



**Contract No. HY/2012/08  
Tuen Mun – Chek Lap Kok Link –  
Northern Connection Sub-sea Tunnel  
Section**

*Fifty-ninth Monthly Environmental Monitoring &  
Audit (EM&A) Report*

15 October 2018

**Environmental Resources Management**  
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Ref.: HYDHZMBEEM00\_0\_6905L.18

15 October 2018

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

By Fax (2293 6300) and By Post

Attention: Messrs. Andy Westmoreland / Roger Man

Dear Sirs,

**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/2012/08 TM-CLKL Northern Connection Sub-sea  
Tunnel Section  
59<sup>th</sup> Monthly EM&A Report for September 2018 (EP-354/2009/D)**

Reference is made to the Monthly Environmental Monitoring and Audit (EM&A) Report (Sep. 2018) (ET's ref.: "0212330\_59th Monthly EM&A\_20181011.doc" dated 15 Oct. 2018) certified by the ET Leader and provided to us via e-mail on 15 Oct. 2018.

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. Stephen Chan (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)  
Dragages – Bouygues JV - Mr. Bryan Lee (By Fax: 2293 7499)

Internal: DY, YH, DF, ENPO Site

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# Contract No. HY/2012/08


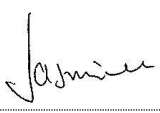


## Tuen Mun – Chek Lap Kok Link – Northern Connection Sub-sea Tunnel Section

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*Fifty-ninth Monthly Environmental Monitoring & Audit (EM&A) Report*

**Document Code: 0212330\_59th Monthly EM&A\_20181011.doc**

Client:  DBJV		Project No:  0212330			
Summary:  This document presents the Fifty-ninth Monthly EM&A Report for Tuen Mun – Chek Lap Kok Link Northern Connection Sub-sea Tunnel Section.		Date: 15 October 2018			
		Approved by:  			
		Mr Craig Reid Partner			
		Certified by:  			
		Dr Jasmine Ng ET Leader			
	59 <sup>th</sup> Monthly EM&A Report	VAR	JN	CAR	15/10/18
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>			
		 			

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## **EXECUTIVE SUMMARY**

Under *Contract No. HY/2012/08*, Dragages – Bouygues Joint Venture (DBJV) is commissioned by the Highways Department (HyD) to undertake the design and construction of the Northern Connection Sub-sea Tunnel Section of the Tuen Mun – Chek Lap Kok Link Project (TM-CLK Link Project) while AECOM Asia Company Limited was appointed by HyD as the Supervising Officer. 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 1 November 2013 and will tentatively be completed by the end of 2019. The impact monitoring of the EM&A programme, including air quality, water quality, marine ecological monitoring and environmental site inspections, were commenced on 1 November 2013.

This is the Fifty-ninth Monthly EM&A report presenting the EM&A works carried out during the period from 1 to 30 September 2018 for the *Contract No. HY/2012/08 Northern Connection Sub-sea Tunnel Section* (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*

- Construction of Cross Passage Tympanum – TBM tunnel;
- Cross Passage Lining Installation – TBM Tunnel;
- Cross Passage Construction by Pipe Jacking – TBM Tunnel;
- Corbel & OVHD Construction – TBM Tunnel;
- Parapet wall and fireboard Installation – TBM Tunnel;
- Bulk Excavation – Portion N-A; and
- CSM treatment, Jet Grouting works and D-wall Construction – Portion S-A

There was no dredging, reclamation or marine sheet piling works in open waters during this reporting period.

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

24-hour TSP Monitoring	9 sessions
1-hour TSP Monitoring	9 sessions
Impact Dolphin Monitoring	2 sessions
Joint Environmental Site Inspection	4 sessions

#### *Implementation of Marine Mammal Exclusion Zone*

There was no dredging, reclamation or marine sheet piling works in open waters during this reporting period. Thus, Passive Acoustic Monitoring (PAM) and the day-time monitoring of Dolphin Exclusion Zone (DEZ) by dolphin observers were not in effect during the reporting period.

#### Summary of Breaches of Action/Limit Levels

##### *Breaches of Action and Limit Levels for Air Quality*

One (1) Action Level exceedance of 1-hour TSP was recorded on 7 September 2018. One (1) Action Level and one (1) Limit Level exceedance of 1-hour TSP was recorded on 28 September 2018. Investigation reports are provided in Appendix K.

##### *Breaches of Action and Limit Levels for Dolphin Monitoring*

Due to monthly variation in dolphin occurrence within the survey area, it would be more appropriate to draw conclusion on whether any unacceptable impacts on dolphins have been detected in relation to the construction activities of this Project in the quarterly EM&A reports, where comparison on distribution, group size and encounter rates of dolphins between the quarterly impact monitoring period and baseline monitoring period will be made.

#### Environmental Complaints, Non-compliance & Summons

No non-compliance with EIA recommendations, EP conditions and other requirements associated with the construction of this Contract was recorded in this reporting period.

No environmental complaint was received in this reporting period.

No environmental summons was received in this reporting period.

#### Reporting Change

There was no reporting change required in the reporting period.

#### Upcoming Works for the Next Reporting Month

Works to be undertaken in the next monitoring period of October 2018 include the following:

*Land-based Works*

- Construction of Cross Passage Tympanum – TBM tunnel;
- Cross Passage Construction by Pipe Jacking – TBM tunnel;
- Cross Passage Lining Installation – TBM Tunnel;
- Parapet wall and fireboard Installation – TBM Tunnel
- Corbel & OVHD Construction – TBM Tunnel;
- Bulk Excavation – Portion S-A; and
- D-wall Construction – Portion S-A

There will be no dredging, reclamation or marine sheet piling works in open waters during next reporting period.

Future Key Issue

Potential environmental impacts arising from the above upcoming construction activities in the next reporting month of October 2018 are mainly associated with dust, marine ecology and waste management issues.

## 1.1

## BACKGROUND

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/2012/08*, Dragages – Bouygues Joint Venture (DBJV) is commissioned by the Highways Department (HyD) to undertake the design and construction of the Northern Connection Sub-sea Tunnel Section of TM-CLKL while AECOM Asia Company Limited was appointed by HyD as the Supervising Officer. 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).

Layout of the Contract components is presented in *Figure 1.1*.

The construction phase of the Contract commenced on 1 November 2013 and will tentatively be completed by the end of 2019. The impact monitoring phase of the EM&A programme, including air quality, water quality, marine ecological monitoring and environmental site inspections, were commenced on 1 November 2013.





Designed By	PKV
Drawn By	DAI
Approved By	SPo
Date	11SEP2013
Rev.	Description
A	FIRST ISSUE
	11SEP13
	PKV
	Checked

Main Contractor  

  
 A member of the Bouygues Construction group  
 Dragages - Bouygues Joint Venture 寶嘉 - 布依格聯營

Client  

 路政署  
**HIGHWAYS DEPARTMENT**

Contractor's Designer  

 Ove Arup & Partners  
 Hong Kong Limited

Project  
 Contract No. HY/2012/08  
 Tuen Mun - Chek Lap Kok Link -  
 Northern Connection Sub-Sea Tunnel Section  
 Drawing Title  
**Figure 1.1**

Drawing no.	TMCLKL8-DBJ-GEN-DWG-00174
Scale	1:25000 © A3
CADD Ref.	TMCLKL8-DBJ-GEN-DWG-00174-DFT-A
Issue Status	DFT (DRAFT)
Revision	A

## 1.2 SCOPE OF REPORT

This is the Fifty-ninth Monthly EM&A Report under the *Contract No. HY/2012/08 Tuen Mun – Chek Lap Kok Link – Northern Connection Sub-sea Tunnel Section*. This report presents a summary of the environmental monitoring and audit works in September 2018.

## 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*

<b>Party</b>	<b>Position</b>	<b>Name</b>	<b>Telephone</b>	<b>Fax</b>
Highways Department	Engr 22/HZMB	Chow Man Lung, Andrew	2762 4110	2762 4110
SOR (AECOM Asia Company Limited)	Chief Resident Engineer	Roger Man	2293 6388	2293 6300
		Andrew Westmoreland	2293 6360	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 (Dragages – Bouygues Joint Venture)	Deputy Environmental Manager	Bryan Lee	2293 7323	2293 7499
		Ashley Au	52950766	
		24-hour hotline	2293 7330	
ET (ERM-HK)	ET Leader	Jasmine Ng	2271 3311	2723 5660

## 1.4 SUMMARY OF CONSTRUCTION WORKS

The construction phase of this Contract was commenced on 1 November 2013. The construction programme is shown in *Appendix B*.

As per DBJV's information, details of major construction works carried out in this reporting period are summarized in *Table 1.2*.

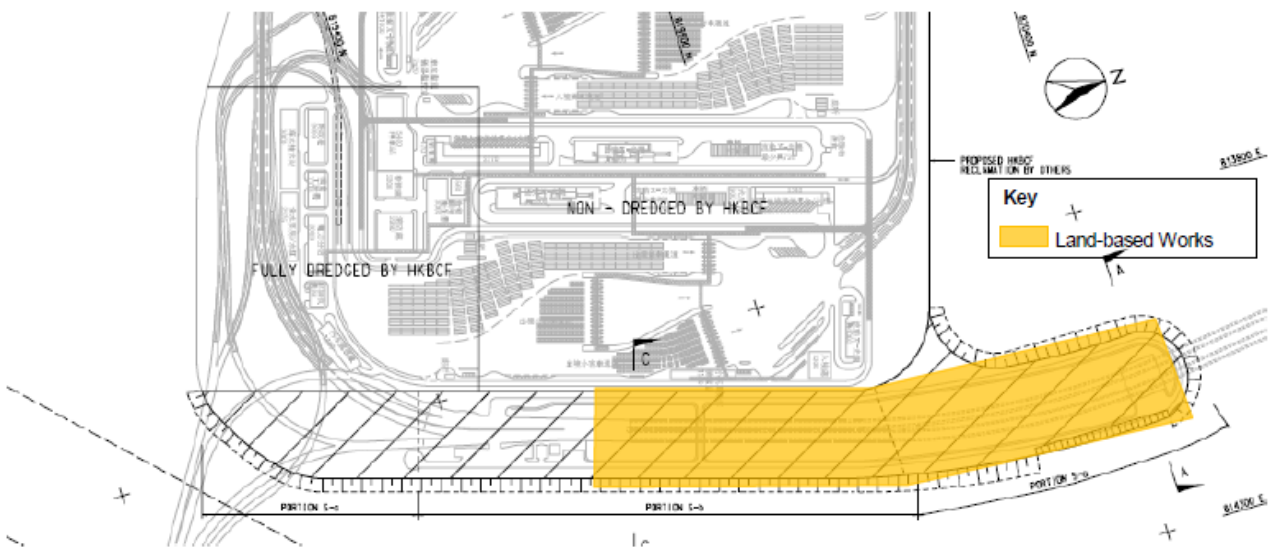
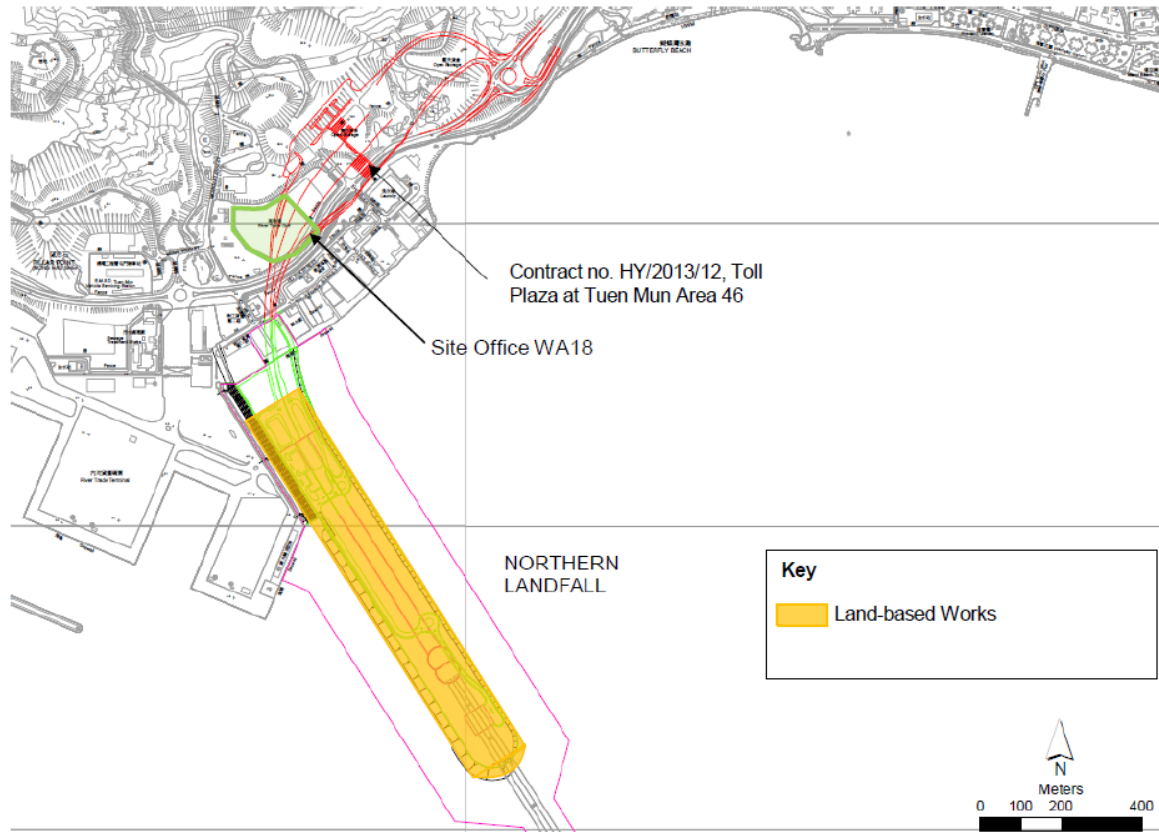
The general layout plan of the site showing the detailed works areas is shown in *Figure 1.2*. The Environmental Sensitive Receivers in the vicinity of the Project are shown in *Figure 1.3*.

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

**Table 1.2** *Summary of Construction Activities Undertaken during the Reporting Period*

<b>Construction Activities Undertaken</b>
<i>Land-based Works</i>
<ul style="list-style-type: none"><li>• Construction of Cross Passage Tympanum – TBM tunnel;</li><li>• Cross Passage Lining Installation – TBM Tunnel;</li><li>• Cross Passage Construction by Pipe Jacking – TBM Tunnel;</li><li>• Corbel &amp; OVHD Construction – TBM Tunnel;</li><li>• Parapet wall and fireboard Installation – TBM Tunnel;</li><li>• Bulk Excavation – Portion N-A; and</li><li>• CSM treatment, Jet Grouting works and D-wall Construction – Portion S-A</li></ul>

Figure 1.2 Locations of Construction Activities – September 2018



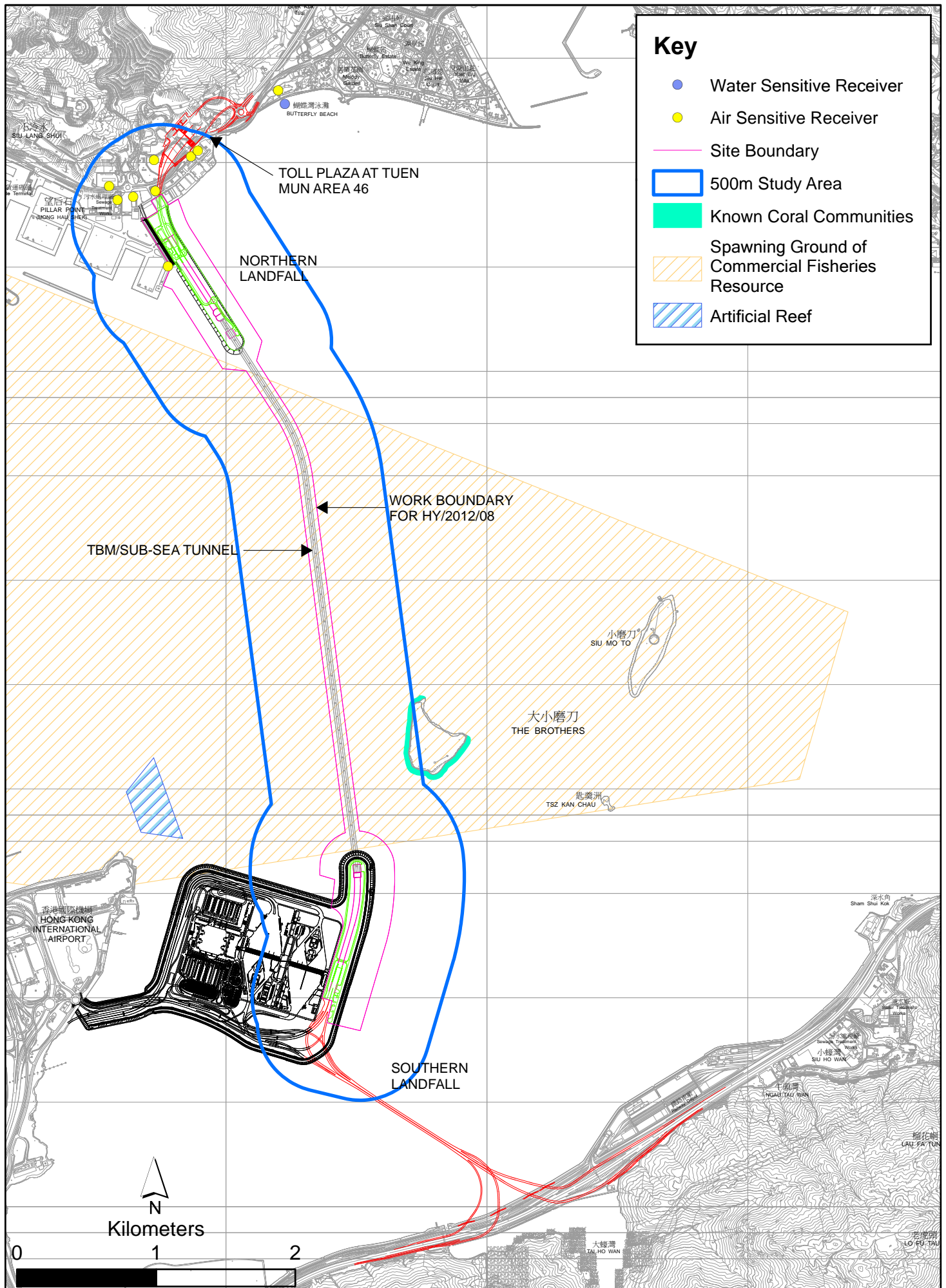


Figure 1.3 Environmental Sensitive Receivers in the vicinity of Contract No. HY/2012/08 Tuen Mun - Chek Lap Kok Link - Northern Connection Sub-Sea Tunnel Section

File: T:\GIS\CONTRACT\0212330\I\mxd\0212330\_EMnA\_Env\_Sensitive\_Receiver.mxd  
Date: 15/4/2014



The EM&A programme required environmental monitoring for air quality, water quality and marine ecology as well as environmental site inspections for air quality, noise, water quality, waste management, marine ecology and landscape and visual impacts. 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 commenced on 24 October 2014.

High volume samplers (HVSs) were used to carry out the 1-hour and 24-hour TSP monitoring on 1, 4, 7, 10, 13, 19, 22, 25 and 28 September 2018 at the five (5) air quality monitoring stations in accordance with the requirements stipulated in the Updated EM&A Manual (*Figure 2.1; Table 2.1*). Wind meter was installed at the rooftop of ASR5 for logging wind speed and wind direction. Details of the equipment deployed are provided in *Table 2.2*. Copies of the calibration certificates for the equipment are presented in *Appendix E*.

**Table 2.1** *Locations of Impact Air Quality Monitoring Stations and Monitoring Dates in this Reporting Period*

Monitoring Station	Monitoring Dates	Location	Description	Parameters & Frequency
ASR1	1, 4, 7, 10, 13, 19, 22, 25 and 28 September 2018	Tuen Mun Fireboat Station	Office	TSP monitoring
ASR5		Pillar Point Fire Station	Office	<ul style="list-style-type: none"> <li>1-hour Total Suspended Particulates (1-hour TSP, <math>\mu\text{g}/\text{m}^3</math>), 3 times in every 6 days</li> <li>24-hour Total Suspended Particulates (24-hour TSP, <math>\mu\text{g}/\text{m}^3</math>), daily for 24-hour in every 6 days</li> </ul>
AQMS1		Previous River Trade Golf	Bare ground	Enhanced TSP monitoring (commenced on 24 October 2014)
ASR6		Butterfly Beach Laundry	Office	<ul style="list-style-type: none"> <li>1-hour Total Suspended Particulates (1-hour TSP, <math>\mu\text{g}/\text{m}^3</math>), 3 times in every 3 days</li> <li>24-hour Total Suspended Particulates (24-hour TSP, <math>\mu\text{g}/\text{m}^3</math>), daily for 24-hour in every 3 days</li> </ul>
ASR10		Butterfly Beach Park	Recreational uses	<ul style="list-style-type: none"> <li>1-hour Total Suspended Particulates (1-hour TSP, <math>\mu\text{g}/\text{m}^3</math>), 3 times in every 3 days</li> <li>24-hour Total Suspended Particulates (24-hour TSP, <math>\mu\text{g}/\text{m}^3</math>), daily for 24-hour in every 3 days</li> </ul>

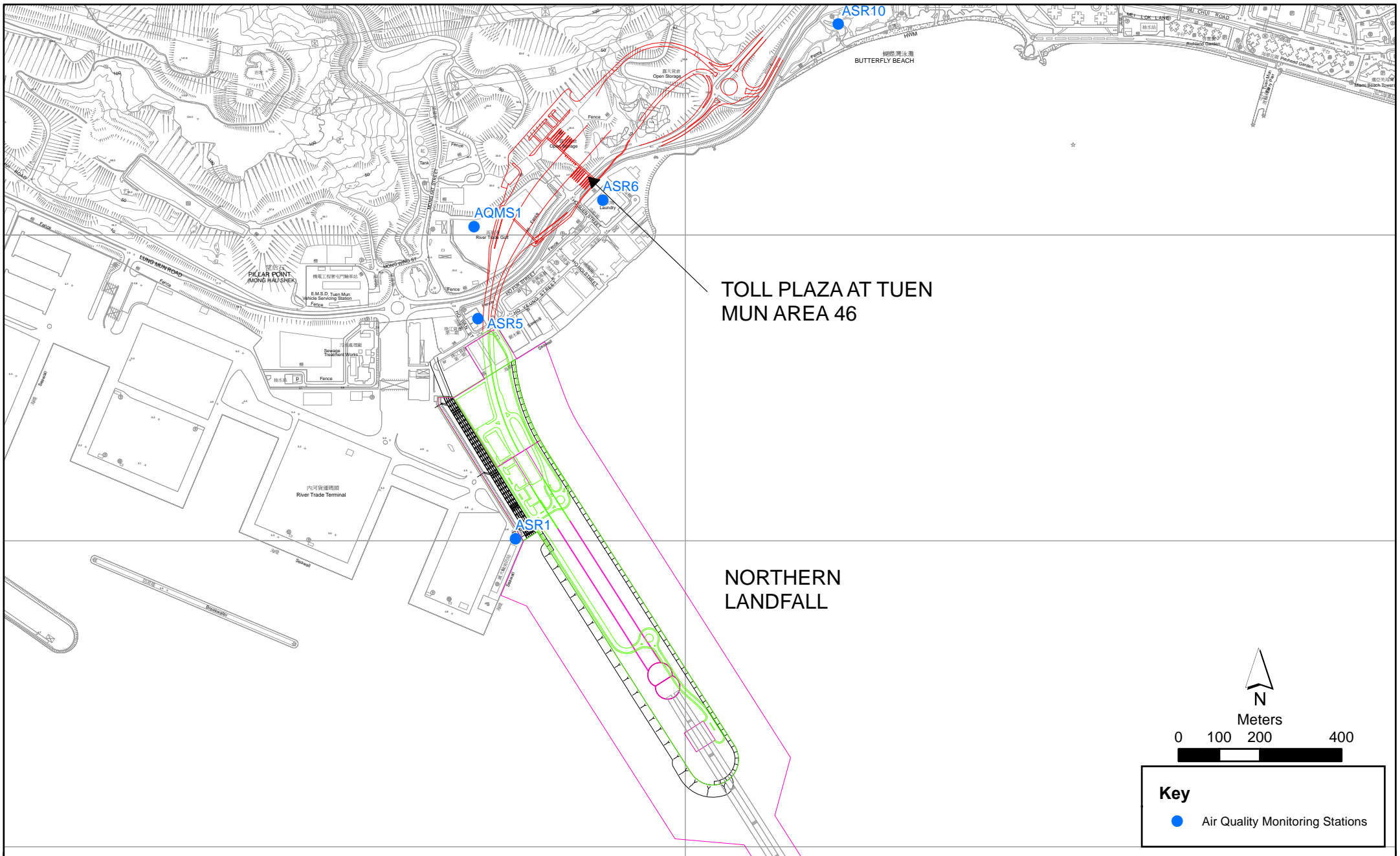


Figure 2.1

Air Quality Monitoring Stations for the Enhanced TSP Monitoring

**Table 2.2 Air Quality Monitoring Equipment**

<b>Equipment</b>	<b>Brand and Model</b>
High Volume Sampler (1-hour TSP and 24-hour TSP)	Tisch Environmental Mass Flow Controlled Total Suspended Particulate (TSP) High Volume Sampler (Model No. TE-5170)
Wind Meter	Davis (Model: Vantage Pro 2 (S/N: AS160104014)
Wind Anemometer for calibration	Lutron (Model No. AM-4201)

**2.1.2 Action & Limit Levels**

The Action and Limit Levels of the air quality monitoring is provided in *Appendix D*. The Event and Action plan is presented in *Appendix J*.

**2.1.3 Monitoring Schedule for the Reporting Month**

The schedule for air quality monitoring in September 2018 is provided in *Appendix F*. Air quality monitoring on 16 September 2018 was cancelled due to adverse weather.

**2.1.4 Results and Observations**

The monitoring results for 1-hour TSP and 24-hour TSP are summarized in *Tables 2.3* and *2.4*, respectively. Detailed impact air quality monitoring results and graphical presentations are presented in *Appendix G*.

**Table 2.3 Summary of 1-hour TSP Monitoring Results in this Reporting Period**

<b>Station</b>	<b>Average (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Range (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Action Level (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Limit Level (<math>\mu\text{g}/\text{m}^3</math>)</b>
ASR1	150	25 - 584	331	500
ASR5	144	33 - 314	340	500
AQMS1	83	25 - 170	335	500
ASR6	114	26 - 211	338	500
ASR10	67	27 - 121	337	500

**Table 2.4 Summary of 24-hour TSP Monitoring Results in this Reporting Period**

<b>Station</b>	<b>Average (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Range (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Action Level (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Limit Level (<math>\mu\text{g}/\text{m}^3</math>)</b>
ASR1	71	28 - 167	213	260
ASR5	83	35 - 140	238	260
AQMS1	50	26 - 68	213	260
ASR6	65	22 - 110	238	260
ASR10	44	20 - 69	214	260

The weather condition during the monitoring period varied from sunny to cloudy. The major dust sources in the reporting period included construction activities under the Contract as well as nearby traffic emissions.

A total of 9 1-hour TSP and 24-hour TSP monitoring were undertaken in which two (2) Action Level and one (1) Limit Level exceedances of 1-hour TSP were recorded in this reporting month.

Meteorological information collected at the ASR5, including wind speed and wind direction, is provided in *Appendix H*.

## 2.2 WATER QUALITY MONITORING

Seawall Enhancement Works at Northern Landfall has been completed on 31 December 2017. Notification of suspension of water quality monitoring has been approved by EPD on 2 March 2018.

## 2.3 DOLPHIN MONITORING

### 2.3.1 Monitoring Requirements

Impact dolphin monitoring is required to be conducted by a qualified dolphin specialist team to evaluate whether there have been any effects on the dolphins. In order to fulfil the EM&A requirements and make good use of available resources, the on-going impact line transect dolphin monitoring data collected by HyD's *Contract No. HY/2011/03 Hong Kong-Zhuhai-Macao Bridge. Hong Kong Link Road - Section between Scenic Hill and Hong Kong Boundary Crossing Facilities* on the monthly basis is adopted to avoid duplicates of survey effort.

### 2.3.2 Monitoring Equipment

Table 2.5 summarises the equipment used for the impact dolphin monitoring.

