19/01/11	17:00	0.9	90
19/01/11	18:00	0.4	88
19/01/11	19:00	0	-
19/01/11	20:00	0	-
19/01/11	21:00	0	-
19/01/11	22:00	0	-
19/01/11	23:00	0	-

*Wind data is sourced from Contract No. HY/2012/08 Tuen Mun - Chek Lap Kok Link - Northern Connection Sub-sea Tunnel Section

PHOTO BY CONTRACTOR ON 11 JANUARY 2019

Photo 1 - Rebar fixing conducted at works area of Administration Building and Maintenance Depot



Photo 2- Watering of unpaved roads near Administration Building and Maintenance Depot



WATERING RECORD ON 11 JANUARY 2019

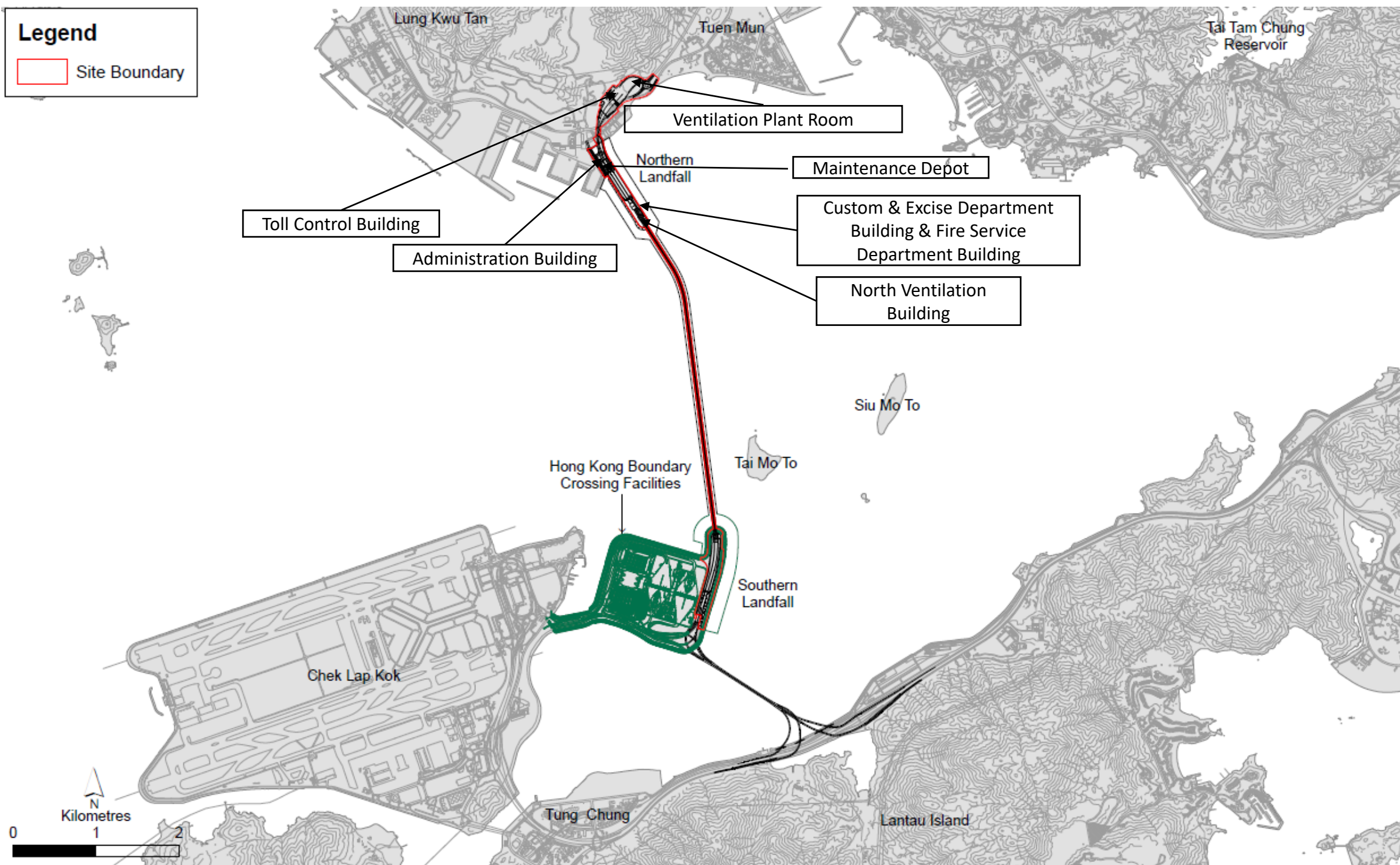
Location: A+B & MD

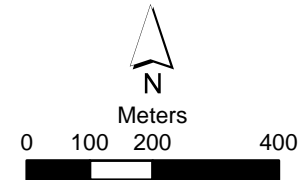
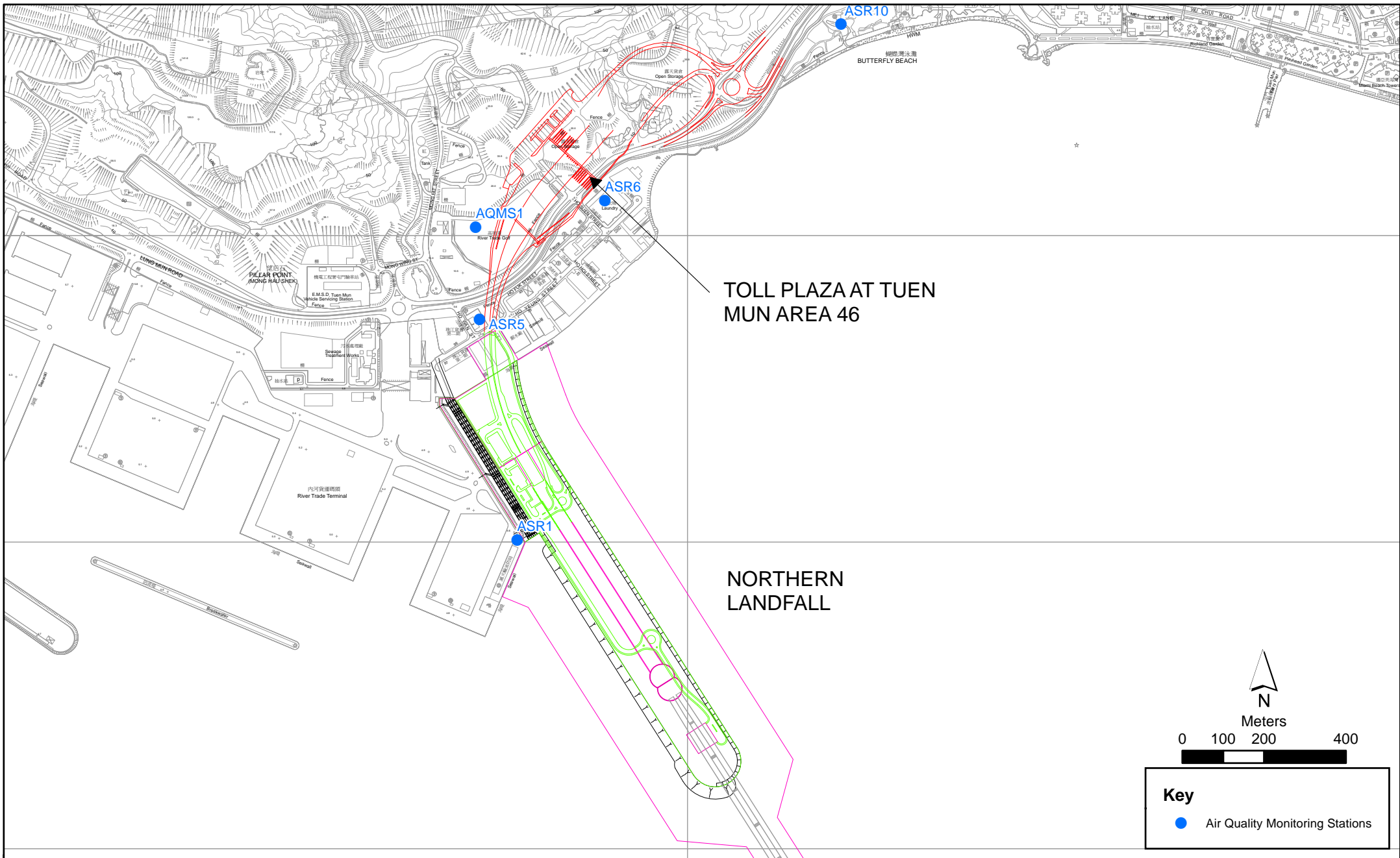
11th Jan

Period		Time	Sign
7-8			
8-9	/	8=10	Man
9-10	/	9=01 9=50	Man
10-11	/	10=39	Man
11-12	/	11=41	Man
12-13	/	12=58	Man
13-14	/	13=40	Man
14-15	/	14=30 14=59	Man
15-16	/	15=44	Man
16-17	/	16=32	Man
17-18	/	17=19	Man
18-19			

Legend

Site Boundary





Key

- Air Quality Monitoring Stations

Air Quality Monitoring Stations for the Enhanced TSP Monitoring
 (Source: Adopted from Contract No. HY/2012/08 Tuen Mun-Chek Lap Kok Link -
 Northern Connection Sub-sea Tunnel Section)

Environmental Resources Management

Email
message

Environmental
Resources
Management

To Ramboll Hong Kong Limited (ENPO)

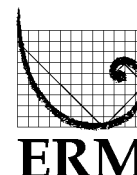
From ERM- Hong Kong, Limited

Ref/Project number Contract No. HY/2017/10
Tuen Mun – Chek Lap Kok Link – Northern
Connection Tunnel Buildings, Electrical and
Mechanical Works

Subject Notification of Exceedance for Air Quality
Impact Monitoring

Date 8 February 2019

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com



Dear Sir/ Madam,

Please find attached the Notification of Exceedance (NOE) of the following
Log no.:

Action Level Exceedance

0463091_17January2019_1hrTSP_Station ASR1
0463091_17January2019_1hrTSP_Station ASR5

Two (2) exceedances were recorded on 17 January 2019.