**Table 2.5 Dolphin Monitoring Equipment**

<b>Equipment</b>	<b>Model</b>
Global Positioning System (GPS)	Garmin 18X-PC Geo One Phottix
Camera	Nikon D90 300m 2.8D fixed focus Nikon D90 20-300m zoom lens
Laser Binocular	Infinitor LRF 1000
Marine Binocular	Bushell 7 x 50 marine binocular with compass and reticules
Vessel for Monitoring	65 foot single engine motor vessel with viewing platform 4.5m above water level

### 2.3.3 *Monitoring Parameter, Frequencies & Duration*

Dolphin monitoring should cover all transect lines in Northeast Lantau (NEL) and the Northwest Lantau (NWL) survey areas twice per month throughout the entire construction period. The monitoring data should be compatible with, and should be made available for, long-term studies of small cetacean ecology in Hong Kong. In order to provide a suitable long-term dataset for comparison, identical methodology and line transects employed in baseline dolphin monitoring was followed in the impact dolphin monitoring.

### 2.3.4 *Monitoring Location*

The impact dolphin monitoring was carried out in the NEL and NWL along the line transect as depicted in *Figure 2.2*. The co-ordinates of all transect lines are shown in *Table 2.6* below.



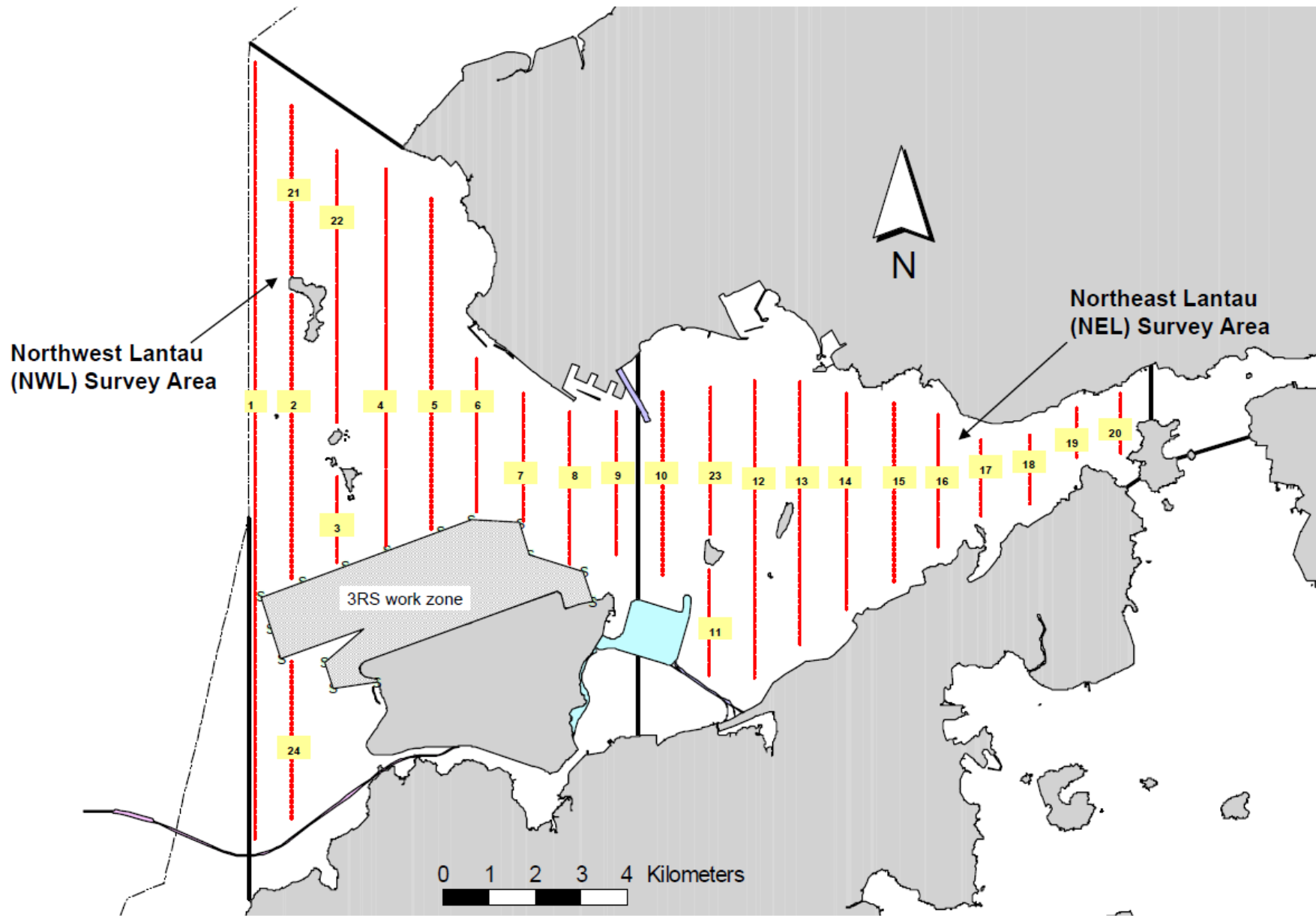


Figure 2.2

Layout of Transect Lines of Dolphin Monitoring in Northwest and Northeast Lantau Areas

**Table 2.6 Impact Dolphin Monitoring Line Transect Co-ordinates**

Line No.		Easting	Northing	Line No.		Easting	Northing
1	Start Point	804671	815456	13	Start Point	816506	819480
1	End Point	804671	831404	13	End Point	816506	824859
2	Start Point	805476	820800*	14	Start Point	817537	820220
2	End Point	805476	826654	14	End Point	817537	824613
3	Start Point	806464	821150*	15	Start Point	818568	820735
3	End Point	806464	822911	15	End Point	818568	824433
4	Start Point	807518	821500*	16	Start Point	819532	821420
4	End Point	807518	829230	16	End Point	819532	824209
5	Start Point	808504	821850*	17	Start Point	820451	822125
5	End Point	808504	828602	17	End Point	820451	823671
6	Start Point	809490	822150*	18	Start Point	821504	822371
6	End Point	809490	825352	18	End Point	821504	823761
7	Start Point	810499	822000*	19	Start Point	822513	823268
7	End Point	810499	824613	19	End Point	822513	824321
8	Start Point	811508	821123	20	Start Point	823477	823402
8	End Point	811508	824254	20	End Point	823477	824613
9	Start Point	812516	821303	21	Start Point	805476	827081
9	End Point	812516	824254	21	End Point	805476	830562
10	Start Point	813525	821176	22	Start Point	806464	824033
10	End Point	813525	824657	22	End Point	806464	829598
11	Start Point	814556	818853	23	Start Point	814559	821739
11	End Point	814556	820992	23	End Point	814559	824768
12	Start Point	815542	818807	24*	Start Point	805476*	815900*
12	End Point	815542	824882	24*	End Point	805476*	819100*

*Remarks: The coordinates of several starting and ending points have been revised due to the presence of a work zone to the north of the airport platform with intense construction activities in association with the construction of the third runway expansion for the Hong Kong International Airport. Co-ordinates in red and marked with asterisk are revised co-ordinates of transect line.*

### 2.3.5 Action & Limit Levels

The Action and Limit levels of impact dolphin monitoring are shown in *Appendix D*. The Event and Action plan is presented in *Appendix J*.

### 2.3.6 *Monitoring Schedule for the Reporting Month*

Dolphin monitoring was carried out on 4, 18, 20 and 26 of September 2018. The dolphin monitoring schedule for the reporting month is shown in *Appendix F*.

### 2.3.7 *Results & Observations*

A total of 263.68 km of survey effort was collected, with 98.08% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility) in September 2018. Among the two areas, 95.80 km and 167.88 km of survey effort were collected from NEL and NWL survey areas, respectively. The total survey effort conducted on primary and secondary lines were 190.81 km and 72.87 km respectively. The survey efforts are summarized in *Appendix I*.

One group of 2 Chinese White Dolphins sightings was recorded during the two sets of surveys in September 2018. The dolphin sighting was made in NWL, while none was sighted in NEL. The dolphin sighting was made on primary lines during on-effort search. The dolphin group was not associated with any operating fishing vessel.

No dolphin sighting was made in the proximity of the TM-CLKL alignment. The distribution of dolphin sightings during the reporting month is shown in *Figure 2.3*.

Encounter rates of Chinese White Dolphins are deduced from the survey effort and on-effort sighting data made under favourable conditions (Beaufort 3 or below) in September 2018 with the results present in *Tables 2.7* and *2.8*.

**Table 2.7 *Individual Survey Event Encounter Rates***

		Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)	Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort)
		Primary Lines Only	Primary Lines Only
NEL	Set 1: September 4 <sup>th</sup> / 18 <sup>th</sup>	0.0	0.0
	Set 2: September 20 <sup>th</sup> / 26 <sup>th</sup>	0.0	0.0
NWL	Set 1: September 4 <sup>th</sup> / 18 <sup>th</sup>	0.0	0.0
	Set 2: September 20 <sup>th</sup> / 26 <sup>th</sup>	1.6	3.2

Note: Dolphin Encounter Rates are deduced from the Two Sets of Surveys (Two Surveys in Each Set) in September 2018 in Northeast (NEL) and Northwest Lantau (NWL)

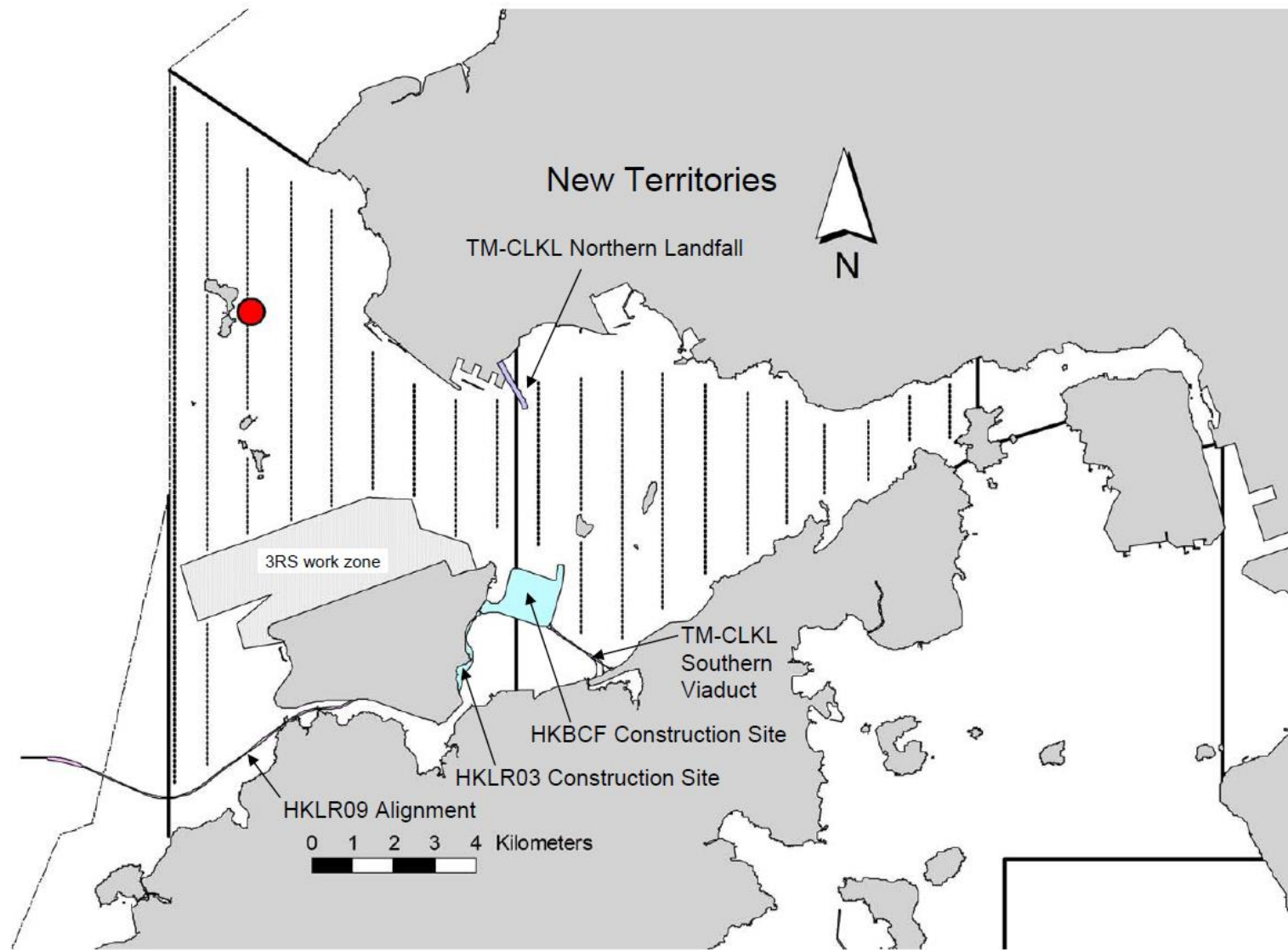


Figure 2.3

HY/2012/08 TM-CLKL Northern Connection Sub-sea Tunnel Section  
 The distribution of dolphin sightings during the reporting period  
 (Source: Adopted from HKLR03 Monitoring Survey in September 2018)

**Table 2.8 Monthly Average Encounter Rates**

	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)		Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort)	
	Primary Lines Only	Both Primary and Secondary Lines	Primary Lines Only	Both Primary and Secondary Lines
<b>Northeast Lantau</b>	0.0	0.0	0.0	0.0
<b>Northwest Lantau</b>	0.8	0.6	1.7	1.2

Note: Overall dolphin encounter rates (sightings per 100 km of survey effort) from all four surveys are conducted in September 2018 on primary lines only as well as both primary lines and secondary lines in Northeast and Northwest Lantau.

Due to monthly variation in dolphin occurrence within the survey area, it would be more appropriate to draw conclusion on whether any unacceptable impacts on dolphins have been detected in relation to the construction activities of this Project in the quarterly EM&A reports, where comparison on distribution, group size and encounter rates of dolphins between the quarterly impact monitoring period and baseline monitoring period will be made.

**2.3.8 Implementation of Marine Mammal Exclusion Zone**

There was no dredging, reclamation or marine sheet piling works in open waters during this reporting period. Thus, Passive Acoustic Monitoring (PAM) and the day-time monitoring of Dolphin Exclusion Zone (DEZ) by dolphin observers were not in effect during the reporting period.

## 2.4

## EM&amp;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 5, 12, 19 and 26 September 2018.

Key observations and recommendations during the site inspections in this reporting period are summarized in *Table 2.9*.

**Table 2.9** *Specific Observations and Recommendations during the Weekly Site Inspection in this Reporting Month*

Inspection Date	Observations	Recommendations/ Remarks
5 September 2018	<p>Works Area – Portion N-A</p> <ul style="list-style-type: none"> <li>Drip tray should be provided for the chemical containers.</li> </ul> <p>Works Area – Portion S-B</p> <ul style="list-style-type: none"> <li>Water bottle should be removed to avoid trapping water.</li> </ul> <p><b>Reminder from the SOR</b></p> <p>Works Area - Portion N-B</p> <ul style="list-style-type: none"> <li>The concrete barrier should be filled with sand.</li> </ul> <p>Works Area - Portion S-B</p> <ul style="list-style-type: none"> <li>The lifting eyes of the concrete blocks should be filled with sand.</li> <li>Stagnant water in the tires should be removed.</li> </ul>	<p>Works Area – Portion N-A</p> <ul style="list-style-type: none"> <li>The Contractor was reminded to provide drip tray for the chemical containers.</li> </ul> <p>Works Area – Portion S-B</p> <ul style="list-style-type: none"> <li>The Contractor was reminded to remove the water bottle to avoid trapping water.</li> </ul> <p><b>Reminder from the SOR</b></p> <p>Works Area - Portion N-B</p> <ul style="list-style-type: none"> <li>The Contractor was reminded to fill the concrete barrier with sand.</li> </ul> <p>Works Area - Portion S-B</p> <ul style="list-style-type: none"> <li>The Contractor was reminded to fill the lifting eyes of the concrete blocks should be with sand.</li> <li>The Contractor was reminded to remove the stagnant water in the tires.</li> </ul>
12 September 2018	<p>Works Area – Portion N-C</p> <ul style="list-style-type: none"> <li>Drip tray should be provided for the chemical containers.</li> </ul> <p>Works Area – Portion N-A</p> <ul style="list-style-type: none"> <li>Water spraying should be applied for dust control.</li> <li>Dust screen and sand bags should be provided to enclose the runoff.</li> </ul> <p>Works Area - Portion S-B</p> <ul style="list-style-type: none"> <li>Faded NRMM label should be replaced.</li> </ul> <p><b>Reminder from the SOR</b></p> <p>Works Area - Portion S-A</p> <ul style="list-style-type: none"> <li>Broken water barrier should be removed.</li> </ul>	<p>Works Area – Portion N-C</p> <ul style="list-style-type: none"> <li>The Contractor was reminded to provide drip tray for the chemical containers.</li> </ul> <p>Works Area – Portion N-A</p> <ul style="list-style-type: none"> <li>The Contractor was reminded to apply water spraying for dust control.</li> <li>The Contractor was reminded to provide dust screen and sandbags to enclose the runoff.</li> </ul> <p>Works Area - Portion S-B</p> <ul style="list-style-type: none"> <li>The Contractor was reminded to replace the faded NRMM label.</li> </ul> <p><b>Reminder from the SOR</b></p> <p>Works Area - Portion S-A</p> <ul style="list-style-type: none"> <li>The Contractor was reminded to remove the broken water barrier.</li> </ul>

Inspection Date	Observations	Recommendations/ Remarks
19 September 2018	<p>Works Area - Portion N-A</p> <ul style="list-style-type: none"> <li>Proper NRMM label should be provided for the crawler crane.</li> </ul> <p>Works Area - TBM tunnel</p> <ul style="list-style-type: none"> <li>Drip tray should be provided for the oil drums.</li> </ul> <p>Works Area - Portion S-B</p> <ul style="list-style-type: none"> <li>Water leakage from the mud pit should be prevented.</li> </ul> <p>Works Area - Portion S-A</p> <ul style="list-style-type: none"> <li>Substandard NRMM label should be replaced.</li> </ul> <p>Works Area - Portion S-C</p> <ul style="list-style-type: none"> <li>Proper NRMM label should be provided for the generator.</li> </ul>	<p>Works Area - Portion N-A</p> <ul style="list-style-type: none"> <li>The Contractor was reminded to provide proper NRMM label for the crawler crane.</li> </ul> <p>Works Area - TBM tunnel</p> <ul style="list-style-type: none"> <li>The Contractor was reminded to provide drip tray for the oil drums.</li> </ul> <p>Works Area - Portion S-B</p> <ul style="list-style-type: none"> <li>The Contractor was reminded to prevent water leakage from the mud pit.</li> </ul> <p>Works Area - Portion S-A</p> <ul style="list-style-type: none"> <li>The Contractor was reminded to replace the substandard NRMM label.</li> </ul> <p>Works Area - Portion S-C</p> <ul style="list-style-type: none"> <li>The Contractor was reminded to provide proper NRMM label for the generator.</li> </ul>
26 September 2018	<p>Works Area - Portion N-A</p> <ul style="list-style-type: none"> <li>Drip tray should be provided for the oil drums.</li> </ul> <p>Works Area - Portion S-B</p> <ul style="list-style-type: none"> <li>Standard NRMM label should be displayed on the crawler crane.</li> </ul> <p><b>Reminder from the SOR</b></p> <p>Works Area - Portion S-A</p> <ul style="list-style-type: none"> <li>The openings of the water barriers should be covered.</li> </ul>	<p>Works Area - Portion N-A</p> <ul style="list-style-type: none"> <li>The Contractor was reminded to provide drip tray for the oil drums.</li> </ul> <p>Works Area - Portion S-B</p> <ul style="list-style-type: none"> <li>The Contractor was reminded to display standard NRMM label on the crawler crane.</li> </ul> <p><b>Reminder from the SOR</b></p> <p>Works Area - Portion S-A</p> <ul style="list-style-type: none"> <li>The Contractor was reminded to cover the openings of the water barriers.</li> </ul>

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

## 2.5 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), chemical wastes and marine sediment. Reference has been made to the waste flow table prepared by the Contractor (*Appendix L*). The quantities of different types of wastes are summarized in *Table 2.10*.

**Table 2.10 Quantities of Different Waste Generated in the Reporting Month**

Month/Year	Inert Construction Waste <sup>(a)</sup> (tonnes)	Inert Construction Waste Re-used (tonnes)	Non-inert Construction Waste <sup>(b)</sup> (tonnes)	Imported Fill (m <sup>3</sup> )	Recyclable Materials <sup>(c)</sup> (kg)	Chemical Wastes (kg)	Marine Sediment (m <sup>3</sup> )	
							Category L	Category M (M <sub>p</sub> & M <sub>f</sub> )
September 2018	39,763	11,276	445	0	0	0	0	7,703

**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.

**2.6 ENVIRONMENTAL LICENSES AND PERMITS**

The status of environmental licensing and permit is summarized in *Table 2.11* below.



**Table 2.11 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	Throughout the Contract	HyD	Application for VEP on 3 March 2015 to supersede EP-354/2009/C
Construction Dust Notification	363510	19 August 2013	Throughout the Contract	DBJV	Northern Landfall
Construction Dust Notification	403620	10 June 2016	Throughout the Contract	DBJV	Southern Landfall
Chemical Waste Registration	5213-422-D2516-02	18 January 2017	Throughout the Contract	DBJV	Northern Landfall
Chemical Waste Registration	5213-951-D2591-01	25 May 2016	Throughout the Contract	DBJV	Southern Landfall
Construction Waste Disposal Account	7018108	28 August 2013	Throughout the Contract	DBJV	Waste disposal in Contract No. HY/2012/08
Construction Waste Disposal Account	7021715	17 July 2018	17 October 2018	DBJV	Vessel Disposal
Waste Water Discharge License	WT00019248-2014	5 June 2014	30 June 2019	DBJV	For site Portion N6 and Reclamation Area E
Waste Water Discharge License	WT00031435-2018	2 August 2018	31 August 2023	DBJV	Southern Landfall
Marine Dumping Permit	EP/MD/19-024	28 August 2018	27 September 2018	DBJV	Type 1 (Dedicated site) and Type 2 (Confined Marine Disposal)
Marine Dumping Permit	EP/MD/19-034	28 September 2018	27 October 2018	DBJV	SVS
Marine Dumping Permit	EP/MD/19-015	5 September 2018	4 March 2019	DBJV	Catepillar Area
Construction Noise Permit	GW-RW0538-17	16 April 2018	15 October 2018	DBJV	For Urmston Road in front of Pillar Point
Construction Noise Permit	GW-RW0344-18	20 August 2018	19 February 2019	DBJV	WA23 @ Tsing Yi
Construction Noise Permit	GW-RS0598-18	15 July 2018	14 January 2019	DBJV	Southern Landfall

**Notes:**

HyD = Highways Department

DBJV = Dragages - Bouygues Joint Venture

VEP = Variation of Environmental Permit

## 2.7 *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.

## 2.8 *SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT*

One (1) Action Level exceedance of 1-hour TSP was recorded on 7 September 2018. One (1) Action Level and one (1) Limit Level exceedances of 1-hour TSP were recorded on 28 September 2018. Investigation reports are provided in *Appendix K*.

Cumulative statistics are provided in *Appendix K*.

## 2.9 *SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS*

The Environmental Complaint Handling Procedure is provided in *Figure 2.4*.

No environmental complaint was received in this reporting period.

No environmental summons was received in this reporting period.

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

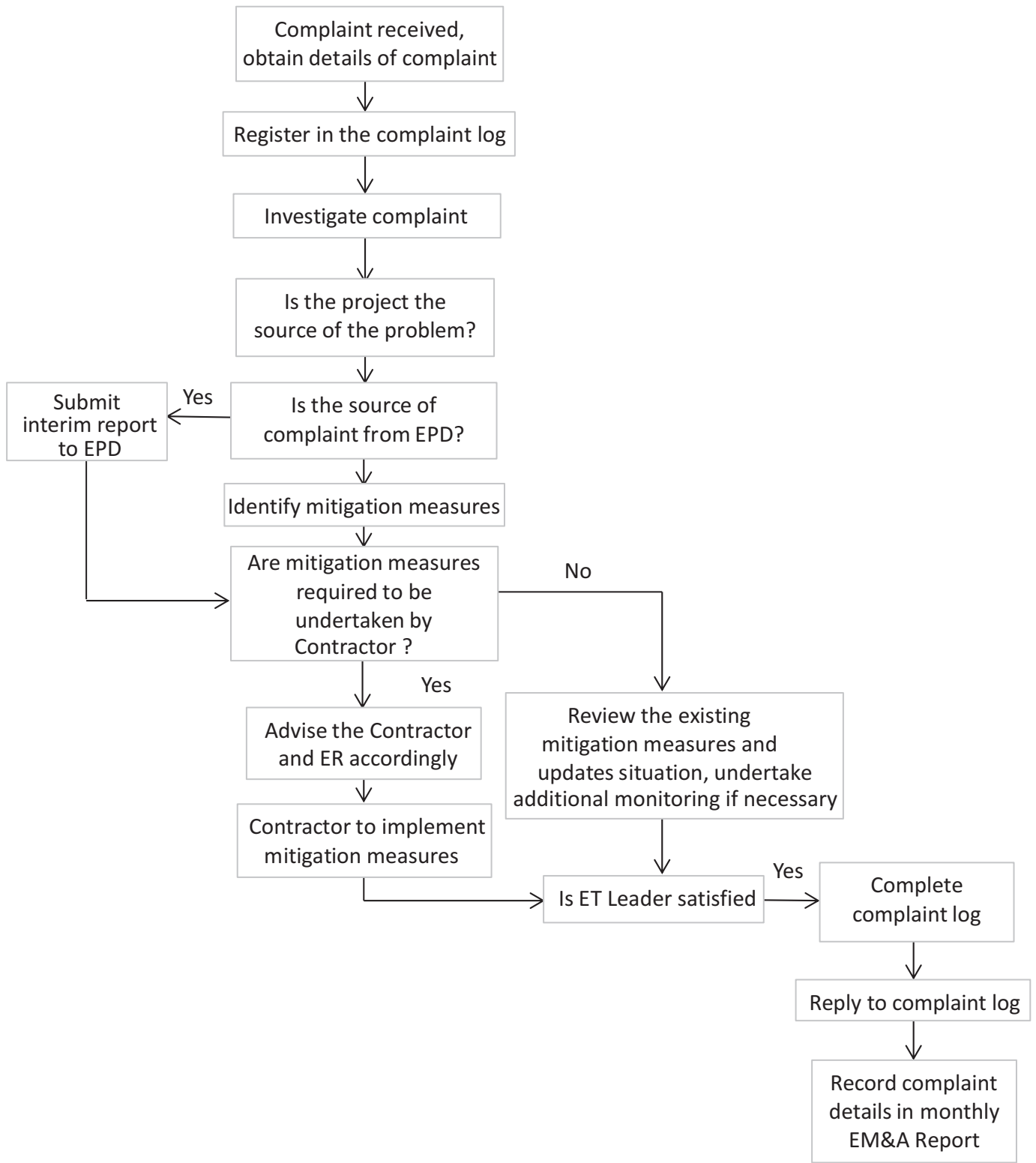


Figure 2.4

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 October 2018 are summarized in *Table 3.1*.

**Table 3.1 Construction Works to Be Undertaken in the Coming Month**

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**Works to be undertaken**

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*Land-based Works*

- Construction of Cross Passage Tympanum – TBM tunnel;
- Cross Passage Construction by Pipe Jacking – TBM tunnel;
- Cross Passage Lining Installation – TBM Tunnel;
- Parapet wall and fireboard Installation – TBM Tunnel
- Corbel & OVHD Construction – TBM Tunnel;
- Bulk Excavation – Portion S-A; and
- D-wall Construction – Portion S-A

There will be no dredging, reclamation or marine sheet piling works in open waters during next reporting period.

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#### 3.2 KEY ISSUES FOR THE COMING MONTH

Potential environmental impacts arising from the above upcoming construction activities in the next reporting month of October 2018 are mainly associated with dust, marine ecology and waste management issues.

#### 3.3 MONITORING SCHEDULE FOR THE COMING MONTH

The tentative schedule for environmental monitoring in October 2018 is provided in *Appendix F*.

**4.1 CONCLUSIONS**

This Fifty-ninth Monthly EM&A Report presents the findings of the EM&A activities undertaken during the period from 1 to 30 September 2018, 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) and dolphin monitoring were carried out in this reporting month.

One (1) Action Level exceedance of 1-hour TSP was recorded on 7 September 2018. One (1) Action Level and one (1) Limit Level exceedances of 1-hour TSP were recorded on 28 September 2018.

One group of 2 Chinese White Dolphins sightings was recorded during the two sets of surveys in September 2018. The dolphin sighting was made in NWL, while none was sighted in NEL. The dolphin sighting was made on primary lines during on-effort search. The dolphin group was not associated with any operating fishing vessel.

Environmental site inspection was carried out four (4) times in September 2018. Remedial actions recommended for the deficiencies identified during the site audits were properly implemented by the Contractor.

No non-compliance event was recorded during the reporting period.

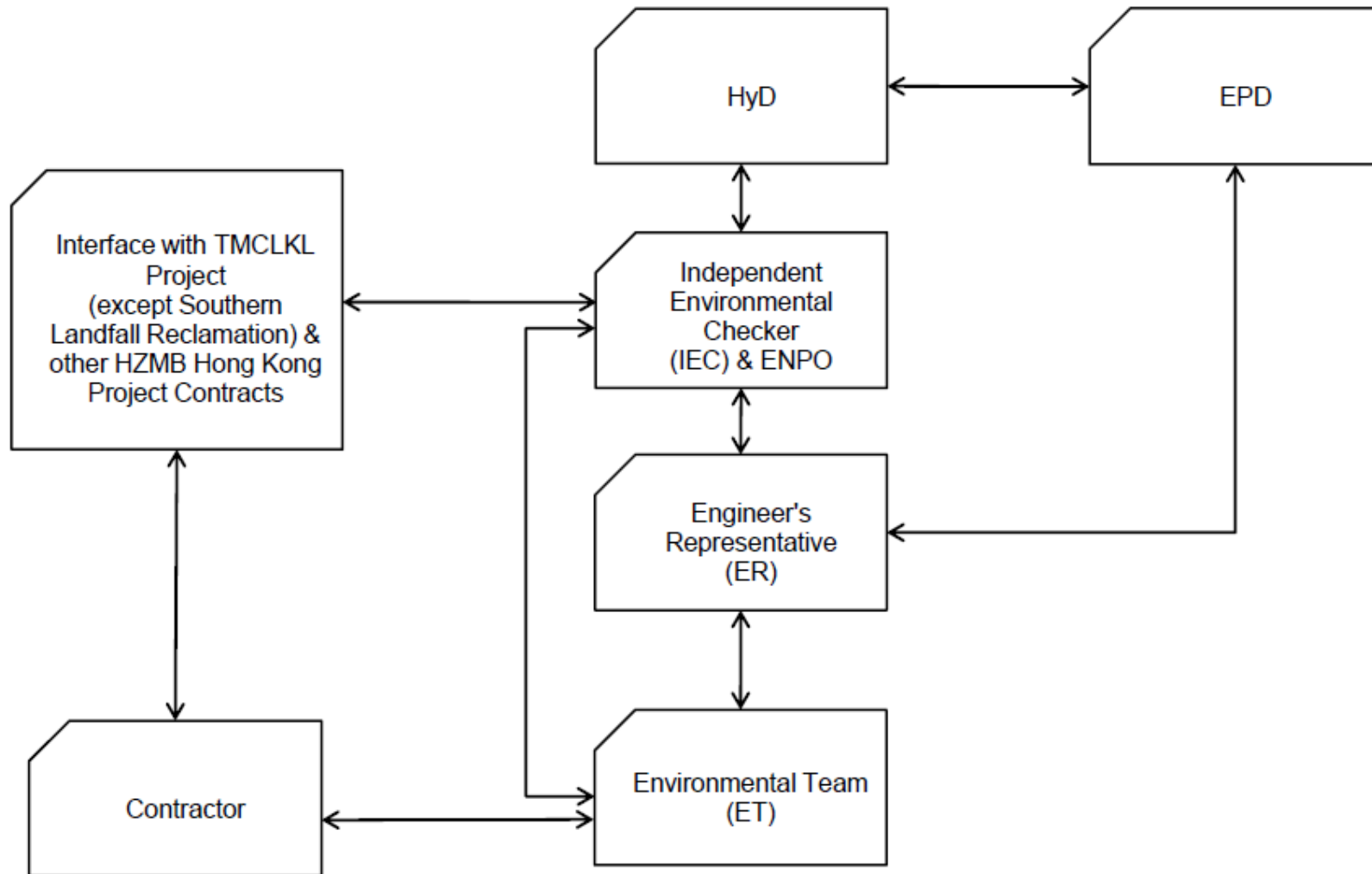
No environmental complaint was received in this reporting period.

No environmental summons was received in this 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



## TMCLKL Northern Connection Sub-sea Tunnel Section

### North Approach Ramp

#### Portion N12 Section

NAR - N12 - Open Cut Section - Structure Start	0	04-Jun-18		125
NAR - N12 - Open cut Section - Ramp Structure	84	04-Jun-18	11-Sep-18	125
NAR - N12 - Open Cut Excavation - Bay 2	12	20-Jun-18	04-Jul-18	54
NAR - N12 - Bay 2 Structure	36	06-Jul-18	16-Aug-18	53
NAR - Sheet Pile at bay 6 & 7	18	20-Jun-18	11-Jul-18	0
NAR - Dewatering well Installation (Bay 3 to 6)	36	12-Jul-18	22-Aug-18	0
NAR - Pumping Test (Bay 3 to 6)	12	23-Aug-18	05-Sep-18	0
NAR - Excavation & Strut Installtion (Bay 3 to 6)	36	06-Sep-18	20-Oct-18	0
NAR - Bay 3 - Base Slab + Retaining Wall	48	20-Sep-18	17-Nov-18	24
NAR - Bay 4 - Base Slab + Retaining Wall	72	06-Oct-18	02-Jan-19	0
NAR - Bay 5 - Base Slab + Retaining Wall	72	22-Oct-18	16-Jan-19	0

#### Access Ramp Section

NLS Temp Access Ramp - Closure	0		04-Jun-18	0
NLS Temp Access Ramp - Concrete Block & Backfill	18	04-Jun-18	25-Jun-18	0
Predrilling - 4 G.I.	12	26-Jun-18	10-Jul-18	0
Pre-bored H-piles - 12p	36	11-Jul-18	21-Aug-18	0
Pre-bored H-piles - Pile Load Test	36	22-Aug-18	04-Oct-18	0
Pipe Pile Wall - Access Ramp Section	36	11-Jul-18	21-Aug-18	0
Pipe Pile Wall - TAM Grouting	36	22-Aug-18	04-Oct-18	0
Pump wells	35	05-Oct-18	15-Nov-18	0
Pump Test	12	16-Nov-18	29-Nov-18	0
Pipe Pile Wall Section - Excavation Start	0	30-Nov-18		0
Excavation to S1 - 7,200 m3	12	30-Nov-18	13-Dec-18	0
Strut & Waling Installtaion - S1 - 7 struts	14	07-Dec-18	22-Dec-18	0
Excavation to S2 - 9,650 m3	16	14-Dec-18	04-Jan-19	0
Strut & Waling Installtaion - S2 - 7 struts	15	24-Dec-18	12-Jan-19	0

#### NLS Interface (OAP-NAR-DWG-10442-B)

NLS Cell 3 Dwall removal (down to +2.5mPD) - 90m3	15	14-Dec-18	03-Jan-19	0
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### North Ventilation Building

North Vent Bldg - Roof Steel Structure	48	04-Jun-18	31-Jul-18	817
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### North Launching Shaft

#### NLS Cell 1 False Tunnel

Cell 1 - Alimak Removal	15	06-Jun-18	23-Jun-18	24
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#### NLS Cell 1-3 Structure for Cell 3 Dwall opening

Cell 3 - Removal of existing NLS Ramp	18	04-Jun-18	25-Jun-18	0
Cell 3 - Dwall extension	35	26-Jun-18	06-Aug-18	0
Cell 3 - Remaining Base Slab	18	07-Aug-18	27-Aug-18	0
Cell 3 - Middle Wall	24	28-Aug-18	24-Sep-18	0
Cell 3 - Top Slab	18	26-Sep-18	18-Oct-18	0
Cell 3 - Base Slab - Connecting to NAR	18	28-Aug-18	17-Sep-18	0
Cell 3 - Wall 17 & 18	24	18-Sep-18	18-Oct-18	0

#### NLS Cell 2

Cell 2 - Removal of remaining NLS Ramp	12	04-Jun-18	16-Jun-18	0
Cell 2 - Expose Coupler for W6 & 7	12	19-Jun-18	03-Jul-18	0
Cell 2 - Wall 6 & 7	24	04-Jul-18	31-Jul-18	0
Cell 2 - ML03 - Prepare Scaffolding for Top Beams	18	01-Aug-18	21-Aug-18	0
Cell 2 - ML03 Top Beams	24	22-Aug-18	18-Sep-18	0
Cell 2 - ML02 - Prepare Scaffolding for Top beams	18	22-Aug-18	11-Sep-18	6
Cell 2 - ML02 - Top Beams	24	19-Sep-18	19-Oct-18	0
NIS Backfill to +3.0mPD for Cell 3 Dwall opening	24	19-Oct-18	15-Nov-18	0

#### NLS Cell 1-3 Remaining Structure

ML02 Cell 1 & 2 Preparation for BRL structure	24	20-Oct-18	16-Nov-18	0
ML02 Cell 1 & 2 BRL Structure	48	17-Nov-18	15-Jan-19	0

### North - Phase 2 Reclamation

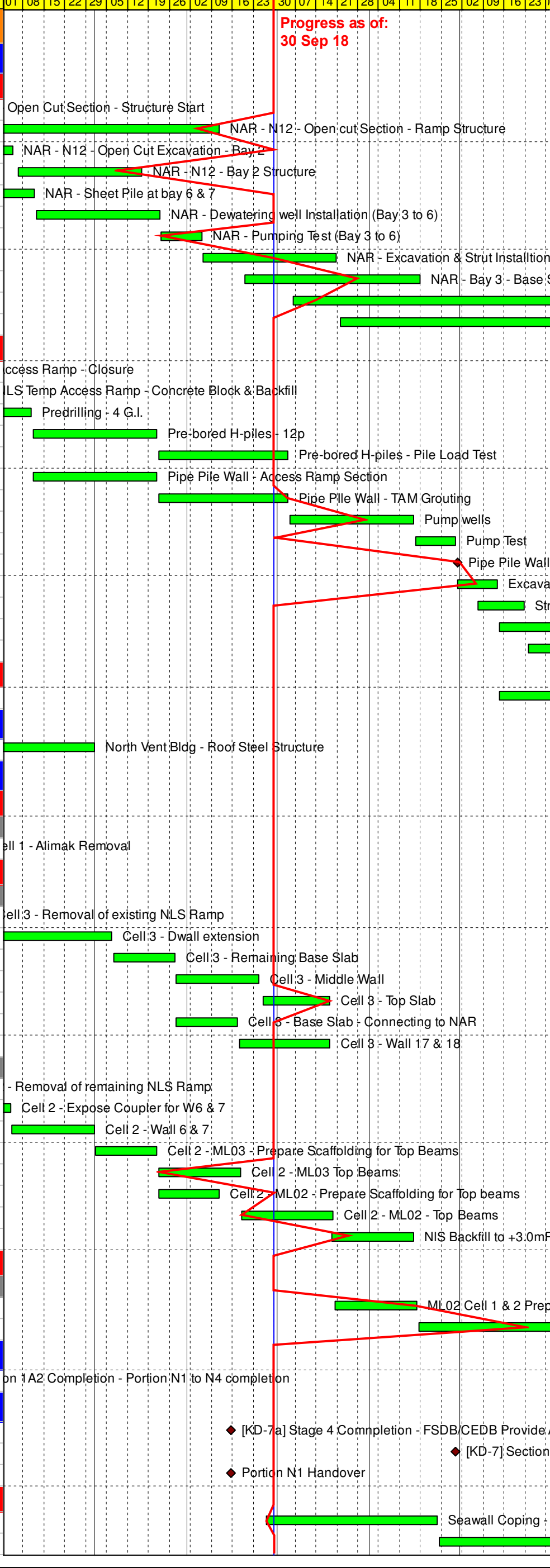
[KD-5] Section 1A2 Completion - Portion N1 to N4 completion	0		04-Jun-18*	-155
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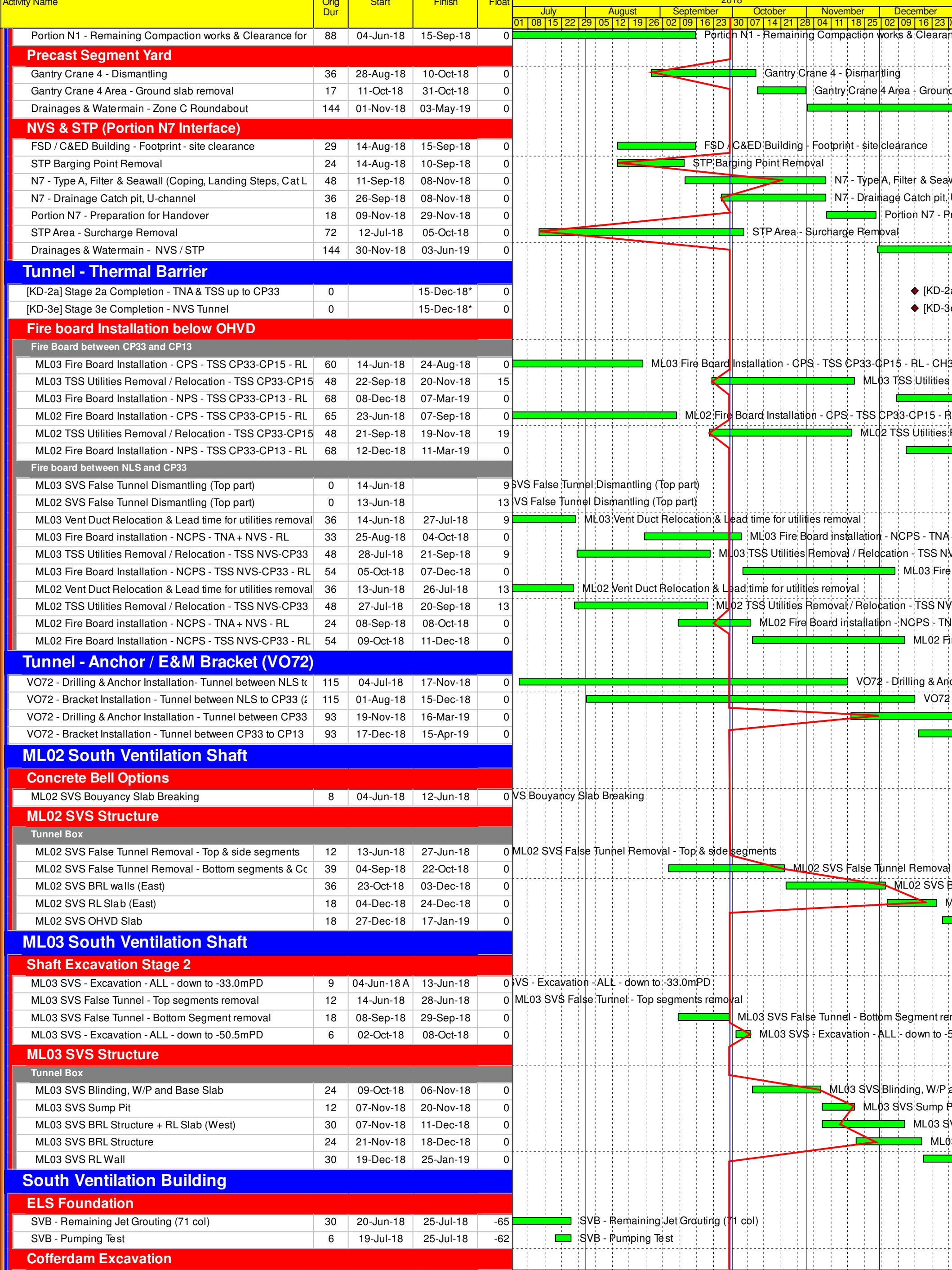
### NLF Demobilization & At-grade works

[KD-7a] Stage 4 Completion - FSDB/CEDB Provide Access	0		15-Sep-18*	0
[KD-7] Section 1C Completion - Portion N7 Handover	0		29-Nov-18*	0
Portion N1 Handover	0		15-Sep-18*	0

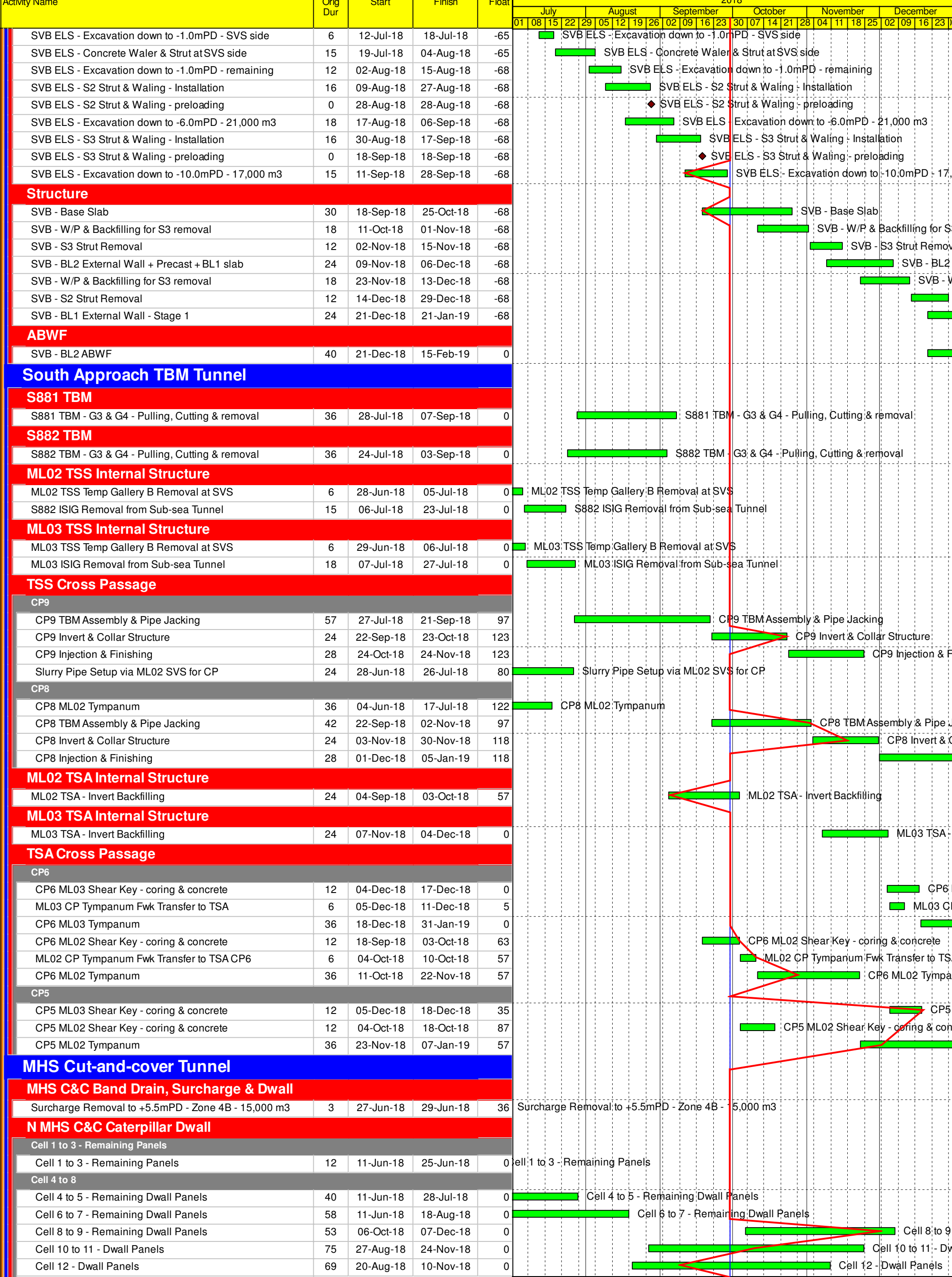
#### Portion N12 & Portion N6B

Seawall Coping - final concreting	48	27-Sep-18	23-Nov-18	0
Portion N12 - Seawall Inspection & Remedial works (if any)	39	24-Nov-18	11-Jan-19	0









Activity Name	Orig Dur	Start	Finish	Float	2018																							
					July				August				September				October				November				December			
					01	08	15	22	29	05	12	19	26	02	09	16	23	30	07	14	21	28	04	11	18	25	02	09
Cell 13 - Dwall Panels	57	13-Aug-18	20-Oct-18	0	Cell 13 - Dwall Panels																							
<b>N MHS C&amp;C Preparation for Excavation</b>																												
Cell 1 to 3 - Lead time for Dwall Interface Coring	12	08-Jun-18	22-Jun-18	0	Cell 1 to 3 - Lead time for Dwall Interface Coring																							
Cell 1 to 3 - Lead time for Capping beam including Excavation	18	23-Jun-18	14-Jul-18	0	Cell 1 to 3 - Lead time for Capping beam including Excavation																							
Cell 1 to 3 - Lead time for Pumping Test	18	16-Jul-18	04-Aug-18	0	Cell 1 to 3 - Lead time for Pumping Test																							
Cell 4 to 5 - Capping beam / Dewatering / Pump Test	24	30-Jul-18	25-Aug-18	105	Cell 4 to 5 - Capping beam / Dewatering / Pump Test																							
Cell 6 to 7 - Capping beam / Dewatering / Pump Test	24	20-Aug-18	15-Sep-18	104	Cell 6 to 7 - Capping beam / Dewatering / Pump Test																							
Cell 8 to 9 - Capping beam / Dewatering / Pump Test	24	08-Dec-18	08-Jan-19	0	Cell 8 to 9 - Capping beam / Dewatering / Pump Test																							
Cell 10 to 11 - Capping beam / Dewatering / Pump Test	24	26-Nov-18	22-Dec-18	0	Cell 10 to 11 - Capping beam / Dewatering / Pump Test																							
Cell 12 - Capping beam / Dewatering / Pump Test	24	12-Nov-18	08-Dec-18	0	Cell 12 - Capping beam / Dewatering / Pump Test																							
Cell 13 - Capping beam / Dewatering / Pump Test	24	22-Oct-18	17-Nov-18	0	Cell 13 - Capping beam / Dewatering / Pump Test																							
<b>N MHS C&amp;C Caterpillar Excavation</b>																												
MHS C&C Cell 12 to 04																												
Cell 1 to 3 - Excavation down to +2.5mPD	18	16-Jul-18	04-Aug-18	0	Cell 1 to 3 - Excavation down to +2.5mPD																							
Cell 1 to 3 - Excavation / Ring Beam / RC Strut / Wing Cort	88	06-Aug-18	19-Nov-18	0	Cell 1 to 3 - Excavation / Ring Beam / RC Strut / Wing Cort																							
Cell 13 Excavation from +2.5mPD to FEL	75	10-Dec-18	16-Mar-19	0	Cell 13 Excavation from +2.5mPD to FEL																							
Cell 12 Excavation from +2.5mPD to FEL	80	24-Dec-18	06-Apr-19	0	Cell 12 Excavation from +2.5mPD to FEL																							
Cell 04 Excavation from +2.5mPD to FEL	140	24-Dec-18	22-Jun-19	0	Cell 04 Excavation from +2.5mPD to FEL																							
Cross Wall Removal																												
Cell 04/03 Cross Wall Removal	18	20-Nov-18	10-Dec-18	95	Cell 04/03 Cross Wall Removal																							
Cell 03/02 Bottom Strut	24	20-Nov-18	17-Dec-18	89	Cell 03/02 Bottom Strut																							
Cell 03/02 Cross Wall Removal	18	18-Dec-18	10-Jan-19	89	Cell 03/02 Cross Wall Removal																							
<b>N MHS C&amp;C Caterpillar Structure</b>																												
Main Box Structure																												
Cell 01 - Base Slab & Tympanum for TBM B/O	87	20-Nov-18	11-Mar-19	0	Cell 01 - Base Slab & Tympanum for TBM B/O																							
<b>MHS Approach Ramp</b>																												
<b>Band Drain &amp; Surcharge</b>																												
Surcharge Removal to +5.5mPD - Zone 3 - 30,000 m3	15	08-Jun-18	26-Jun-18	0	Surcharge Removal to +5.5mPD - Zone 3 - 30,000 m3																							
<b>MHS Ramp Dwall, Treatment &amp; King Post</b>																												
Caterpillar Cell 14 to 15 - Dwall Panels	75	04-Jul-18	29-Sep-18	0	Caterpillar Cell 14 to 15 - Dwall Panels																							
SAR Straight Wall - Dwall Panels	66	08-Jun-18	25-Aug-18	0	SAR Straight Wall - Dwall Panels																							
SAR Open Cut - Sheet Pile Installation	48	08-Jun-18	04-Aug-18	0	SAR Open Cut - Sheet Pile Installation																							
SAR Open Cut - Dewatering Well - along sheet piles	36	30-Jun-18	11-Aug-18	0	SAR Open Cut - Dewatering Well - along sheet piles																							
SAR Open Cut - Dewatering Well - along Dwall	15	13-Aug-18	29-Aug-18	0	SAR Open Cut - Dewatering Well - along Dwall																							
SAR Open Cut - Pump Test	12	30-Aug-18	12-Sep-18	0	SAR Open Cut - Pump Test																							
SAR Open Cut ELS - King Post Installation	18	06-Aug-18	25-Aug-18	39	SAR Open Cut ELS - King Post Installation																							
<b>MHS Approach Ramp Excavation</b>																												
SAR Open Cut Excavation - Above +2.5mPD	12	30-Aug-18	12-Sep-18	0	SAR Open Cut Excavation - Above +2.5mPD																							
SAR Open Cut Excavation - strut free section	36	13-Sep-18	27-Oct-18	0	SAR Open Cut Excavation - strut free section																							
SAR Open Cut Excavation - 1 strut section	36	13-Oct-18	24-Nov-18	0	SAR Open Cut Excavation - 1 strut section																							
SAR Open Cut Excavation - 3 strut section	36	05-Nov-18	15-Dec-18	0	SAR Open Cut Excavation - 3 strut section																							
MHS Caterpillar Cell 15/14 - Capping Beam / Pump test lead	24	02-Oct-18	30-Oct-18	16	MHS Caterpillar Cell 15/14 - Capping Beam / Pump test lead																							
MHS Caterpillar Cell 15 Excavation	57	19-Nov-18	26-Jan-19	0	MHS Caterpillar Cell 15 Excavation																							
MHS Caterpillar Cell 14 Excavation	75	10-Dec-18	16-Mar-19	0	MHS Caterpillar Cell 14 Excavation																							
<b>MHS Approach Ramp Structure</b>																												
SAR Structure - Base Slab - strut free section	60	13-Sep-18	24-Nov-18	0	SAR Structure - Base Slab - strut free section																							
SAR Structure - Retaining Wall - strut free section	66	13-Oct-18	02-Jan-19	0	SAR Structure - Retaining Wall - strut free section																							
SAR Structure - Base Slab - strut section	51	12-Nov-18	12-Jan-19	0	SAR Structure - Base Slab - strut section																							
SAR Structure - Retaining Wall - strut section	92	10-Dec-18	06-Apr-19	0	SAR Structure - Retaining Wall - strut section																							
<b>VO73 SCB Foundation &amp; Substructure</b>																												
Foundation																												
SCB Foundation - Predrilling & Toe level confirmation	30	08-Jun-18	14-Jul-18	0	SCB Foundation - Predrilling & Toe level confirmation																							
SCB Foundation - Barrettes - within SAR cofferdam	24	16-Jul-18	11-Aug-18	0	SCB Foundation - Barrettes - within SAR cofferdam																							
SCB Foundation - Barrettes - outside SAR cofferdam	24	13-Aug-18	08-Sep-18	74	SCB Foundation - Barrettes - outside SAR cofferdam																							
SCB Foundation - Verification Coring - within SAR cofferdam	27	13-Aug-18	12-Sep-18	0	SCB Foundation - Verification Coring - within SAR cofferdam																							
SCB Foundation - Verification Coring - outside SAR cofferdam	27	10-Sep-18	12-Oct-18	74	SCB Foundation - Verification Coring - outside SAR cofferdam																							
<b>Southern Landfall - Surface</b>																												
<b>HKBCF Seawall Modification (schedule TBC)</b>																												
HKBCF Vertical Seawall - place Rock underlayer bottom	9	01-Aug-18*	10-Aug-18	-229	HKBCF Vertical Seawall - place Rock underlayer bottom																							
Pause Period (to be verified on site)	90	11-Aug-18	08-Nov-18	-287	Pause Period (to be verified on site)																							
HKBCF Vertical Seawall - place Rock Grade 400	15	09-Nov-18	26-Nov-18	-229	HKBCF Vertical Seawall - place Rock Grade 400																							
Pause Period (to be verified on site)	90	27-Nov-18	24-Feb-19	-287	Pause Period (to be verified on site)																							
<b>UU / At-grade works</b>																												
Demobilization of Dwall site setup	78	08-Dec-18	19-Mar-19	0	Demobilization of Dwall site setup																							

Appendix C

# Environmental Mitigation and Enhancement Measure Implementation Schedules

*Contract No. HY/2012/08  
Tuen Mun – Chek Lap Kok Link  
Northern Connection Sub-sea Tunnel Section  
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	
<b>Air Quality</b>									
4.8.1	3.8	An effective watering programme of twice daily watering with complete coverage, is estimated to reduce by 50%. This is recommended for all areas in order to reduce dust levels to a minimum;	All areas / throughout construction period	Contractor	TMEIA Avoid smoke impacts and disturbance		Y		✓
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		✓