Regards,

Dr Jasmine Ng
Environmental Team Leader

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ERM-Hong Kong, Limited

**CONTRACT NO. HY/2017/10
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION TUNNEL BUILDINGS,
ELECTRICAL AND MECHANICAL WORKS**

Air Quality Impact Monitoring

Notification of Exceedance

Log No.	<u>Action Level Exceedance</u> 0463091_17January2019_1hrTSP_Station ASR1 0463091_17January2019_1hrTSP_Station ASR5 [Total No. of Exceedances = 2]	
Date	17 January 2019 (Measured) 8 February 2019 (Results obtained from ENPO Website)	
Monitoring Station	ASR1, ASR5, ASR6, ASR10, AQMS1	
Parameter(s) with Exceedance(s)	1-hr TSP	
Action Levels	1-hr TSP ($\mu\text{g}/\text{m}^3$)	ASR1 = 331 ASR5 = 340 ASR6 = 338 ASR10 = 335 AQMS1 = 337
Limit Levels	1-hr TSP ($\mu\text{g}/\text{m}^3$)	500
Measured Levels	Refer to the attached data sheet.	
Works Undertaken (at the time of monitoring event)	Works undertaken under this Contract on 17 January 2019 included: ▪ Rebar fixing at Administration Building and Maintenance Depot (<i>refer to Contractor's photo</i>)	
Possible Reason for Action or Limit Level Exceedance(s)	<p>The exceedances are unlikely to be due to the Contract, in view of the following:</p> <ul style="list-style-type: none"> • Apart from exceedances of 1 hour-TSP at ASR1 during 16:04 to 17:04 and at ASR5 during 15:52 to 16:52, other 1hr-TSP levels and all 24-hr TSP at all monitoring stations were in compliance with the Action and Limit Levels on the same day. • Watering record provided by the Contractor was reviewed. Watering was maintained on unpaved and dry road on 17 January 2019 (<i>refer to Contractor's Photo and watering record</i>). • With reference to the recorded wind direction (ranged between 284° and 351°, blowing from a north-westerly direction) during the period of the observed 1-hr TSP exceedances, no works are conducted upstream of stations ASR1 and ASR5. <p>Based on the above, the exceedances are unlikely to be due to the Contract.</p>	
Actions Taken / To Be Taken	The Contractor has been reminded to ensure all dust suppression measures are implemented at the site area including water spraying at unpaved road. The ET will monitor for future trends in exceedances.	
Remarks	The monitoring results on 17 January 2019 and locations of air quality monitoring stations are attached. The location of the works area under this Contract is attached. The attached wind data on 17 January 2019 is sourced from <i>Contract No. HY/2012/08</i> for reference.	

Results of Air Quality Monitoring

Project	Works	Date (yyyy-mm-dd)	Station	Time (hh:mm, 24hour)	Parameter	Results	Unit
TMCLKL	HY/2012/08	2019-01-17	AQMS1	14:13	1-hour TSP	101	ug/m3
TMCLKL	HY/2012/08	2019-01-17	AQMS1	15:14	1-hour TSP	194	ug/m3
TMCLKL	HY/2012/08	2019-01-17	AQMS1	16:16	1-hour TSP	165	ug/m3
TMCLKL	HY/2012/08	2019-01-17	ASR1	14:00	1-hour TSP	154	ug/m3
TMCLKL	HY/2012/08	2019-01-17	ASR1	15:02	1-hour TSP	200	ug/m3
TMCLKL	HY/2012/08	2019-01-17	ASR1	16:04	1-hour TSP	519	ug/m3
TMCLKL	HY/2012/08	2019-01-17	ASR10	13:26	1-hour TSP	223	ug/m3
TMCLKL	HY/2012/08	2019-01-17	ASR10	14:28	1-hour TSP	156	ug/m3
TMCLKL	HY/2012/08	2019-01-17	ASR10	15:30	1-hour TSP	113	ug/m3
TMCLKL	HY/2012/08	2019-01-17	ASR5	13:48	1-hour TSP	140	ug/m3
TMCLKL	HY/2012/08	2019-01-17	ASR5	14:50	1-hour TSP	269	ug/m3
TMCLKL	HY/2012/08	2019-01-17	ASR5	15:52	1-hour TSP	354	ug/m3
TMCLKL	HY/2012/08	2019-01-17	ASR6	13:37	1-hour TSP	97	ug/m3
TMCLKL	HY/2012/08	2019-01-17	ASR6	14:39	1-hour TSP	304	ug/m3
TMCLKL	HY/2012/08	2019-01-17	ASR6	15:41	1-hour TSP	255	ug/m3
TMCLKL	HY/2012/08	2019-01-17	AQMS1	17:18	24-hour TSP	82	ug/m3
TMCLKL	HY/2012/08	2019-01-17	ASR1	17:06	24-hour TSP	137	ug/m3
TMCLKL	HY/2012/08	2019-01-17	ASR10	16:32	24-hour TSP	73	ug/m3
TMCLKL	HY/2012/08	2019-01-17	ASR5	16:54	24-hour TSP	126	ug/m3
TMCLKL	HY/2012/08	2019-01-17	ASR6	16:43	24-hour TSP	98	ug/m3

Note: Indicates Exceedance of Action Level
Indicates Exceedance of Limit Level

PHOTO BY CONTRACTOR ON 17 JANUARY 2019

Photo 1 - Rebar fixing conducted at works area of Administration Building and Maintenance Depot



Photo 2- Watering of unpaved roads near Administration Building and Maintenance Depot