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						D	C	O	
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		✓
<b>WATER QUALITY</b>									
<i>Marine Works (Sequence A)</i>									
6.1	Annex A	Construction of seawalls to be advanced by at least 200m before the main reclamation dredging and filling can commence. The protection by advanced seawall is a dynamic process depending on the progress of the construction activities and the stage when such protection could be realised is illustrated in Figure 6.2a and detailed in Appendix D6a. The part of the works where such measures can be undertaken for the majority of the time includes the following locations:  - TM-CLKL northern reclamation;	All areas/ prior to dredging and backfilling works	Contractor	TM-EIAO		Y		✓
6.1	-	a maximum of 50% public fill to be used for all seawall filling below +2.5mPD for TM-CLKL southern and northern landfalls.	TM-CLKL seawall filling	Contractor	TM-EIAO		Y		✓

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						D	C	O	
6.1	-	a maximum of 30% public fill to be used for reclamation filling below +2.5mPD for TM-CLKL southern landfall	TM-CLKL southern landfall reclamation filling	Contractor	TM-EIAO		Y		N/A
6.1	-	a maximum of 100% public fill to be used for reclamation filling below +2.5mPD for TM-CLKL northern landfall	TM-CLKL northern landfall reclamation filling	Contractor	TM-EIAO		Y		✓
6.1	-	Use of cage type silt curtains round allgrab dredgers during the HKBCF, HKLR and TM-CLKL southern reclamation works.	All areas dredging works	Contractor	TM-EIAO		Y		✓
	Figure 1.1 of Annex C	A layer of floating type silt curtain will be applied when dredging and reclamation works are being undertaken at Portion N-a as shown in Figure 1.1 of Annex C of the EM&A Manual.	All areas/ through out marine works	Contractor	TM-EIAO		Y		✓
6.1	-	Trailer suction hopper dredgers shall not allow mud to overflow.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	The use of Lean Material Overboard (LMOB) systems shall be prohibited.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	Annex A  Figure 6.2b Appendix D6b	For other parts of the reclamation works construction of seawalls to be advanced by at least 200m before the main reclamation dredging and filling can commence. It should be noted that the protection by advanced seawall is a dynamic process depending on the progress of the construction activities and the stage when such protection could be realised is illustrated in Figure 6.2b and detailed in Appendices D6b. The part of the works where such measures can be undertaken for the majority of the time includes the following locations:  - TM-CLKL northern reclamation;  - Reclamation filling for Portion D of HKBCF; Reclamation filling for FSD berth of HKBCF; and	TM-CLKL northern landfall, Portion D of HKBCF and HKLR	Contractor	TM-EIAO		Y		✓

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**Environmental Mitigation and Enhancement Measure Implementation Schedule**

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						D	C	O	
		- Reclamation dredging and filling for Portion 1 of HKLR;							
6.1	-	The filling material for the other parts of the works are the same as Sequence A;	All other areas/backfilling works	Contractor	TM-EIAO		Y		N/A
6.1	5.7	Cage type silt curtain (with steel enclosure) shall be used for grab dredgers working in the site of HKBCF and TM- CLKL southern reclamation. Cage type silt curtains will be applied round all grab dredgers at other works area.	HKBCF, HKLR and TM-CLKL grab dredging	Contractor	TM-EIAO		Y		✓
6.1	Annex A	A layer of floating type silt curtain will be applied around all works as defined in Appendix D6b.	All areas/ through out marine works	Contractor	TM-EIAO		Y		✓
6.1	-	TM-CLKL northern landfall: - Reclamation filling shall not proceed until at least 200m section of leading seawall at both the east and west sides of the reclamation are formed above +2.5 mPD, except for 100m gaps for marine access;	All areas/ through out marine works	Contractor	TM-EIAO		Y		✓
<i>General Marine Works</i>									
6.1	-	Use of TBM for the construction of the submarine tunnel.	Tunnel works / Construction phase	Contractor	TM-EIAO		Y		N/A
6.1	-	Export dredged spoils from NWWCZ.	All areas as much as possible / dredging activities	Contractor	DASO Permit conditions		Y		✓
6.1	-	Where public fill is proposed for filling below +2.5mPD, the fine content in the public fill will be controlled to 25%	All areas/ backfilling works	Contractor	TM-EIAO		Y		N/A
6.1	-	Where sand fill is proposed for filling below +2.5mPD, the fine content in the sand fill will be controlled to 5%.	All areas/ backfilling works	Contractor	TM-EIAO		Y		N/A
6.1	-	Mechanical grabs shall be designed and maintained to avoid spillage and should seal tightly while being lifted.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	Barges and hopper dredgers shall have tight fitting seals to their bottom openings to prevent leakage of material.	All areas/ throughout construction period	Contractor	Marine Fill Committee		Y		✓

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						D	C	O	
					Guidelines. DASO permit conditions.				
6.1	-	Any pipe leakages shall be repaired quickly. Plant should not be operated with leaking pipes.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	Loading of barges and hoppers shall be controlled to prevent splashing of dredged material to the surrounding water. Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	Excess material shall be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action;	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		N/A
6.1	-	All vessels shall be sized such that adequate clearance is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		N/A
6.1	-	The works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit		Y		✓

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						D	C	O	
					conditions.				
6.1	5.2	Silt curtain shall have proved effectiveness from the producer and shall be fully maintained throughout the works by the contractor.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	The daily maximum production rates shall not exceed those assumed in the water quality assessment.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	The dredging and filling works shall be scheduled to spread the works evenly over a working day.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
<i>Land Works</i>									
6.1	-	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		✓
6.1	-	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		✓
6.1	-	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		<>
6.1	-	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		✓
6.1	-	Temporary access roads should be surfaced with crushed stone or gravel.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	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		✓

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						D	C	O	
6.1	-	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		✓
6.1	-	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		✓
6.1	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		✓
6.1	-	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		✓
6.1	-	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		✓
6.1	-	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		✓
6.1	-	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		✓
6.1	-	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		✓
6.1	-	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
6.1	-	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		✓

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						D	C	O	
6.1	-	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		✓
6.1	-	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		✓
6.1	-	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		✓
6.1	-	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	✓
6.1	Section 5	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		✓
<b>Water Quality Monitoring</b>									
6.1	Section 5	Water quality monitoring shall be undertaken for suspended solids, turbidity, and dissolved oxygen. Nutrients and metal parameters shall also be measured for Mf sediment operations (only HKBCF and HKLR required handling of Mf sediment) during baseline, backfilling and post construction period.  One year operation phase water quality monitoring at designated stations.	Designated monitoring stations as defined in EM&A Manual, Section 5/ Before, through-out marine construction period, post construction and monthly operational phase water quality monitoring for a year.	Contractor	EM&A Manual		Y	Y	✓
<b>ECOLOGY</b>									
8.14	6.3	Specification for and implement pre, during and post construction dolphin abundance monitoring.	All Areas/Detailed Design/ during construction works/post construction	Design Consultant/ Contractor	TMEIA	Y	Y	Y	✓
8.14	6.3,6.5	Specification and implementation of 250m dolphin exclusion zone.	All dredging and reclamation areas/Detailed Design/ during all reclamation and dredging works	Design Consultant/ Contractor	TMEIA	Y	Y		✓

Legend: D=Design, C=Construction, O=Operation

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**Contract No. HY/2012/08**  
**Tuen Mun – Chek Lap Kok Link**  
**Northern Connection Sub-sea Tunnel Section**  
**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	
8.15	6.3, 6.5	Specification and deployment of an artificial reef of an area of 3,600m2 in an area where fishing activities are prohibited.	Area of prohibited fishing activities/Detailed Design/towards end of construction period	TM-CLKL/ HKBCF Design Consultant/TM-CLKL/ HKBCF Contractor	TMEIA	Y		Y	N/A. To be implemented by AFCD.
8.14	6.3, 6.5	Specification and implementation of marine vessel control specifications	All areas/Detailed Design/during construction works	Design Consultant/ Contractor	TMEIA	Y	Y		✓
8.14	6.3, 6.5	Design and implementation of acoustic decoupling methods for dredging and reclamation works	All areas/ Detailed Design/during dredging and reclamation works	Design Consultant/ Contractor	TMEIA	Y	Y		✓
8.15	6.3, 6.4	Pre-construction phase survey and coral translocation	Detailed Design/Prior to construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
8.15	6.5	Audit coral translocation success	Post translocation	Contractor	TMEIA		Y		✓
7.13	6.5	The loss of habitat shall be supplemented by enhancement planting in accordance with the landscape mitigation schedule.	All areas / As soon as accessible	Contractor	TMEIA		Y		N/A
7.13	6.5	Spoil heaps shall be covered at all times.	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
7.13	6.5	Avoid damage and disturbance to the remaining and surrounding natural habitat	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
7.13	6.5	Placement of equipment in designated areas within the existing disturbed land	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
7.13	6.5	Disturbed areas to be reinstated immediately after completion of the works.	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
7.13	6.5	Construction activities should be restricted to the proposed works boundary.	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
<b>LANDSCAPE AND VISUAL</b>									
10.9	7.6	The colour and shape of the toll control buildings, ventilation building and administration building shall adopt a design which could blend it into the vicinity elements, and the details will be developed in detailed design stage (DM2)	All areas/detailed design	Design Consultant	TMEIA	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	Aesthetic design of the viaduct, retaining wall and other structures will be developed under ACABAS submission (DM5)	All areas/detailed design	Design Consultant	TMEIA	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/post construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
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		✓
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	Aesthetically pleasing design (visually unobtrusive and non-reflective) as regard to the form, material and finishes shall be incorporated to all buildings, engineering structures and associated infrastructure facilities (OM5)	All areas/detailed design/ during construction / during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	N/A
10.9	7.6	Avoidance of excessive height and bulk of buildings and structures (OM6)	All areas/detailed design/ during construction / during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	N/A
<b>WASTE</b>									
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		✓
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		Y		✓

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Tuen Mun – Chek Lap Kok Link  
Northern Connection Sub-sea Tunnel Section  
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	
					Provisions) Ordinance (Cap 28); Waste Disposal Ordinance (Cap 354); Dumping at Sea Ordinance (Cap 466); Water Pollution Control Ordinance.				
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 surplus surcharge should be transferred to a fill bank	Reclamation areas / after surcharge works	Contractor	TMEIA		Y		N/A
12.6	8.1	Rock armour from the existing seawall should be reused on the new sloping seawall as far as possible	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	Provisions to be made in contract documents to allow and promote the use of recycled aggregates where appropriate.	Detailed Design	Design Consultant	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		✓

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Tuen Mun – Chek Lap Kok Link  
Northern Connection Sub-sea Tunnel Section  
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	
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	Dredged marine mud shall be disposed of in a gazetted marine disposal ground under the requirements of the Dumping at Seas Ordinance.	Reclamation areas / throughout dredging works	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		✓
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:  f suitable for the substance to be held, resistant to corrosion, maintained in good conditions and securely closed;	All areas / throughout construction period	Contractor	TMEIA		Y		<>

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Tuen Mun – Chek Lap Kok Link  
Northern Connection Sub-sea Tunnel Section  
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	
		<p><i>f</i> Having a capacity of &lt;450L unless the specifications have been approved by the EPD; and</p> <p><i>w</i> Chinese according to the instructions prescribed in Schedule 2 of the Regulations.</p> <p><i>f</i> Clearly labelled and used solely for the storage of chemical wastes;</p> <p><i>f</i> Enclosed with at least 3 sides;</p> <p><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;</p> <p><i>f</i> Adequate ventilation;</p> <p><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</p> <p><i>f</i> Incompatible materials are adequately separated.</p>							
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		✓
12.6	8.1	Night soil should be regularly collected by licensed collectors.	All areas / throughout construction period	Contractor	TMEIA		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	
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	Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including waste reduction, reuse and recycling.	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		✓
<b>CULTURAL HERITAGE</b>									
11.8	Section 9	EM&A in the form of audit of the mitigation measures	All areas / throughout construction period	Highways Department	EIAO-TM		Y		N/A

**\* 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*

<b>Parameters</b>	<b>Action</b>	<b>Limit</b>
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** *Action and Limit Levels for Impact Dolphin Monitoring*

	<b>North Lantau Social Cluster</b>	
	<b>NEL</b>	<b>NWL</b>
Action Level	STG < 70% of baseline & ANI < 70% of baseline	STG < 70% of baseline & ANI < 70% of baseline
Limit Level	[STG < 40% of baseline & ANI < 40% of baseline] and STG < 40% of baseline & ANI < 40% of baseline	

**Notes:**

1. STG means quarterly encounter rate of number of dolphin sightings, which is **6.00 in NEL** and **9.85 in NWL** during the baseline monitoring period
2. ANI means quarterly encounter rate of total number of dolphins, which is **22.19 in NEL** and **44.66 in NWL** during the baseline monitoring period
3. For North Lantau Social Cluster, AL will be trigger if NEL or NWL fall below the criteria; LL will be triggered if both NEL and NWL fall below the criteria.

**Table D3** *Derived Value of Action Level (AL) and Limit Level (LL)*

	<b>North Lantau Social Cluster</b>	
	<b>NEL</b>	<b>NWL</b>
Action Level	STG < 4.2 & ANI < 15.5	STG < 6.9 & ANI < 31.3
Limit Level	NEL = [STG < 2.4 & ANI < 8.9] and NWL = [STG < 3.9 & ANI < 17.9]	

Appendix E

Copies of Calibration  
Certificates for Air  
Quality Monitoring

High-Volume TSP Sampler  
5-Point Calibration Record

Location : ASR 5  
 Calibrated by : P.F. Yeung  
 Date : 09/08/2018

Sampler

Model : TE-5170  
 Serial Number : S/N 0816

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454  
 Service Date : 19 Mar 2018  
 Slope (m) : 2.05242  
 Intercept (b) : -0.01383  
 Correlation Coefficient(r) : 0.99994

Standard Condition

Pstd (hpa) : 1013  
 Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1002  
 Ta(K) : 303

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	11.0	3.271	1.601	58	57.21
2	13 holes	9.0	2.959	1.448	52	51.29
3	10 holes	6.8	2.572	1.260	47	46.36
4	7 holes	4.6	2.115	1.037	41	40.44
5	5 holes	2.5	1.560	0.768	32	31.56

Notes:  $Z = \sqrt{dH(Pa/Pstd)(Tstd/Ta)}$ ,  $X = Z/m - b$ ,  $Y(\text{Corrected Flow}) = IC * \{\sqrt{Pa/Pstd}(Tstd/Ta)\}$

Sampler Calibration Relationship (Linear Regression)

Slope(m): 29.844

Intercept(b): 8.883

Correlation Coefficient(r): 0.9982

Checked by: Magnum Fan

Date: 12/08/2018

High-Volume TSP Sampler  
5-Point Calibration Record

Location : ASR10  
 Calibrated by : P.F. Yeung  
 Date : 09/08/2018

Sampler

Model : TE-5170  
 Serial Number : S/N 8162

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454  
 Service Date : 19 Mar 2018  
 Slope (m) : 2.05242  
 Intercept (b) : -0.01383  
 Correlation Coefficient(r) : 0.99994

Standard Condition

Pstd (hpa) : 1013  
 Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1002  
 Ta(K) : 303

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	10.6	3.211	1.571	52	51.29
2	13 holes	8.8	2.926	1.432	48	47.34
3	10 holes	6.5	2.515	1.232	43	42.41
4	7 holes	4.2	2.021	0.992	36	35.51
5	5 holes	2.7	1.621	0.796	28	27.62

Notes:  $Z = \sqrt{dH(Pa/Pstd)(Tstd/Ta)}$ ,  $X = Z/m - b$ ,  $Y(\text{Corrected Flow}) = IC * \{\sqrt{Pa/Pstd}(Tstd/Ta)\}$

Sampler Calibration Relationship (Linear Regression)

Slope(m): 29.790                      Intercept(b): 4.945                      Correlation Coefficient(r): 0.9957

Checked by: Magnum Fan

Date: 12/08/2018



High-Volume TSP Sampler  
5-Point Calibration Record

Location : AQMS1  
 Calibrated by : P.F. Yeung  
 Date : 09/08/2018

Sampler

Model : TE-5170  
 Serial Number : S/N 1253

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454  
 Service Date : 19 Mar 2018  
 Slope (m) : 2.05242  
 Intercept (b) : -0.01383  
 Correlation Coefficient(r) : 0.99994

Standard Condition

Pstd (hpa) : 1013  
 Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1002  
 Ta(K) : 303

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	11.6	3.359	1.643	58	57.21
2	13 holes	9.2	2.992	1.464	53	52.27
3	10 holes	6.8	2.572	1.260	47	46.36
4	7 holes	4.6	2.115	1.037	42	41.43
5	5 holes	2.7	1.621	0.796	35	34.52

Notes:  $Z = \sqrt{dH(Pa/Pstd)(Tstd/Ta)}$ ,  $X = Z/m - b$ ,  $Y(\text{Corrected Flow}) = IC * \{\sqrt{Pa/Pstd}(Tstd/Ta)\}$

Sampler Calibration Relationship (Linear Regression)

Slope(m): 26.486                      Intercept(b): 13.506                      Correlation Coefficient(r): 0.9981

Checked by: Magnum Fan

Date: 12/08/2018

High-Volume TSP Sampler  
5-Point Calibration Record

Location : ASR 1  
 Calibrated by : P.F.Yeung  
 Date : 09/08/2018

Sampler

Model : TE-5170  
 Serial Number : S/N 0146

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454  
 Service Date : 19 Mar 2018  
 Slope (m) : 2.05242  
 Intercept (b) : -0.01383  
 Correlation Coefficient(r) : 0.99994

Standard Condition

Pstd (hpa) : 1013  
 Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1002  
 Ta(K) : 303

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	11.4	3.330	1.629	54	53.26
2	13 holes	9.2	2.992	1.464	49	48.33
3	10 holes	6.6	2.534	1.241	43	42.41
4	7 holes	4.5	2.092	1.026	35	34.52
5	5 holes	2.6	1.590	0.782	28	27.62

Notes:  $Z = \sqrt{dH(Pa/Pstd)(Tstd/Ta)}$ ,  $X = Z/m - b$ ,  $Y(\text{Corrected Flow}) = IC * \{\sqrt{Pa/Pstd}(Tstd/Ta)\}$

Sampler Calibration Relationship (Linear Regression)

Slope(m): 30.526                      Intercept(b): 3.726                      Correlation Coefficient(r): 0.9989

Checked by: Magnum Fan

Date: 12/08/2018

High-Volume TSP Sampler  
5-Point Calibration Record

Location : ASR 6  
 Calibrated by : P.F. Yeung  
 Date : 09/08/2018

Sampler

Model : TE-5170  
 Serial Number : S/N 3957

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454  
 Service Date : 19 Mar 2018  
 Slope (m) : 2.05242  
 Intercept (b) : -0.01383  
 Correlation Coefficient(r) : 0.99994

Standard Condition

Pstd (hpa) : 1013  
 Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1002  
 Ta(K) : 303

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	12.2	3.445	1.685	54	53.26
2	13 holes	9.6	3.056	1.496	50	49.32
3	10 holes	7.2	2.647	1.296	46	45.37
4	7 holes	4.8	2.161	1.060	38	37.48
5	5 holes	2.6	1.590	0.782	30	29.59

Notes:  $Z = \sqrt{dH(Pa/Pstd)(Tstd/Ta)}$ ,  $X = Z/m - b$ ,  $Y(\text{Corrected Flow}) = IC * \{\sqrt{Pa/Pstd}(Tstd/Ta)\}$

Sampler Calibration Relationship (Linear Regression)

Slope(m): 26.565                      Intercept(b): 9.433                      Correlation Coefficient(r): 0.9951

Checked by: Magnum Fan

Date: 12/08/2018



# Certificate of Calibration

Calibration Certification Information			
Cal. Date: March 19, 2018	Rootsmeter S/N: 438320	Ta: 294	°K
Operator: Jim Tisch		Pa: 746.8	mm Hg
Calibration Model #: TE-5025A	Calibrator S/N: <b>2454</b>		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4300	3.2	2.00
2	3	4	1	1.0040	6.4	4.00
3	5	6	1	0.9030	7.9	5.00
4	7	8	1	0.8590	8.7	5.50
5	9	10	1	0.7080	12.8	8.00

Data Tabulation					
Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left( \frac{Pa}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left( \frac{Ta}{Pa} \right)}$ (y-axis)
0.9917	0.6935	1.4113	0.9957	0.6963	0.8874
0.9874	0.9835	1.9959	0.9914	0.9875	1.2549
0.9854	1.0913	2.2315	0.9894	1.0957	1.4030
0.9843	1.1459	2.3405	0.9883	1.1506	1.4715
0.9789	1.3826	2.8227	0.9829	1.3882	1.7747
<b>QSTD</b>	m=	2.05242	<b>QA</b>	m=	1.28519
	b=	-0.01383		b=	-0.00869
	r=	0.99994		r=	0.99994

Calculations	
Vstd= $\Delta Vol \left( \frac{Pa - \Delta P}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)$	Va= $\Delta Vol \left( \frac{Pa - \Delta P}{Pa} \right)$
Qstd= Vstd/ΔTime	Qa= Va/ΔTime
For subsequent flow rate calculations:	
Qstd= $1/m \left( \left( \sqrt{\Delta H \left( \frac{Pa}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)} \right) - b \right)$	Qa= $1/m \left( \left( \sqrt{\Delta H \left( \frac{Ta}{Pa} \right)} \right) - b \right)$

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg
Key	
ΔH: calibrator manometer reading (in H2O)	
ΔP: rootsmeter manometer reading (mm Hg)	
Ta: actual absolute temperature (°K)	
Pa: actual barometric pressure (mm Hg)	
b: intercept	
m: slope	

RECALIBRATION
US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

**ENVIROTECH SERVICES CO.**

**Calibration Report of Wind Meter**

Date of Calibration : 01 April 2018

Brand of Test Meter: Davis

Model: Vantage Pro 2 ( s/n: AS160104014)

Location : Roof of Tuen Mun Firestation

Procedures :

- 1. Wind Still Test: The wind speed sensor was hold by hand until it keep still
- 2. Wind Speed Test: The wind meter was on-site calibrated against the Anemometer
- 3. Wind Direction Test : The wind meter was on-site calibrated against the marine compass at four directions

Results:

Wind Still Test

Wind Speed (m/s)
0.00

Wind Speed Test

Davis (m/s)	Anemometer (m/s)
0.5	0.4
1.0	0.9
1.7	1.5

Wind Direction Test

Davis (o)	Marine Compass (o)
269	270
359	0
91	90
179	180

Calibrated by: *Ho*  
Yeung Ping Fai  
(Technical Officer)

Checked by : *Fai*  
Ho Kam Fat  
(Senior Technical Officer)



輝創工程有限公司

Sun Creation Engineering Limited

Calibration and Testing Laboratory

# Certificate of Calibration 校正證書

Certificate No. : C175727  
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC17-2277)      Date of Receipt / 收件日期 : 3 October 2017

Description / 儀器名稱 : Anemometer  
Manufacturer / 製造商 : Lutron  
Model No. / 型號 : AM-4201  
Serial No. / 編號 : AF.27513  
Supplied By / 委託者 : Envirotech Services Co.  
Room 113, 1/F, My Loft, 9 Hoi Wing Road, Tuen Mun,  
New Territories, Hong Kong

## TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C      Relative Humidity / 相對濕度 : (55 ± 20)%  
Line Voltage / 電壓 : ---

## TEST SPECIFICATIONS / 測試規範


Calibration check


DATE OF TEST / 測試日期 : 13 October 2017

## TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.  
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :  
- Testo Industrial Services GmbH, Germany

Tested By :   
測試 H C Chan  
Engineer

Certified By :   
核證 K C Lee  
Engineer

Date of Issue : 16 October 2017  
簽發日期

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.  
本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。



# Certificate of Calibration

## 校正證書

Certificate No. : C175727

證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
2. The results presented are the mean of 10 measurements at each calibration point.
3. Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL386	Multi-function Measuring Instrument	S16493

4. Test procedure : MA130N.

5. Results :

### Air Velocity

Applied Value (m/s)	UUT Reading (m/s)	Measured Correction		
		Value (m/s)	Measurement Uncertainty	
			Expanded Uncertainty (m/s)	Coverage Factor
1.9	1.7	+0.2	0.2	2.0
4.0	3.8	+0.2	0.2	2.0
6.0	5.9	+0.1	0.3	2.0
8.0	8.0	0.0	0.3	2.0
10.0	10.1	-0.1	0.4	2.0

Remarks : - The Measured Corrections are defined as :  
Value = Applied Value - UUT Reading

- The expanded uncertainties are for a level of confidence of 95 %.

### Note :

Only the original copy or the laboratory's certified true copy is valid.

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

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部深印本證書需先獲本實驗室書面批准。

Sun Creation Engineering Limited Calibration & Testing Laboratory

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輝創工程有限公司 校正及檢測實驗室

c/o 香港新界屯門興安里一號青山灣機樓四樓

Tel 電話: 2927 2606

Fax 傳真: 2744 8986

E-mail 電郵: callab@suncreation.com

Website 網址: www.suncreation.com

Appendix F

## EM&A Monitoring Schedules



**HY/2012/08 - Tuen Mun - Chek Lap Kok Link  
Northern Connection Sub-sea Tunnel Section  
Air Quality Impact Monitoring Schedule - September 2018**

Air quality monitoring stations: ASR1, ASR5, ASR6, ASR10, AQMS1

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Sep
						1-hour TSP - 3 times 24-hour TSP - 1 time  Impact AQM
2-Sep	3-Sep	4-Sep	5-Sep	6-Sep	7-Sep	8-Sep
		1-hour TSP - 3 times 24-hour TSP - 1 time  Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time  Impact AQM	
9-Sep	10-Sep	11-Sep	12-Sep	13-Sep	14-Sep	15-Sep
	1-hour TSP - 3 times 24-hour TSP - 1 time  Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time  Impact AQM		
16-Sep	17-Sep	18-Sep	19-Sep	20-Sep	21-Sep	22-Sep
AQM cancelled due to adverse weather.			1-hour TSP - 3 times 24-hour TSP - 1 time  Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time  Impact AQM
23-Sep	24-Sep	25-Sep	26-Sep	27-Sep	28-Sep	29-Sep
		1-hour TSP - 3 times 24-hour TSP - 1 time  Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time  Impact AQM	
30-Sep						

**HY/2012/08 - Tuen Mun - Chek Lap Kok Link  
Northern Connection Sub-sea Tunnel Section  
Tentative Air Quality Impact Monitoring Schedule - October 2018**

Air quality monitoring stations: ASR1, ASR5, ASR6, ASR10, AQMS1

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
	Public holiday	1-Oct	2-Oct	3-Oct	4-Oct	5-Oct	6-Oct
	1-hour TSP - 3 times 24-hour TSP - 1 time  Impact AQM				1-hour TSP - 3 times 24-hour TSP - 1 time  Impact AQM		
7-Oct	8-Oct	9-Oct	10-Oct	11-Oct	12-Oct	13-Oct	
1-hour TSP - 3 times 24-hour TSP - 1 time  Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time  Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time  Impact AQM	
14-Oct	15-Oct	16-Oct	Public holiday	17-Oct	18-Oct	19-Oct	20-Oct
		1-hour TSP - 3 times 24-hour TSP - 1 time  Impact AQM				1-hour TSP - 3 times 24-hour TSP - 1 time  Impact AQM	
21-Oct	22-Oct	23-Oct	24-Oct	25-Oct	26-Oct	27-Oct	
	1-hour TSP - 3 times 24-hour TSP - 1 time  Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time  Impact AQM			
28-Oct	29-Oct	30-Oct	31-Oct				
1-hour TSP - 3 times 24-hour TSP - 1 time  Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time  Impact AQM				

The schedule is subject to agreement from the EPD on the monitoring times. The schedule will be revised after reviewing the progress of the construction works or due to adverse (safety, weather etc) conditions.

**HY/2012/08 - Tuen Mun - Chek Lap Kok Link  
Northern Connection Sub-sea Tunnel Section  
Impact Dolphin Monitoring Survey Monitoring Schedule - September 2018**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Sep
2-Sep	3-Sep	4-Sep	5-Sep	6-Sep	7-Sep	8-Sep
		<b>Impact Dolphin Monitoring</b>				
9-Sep	10-Sep	11-Sep	12-Sep	13-Sep	14-Sep	15-Sep
16-Sep	17-Sep	18-Sep	19-Sep	20-Sep	21-Sep	22-Sep
		<b>Impact Dolphin Monitoring</b>		<b>Impact Dolphin Monitoring</b>		
23-Sep	24-Sep	25-Sep	26-Sep	27-Sep	28-Sep	29-Sep
			<b>Impact Dolphin Monitoring</b>			
30-Sep						

**HY/2012/08 - Tuen Mun - Chek Lap Kok Link  
Northern Connection Sub-sea Tunnel Section  
Tentative Impact Dolphin Monitoring Survey Monitoring Schedule - October 2018**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Public Holiday	1-Oct	2-Oct	3-Oct	4-Oct	5-Oct
					Impact Dolphin Monitoring	
7-Oct	8-Oct	9-Oct	10-Oct	11-Oct	12-Oct	13-Oct
					Impact Dolphin Monitoring	
14-Oct	15-Oct	16-Oct	Public Holiday	17-Oct	18-Oct	19-Oct
		Impact Dolphin Monitoring				
21-Oct	22-Oct	23-Oct	24-Oct	25-Oct	26-Oct	27-Oct
		Impact Dolphin Monitoring				
28-Oct	29-Oct	30-Oct	31-Oct			

The schedule is subject to agreement from the EPD on the monitoring times. The schedule will be revised after reviewing the progress of the construction works or due to adverse (safety, weather etc) conditions.