WATERING RECORD ON 17 JANUARY 2019

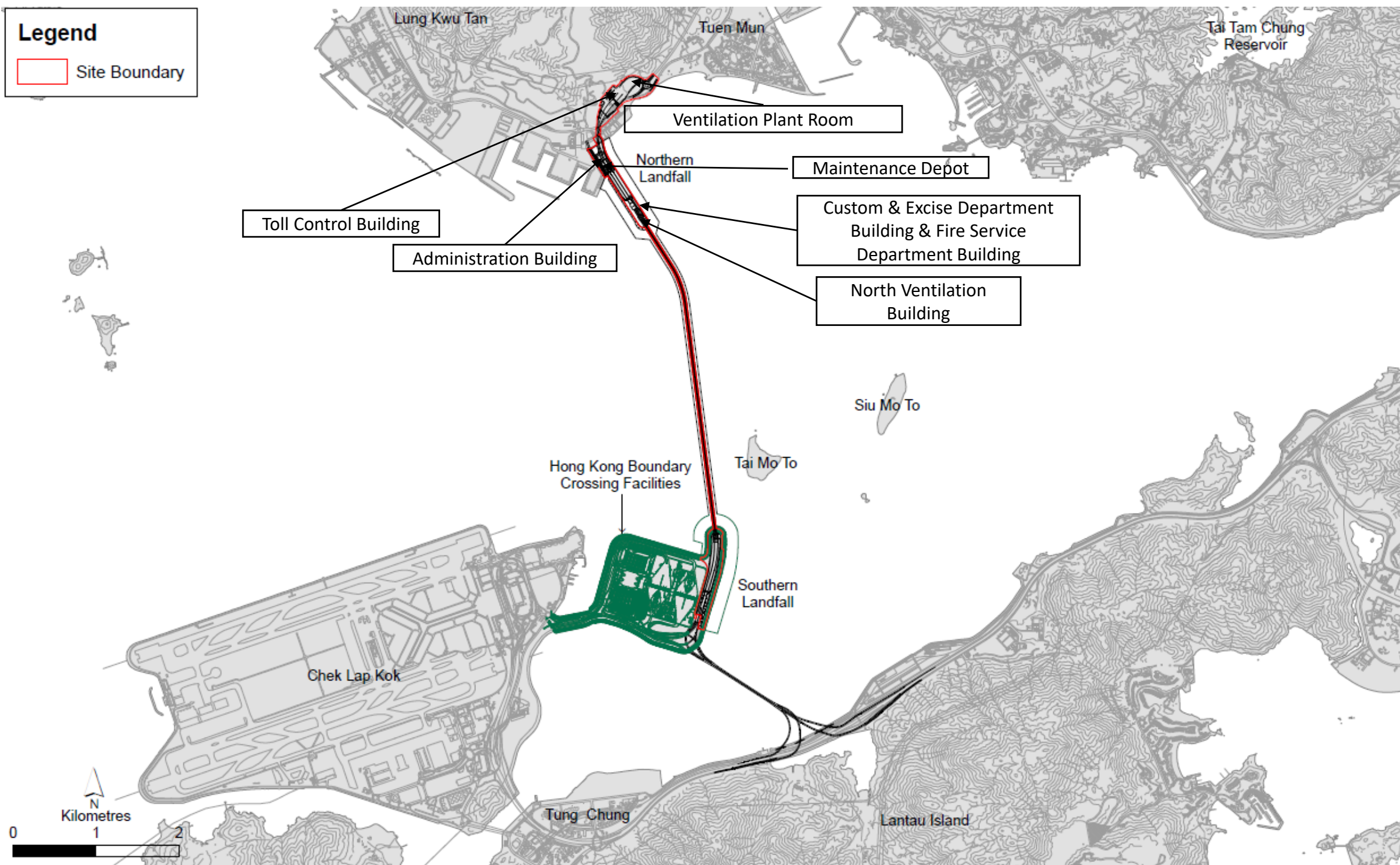
17 th Jan		Location: A+B & MD	
Period		Time	Sign
7-8			
8-9	/	8:03	Man
9-10	/ /	9:15 9:40	Man
10-11	/	10:08	Man
11-12	/	11:10	Man
12-13	/	12:50	Man
13-14	/ /	13:21 13:50	Man
14-15	/	14:30	Man
15-16	/	15:42	Man
16-17	/	16:31	Man
17-18	/	17:24	Man
18-19			