Appendix G

## Impact Air Quality Monitoring Results

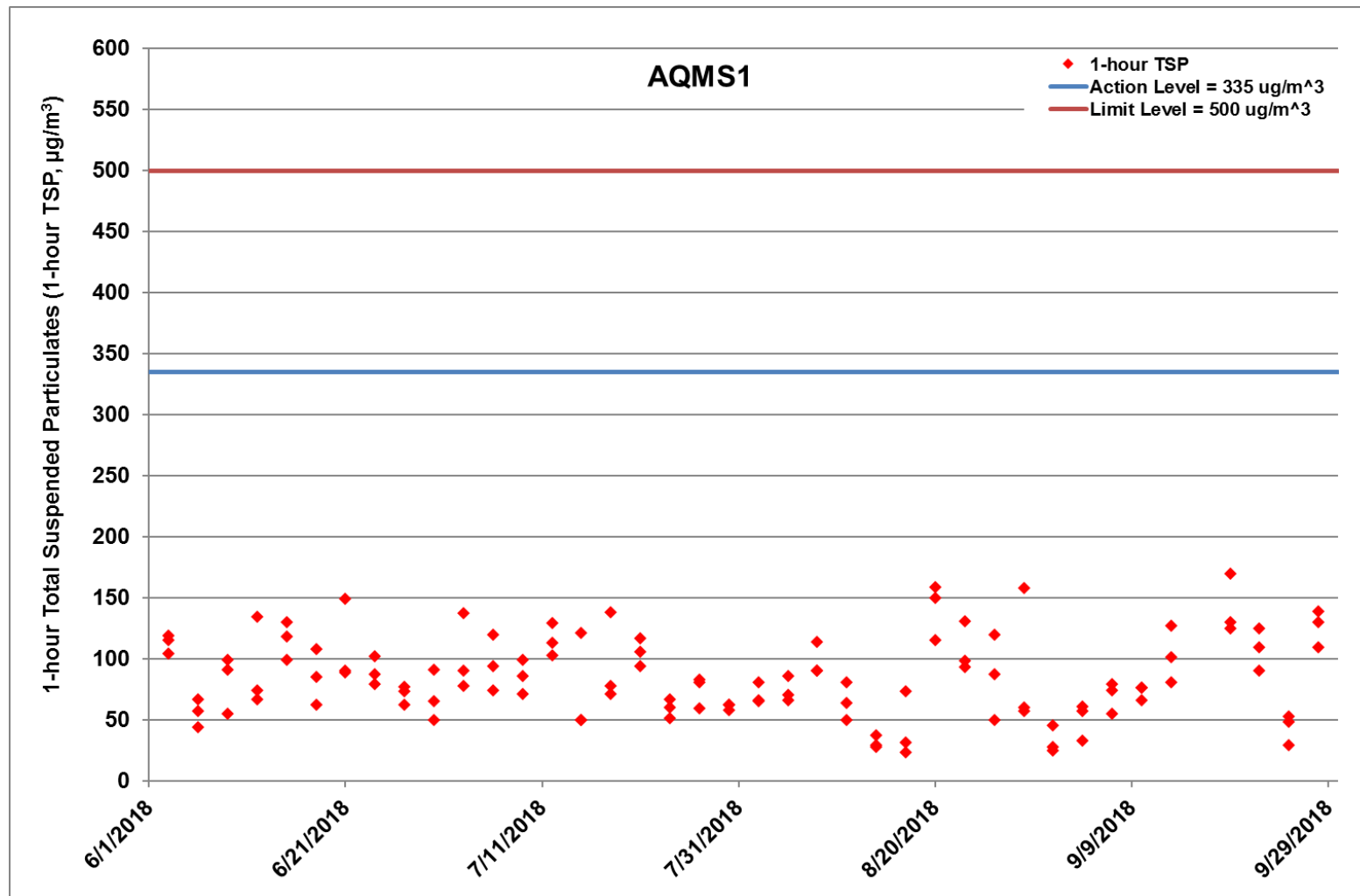


Figure G.1 Impact Monitoring - 1-hour Total Suspended Particulates ( $\mu\text{g}/\text{m}^3$ ) at AQMS1 between 1 June 2018 and 30 September 2018 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Box Culvert Extension, TBM Tunnel Works (1/6/2018 - 30/9/2018)

Ref: 0212330\_Impact AQM graphs\_September 2018\_REV a.xlsx



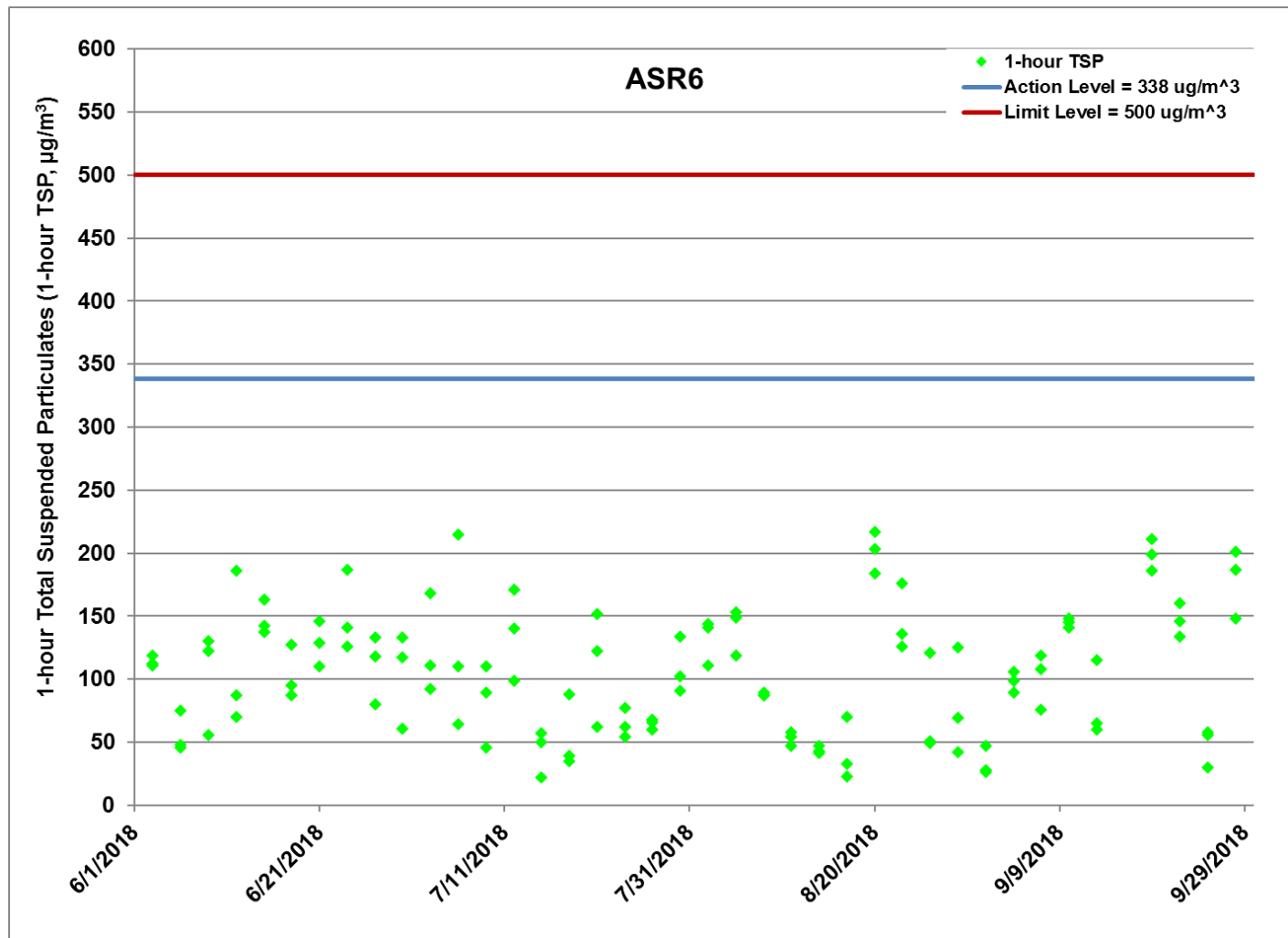


Figure G.2 Impact Monitoring - 1-hour Total Suspended Particulates ( $\mu\text{g}/\text{m}^3$ ) at ASR6 between 1 June 2018 and 30 September 2018 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Tunnel Works (1/6/2018 - 30/9/2018)

Ref: 0212330\_Impact AQM graphs\_September 2018\_REV a.xlsx







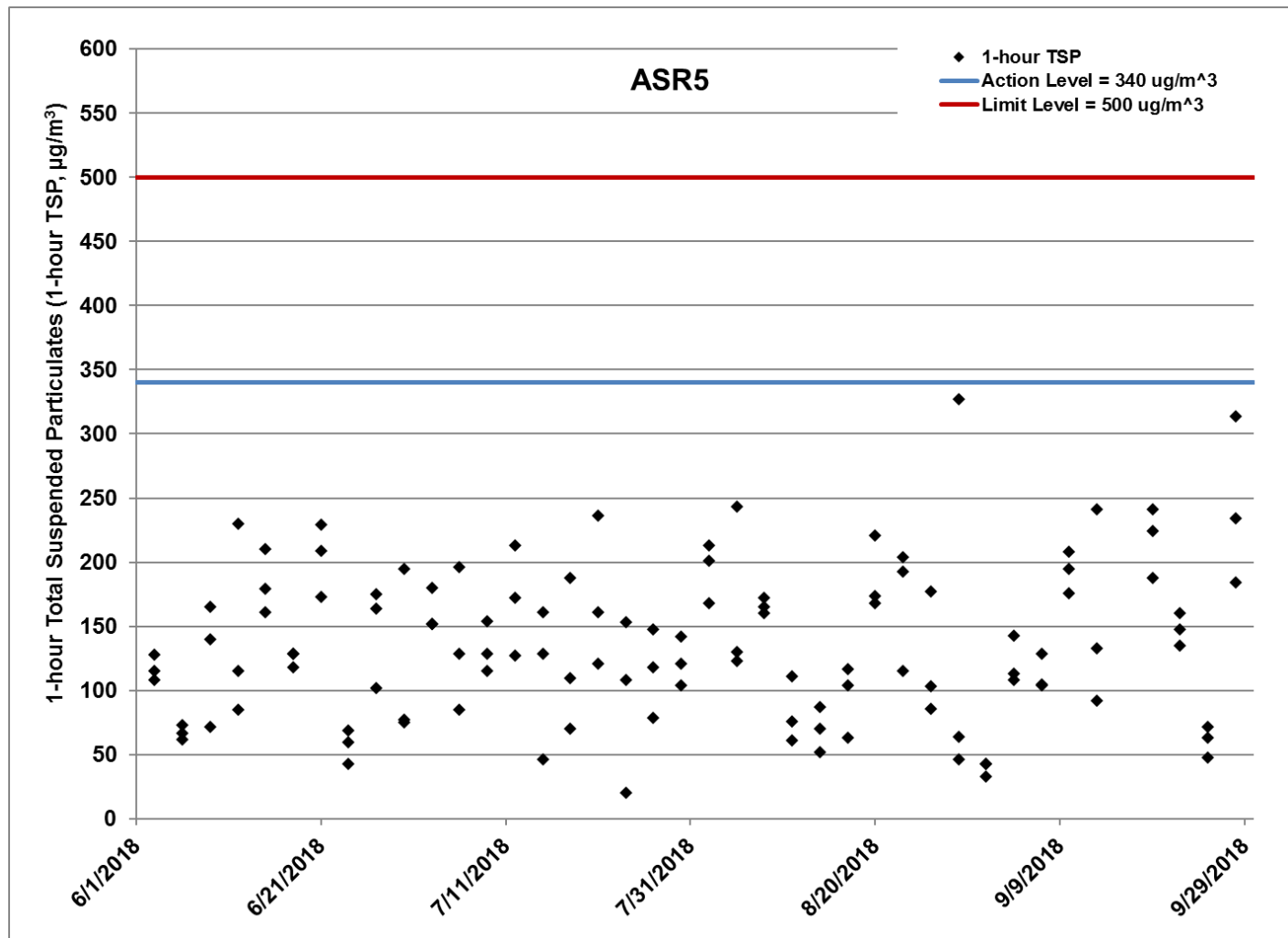


Figure G.4 Impact Monitoring - 1-hour Total Suspended Particulates ( $\mu\text{g}/\text{m}^3$ ) at ASR5 between 1 June 2018 and 30 September 2018 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Tunnel Works (1/6/2018 - 30/9/2018)

Ref: 0212330\_Impact AQM graphs\_September 2018\_REV a.xlsx



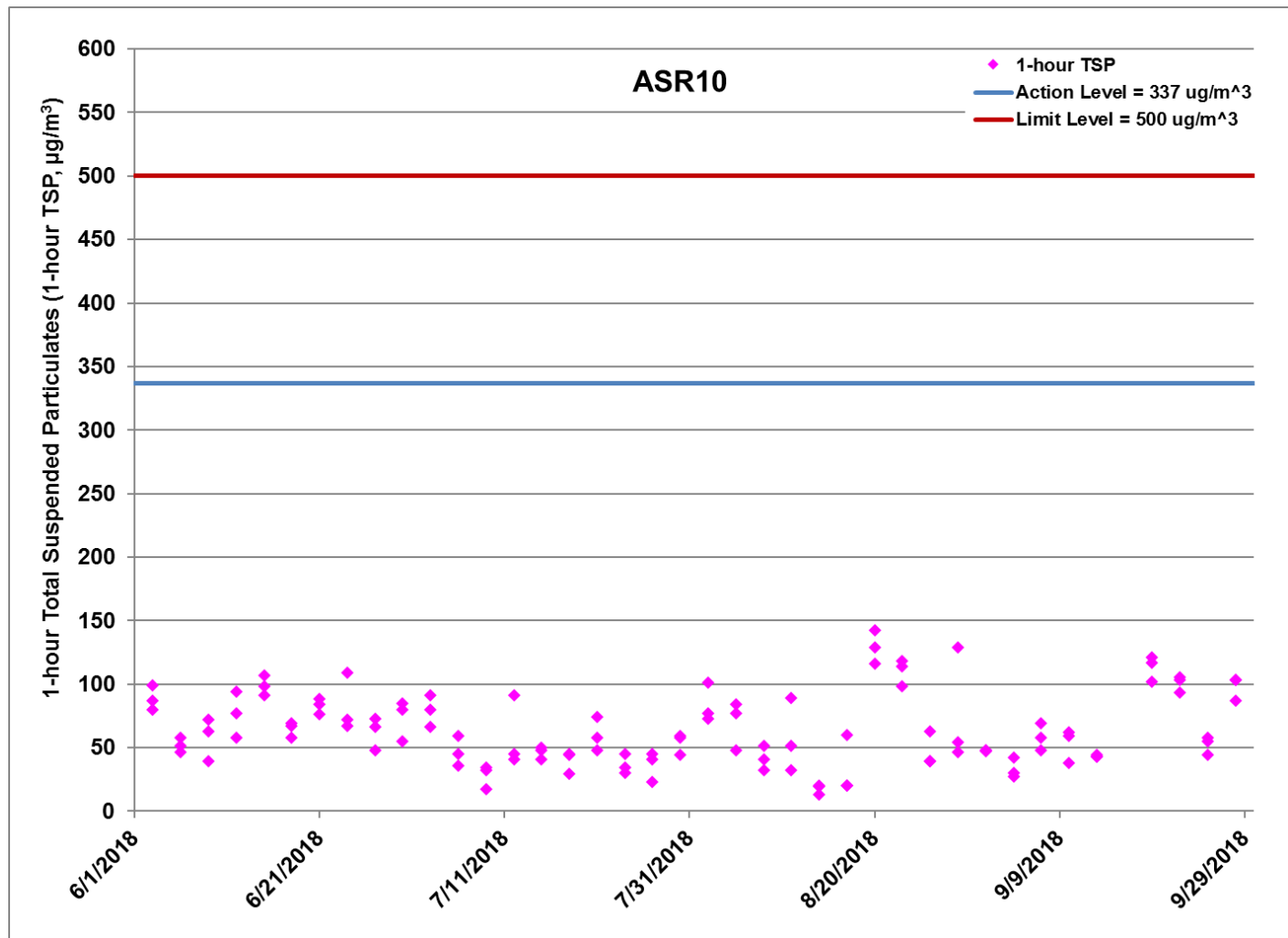


Figure G.5 Impact Monitoring - 1-hour Total Suspended Particulates ( $\mu\text{g}/\text{m}^3$ ) at ASR10 between 1 June 2018 and 30 September 2018 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Tunnel Works (1/6/2018 - 30/9/2018)

Ref: 0212330\_Impact AQM graphs\_September 2018\_REV a.xlsx



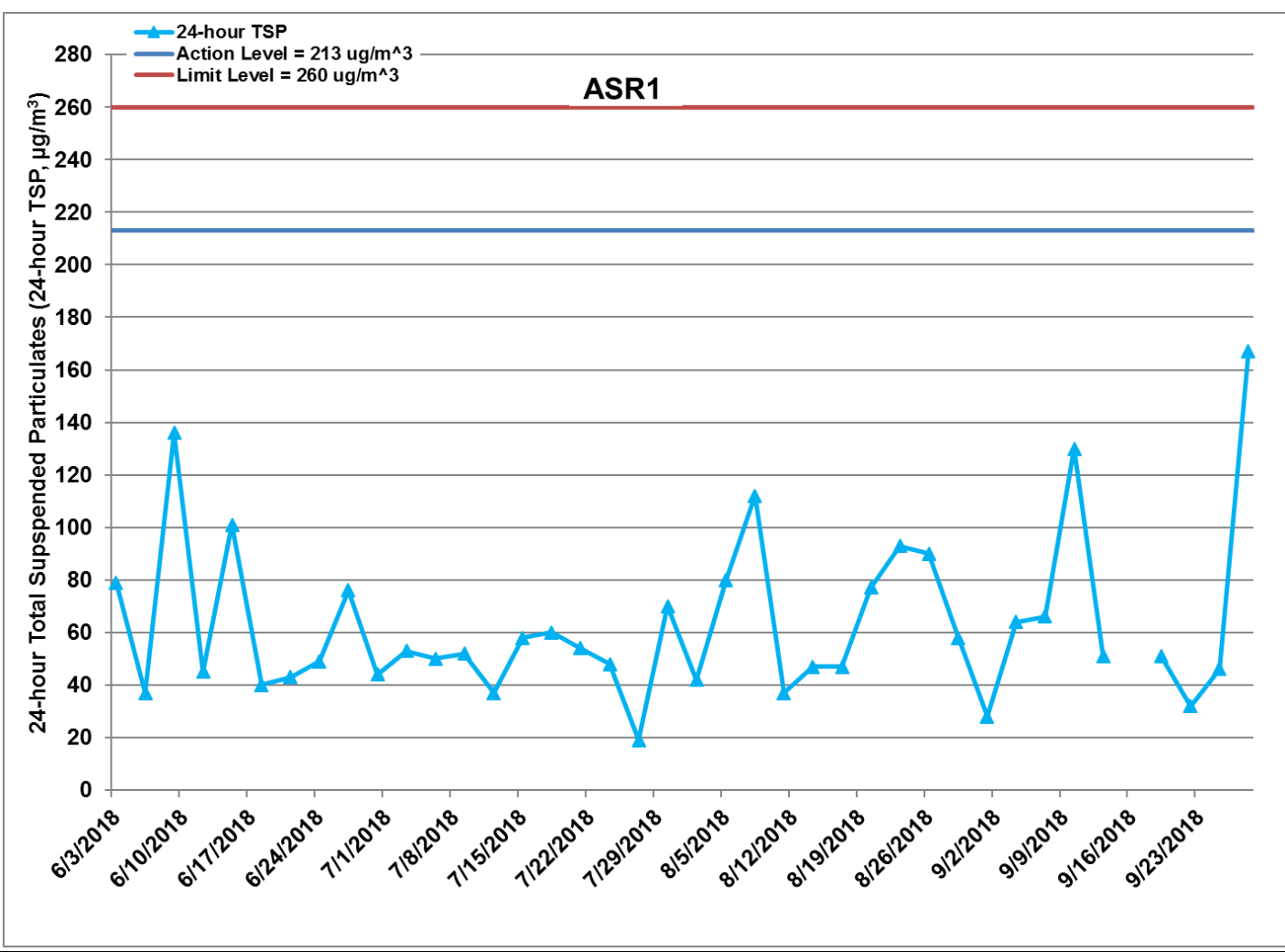


Figure G.6 Impact Monitoring - 24-hour Total Suspended Particulates ( $\mu\text{g}/\text{m}^3$ ) at ASR1 between 1 June 2018 and 30 September 2018 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Tunnel Works (1/6/2018 - 30/9/2018)

Ref: 0212330\_Impact AQM graphs\_September 2018\_REV a.xlsx



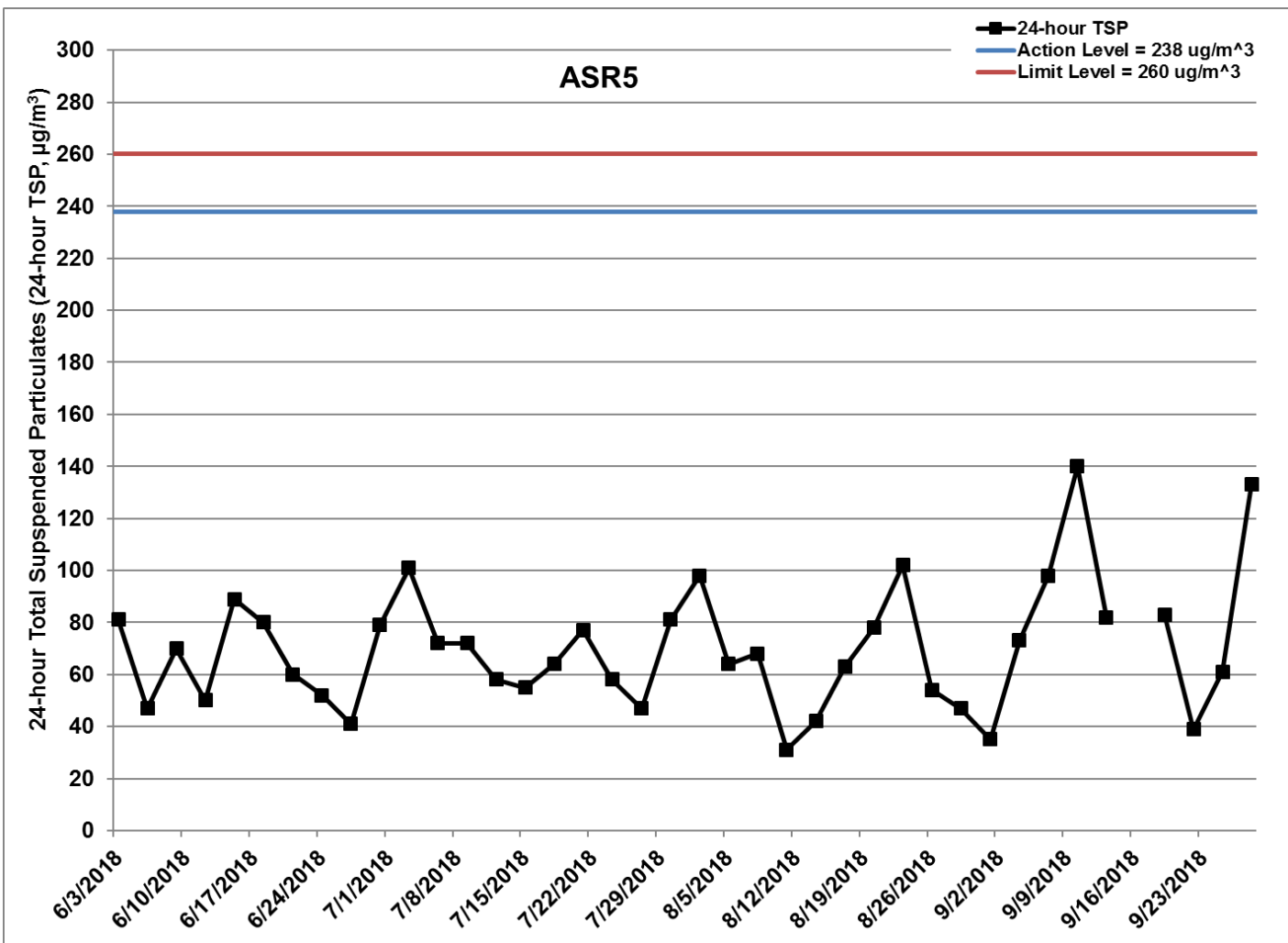


Figure G.7 Impact Monitoring - 24-hour Total Suspended Particulates ( $\mu\text{g}/\text{m}^3$ ) at ASR5 between 1 June 2018 and 30 September 2018 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Tunnel Works (1/6/2018 - 30/9/2018)

Ref: 0212330\_Impact AQM graphs\_September 2018\_REV a.xlsx



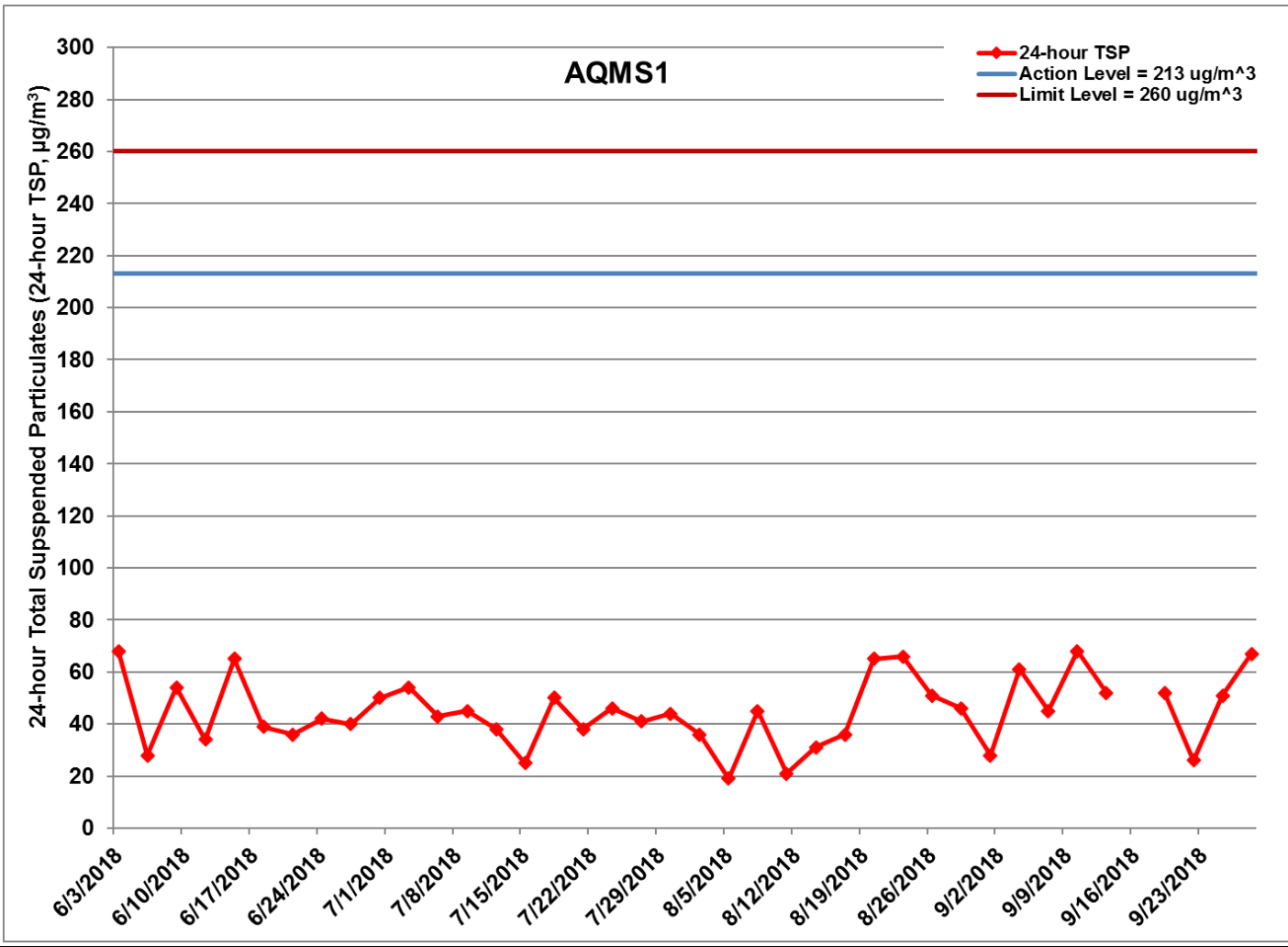


Figure G.8 Impact Monitoring - 24-hour Total Suspended Particulates ( $\mu\text{g}/\text{m}^3$ ) at AQMS1 between 1 June 2018 and 30 September 2018 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Tunnel Works (1/6/2018 - 30/9/2018)