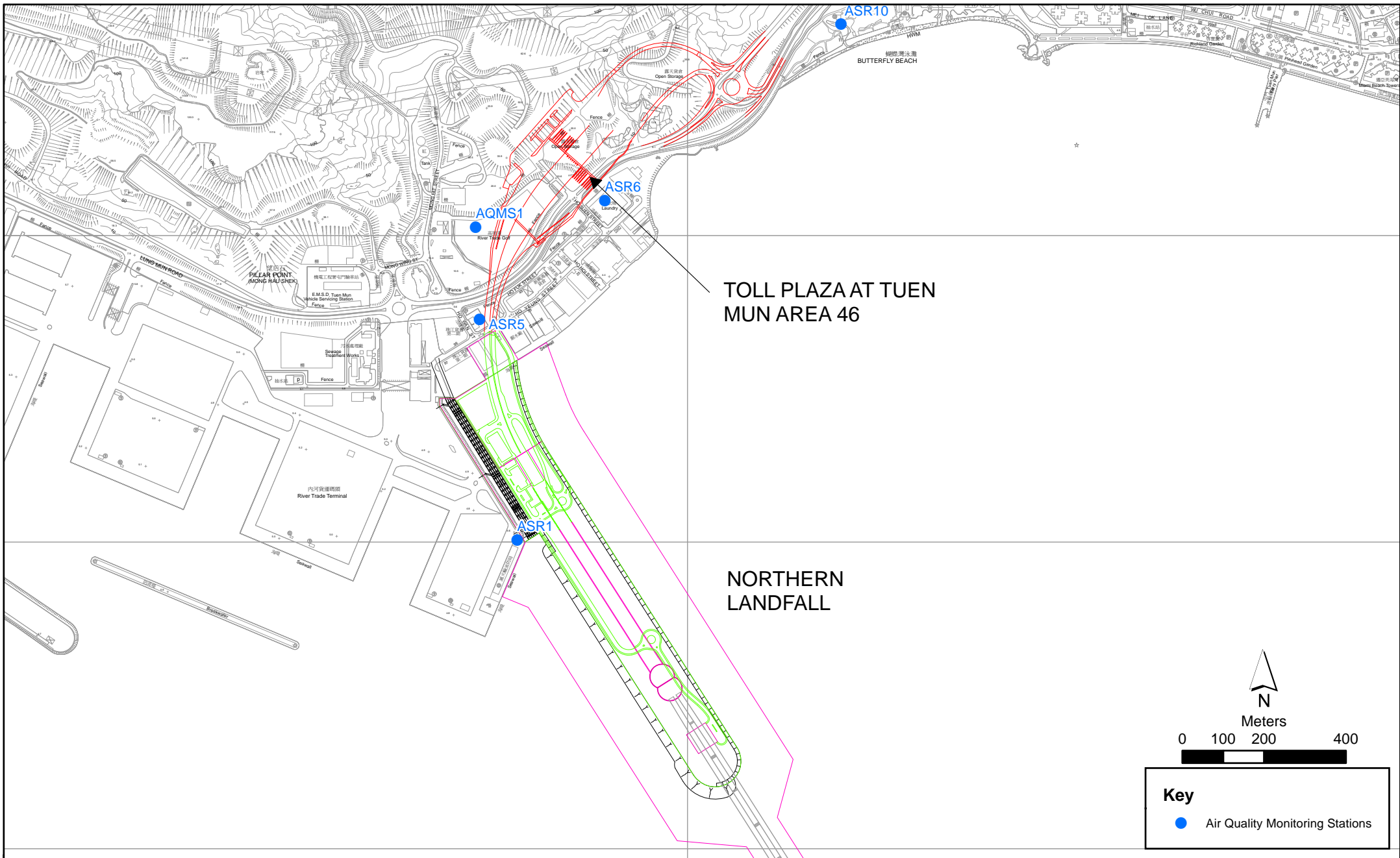
Meteorological Data for Impact Monitoring in the reporting period*			
Date (yy-mm-dd)	Time (24hrs)	Average of Wind Speed (m/s)	Average of Wind Director (degree)
19/01/17	0:00	1.3	342
19/01/17	1:00	1.8	340
19/01/17	2:00	2.2	32
19/01/17	3:00	1.8	30
19/01/17	4:00	1.8	22
19/01/17	5:00	1.8	49
19/01/17	6:00	1.8	17
19/01/17	7:00	1.3	55
19/01/17	8:00	0.9	32
19/01/17	9:00	1.8	45
19/01/17	10:00	2.2	47
19/01/17	11:00	2.2	52
19/01/17	12:00	1.8	29
19/01/17	13:00	2.2	207
19/01/17	14:00	2.2	274
19/01/17	15:00	3.1	276
19/01/17	16:00	2.2	284
19/01/17	17:00	0.9	351
19/01/17	18:00	1.8	90
19/01/17	19:00	1.3	85
19/01/17	20:00	0.9	32
19/01/17	21:00	1.3	37
19/01/17	22:00	1.3	42
19/01/17	23:00	1.3	44

*Wind data is sourced from Contract No. HY/2012/08 Tuen Mun - Chek Lap Kok Link - Northern Connection Sub-sea Tunnel Section

Legend

Site Boundary





TOLL PLAZA AT TUEN
MUN AREA 46

NORTHERN
LANDFALL



Meters

0 100 200 400



Key

- Air Quality Monitoring Stations

Air Quality Monitoring Stations for the Enhanced TSP Monitoring
(Source: Adopted from Contract No. HY/2012/08 Tuen Mun-Chek Lap Kok Link -
Northern Connection Sub-sea Tunnel Section)

**Environmental
Resources
Management**



Email
message

Environmental
Resources
Management

To Ramboll Hong Kong Limited (ENPO)

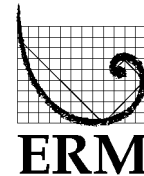
From ERM- Hong Kong, Limited

Ref/Project number Contract No. HY/2017/10
Tuen Mun – Chek Lap Kok Link – Northern
Connection Tunnel Buildings, Electrical and
Mechanical Works

Subject Notification of Exceedance for Air Quality
Impact Monitoring

Date 12 February 2019

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com



Dear Sir/ Madam,

Please find attached the Notification of Exceedance (NOE) of the following
Log no.:

Action Level Exceedance
0463091_26January2019_1hrTSP_Station ASR5

One (1) exceedance were recorded on 26 January 2019.