Ref: 0212330\_Impact AQM graphs\_September 2018\_REV a.xlsx



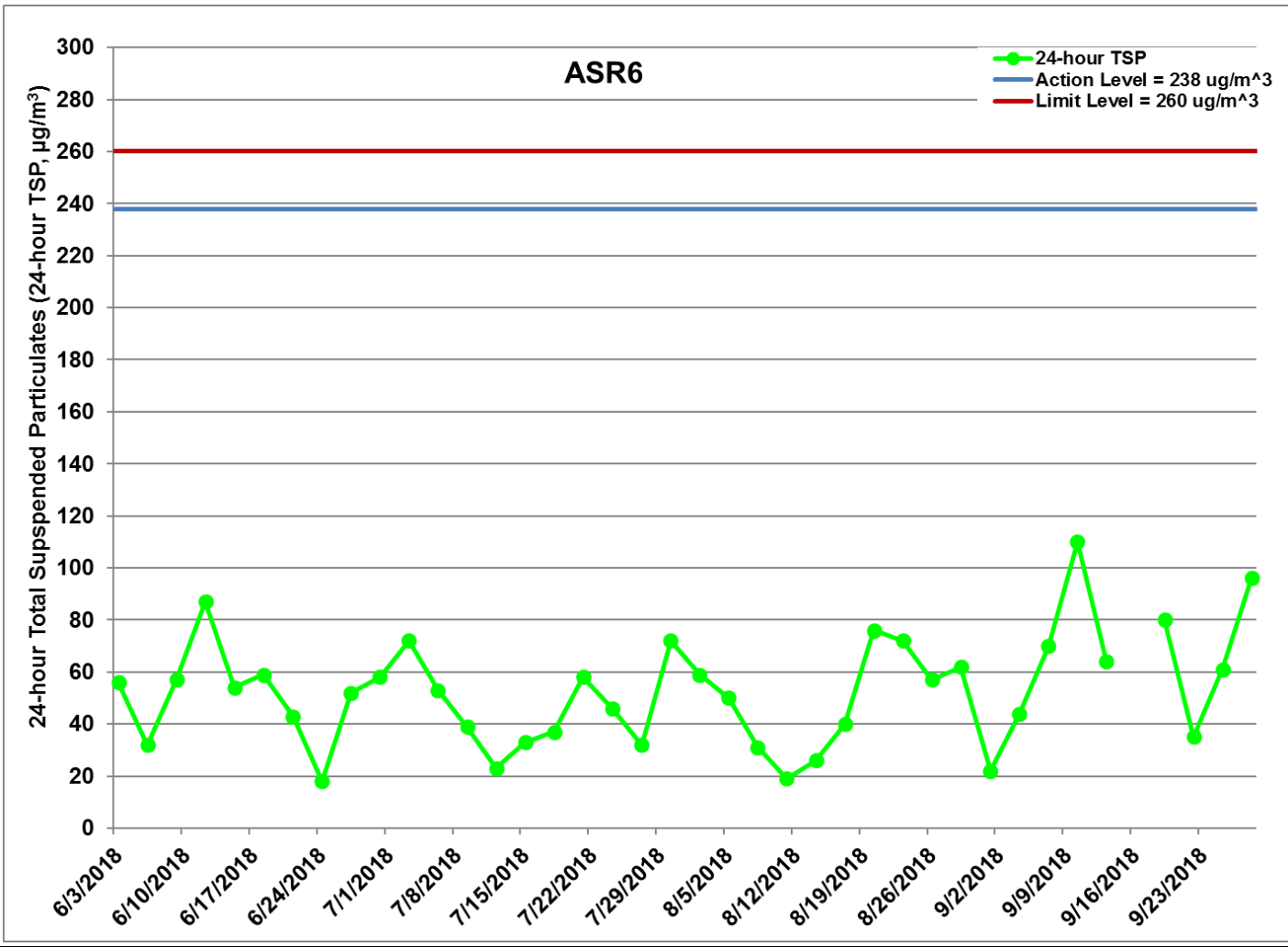


Figure G.9 Impact Monitoring - 24-hour Total Suspended Particulates ( $\mu\text{g}/\text{m}^3$ ) at ASR6 between 1 June 2018 and 30 September 2018 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Tunnel Works (1/6/2018 - 30/9/2018)

Ref: 0212330\_Impact AQM graphs\_September 2018\_REV a.xlsx



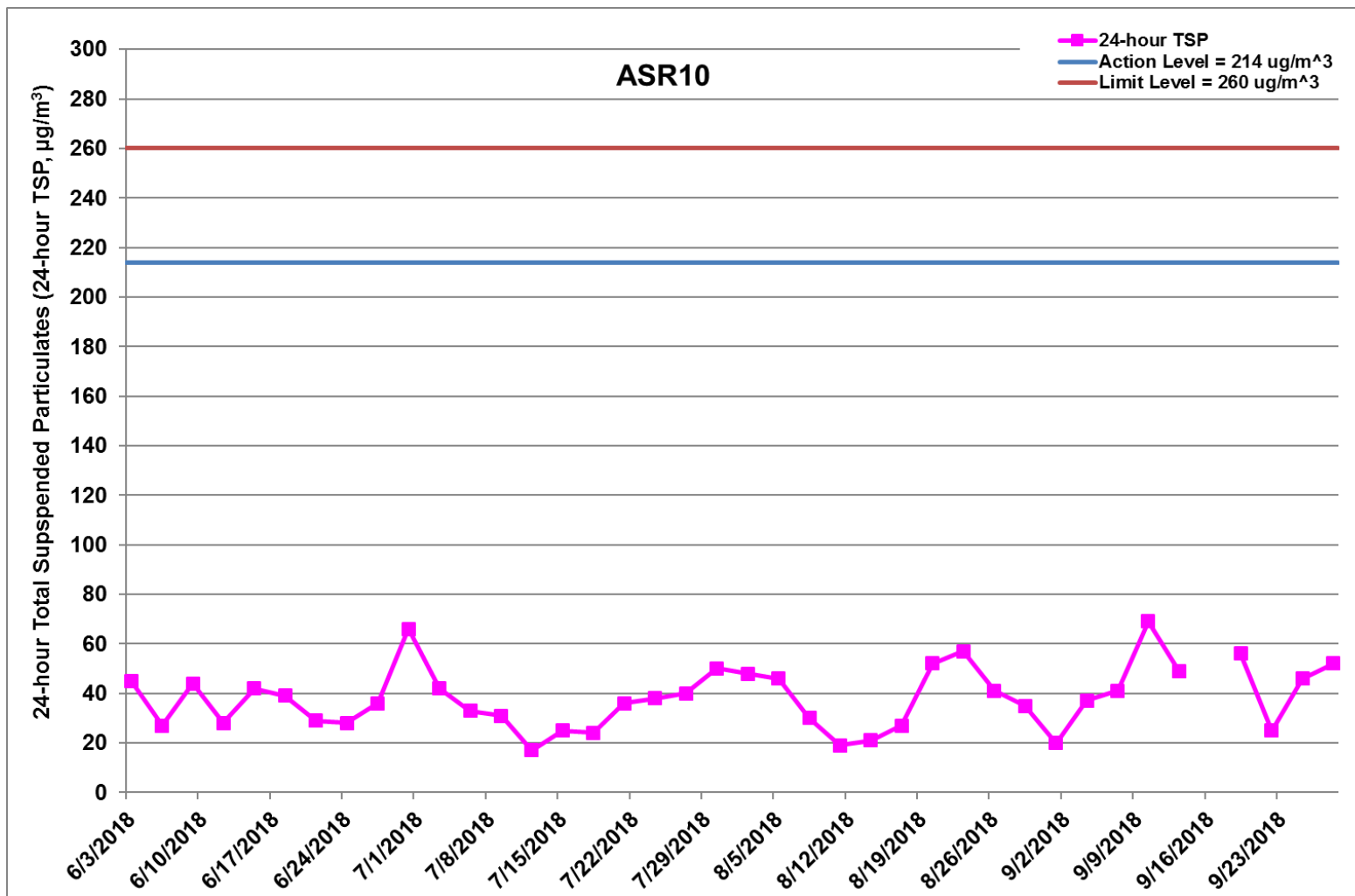


Figure G.10 Impact Monitoring – 24-hour Total Suspended Particulates ( $\mu\text{g}/\text{m}^3$ ) at ASR10 between 1 June 2018 and 30 September 2018 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Tunnel Works (1/6/2018 – 30/9/2018)

Ref: 0212330\_Impact AQM graphs\_September 2018\_REV a.xlsx



Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2018-09-01	AQMS1	Rainy	08:55	1-hour TSP	45	ug/m3
TMCLKL	HY/2012/08	2018-09-01	AQMS1	Rainy	09:57	1-hour TSP	28	ug/m3
TMCLKL	HY/2012/08	2018-09-01	AQMS1	Rainy	10:59	1-hour TSP	25	ug/m3
TMCLKL	HY/2012/08	2018-09-01	ASR1	Rainy	08:44	1-hour TSP	59	ug/m3
TMCLKL	HY/2012/08	2018-09-01	ASR1	Rainy	09:46	1-hour TSP	56	ug/m3
TMCLKL	HY/2012/08	2018-09-01	ASR1	Rainy	10:48	1-hour TSP	43	ug/m3
TMCLKL	HY/2012/08	2018-09-01	ASR10	Rainy	08:08	1-hour TSP	48	ug/m3
TMCLKL	HY/2012/08	2018-09-01	ASR10	Rainy	09:10	1-hour TSP	48	ug/m3
TMCLKL	HY/2012/08	2018-09-01	ASR10	Rainy	10:12	1-hour TSP	47	ug/m3
TMCLKL	HY/2012/08	2018-09-01	ASR5	Rainy	08:32	1-hour TSP	43	ug/m3
TMCLKL	HY/2012/08	2018-09-01	ASR5	Rainy	09:34	1-hour TSP	33	ug/m3
TMCLKL	HY/2012/08	2018-09-01	ASR5	Rainy	10:36	1-hour TSP	43	ug/m3
TMCLKL	HY/2012/08	2018-09-01	ASR6	Rainy	08:19	1-hour TSP	47	ug/m3
TMCLKL	HY/2012/08	2018-09-01	ASR6	Rainy	09:21	1-hour TSP	28	ug/m3
TMCLKL	HY/2012/08	2018-09-01	ASR6	Rainy	10:23	1-hour TSP	26	ug/m3
TMCLKL	HY/2012/08	2018-09-04	AQMS1	Sunny	14:06	1-hour TSP	61	ug/m3
TMCLKL	HY/2012/08	2018-09-04	AQMS1	Sunny	15:08	1-hour TSP	57	ug/m3
TMCLKL	HY/2012/08	2018-09-04	AQMS1	Sunny	16:10	1-hour TSP	33	ug/m3
TMCLKL	HY/2012/08	2018-09-04	ASR1	Sunny	13:55	1-hour TSP	180	ug/m3
TMCLKL	HY/2012/08	2018-09-04	ASR1	Sunny	14:57	1-hour TSP	155	ug/m3
TMCLKL	HY/2012/08	2018-09-04	ASR1	Sunny	15:59	1-hour TSP	111	ug/m3
TMCLKL	HY/2012/08	2018-09-04	ASR10	Sunny	13:21	1-hour TSP	42	ug/m3
TMCLKL	HY/2012/08	2018-09-04	ASR10	Sunny	14:23	1-hour TSP	27	ug/m3
TMCLKL	HY/2012/08	2018-09-04	ASR10	Sunny	15:25	1-hour TSP	30	ug/m3
TMCLKL	HY/2012/08	2018-09-04	ASR5	Sunny	13:44	1-hour TSP	108	ug/m3
TMCLKL	HY/2012/08	2018-09-04	ASR5	Sunny	14:46	1-hour TSP	113	ug/m3
TMCLKL	HY/2012/08	2018-09-04	ASR5	Sunny	15:48	1-hour TSP	143	ug/m3
TMCLKL	HY/2012/08	2018-09-04	ASR6	Sunny	13:32	1-hour TSP	89	ug/m3
TMCLKL	HY/2012/08	2018-09-04	ASR6	Sunny	14:34	1-hour TSP	106	ug/m3
TMCLKL	HY/2012/08	2018-09-04	ASR6	Sunny	15:36	1-hour TSP	99	ug/m3



Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2018-09-07	AQMS1	Sunny	09:08	1-hour TSP	74	ug/m3
TMCLKL	HY/2012/08	2018-09-07	AQMS1	Sunny	10:10	1-hour TSP	79	ug/m3
TMCLKL	HY/2012/08	2018-09-07	AQMS1	Sunny	11:12	1-hour TSP	55	ug/m3
TMCLKL	HY/2012/08	2018-09-07	ASR1	Sunny	08:57	1-hour TSP	392	ug/m3
TMCLKL	HY/2012/08	2018-09-07	ASR1	Sunny	09:59	1-hour TSP	120	ug/m3
TMCLKL	HY/2012/08	2018-09-07	ASR1	Sunny	11:01	1-hour TSP	60	ug/m3
TMCLKL	HY/2012/08	2018-09-07	ASR10	Sunny	08:24	1-hour TSP	58	ug/m3
TMCLKL	HY/2012/08	2018-09-07	ASR10	Sunny	09:26	1-hour TSP	48	ug/m3
TMCLKL	HY/2012/08	2018-09-07	ASR10	Sunny	10:28	1-hour TSP	69	ug/m3
TMCLKL	HY/2012/08	2018-09-07	ASR5	Sunny	08:46	1-hour TSP	104	ug/m3
TMCLKL	HY/2012/08	2018-09-07	ASR5	Sunny	09:48	1-hour TSP	105	ug/m3
TMCLKL	HY/2012/08	2018-09-07	ASR5	Sunny	10:50	1-hour TSP	129	ug/m3
TMCLKL	HY/2012/08	2018-09-07	ASR6	Sunny	08:34	1-hour TSP	76	ug/m3
TMCLKL	HY/2012/08	2018-09-07	ASR6	Sunny	09:36	1-hour TSP	119	ug/m3
TMCLKL	HY/2012/08	2018-09-07	ASR6	Sunny	10:38	1-hour TSP	108	ug/m3
TMCLKL	HY/2012/08	2018-09-10	AQMS1	Sunny	14:14	1-hour TSP	66	ug/m3
TMCLKL	HY/2012/08	2018-09-10	AQMS1	Sunny	15:16	1-hour TSP	76	ug/m3
TMCLKL	HY/2012/08	2018-09-10	AQMS1	Sunny	16:18	1-hour TSP	76	ug/m3
TMCLKL	HY/2012/08	2018-09-10	ASR1	Sunny	14:03	1-hour TSP	107	ug/m3
TMCLKL	HY/2012/08	2018-09-10	ASR1	Sunny	15:05	1-hour TSP	141	ug/m3
TMCLKL	HY/2012/08	2018-09-10	ASR1	Sunny	16:07	1-hour TSP	91	ug/m3
TMCLKL	HY/2012/08	2018-09-10	ASR10	Sunny	13:29	1-hour TSP	38	ug/m3
TMCLKL	HY/2012/08	2018-09-10	ASR10	Sunny	14:31	1-hour TSP	59	ug/m3
TMCLKL	HY/2012/08	2018-09-10	ASR10	Sunny	15:33	1-hour TSP	62	ug/m3
TMCLKL	HY/2012/08	2018-09-10	ASR5	Sunny	13:52	1-hour TSP	195	ug/m3
TMCLKL	HY/2012/08	2018-09-10	ASR5	Sunny	14:54	1-hour TSP	176	ug/m3
TMCLKL	HY/2012/08	2018-09-10	ASR5	Sunny	15:56	1-hour TSP	208	ug/m3
TMCLKL	HY/2012/08	2018-09-10	ASR6	Sunny	13:40	1-hour TSP	145	ug/m3
TMCLKL	HY/2012/08	2018-09-10	ASR6	Sunny	14:42	1-hour TSP	148	ug/m3
TMCLKL	HY/2012/08	2018-09-10	ASR6	Sunny	15:44	1-hour TSP	141	ug/m3

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2018-09-13	AQMS1	Sunny	13:59	1-hour TSP	81	ug/m3
TMCLKL	HY/2012/08	2018-09-13	AQMS1	Sunny	15:01	1-hour TSP	101	ug/m3
TMCLKL	HY/2012/08	2018-09-13	AQMS1	Sunny	16:03	1-hour TSP	127	ug/m3
TMCLKL	HY/2012/08	2018-09-13	ASR1	Sunny	13:47	1-hour TSP	193	ug/m3
TMCLKL	HY/2012/08	2018-09-13	ASR1	Sunny	14:49	1-hour TSP	136	ug/m3
TMCLKL	HY/2012/08	2018-09-13	ASR1	Sunny	15:51	1-hour TSP	105	ug/m3
TMCLKL	HY/2012/08	2018-09-13	ASR10	Sunny	13:13	1-hour TSP	43	ug/m3
TMCLKL	HY/2012/08	2018-09-13	ASR10	Sunny	14:15	1-hour TSP	43	ug/m3
TMCLKL	HY/2012/08	2018-09-13	ASR10	Sunny	15:17	1-hour TSP	44	ug/m3
TMCLKL	HY/2012/08	2018-09-13	ASR5	Sunny	13:36	1-hour TSP	241	ug/m3
TMCLKL	HY/2012/08	2018-09-13	ASR5	Sunny	14:38	1-hour TSP	133	ug/m3
TMCLKL	HY/2012/08	2018-09-13	ASR5	Sunny	15:40	1-hour TSP	92	ug/m3
TMCLKL	HY/2012/08	2018-09-13	ASR6	Sunny	13:25	1-hour TSP	115	ug/m3
TMCLKL	HY/2012/08	2018-09-13	ASR6	Sunny	14:27	1-hour TSP	65	ug/m3
TMCLKL	HY/2012/08	2018-09-13	ASR6	Sunny	15:29	1-hour TSP	60	ug/m3
TMCLKL	HY/2012/08	2018-09-16	AQMS1	Sunny	-	1-hour TSP	-	ug/m3
TMCLKL	HY/2012/08	2018-09-16	AQMS1	Sunny	-	1-hour TSP	-	ug/m3
TMCLKL	HY/2012/08	2018-09-16	AQMS1	Sunny	-	1-hour TSP	-	ug/m3
TMCLKL	HY/2012/08	2018-09-16	ASR1	Sunny	-	1-hour TSP	-	ug/m3
TMCLKL	HY/2012/08	2018-09-16	ASR1	Sunny	-	1-hour TSP	-	ug/m3
TMCLKL	HY/2012/08	2018-09-16	ASR1	Sunny	-	1-hour TSP	-	ug/m3
TMCLKL	HY/2012/08	2018-09-16	ASR10	Sunny	-	1-hour TSP	-	ug/m3
TMCLKL	HY/2012/08	2018-09-16	ASR10	Sunny	-	1-hour TSP	-	ug/m3
TMCLKL	HY/2012/08	2018-09-16	ASR10	Sunny	-	1-hour TSP	-	ug/m3
TMCLKL	HY/2012/08	2018-09-16	ASR5	Sunny	-	1-hour TSP	-	ug/m3
TMCLKL	HY/2012/08	2018-09-16	ASR5	Sunny	-	1-hour TSP	-	ug/m3
TMCLKL	HY/2012/08	2018-09-16	ASR5	Sunny	-	1-hour TSP	-	ug/m3
TMCLKL	HY/2012/08	2018-09-16	ASR6	Sunny	-	1-hour TSP	-	ug/m3
TMCLKL	HY/2012/08	2018-09-16	ASR6	Sunny	-	1-hour TSP	-	ug/m3
TMCLKL	HY/2012/08	2018-09-16	ASR6	Sunny	-	1-hour TSP	-	ug/m3

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2018-09-19	AQMS1	Sunny	13:53	1-hour TSP	125	ug/m3
TMCLKL	HY/2012/08	2018-09-19	AQMS1	Sunny	14:55	1-hour TSP	170	ug/m3
TMCLKL	HY/2012/08	2018-09-19	AQMS1	Sunny	15:57	1-hour TSP	130	ug/m3
TMCLKL	HY/2012/08	2018-09-19	ASR1	Sunny	13:42	1-hour TSP	203	ug/m3
TMCLKL	HY/2012/08	2018-09-19	ASR1	Sunny	14:44	1-hour TSP	128	ug/m3
TMCLKL	HY/2012/08	2018-09-19	ASR1	Sunny	15:46	1-hour TSP	180	ug/m3
TMCLKL	HY/2012/08	2018-09-19	ASR10	Sunny	13:08	1-hour TSP	102	ug/m3
TMCLKL	HY/2012/08	2018-09-19	ASR10	Sunny	14:20	1-hour TSP	117	ug/m3
TMCLKL	HY/2012/08	2018-09-19	ASR10	Sunny	15:12	1-hour TSP	121	ug/m3
TMCLKL	HY/2012/08	2018-09-19	ASR5	Sunny	13:30	1-hour TSP	241	ug/m3
TMCLKL	HY/2012/08	2018-09-19	ASR5	Sunny	14:32	1-hour TSP	188	ug/m3
TMCLKL	HY/2012/08	2018-09-19	ASR5	Sunny	13:34	1-hour TSP	224	ug/m3
TMCLKL	HY/2012/08	2018-09-19	ASR6	Sunny	13:20	1-hour TSP	199	ug/m3
TMCLKL	HY/2012/08	2018-09-19	ASR6	Sunny	14:22	1-hour TSP	186	ug/m3
TMCLKL	HY/2012/08	2018-09-19	ASR6	Sunny	15:24	1-hour TSP	211	ug/m3
TMCLKL	HY/2012/08	2018-09-22	AQMS1	Sunny	13:55	1-hour TSP	109	ug/m3
TMCLKL	HY/2012/08	2018-09-22	AQMS1	Sunny	14:57	1-hour TSP	125	ug/m3
TMCLKL	HY/2012/08	2018-09-22	AQMS1	Sunny	15:59	1-hour TSP	90	ug/m3
TMCLKL	HY/2012/08	2018-09-22	ASR1	Sunny	13:44	1-hour TSP	99	ug/m3
TMCLKL	HY/2012/08	2018-09-22	ASR1	Sunny	14:46	1-hour TSP	69	ug/m3
TMCLKL	HY/2012/08	2018-09-22	ASR1	Sunny	15:48	1-hour TSP	87	ug/m3
TMCLKL	HY/2012/08	2018-09-22	ASR10	Sunny	13:12	1-hour TSP	93	ug/m3
TMCLKL	HY/2012/08	2018-09-22	ASR10	Sunny	14:14	1-hour TSP	103	ug/m3
TMCLKL	HY/2012/08	2018-09-22	ASR10	Sunny	15:16	1-hour TSP	105	ug/m3
TMCLKL	HY/2012/08	2018-09-22	ASR5	Sunny	13:34	1-hour TSP	148	ug/m3
TMCLKL	HY/2012/08	2018-09-22	ASR5	Sunny	14:36	1-hour TSP	160	ug/m3
TMCLKL	HY/2012/08	2018-09-22	ASR5	Sunny	15:38	1-hour TSP	135	ug/m3
TMCLKL	HY/2012/08	2018-09-22	ASR6	Sunny	13:23	1-hour TSP	134	ug/m3
TMCLKL	HY/2012/08	2018-09-22	ASR6	Sunny	14:25	1-hour TSP	160	ug/m3
TMCLKL	HY/2012/08	2018-09-22	ASR6	Sunny	15:27	1-hour TSP	146	ug/m3

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2018-09-25	AQMS1	Sunny	08:47	1-hour TSP	29	ug/m3
TMCLKL	HY/2012/08	2018-09-25	AQMS1	Sunny	09:49	1-hour TSP	48	ug/m3
TMCLKL	HY/2012/08	2018-09-25	AQMS1	Sunny	10:51	1-hour TSP	53	ug/m3
TMCLKL	HY/2012/08	2018-09-25	ASR1	Sunny	08:35	1-hour TSP	25	ug/m3
TMCLKL	HY/2012/08	2018-09-25	ASR1	Sunny	09:57	1-hour TSP	36	ug/m3
TMCLKL	HY/2012/08	2018-09-25	ASR1	Sunny	10:39	1-hour TSP	28	ug/m3
TMCLKL	HY/2012/08	2018-09-25	ASR10	Sunny	08:00	1-hour TSP	44	ug/m3
TMCLKL	HY/2012/08	2018-09-25	ASR10	Sunny	09:02	1-hour TSP	58	ug/m3
TMCLKL	HY/2012/08	2018-09-25	ASR10	Sunny	10:04	1-hour TSP	55	ug/m3
TMCLKL	HY/2012/08	2018-09-25	ASR5	Sunny	08:23	1-hour TSP	48	ug/m3
TMCLKL	HY/2012/08	2018-09-25	ASR5	Sunny	09:25	1-hour TSP	72	ug/m3
TMCLKL	HY/2012/08	2018-09-25	ASR5	Sunny	10:27	1-hour TSP	63	ug/m3
TMCLKL	HY/2012/08	2018-09-25	ASR6	Sunny	08:11	1-hour TSP	30	ug/m3
TMCLKL	HY/2012/08	2018-09-25	ASR6	Sunny	09:13	1-hour TSP	56	ug/m3
TMCLKL	HY/2012/08	2018-09-25	ASR6	Sunny	10:15	1-hour TSP	58	ug/m3
TMCLKL	HY/2012/08	2018-09-28	AQMS1	Sunny	13:48	1-hour TSP	109	ug/m3
TMCLKL	HY/2012/08	2018-09-28	AQMS1	Sunny	14:50	1-hour TSP	130	ug/m3
TMCLKL	HY/2012/08	2018-09-28	AQMS1	Sunny	15:52	1-hour TSP	139	ug/m3
TMCLKL	HY/2012/08	2018-09-28	ASR1	Sunny	13:37	1-hour TSP	252	ug/m3
TMCLKL	HY/2012/08	2018-09-28	ASR1	Sunny	14:39	1-hour TSP	584	ug/m3
TMCLKL	HY/2012/08	2018-09-28	ASR1	Sunny	15:41	1-hour TSP	417	ug/m3
TMCLKL	HY/2012/08	2018-09-28	ASR10	Sunny	13:02	1-hour TSP	103	ug/m3
TMCLKL	HY/2012/08	2018-09-28	ASR10	Sunny	14:04	1-hour TSP	87	ug/m3
TMCLKL	HY/2012/08	2018-09-28	ASR10	Sunny	15:06	1-hour TSP	103	ug/m3
TMCLKL	HY/2012/08	2018-09-28	ASR5	Sunny	13:25	1-hour TSP	314	ug/m3
TMCLKL	HY/2012/08	2018-09-28	ASR5	Sunny	14:27	1-hour TSP	184	ug/m3
TMCLKL	HY/2012/08	2018-09-28	ASR5	Sunny	15:29	1-hour TSP	234	ug/m3
TMCLKL	HY/2012/08	2018-09-28	ASR6	Sunny	13:14	1-hour TSP	201	ug/m3
TMCLKL	HY/2012/08	2018-09-28	ASR6	Sunny	14:16	1-hour TSP	148	ug/m3
TMCLKL	HY/2012/08	2018-09-28	ASR6	Sunny	15:18	1-hour TSP	187	ug/m3