Regards,



Dr Jasmine Ng
Environmental Team Leader

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ERM-Hong Kong, Limited

**CONTRACT NO. HY/2017/10
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION TUNNEL BUILDINGS,
ELECTRICAL AND MECHANICAL WORKS**

Air Quality Impact Monitoring

Notification of Exceedance

Log No.	<u>Action Level Exceedance</u> 0463091_26January2019_1hrTSP_Station ASR5 [Total No. of Exceedances = 1]	
Date	26 January 2019 (Measured) 12 February 2019 (Results obtained from ENPO Website)	
Monitoring Station	ASR1, ASR5, ASR6, ASR10, AQMS1	
Parameter(s) with Exceedance(s)	1-hr TSP	
Action Levels	1-hr TSP ($\mu\text{g}/\text{m}^3$)	ASR1 = 331 ASR5 = 340 ASR6 = 338 ASR10 = 335 AQMS1 = 337
Limit Levels	1-hr TSP ($\mu\text{g}/\text{m}^3$)	500
Measured Levels	Refer to the attached data sheet.	
Works Undertaken (at the time of monitoring event)	Works undertaken under this Contract on 26 January 2019 included: <ul style="list-style-type: none"> ▪ Rebar fixing at Administration Building and Maintenance Depot (<i>refer to Contractor's photo</i>) 	
Possible Reason for Action or Limit Level Exceedance(s)	<p>The exceedances are unlikely to be due to the Contract, in view of the following:</p> <ul style="list-style-type: none"> • Apart from exceedance of 1 hour-TSP at ASR5 during 8:30 to 9:30, other 1hr-TSP levels and all 24-hr TSP at all monitoring stations were in compliance with the Action and Limit Levels on the same day. • Watering record provided by the Contractor was reviewed. Watering was maintained on unpaved and dry road on 26 January 2019 (<i>refer to Contractor's Photo</i>). • With reference to the recorded wind direction (ranged between 143° and 158°, blowing from a south-easterly direction) during the period of the observed 1-hr TSP exceedances, station ASR5 is located downstream of the Administration Building and Maintenance Depot. However, rebar fixing was conducted at the Administration Building and Maintenance Depot which are not major dust generating works. <p>Based on the above, the exceedances are unlikely to be due to the Contract.</p>	
Actions Taken / To Be Taken	The Contractor has been reminded to ensure all dust suppression measures are implemented at the site area including water spraying at unpaved road. The ET will monitor for future trends in exceedances.	
Remarks	The monitoring results on 26 January 2019 and locations of air quality monitoring stations are attached. The location of the works area under this Contract is attached. The attached wind data on 26 January 2019 is sourced from <i>Contract No. HY/2012/08</i> for reference.	

Results of Air Quality Monitoring

Project	Works	Date (yyyy-mm-dd)	Station	Time (hh:mm, 24hour)	Parameter	Results	Unit
TMCLKL	HY/2012/08	2019-01-26	AQMS1	8:53	1-hour TSP	126	ug/m3
TMCLKL	HY/2012/08	2019-01-26	AQMS1	9:55	1-hour TSP	69	ug/m3
TMCLKL	HY/2012/08	2019-01-26	AQMS1	10:57	1-hour TSP	75	ug/m3
TMCLKL	HY/2012/08	2019-01-26	ASR1	8:42	1-hour TSP	245	ug/m3
TMCLKL	HY/2012/08	2019-01-26	ASR1	9:44	1-hour TSP	207	ug/m3
TMCLKL	HY/2012/08	2019-01-26	ASR1	10:46	1-hour TSP	112	ug/m3
TMCLKL	HY/2012/08	2019-01-26	ASR10	8:08	1-hour TSP	106	ug/m3
TMCLKL	HY/2012/08	2019-01-26	ASR10	9:10	1-hour TSP	74	ug/m3
TMCLKL	HY/2012/08	2019-01-26	ASR10	10:12	1-hour TSP	71	ug/m3
TMCLKL	HY/2012/08	2019-01-26	ASR5	8:30	1-hour TSP	399	ug/m3
TMCLKL	HY/2012/08	2019-01-26	ASR5	9:32	1-hour TSP	208	ug/m3
TMCLKL	HY/2012/08	2019-01-26	ASR5	10:34	1-hour TSP	208	ug/m3
TMCLKL	HY/2012/08	2019-01-26	ASR6	8:19	1-hour TSP	304	ug/m3
TMCLKL	HY/2012/08	2019-01-26	ASR6	9:21	1-hour TSP	111	ug/m3
TMCLKL	HY/2012/08	2019-01-26	ASR6	10:23	1-hour TSP	141	ug/m3
TMCLKL	HY/2012/08	2019-01-26	AQMS1	11:59	24-hour TSP	81	ug/m3
TMCLKL	HY/2012/08	2019-01-26	ASR1	11:48	24-hour TSP	83	ug/m3
TMCLKL	HY/2012/08	2019-01-26	ASR10	11:14	24-hour TSP	73	ug/m3
TMCLKL	HY/2012/08	2019-01-26	ASR5	11:36	24-hour TSP	101	ug/m3
TMCLKL	HY/2012/08	2019-01-26	ASR6	11:25	24-hour TSP	90	ug/m3