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2018-09-01	AQMS1	Sunny	12:01	24-hour TSP	28	ug/m3
TMCLKL	HY/2012/08	2018-09-01	ASR1	Sunny	11:50	24-hour TSP	28	ug/m3
TMCLKL	HY/2012/08	2018-09-01	ASR10	Sunny	11:14	24-hour TSP	20	ug/m3
TMCLKL	HY/2012/08	2018-09-01	ASR5	Sunny	11:38	24-hour TSP	35	ug/m3
TMCLKL	HY/2012/08	2018-09-01	ASR6	Sunny	11:25	24-hour TSP	22	ug/m3
TMCLKL	HY/2012/08	2018-09-04	AQMS1	Sunny	17:12	24-hour TSP	61	ug/m3
TMCLKL	HY/2012/08	2018-09-04	ASR1	Sunny	17:01	24-hour TSP	64	ug/m3
TMCLKL	HY/2012/08	2018-09-04	ASR10	Sunny	16:27	24-hour TSP	37	ug/m3
TMCLKL	HY/2012/08	2018-09-04	ASR5	Sunny	16:50	24-hour TSP	73	ug/m3
TMCLKL	HY/2012/08	2018-09-04	ASR6	Sunny	16:38	24-hour TSP	44	ug/m3
TMCLKL	HY/2012/08	2018-09-07	AQMS1	Sunny	12:14	24-hour TSP	45	ug/m3
TMCLKL	HY/2012/08	2018-09-07	ASR1	Sunny	12:03	24-hour TSP	66	ug/m3
TMCLKL	HY/2012/08	2018-09-07	ASR10	Sunny	11:30	24-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	2018-09-07	ASR5	Sunny	11:52	24-hour TSP	98	ug/m3
TMCLKL	HY/2012/08	2018-09-07	ASR6	Sunny	11:41	24-hour TSP	70	ug/m3
TMCLKL	HY/2012/08	2018-09-10	AQMS1	Sunny	17:20	24-hour TSP	68	ug/m3
TMCLKL	HY/2012/08	2018-09-10	ASR1	Sunny	17:09	24-hour TSP	130	ug/m3
TMCLKL	HY/2012/08	2018-09-10	ASR10	Sunny	16:35	24-hour TSP	69	ug/m3
TMCLKL	HY/2012/08	2018-09-10	ASR5	Sunny	16:58	24-hour TSP	140	ug/m3
TMCLKL	HY/2012/08	2018-09-10	ASR6	Sunny	16:46	24-hour TSP	110	ug/m3
TMCLKL	HY/2012/08	2018-09-13	AQMS1	Sunny	17:05	24-hour TSP	52	ug/m3
TMCLKL	HY/2012/08	2018-09-13	ASR1	Sunny	16:53	24-hour TSP	51	ug/m3
TMCLKL	HY/2012/08	2018-09-13	ASR10	Sunny	16:19	24-hour TSP	49	ug/m3
TMCLKL	HY/2012/08	2018-09-13	ASR5	Sunny	16:42	24-hour TSP	82	ug/m3
TMCLKL	HY/2012/08	2018-09-13	ASR6	Sunny	16:31	24-hour TSP	64	ug/m3
TMCLKL	HY/2012/08	2018-09-16	AQMS1	Sunny	-	24-hour TSP	-	ug/m3
TMCLKL	HY/2012/08	2018-09-16	ASR1	Sunny	-	24-hour TSP	-	ug/m3
TMCLKL	HY/2012/08	2018-09-16	ASR10	Sunny	-	24-hour TSP	-	ug/m3
TMCLKL	HY/2012/08	2018-09-16	ASR5	Sunny	-	24-hour TSP	-	ug/m3
TMCLKL	HY/2012/08	2018-09-16	ASR6	Sunny	-	24-hour TSP	-	ug/m3

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2018-09-19	AQMS1	Sunny	16:59	24-hour TSP	52	ug/m3
TMCLKL	HY/2012/08	2018-09-19	ASR1	Sunny	16:48	24-hour TSP	51	ug/m3
TMCLKL	HY/2012/08	2018-09-19	ASR10	Sunny	16:14	24-hour TSP	56	ug/m3
TMCLKL	HY/2012/08	2018-09-19	ASR5	Sunny	16:36	24-hour TSP	83	ug/m3
TMCLKL	HY/2012/08	2018-09-19	ASR6	Sunny	16:26	24-hour TSP	80	ug/m3
TMCLKL	HY/2012/08	2018-09-22	AQMS1	Sunny	17:01	24-hour TSP	26	ug/m3
TMCLKL	HY/2012/08	2018-09-22	ASR1	Sunny	16:50	24-hour TSP	32	ug/m3
TMCLKL	HY/2012/08	2018-09-22	ASR10	Sunny	16:18	24-hour TSP	25	ug/m3
TMCLKL	HY/2012/08	2018-09-22	ASR5	Sunny	16:40	24-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	2018-09-22	ASR6	Sunny	16:29	24-hour TSP	35	ug/m3
TMCLKL	HY/2012/08	2018-09-25	AQMS1	Sunny	11:53	24-hour TSP	51	ug/m3
TMCLKL	HY/2012/08	2018-09-25	ASR1	Sunny	11:41	24-hour TSP	46	ug/m3
TMCLKL	HY/2012/08	2018-09-25	ASR10	Sunny	11:06	24-hour TSP	46	ug/m3
TMCLKL	HY/2012/08	2018-09-25	ASR5	Sunny	11:29	24-hour TSP	61	ug/m3
TMCLKL	HY/2012/08	2018-09-25	ASR6	Sunny	11:17	24-hour TSP	61	ug/m3
TMCLKL	HY/2012/08	2018-09-28	AQMS1	Sunny	16:54	24-hour TSP	67	ug/m3
TMCLKL	HY/2012/08	2018-09-28	ASR1	Sunny	16:43	24-hour TSP	167	ug/m3
TMCLKL	HY/2012/08	2018-09-28	ASR10	Sunny	16:08	24-hour TSP	52	ug/m3
TMCLKL	HY/2012/08	2018-09-28	ASR5	Sunny	16:31	24-hour TSP	133	ug/m3
TMCLKL	HY/2012/08	2018-09-28	ASR6	Sunny	16:20	24-hour TSP	96	ug/m3

Appendix H

## Meteorological Data

**Meteorological Data for Impact Monitoring in the reporting period**

<b>Date (yy-mm-dd)</b>	<b>Time (24hrs)</b>	<b>Average of Wind Speed (m/s)</b>	<b>Average of Wind Direction(degree)</b>
18/09/01	1:00	1.3	90
18/09/01	2:00	1.3	105
18/09/01	3:00	1.3	115
18/09/01	4:00	1.3	100
18/09/01	5:00	1.3	120
18/09/01	6:00	1.8	84
18/09/01	7:00	1.3	79
18/09/01	8:00	1.3	151
18/09/01	9:00	2.2	95
18/09/01	10:00	0.4	332
18/09/01	11:00	0.4	294
18/09/01	12:00	0.9	46
18/09/01	13:00	0.9	24
18/09/01	14:00	0.9	18
18/09/01	15:00	1.3	88
18/09/01	16:00	1.8	96
18/09/01	17:00	2.2	80
18/09/01	18:00	1.8	98
18/09/01	19:00	1.3	87
18/09/01	20:00	0.9	30
18/09/01	21:00	0.4	56
18/09/01	22:00	0	-
18/09/01	23:00	0	-
18/09/02	0:00	0.4	61
18/09/02	1:00	0.4	85
18/09/02	2:00	0.9	80
18/09/02	3:00	0.4	34
18/09/02	4:00	0.4	65
18/09/02	5:00	0.4	57
18/09/02	6:00	0	-
18/09/02	7:00	0.4	84
18/09/02	8:00	0.9	82
18/09/02	9:00	0.4	80
18/09/02	10:00	0.4	18
18/09/02	11:00	0.9	22
18/09/02	12:00	0.9	61
18/09/02	13:00	1.3	80
18/09/02	14:00	1.3	85
18/09/02	15:00	1.3	84
18/09/02	16:00	1.8	85
18/09/02	17:00	1.3	94
18/09/02	18:00	0.9	101
18/09/02	19:00	0.9	90
18/09/02	20:00	1.3	71
18/09/02	21:00	0.9	63
18/09/02	22:00	0.4	38
18/09/02	23:00	0.4	358
18/09/04	0:00	0	-
18/09/04	1:00	0.4	281
18/09/04	2:00	0.9	219
18/09/04	3:00	0.4	191
18/09/04	4:00	0.4	281
18/09/04	5:00	0.9	296
18/09/04	6:00	0.9	302
18/09/04	7:00	0.4	288



**Meteorological Data for Impact Monitoring in the reporting period**

<b>Date (yy-mm-dd)</b>	<b>Time (24hrs)</b>	<b>Average of Wind Speed (m/s)</b>	<b>Average of Wind Direction(degree)</b>
18/09/04	8:00	0.4	264
18/09/04	9:00	1.3	278
18/09/04	10:00	1.8	207
18/09/04	11:00	2.7	230
18/09/04	12:00	2.7	206
18/09/04	13:00	3.1	196
18/09/04	14:00	3.1	205
18/09/04	15:00	2.7	193
18/09/04	16:00	2.2	197
18/09/04	17:00	2.2	207
18/09/04	18:00	1.3	269
18/09/04	19:00	0.9	285
18/09/04	20:00	0.9	297
18/09/04	21:00	0.4	285
18/09/04	22:00	0.4	281
18/09/04	23:00	0.4	182
18/09/05	0:00	0.9	302
18/09/05	1:00	0.4	256
18/09/05	2:00	0.4	214
18/09/05	3:00	0.9	210
18/09/05	4:00	0.4	221
18/09/05	5:00	0	-
18/09/05	6:00	0.4	292
18/09/05	7:00	0.4	265
18/09/05	8:00	0.4	225
18/09/05	9:00	1.3	195
18/09/05	10:00	2.7	205
18/09/05	11:00	2.7	201
18/09/05	12:00	2.7	195
18/09/05	13:00	2.2	203
18/09/05	14:00	2.2	199
18/09/05	15:00	2.2	196
18/09/05	16:00	1.3	201
18/09/05	17:00	0.4	297
18/09/05	18:00	0.4	289
18/09/05	19:00	1.8	25
18/09/05	20:00	1.8	85
18/09/05	21:00	0.9	82
18/09/05	22:00	1.3	71
18/09/05	23:00	0.9	71
18/09/07	0:00	0.9	90
18/09/07	1:00	1.3	79
18/09/07	2:00	1.3	94
18/09/07	3:00	0.9	60
18/09/07	4:00	0	-
18/09/07	5:00	0	-
18/09/07	6:00	0	-
18/09/07	7:00	0	-
18/09/07	8:00	0.4	144
18/09/07	9:00	0.9	143
18/09/07	10:00	0.9	129
18/09/07	11:00	0.9	125
18/09/07	12:00	2.2	196
18/09/07	13:00	1.8	204
18/09/07	14:00	0.9	274

**Meteorological Data for Impact Monitoring in the reporting period**

<b>Date (yy-mm-dd)</b>	<b>Time (24hrs)</b>	<b>Average of Wind Speed (m/s)</b>	<b>Average of Wind Direction(degree)</b>
18/09/07	15:00	0.9	200
18/09/07	16:00	0.4	288
18/09/07	17:00	1.3	72
18/09/07	18:00	1.3	74
18/09/07	19:00	1.3	95
18/09/07	20:00	0.4	63
18/09/07	21:00	0.4	281
18/09/07	22:00	0.4	281
18/09/07	23:00	1.3	319
18/09/08	0:00	0.9	282
18/09/08	1:00	0.9	303
18/09/08	2:00	0.9	295
18/09/08	3:00	0.4	282
18/09/08	4:00	0.4	283
18/09/08	5:00	0.9	288
18/09/08	6:00	0.9	295
18/09/08	7:00	1.3	301
18/09/08	8:00	3.1	34
18/09/08	9:00	2.7	20
18/09/08	10:00	1.8	34
18/09/08	11:00	2.7	343
18/09/08	12:00	1.8	333
18/09/08	13:00	1.8	347
18/09/08	14:00	2.2	337
18/09/08	15:00	1.8	335
18/09/08	16:00	1.8	326
18/09/08	17:00	2.2	309
18/09/08	18:00	1.3	295
18/09/08	19:00	0.4	32
18/09/08	20:00	0.4	284
18/09/08	21:00	0.4	299
18/09/08	22:00	1.8	25
18/09/08	23:00	1.8	331
18/09/10	0:00	3.1	89
18/09/10	1:00	2.2	80
18/09/10	2:00	2.2	99
18/09/10	3:00	1.3	66
18/09/10	4:00	0.9	22
18/09/10	5:00	0.9	23
18/09/10	6:00	1.3	90
18/09/10	7:00	1.3	68
18/09/10	8:00	1.3	48
18/09/10	9:00	1.8	89
18/09/10	10:00	1.3	144
18/09/10	11:00	0.4	145
18/09/10	12:00	0.9	278
18/09/10	13:00	1.3	91
18/09/10	14:00	0.9	125
18/09/10	15:00	0.9	301
18/09/10	16:00	0.9	261
18/09/10	17:00	0.9	236
18/09/10	18:00	0.4	216
18/09/10	19:00	0	-
18/09/10	20:00	0.4	321
18/09/10	21:00	0	-

**Meteorological Data for Impact Monitoring in the reporting period**

<b>Date (yy-mm-dd)</b>	<b>Time (24hrs)</b>	<b>Average of Wind Speed (m/s)</b>	<b>Average of Wind Direction(degree)</b>
18/09/10	22:00	0	-
18/09/10	23:00	0.4	319
18/09/11	0:00	0.4	314
18/09/11	1:00	0.4	320
18/09/11	2:00	0.4	326
18/09/11	3:00	0	-
18/09/11	4:00	0	-
18/09/11	5:00	0	-
18/09/11	6:00	0.4	321
18/09/11	7:00	0.9	341
18/09/11	8:00	0.9	348
18/09/11	9:00	0.9	51
18/09/11	10:00	1.8	20
18/09/11	11:00	1.8	36
18/09/11	12:00	1.3	24
18/09/11	13:00	2.7	282
18/09/11	14:00	2.2	290
18/09/11	15:00	2.7	282
18/09/11	16:00	2.2	265
18/09/11	17:00	1.8	279
18/09/11	18:00	1.3	285
18/09/11	19:00	0.9	305
18/09/11	20:00	0.9	314
18/09/11	21:00	0.4	348
18/09/11	22:00	0.4	295
18/09/11	23:00	0.9	319
18/09/13	0:00	3.1	86
18/09/13	1:00	2.7	99
18/09/13	2:00	2.7	78
18/09/13	3:00	2.7	72
18/09/13	4:00	3.6	80
18/09/13	5:00	2.2	92
18/09/13	6:00	1.8	89
18/09/13	7:00	1.3	73
18/09/13	8:00	1.3	53
18/09/13	9:00	2.7	86
18/09/13	10:00	4	82
18/09/13	11:00	4	87
18/09/13	12:00	2.2	101
18/09/13	13:00	3.1	96
18/09/13	14:00	4	89
18/09/13	15:00	4.5	87
18/09/13	16:00	4.5	90
18/09/13	17:00	4	83
18/09/13	18:00	4.5	83
18/09/13	19:00	3.6	98
18/09/13	20:00	3.6	94
18/09/13	21:00	3.6	99
18/09/13	22:00	2.7	88
18/09/13	23:00	1.3	79
18/09/14	0:00	1.3	68
18/09/14	1:00	0.4	94
18/09/14	2:00	0	-
18/09/14	3:00	0.4	48
18/09/14	4:00	0.9	21

Meteorological Data for Impact Monitoring in the reporting period			
Date (yy-mm-dd)	Time (24hrs)	Average of Wind Speed (m/s)	Average of Wind Direction(degree)
18/09/14	5:00	0.9	42
18/09/14	6:00	0	-
18/09/14	7:00	0.4	111
18/09/14	8:00	1.3	86
18/09/14	9:00	1.3	70
18/09/14	10:00	1.3	157
18/09/14	11:00	1.3	34
18/09/14	12:00	0.9	187
18/09/14	13:00	1.3	291
18/09/14	14:00	2.2	267
18/09/14	15:00	3.1	191
18/09/14	16:00	1.3	219
18/09/14	17:00	1.8	94
18/09/14	18:00	2.2	66
18/09/14	19:00	1.8	67
18/09/14	20:00	1.8	59
18/09/14	21:00	1.8	77
18/09/14	22:00	1.8	74
18/09/14	23:00	1.8	72
18/09/19	9:00	0.4	151
18/09/19	10:00	1.8	222
18/09/19	11:00	1.3	302
18/09/19	12:00	1.3	297
18/09/19	13:00	1.3	298
18/09/19	14:00	1.8	287
18/09/19	15:00	1.8	299
18/09/19	16:00	1.8	301
18/09/19	17:00	1.8	227
18/09/19	18:00	1.3	233
18/09/19	19:00	0.4	290
18/09/19	20:00	0.9	313
18/09/19	21:00	0.4	317
18/09/19	22:00	0.4	345
18/09/19	23:00	0.4	59
18/09/20	0:00	0.9	58
18/09/20	1:00	0.9	77
18/09/20	2:00	1.3	94
18/09/20	3:00	0.4	58
18/09/20	4:00	0.4	335
18/09/20	5:00	0	-
18/09/20	6:00	0.4	68
18/09/20	7:00	0.4	66
18/09/20	8:00	0.9	97
18/09/20	9:00	1.8	82
18/09/20	10:00	1.3	215
18/09/20	11:00	1.8	226
18/09/20	12:00	2.2	224
18/09/20	13:00	1.8	231
18/09/20	14:00	1.8	252
18/09/20	15:00	2.7	205
18/09/20	16:00	2.2	216
18/09/20	17:00	1.3	246
18/09/20	18:00	0.4	277
18/09/20	19:00	0.9	287
18/09/20	20:00	1.8	82
18/09/20	21:00	1.3	93
18/09/20	22:00	1.8	84

**Meteorological Data for Impact Monitoring in the reporting period**

<b>Date (yy-mm-dd)</b>	<b>Time (24hrs)</b>	<b>Average of Wind Speed (m/s)</b>	<b>Average of Wind Direction(degree)</b>
18/09/20	23:00	1.3	71
18/09/22	0:00	1.3	78
18/09/22	1:00	0.9	67
18/09/22	2:00	0.9	65
18/09/22	3:00	0.4	71
18/09/22	4:00	0.9	65
18/09/22	5:00	0.9	67
18/09/22	6:00	0.4	47
18/09/22	7:00	0.4	334
18/09/22	8:00	0	-
18/09/22	9:00	0.4	160
18/09/22	10:00	0.9	131
18/09/22	11:00	0.9	133
18/09/22	12:00	1.3	220
18/09/22	13:00	2.2	220
18/09/22	14:00	2.2	228
18/09/22	15:00	1.8	220
18/09/22	16:00	2.2	201
18/09/22	17:00	1.3	222
18/09/22	18:00	1.8	87
18/09/22	19:00	1.8	150
18/09/22	20:00	2.2	93
18/09/22	21:00	1.8	103
18/09/22	22:00	1.8	100
18/09/22	23:00	1.3	81
18/09/23	0:00	1.3	79
18/09/23	1:00	1.3	119
18/09/23	2:00	0.9	101
18/09/23	3:00	0.9	95
18/09/23	4:00	0.4	85
18/09/23	5:00	0.9	101
18/09/23	6:00	0	-
18/09/23	7:00	0.4	80
18/09/23	8:00	0.9	98
18/09/23	9:00	0.9	39
18/09/23	10:00	0.9	89
18/09/23	11:00	0.9	166
18/09/23	12:00	1.3	123
18/09/23	13:00	1.3	197
18/09/23	14:00	1.3	157
18/09/23	15:00	1.3	222
18/09/23	16:00	1.3	221
18/09/23	17:00	0.9	325
18/09/23	18:00	1.3	89
18/09/23	19:00	1.3	69
18/09/23	20:00	1.3	77
18/09/23	21:00	1.3	62
18/09/23	22:00	1.3	58
18/09/23	23:00	1.3	79
18/09/25	0:00	1.3	76
18/09/25	1:00	2.7	101
18/09/25	2:00	2.7	96
18/09/25	3:00	2.2	100
18/09/25	4:00	2.2	91
18/09/25	5:00	1.3	70
18/09/25	6:00	0.9	64
18/09/25	7:00	1.3	99

**Meteorological Data for Impact Monitoring in the reporting period**

<b>Date (yy-mm-dd)</b>	<b>Time (24hrs)</b>	<b>Average of Wind Speed (m/s)</b>	<b>Average of Wind Direction(degree)</b>
18/09/25	8:00	1.3	84
18/09/25	9:00	1.8	85
18/09/25	10:00	3.1	82
18/09/25	11:00	4	99
18/09/25	12:00	3.6	118
18/09/25	13:00	2.7	104
18/09/25	14:00	2.2	132
18/09/25	15:00	1.8	124
18/09/25	16:00	2.2	103
18/09/25	17:00	2.2	106
18/09/25	18:00	1.8	139
18/09/25	19:00	1.8	120
18/09/25	20:00	3.6	123
18/09/25	21:00	3.1	83
18/09/25	22:00	1.3	65
18/09/25	23:00	1.3	91
18/09/26	0:00	1.3	51
18/09/26	1:00	2.2	83
18/09/26	2:00	1.3	73
18/09/26	3:00	0.4	79
18/09/26	4:00	0	-
18/09/26	5:00	0.1	93
18/09/26	6:00	0.1	95
18/09/26	7:00	0	-
18/09/26	8:00	0.4	27
18/09/26	9:00	0.9	123
18/09/26	10:00	1.3	141
18/09/26	11:00	1.8	138
18/09/26	12:00	0.9	98
18/09/26	13:00	1.3	166
18/09/26	14:00	1.8	161
18/09/26	15:00	1.8	119
18/09/26	16:00	1.3	107
18/09/26	17:00	1.3	103
18/09/26	18:00	1.8	87
18/09/26	19:00	1.8	85
18/09/26	20:00	1.3	57
18/09/26	21:00	0.9	75
18/09/26	22:00	1.3	93
18/09/26	23:00	0.4	110
18/09/28	0:00	0.4	320
18/09/28	1:00	0.4	310
18/09/28	2:00	0	-
18/09/28	3:00	0.4	43
18/09/28	4:00	0.4	47
18/09/28	5:00	0.4	12
18/09/28	6:00	0.9	40
18/09/28	7:00	0.9	47
18/09/28	8:00	1.8	12
18/09/28	9:00	1.8	49
18/09/28	10:00	2.2	53
18/09/28	11:00	1.8	36
18/09/28	12:00	2.2	314
18/09/28	13:00	2.2	312
18/09/28	14:00	2.7	301
18/09/28	15:00	2.7	297
18/09/28	16:00	2.7	282

**Meteorological Data for Impact Monitoring in the reporting period**

<b>Date (yy-mm-dd)</b>	<b>Time (24hrs)</b>	<b>Average of Wind Speed (m/s)</b>	<b>Average of Wind Direction(degree)</b>
18/09/28	17:00	1.3	297
18/09/28	18:00	1.3	338
18/09/28	19:00	1.8	296
18/09/28	20:00	1.8	340
18/09/28	21:00	2.2	348
18/09/28	22:00	1.8	348
18/09/28	23:00	1.3	292
18/09/29	0:00	1.8	341
18/09/29	1:00	1.3	347
18/09/29	2:00	1.3	296
18/09/29	3:00	1.3	347
18/09/29	4:00	2.2	340
18/09/29	5:00	1.8	331
18/09/29	6:00	1.3	331
18/09/29	7:00	0.9	292
18/09/29	8:00	1.3	326
18/09/29	9:00	1.3	342
18/09/29	10:00	1.8	31
18/09/29	11:00	2.2	357
18/09/29	12:00	2.7	342
18/09/29	13:00	1.8	329
18/09/29	14:00	2.2	335
18/09/29	15:00	2.2	322
18/09/29	16:00	2.7	346
18/09/29	17:00	2.2	347
18/09/29	18:00	2.2	344
18/09/29	19:00	1.8	336
18/09/29	20:00	1.8	5
18/09/29	21:00	2.7	355
18/09/29	22:00	3.1	2
18/09/29	23:00	4	358

Appendix I

# Impact Dolphin Monitoring Survey



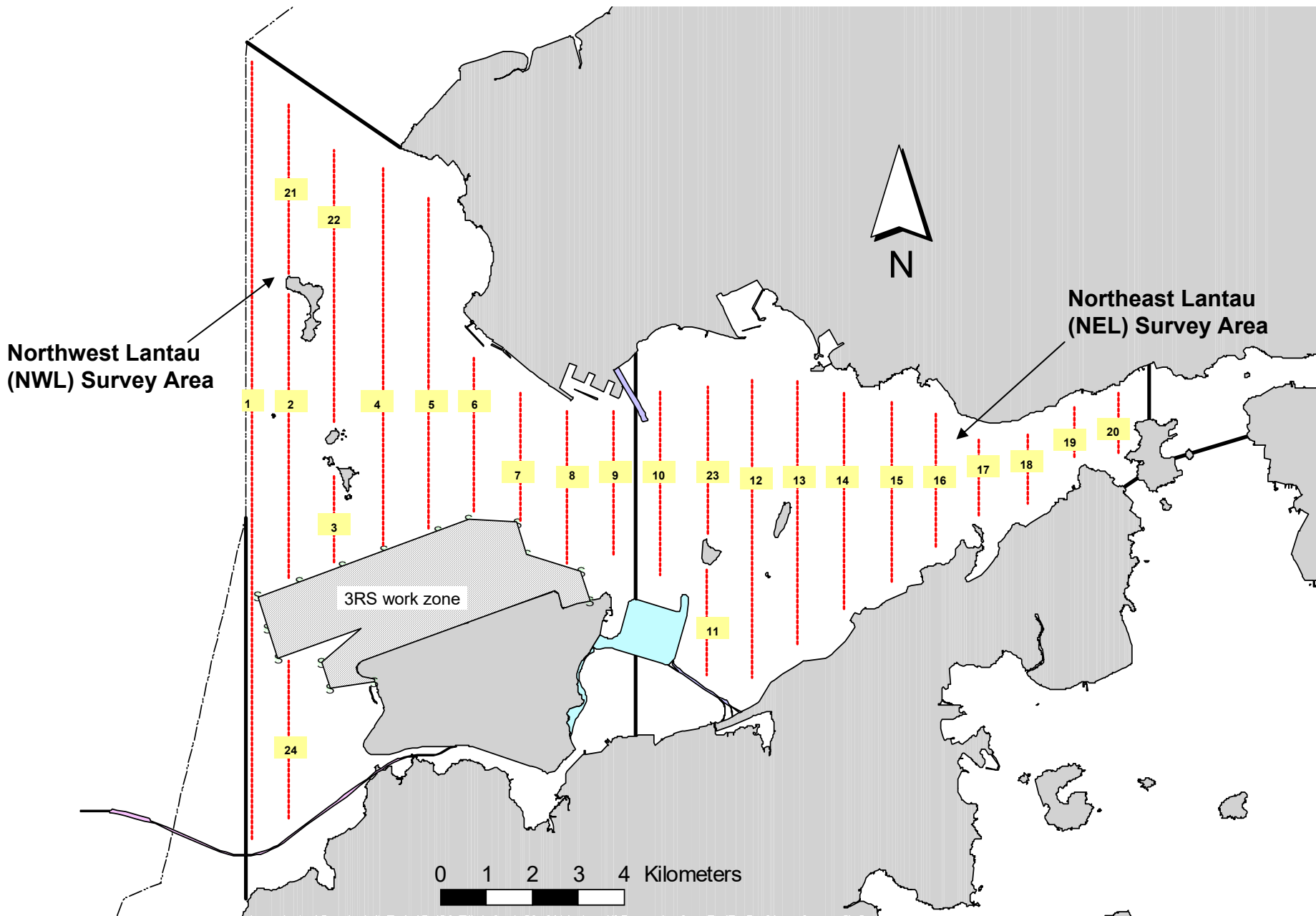


Figure 1. Transect Line Layout in Northwest and Northeast Lantau Survey Areas

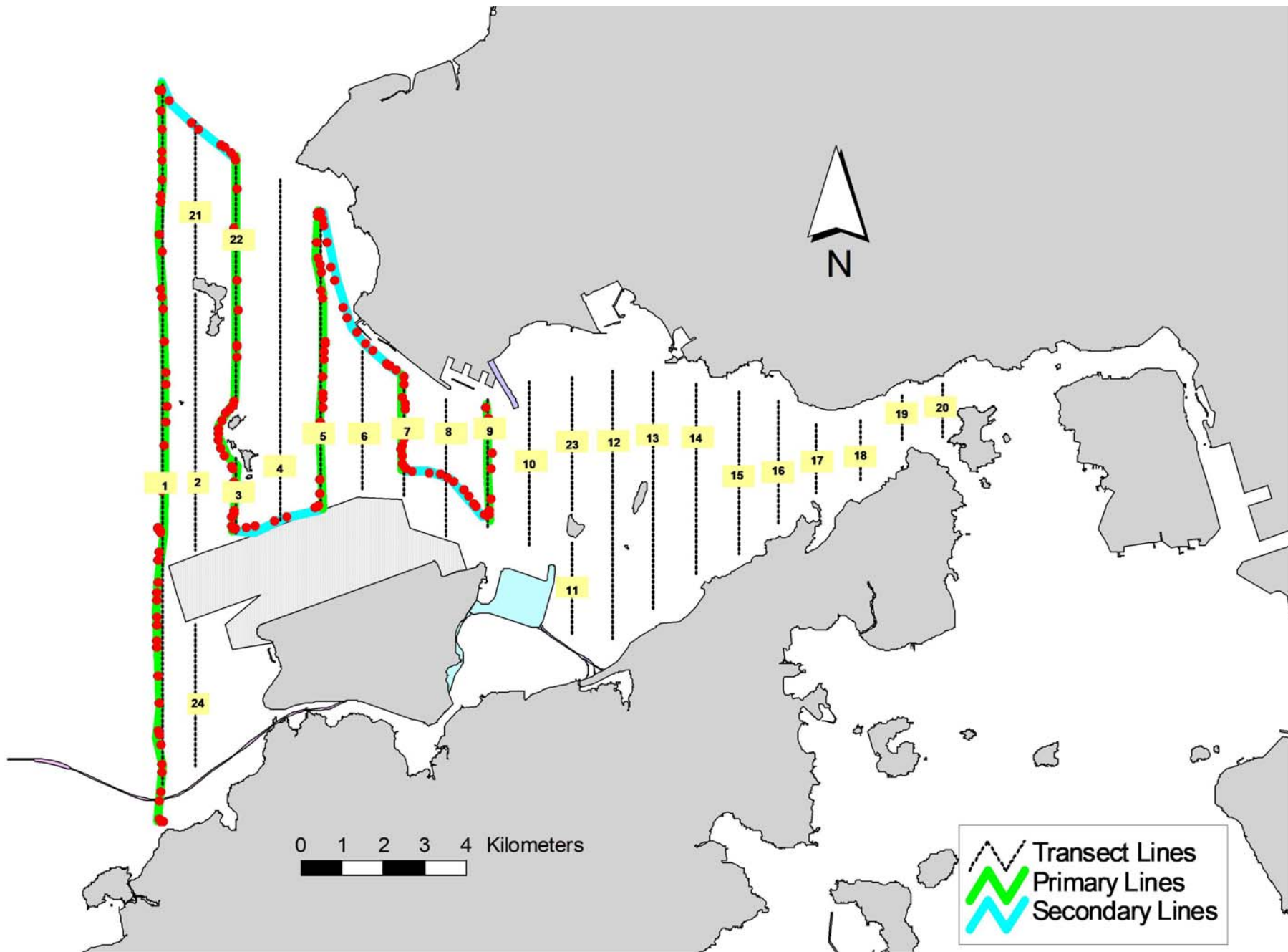


Figure 2. Survey Route on September 4<sup>th</sup>, 2018 (from HKLR03 project)