Note: Indicates Exceedance of Action Level
Indicates Exceedance of Limit Level

Photo 1 - Rebar fixing conducted at works area of Administration Building and Maintenance Depot



Photo 2- Watering of unpaved roads near Administration Building and Maintenance Depot



WATERING RECORD ON 26 JANUARY 2019

Location: A&B & up

26th Jan

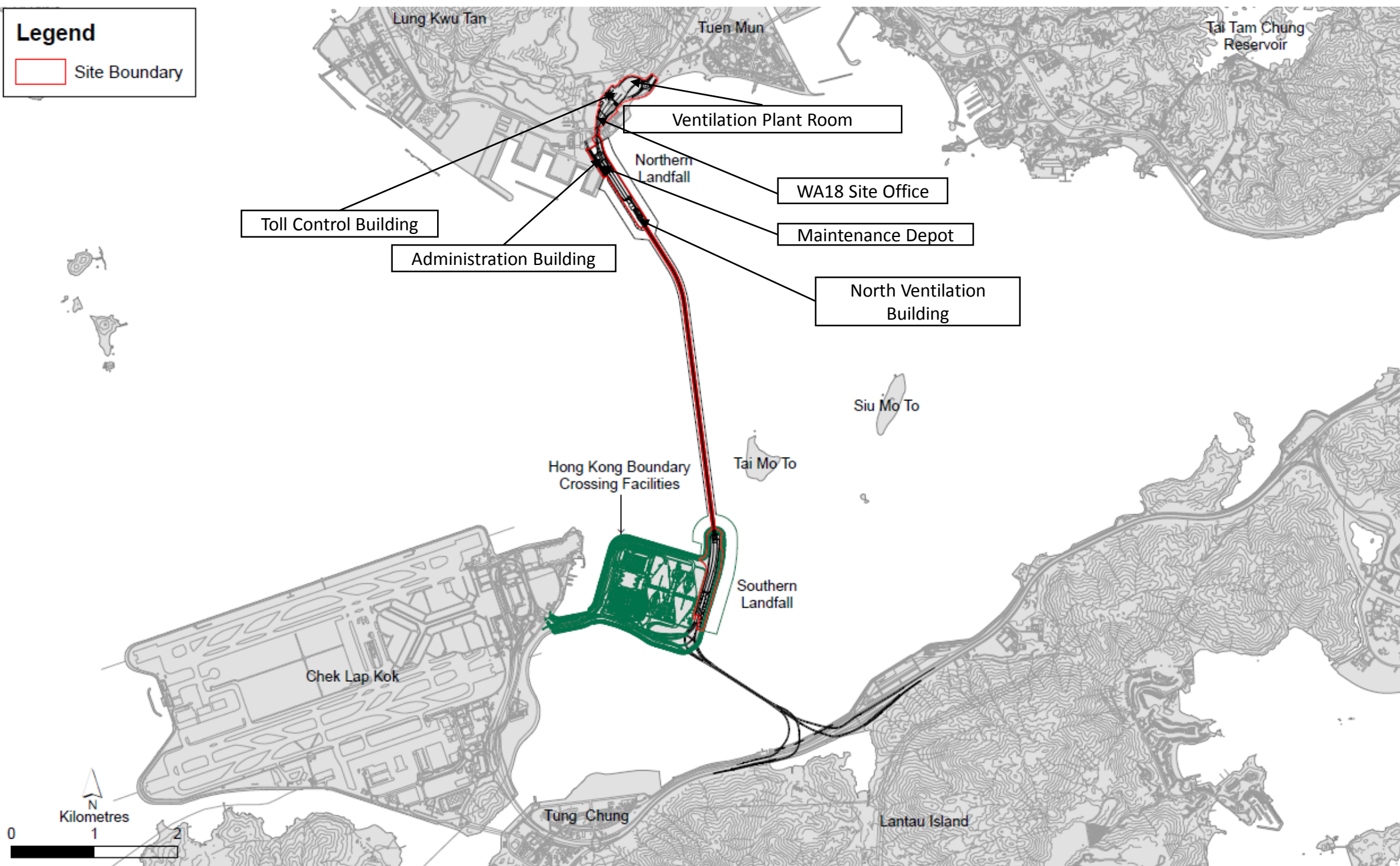
Period		Time	Sign
7-8			
8-9	✓	8:05	Alan
9-10	✓	9:06	Alan
10-11	✓	10:11	Alan
11-12	✓ ✓	11:07 11:43	Alan
12-13	✓	12:50	Alan
13-14	✓	13:31	Alan
14-15	✓	14:15	Alan
15-16	✓ ✓	15:03 15:44	Alan
16-17	✓	16:41	Alan
17-18	✓	17:29	Alan
18-19			

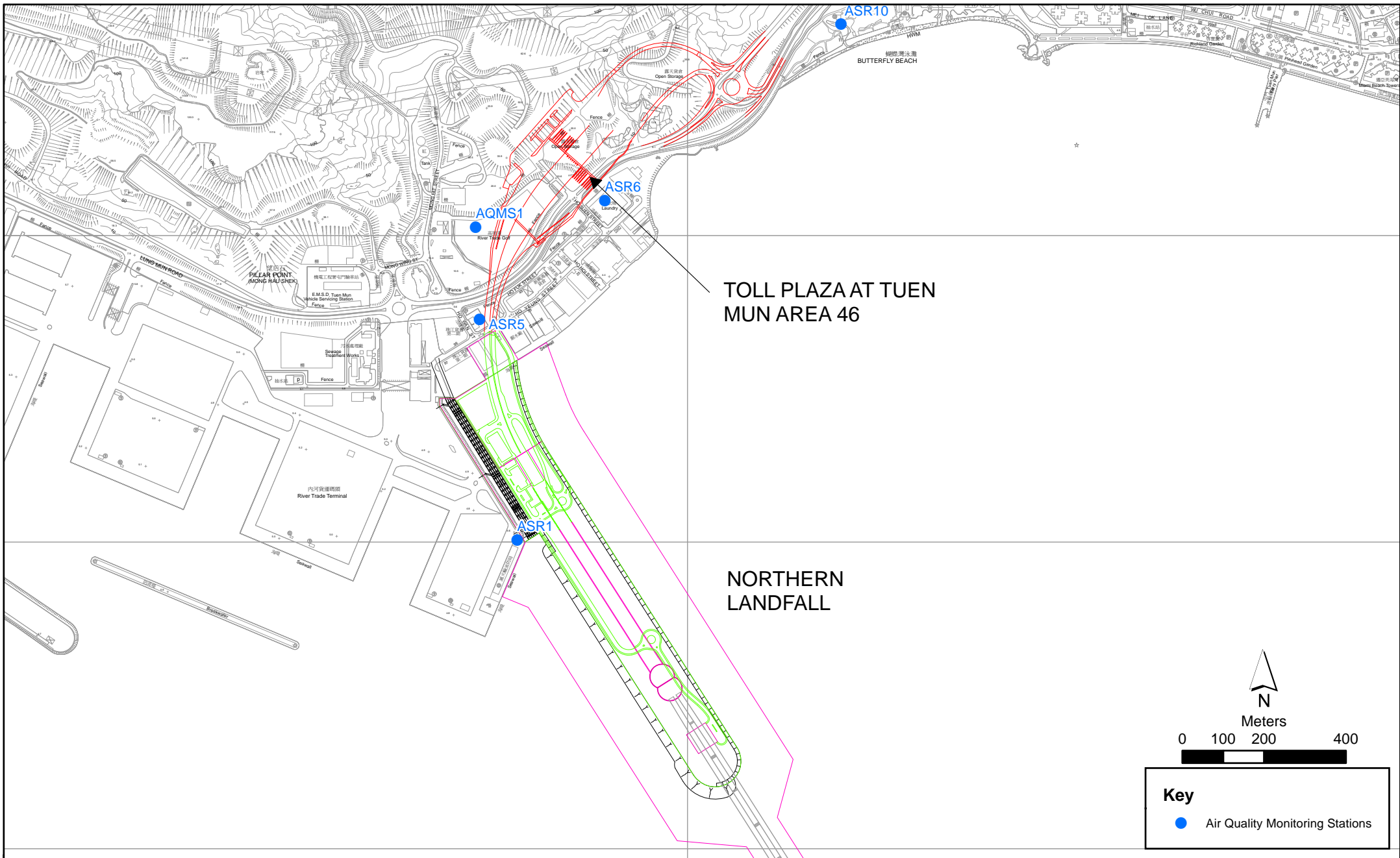
Meteorological Data for Impact Monitoring in the reporting period*			
Date (yy-mm-dd)	Time (24hrs)	Average of Wind Speed (m/s)	Average of Wind Director (degree)
19/01/26	0:00	0.0	-
19/01/26	1:00	0.0	-
19/01/26	2:00	0.4	12
19/01/26	3:00	2.2	34
19/01/26	4:00	2.2	47
19/01/26	5:00	2.2	39
19/01/26	6:00	2.7	47
19/01/26	7:00	1.8	14
19/01/26	8:00	1.3	143
19/01/26	9:00	2.2	158
19/01/26	10:00	2.2	154
19/01/26	11:00	1.8	221
19/01/26	12:00	2.2	215
19/01/26	13:00	1.3	220
19/01/26	14:00	1.3	254
19/01/26	15:00	2.2	213
19/01/26	16:00	2.2	232
19/01/26	17:00	1.3	94
19/01/26	18:00	1.8	96
19/01/26	19:00	1.8	95
19/01/26	20:00	2.2	85
19/01/26	21:00	2.7	94
19/01/26	22:00	3.6	86
19/01/26	23:00	3.1	95

*Wind data is sourced from Contract No. HY/2012/08 Tuen Mun - Chek Lap Kok Link - Northern Connection Sub-sea Tunnel Section

Legend

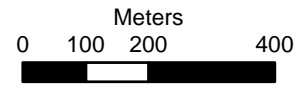
 Site Boundary





TOLL PLAZA AT TUEN
MUN AREA 46

NORTHERN
LANDFALL



Key

- Air Quality Monitoring Stations

Air Quality Monitoring Stations for the Enhanced TSP Monitoring
(Source: Adopted from Contract No. HY/2012/08 Tuen Mun-Chek Lap Kok Link -
Northern Connection Sub-sea Tunnel Section)

**Environmental
Resources
Management**

ERM