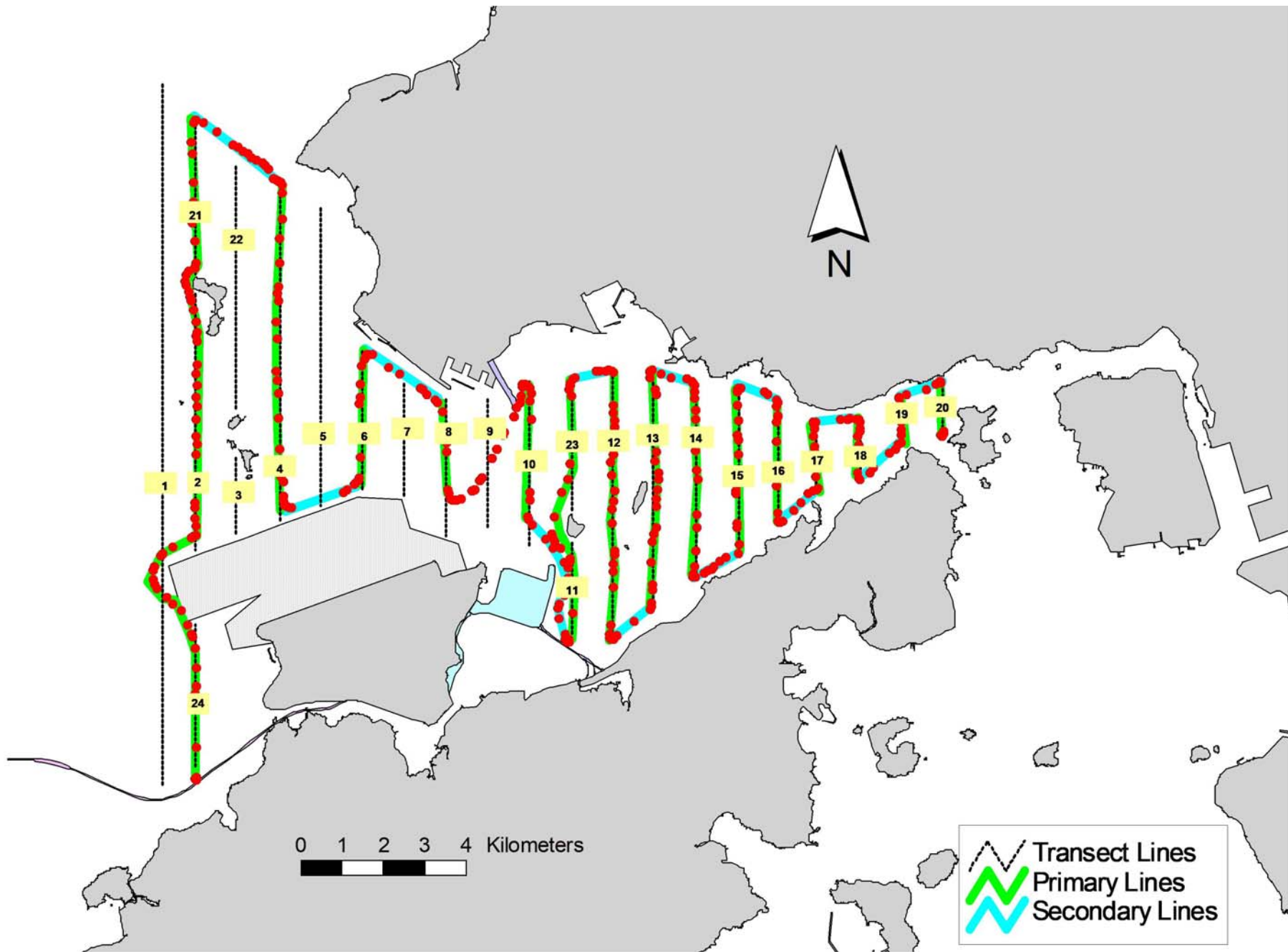


Figure 3. Survey Route on September 18<sup>th</sup>, 2018 (from HKLR03 project)

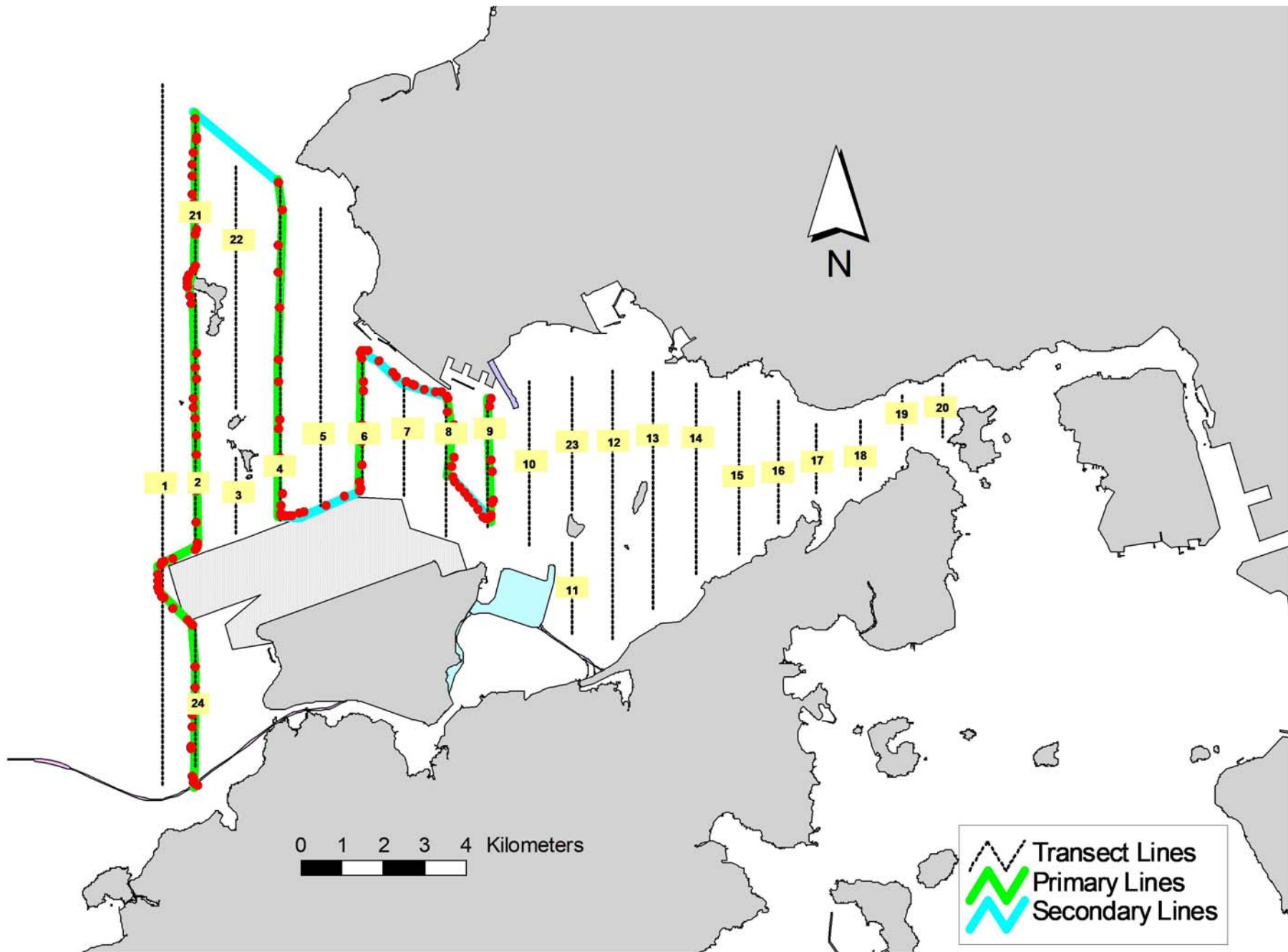


Figure 4. Survey Route on September 20<sup>th</sup>, 2018 (from HKLR03 project)

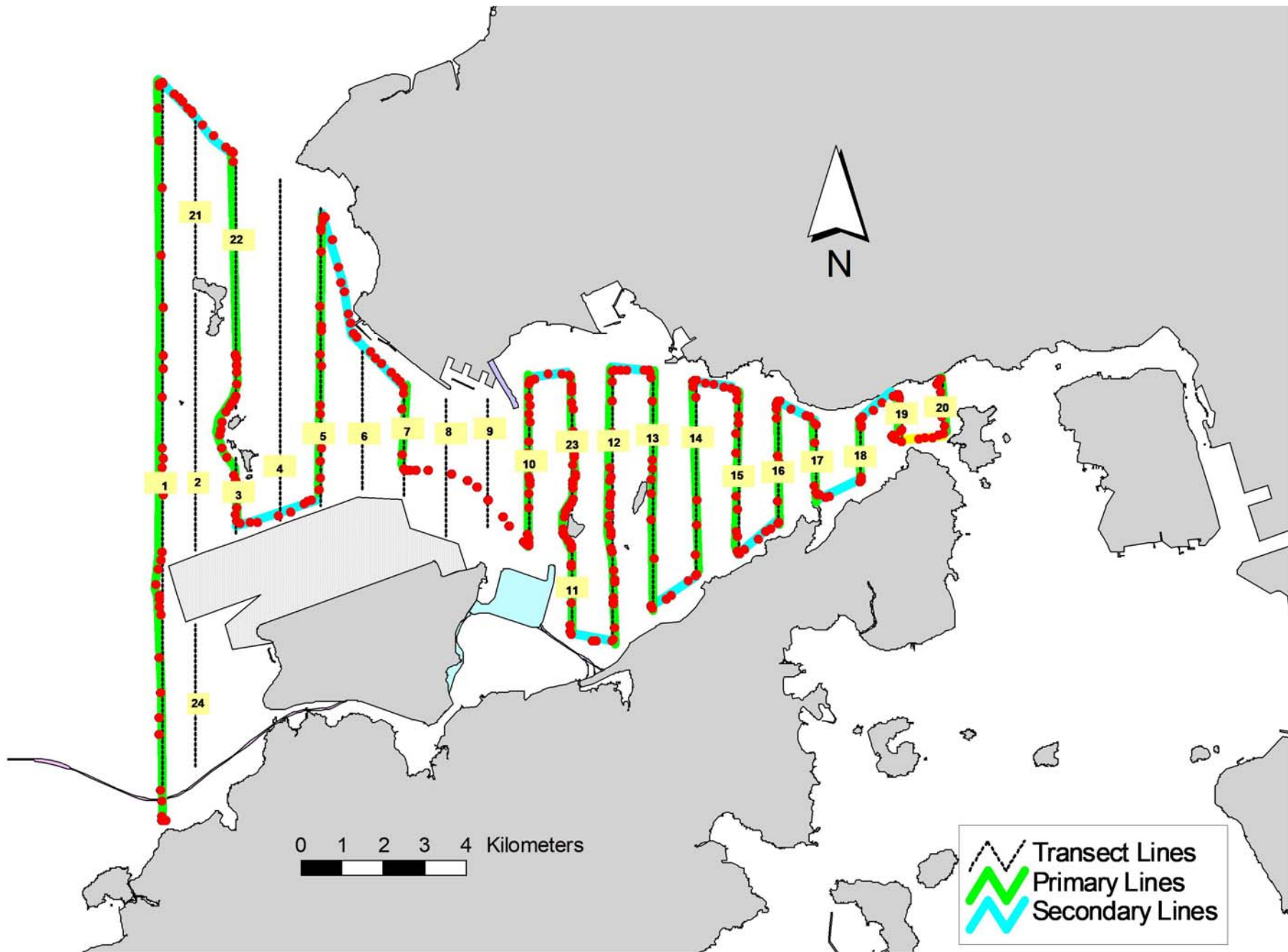


Figure 5. Survey Route on September 26<sup>th</sup>, 2018 (from HKLR03 project)



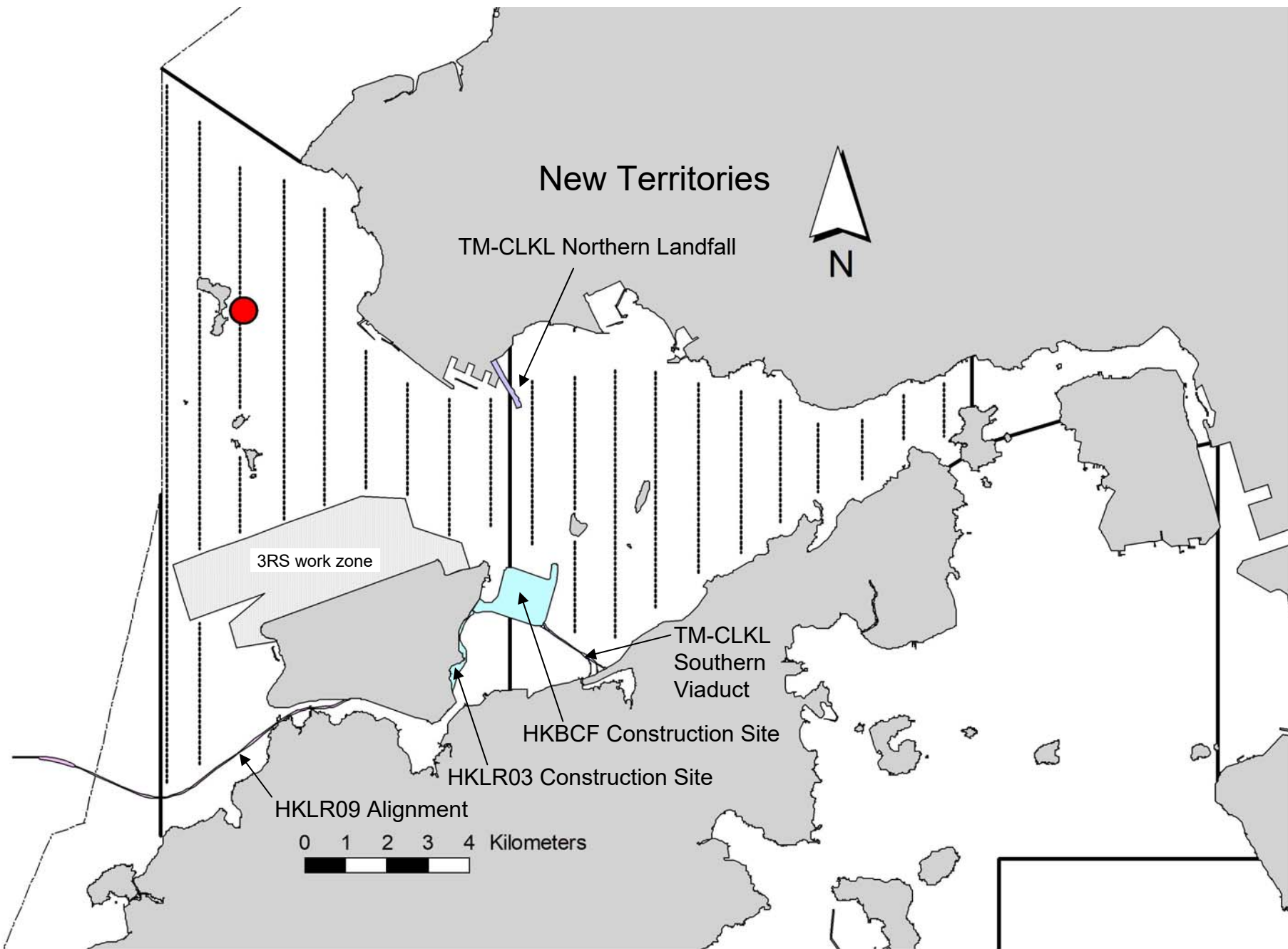


Figure 6. Distribution of Chinese White Dolphin Sightings during September 2018 HKLR03 Monitoring Surveys

## Appendix I. HKLR03 Survey Effort Database (September 2018)

(Abbreviations: BEAU = Beaufort Sea State; P = Primary Line Effort; S = Secondary Line Effort)

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
4-Sep-18	NW LANTAU	1	7.70	AUTUMN	STANDARD36826	HKLR	P
4-Sep-18	NW LANTAU	2	24.60	AUTUMN	STANDARD36826	HKLR	P
4-Sep-18	NW LANTAU	3	3.00	AUTUMN	STANDARD36826	HKLR	P
4-Sep-18	NW LANTAU	1	4.20	AUTUMN	STANDARD36826	HKLR	S
4-Sep-18	NW LANTAU	2	7.80	AUTUMN	STANDARD36826	HKLR	S
4-Sep-18	NW LANTAU	3	1.30	AUTUMN	STANDARD36826	HKLR	S
18-Sep-18	NE LANTAU	3	34.10	AUTUMN	STANDARD36826	HKLR	P
18-Sep-18	NE LANTAU	4	1.10	AUTUMN	STANDARD36826	HKLR	P
18-Sep-18	NE LANTAU	2	2.50	AUTUMN	STANDARD36826	HKLR	S
18-Sep-18	NE LANTAU	3	13.40	AUTUMN	STANDARD36826	HKLR	S
18-Sep-18	NW LANTAU	2	3.50	AUTUMN	STANDARD36826	HKLR	P
18-Sep-18	NW LANTAU	3	17.73	AUTUMN	STANDARD36826	HKLR	P
18-Sep-18	NW LANTAU	4	3.97	AUTUMN	STANDARD36826	HKLR	P
18-Sep-18	NW LANTAU	2	4.10	AUTUMN	STANDARD36826	HKLR	S
18-Sep-18	NW LANTAU	3	5.90	AUTUMN	STANDARD36826	HKLR	S
20-Sep-18	NW LANTAU	2	21.14	AUTUMN	STANDARD36826	HKLR	P
20-Sep-18	NW LANTAU	3	6.75	AUTUMN	STANDARD36826	HKLR	P
20-Sep-18	NW LANTAU	2	7.28	AUTUMN	STANDARD36826	HKLR	S
20-Sep-18	NW LANTAU	3	2.01	AUTUMN	STANDARD36826	HKLR	S
26-Sep-18	NE LANTAU	2	33.45	AUTUMN	STANDARD138716	HKLR	P
26-Sep-18	NE LANTAU	2	11.25	AUTUMN	STANDARD138716	HKLR	S
26-Sep-18	NW LANTAU	2	13.12	AUTUMN	STANDARD138716	HKLR	P
26-Sep-18	NW LANTAU	3	20.65	AUTUMN	STANDARD138716	HKLR	P
26-Sep-18	NW LANTAU	2	10.51	AUTUMN	STANDARD138716	HKLR	S
26-Sep-18	NW LANTAU	3	2.62	AUTUMN	STANDARD138716	HKLR	S

**Appendix II. HKLR03 Chinese White Dolphin Sighting Database (September 2018)**

(Abbreviations: STG# = Sighting Number; HRD SZ = Dolphin Herd Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance; BOAT ASSOC. = Fishing Boat Association; P/S: Sighting Made on Primary/Secondary Line)

DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	TYPE	NORTHING	EASTING	SEASON	BOAT ASSOC.	P/S
26-Sep-18	1	1433	2	NW LANTAU	2	258	ON	HKLR	826241	806517	AUTUMN	NONE	P



**Appendix III. Individual dolphins identified during HKLR03 monitoring surveys in September 2018**

<b>ID#</b>	<b>DATE</b>	<b>STG#</b>	<b>AREA</b>
NL182	26/09/18	1	NW LANTAU



Appendix IV. Photographs of Identified Individual Dolphin in  
September 2018 (HKLR03)

Appendix J

## Event and Action Plan

*Event and Action Plan for Impact Air Monitoring*

	Action			
	ET (a)	IEC (a)	SOR (a)	Contractor(s)
<b>Action Level Exceedance</b>				
1. Identify the source.		1. Check monitoring data submitted by the ET.	1. Confirm receipt of notification of failure in writing.	1. Rectify any unacceptable practice
2. Repeat measurement to confirm finding. If two consecutive measurements exceed Action Level, the exceedance is then confirmed.		2. Check the Contractor's working method.	2. Notify the Contractor.	2. Amend working methods if appropriate
3. Inform the IEC and the SOR.		3. If the exceedance is confirmed to be Project related after investigation, discuss with the ET and the Contractor on possible remedial measures.	3. Ensure remedial measures properly implemented.	3. If the exceedance is confirmed to be Project related, submit proposals for remedial actions to IEC within 3 working days of notification
4. Investigate the cause of exceedance and check Contractor's working procedures to determine possible mitigation to be implemented.		4. Advise the SOR on the effectiveness of the proposed remedial measures.		4. Implement the agreed proposals
5. If the exceedance is confirmed to be Project related after investigation, increase monitoring frequency to daily.		5. Supervise implementation of remedial measures.		5. Amend proposal if appropriate
6. Discuss with the IEC and the Contractor on remedial actions required.				
7. If exceedance continues, arrange meeting with the IEC and the SOR.				
8. If exceedance stops, cease additional monitoring.				

	<b>Action</b>			
	<b>ET (a)</b>	<b>IEC (a)</b>	<b>SOR (a)</b>	<b>Contractor(s)</b>
<b>Limit Level Exceedance</b>				
	<ol style="list-style-type: none"> <li>1. Identify the source.</li> <li>2. Repeat measurement to confirm finding. If two consecutive measurements exceed Limit Level, the exceedance is then confirmed.</li> <li>3. Inform the IEC, the SOR, the DEP and the Contractor.</li> <li>4. Investigate the cause of exceedance and check Contractor’s working procedures to determine possible mitigation to be implemented.</li> <li>5. If the exceedance is confirmed to be Project related after investigation, increase monitoring frequency to daily.</li> <li>6. Carry out analysis of the Contractor’s working procedures to determine possible mitigation to be implemented.</li> <li>7. Arrange meeting with the IEC and the SOR to discuss the remedial actions to be taken.</li> <li>8. Assess effectiveness of the Contractor’s remedial actions and keep the IEC, the DEP and the SOR informed of the results.</li> <li>9. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by the ET.</li> <li>2. Check Contractor’s working method.</li> <li>3. If the exceedance is confirmed to be Project related after investigation, discuss with the ET and the Contractor on possible remedial measures.</li> <li>4. Advise the SOR on the effectiveness of the proposed remedial measures.</li> <li>5. Supervise implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing.</li> <li>2. Notify the Contractor.</li> <li>3. If the exceedance is confirmed to be Project related after investigation, in consultation with the IEC, agree with the Contractor on the remedial measures to be implemented.</li> <li>4. Ensure remedial measures are properly implemented.</li> <li>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.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance.</li> <li>2. If the exceedance is confirmed to be Project related after investigation, submit proposals for remedial actions to IEC within 3 working days of notification.</li> <li>3. Implement the agreed proposals.</li> <li>4. Amend proposal if appropriate.</li> <li>5. Stop the relevant activity of works as determined by the SOR until the exceedance is abated.</li> </ol>

Note: (a) ET - Environmental Team; IEC - Independent Environmental Checker; SOR - Supervising Officer’s Representative

*Event / Action Plan for Impact Dolphin Monitoring*

EVENT	ACTION			
	ET	IEC	SOR	Contractor
Action Level	<ol style="list-style-type: none"> <li>1. Repeat statistical data analysis to confirm findings;</li> <li>2. Review all available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&amp;A, to ascertain if differences are as a result of natural variation or previously observed seasonal differences;</li> <li>3. Identify source(s) of impact;</li> <li>4. Inform the IEC, SOR and Contractor;</li> <li>5. Check monitoring data.</li> <li>6. Review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET and Contractor;</li> <li>2. Discuss monitoring results and finding with the ET and the Contractor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss monitoring with the IEC and any other measures proposed by the ET;</li> <li>2. If SOR is satisfied with the proposal of any other measures, SOR to signify the agreement in writing on the measures to be implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform the SOR and confirm notification of the non-compliance in writing;</li> <li>2. Discuss with the ET and the IEC and propose measures to the IEC and the SOR;</li> <li>3. Implement the agreed measures.</li> </ol>
Limit Level	<ol style="list-style-type: none"> <li>1. Repeat statistical data analysis to confirm findings;</li> <li>2. Review all available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&amp;A, to ascertain if differences are as a result of natural variation or previously observed seasonal differences;</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET and Contractor;</li> <li>2. Discuss monitoring results and findings with the ET and the Contractor;</li> <li>3. Attend the meeting to discuss with ET, SOR and</li> </ol>	<ol style="list-style-type: none"> <li>1. Attend the meeting to discuss with ET, IEC and Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures.</li> <li>2. If SOR is satisfied with the</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform the SOR and confirm notification of the non-compliance in writing;</li> <li>2. Attend the meeting to discuss with ET, IEC and SOR the necessity of additional dolphin monitoring and any other</li> </ol>

EVENT	ACTION			
	ET	IEC	SOR	Contractor
	<ol style="list-style-type: none"> <li>3. Identify source(s) of impact;</li> <li>4. Inform the IEC, SOR and Contractor of findings;</li> <li>5. Check monitoring data;</li> <li>6. Repeat review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary.</li> <li>7. If ET proves that the source of impact is caused by any of the construction activity by the works contract, ET to arrange a meeting to discuss with IEC, SOR and Contractor the necessity of additional dolphin monitoring and/or any other potential mitigation measures (e.g., consider to modify the perimeter silt curtain or consider to control/temporarily stop relevant construction activity etc.) and submit to IEC a proposal of additional dolphin monitoring and/or mitigation measures where necessary.</li> </ol>	<p>Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures.</p> <ol style="list-style-type: none"> <li>4. Review proposals for additional monitoring and any other mitigation measures submitted by ET and Contractor and advise SOR of the results and findings accordingly.</li> <li>5. Supervise / Audit the implementation of additional monitoring and/or any other mitigation measures and advise SOR the results and findings accordingly.</li> </ol>	<p>proposals for additional dolphin monitoring and/or any other mitigation measures submitted by ET and Contractor and verified by IEC, SOR to signify the agreement in writing on such proposals and any other mitigation measures.</p> <ol style="list-style-type: none"> <li>3. Supervise the implementation of additional monitoring and/or any other mitigation measures.</li> </ol>	<p>potential mitigation measures.</p> <ol style="list-style-type: none"> <li>3. Jointly submit with ET to IEC a proposal of additional dolphin monitoring and/or any other mitigation measures when necessary.</li> <li>4. Implement the agreed additional dolphin monitoring and/or any other mitigation measures.</li> </ol>

Note: ET – Environmental Team, IEC – Independent Environmental Checker, SOR – Supervising Officer’s Representative

Appendix K

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



**Table K1** *Cumulative Statistics on Exceedances*

Parameters	Level of Exceedance	Total No. recorded in this reporting month	Total No. recorded since project commencement
1-hr TSP	Action	2	70
	Limit	1	5
24-hr TSP	Action	0	8
	Limit	0	4
Water Quality	Action	0	20
	Limit	0	1
Impact Dolphin Monitoring	Action	0	11
	Limit	0	13

**Table K2** *Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions*

Reporting Period	Cumulative Statistics		
	Complaints	Notifications of Summons	Successful Prosecutions
This Reporting Month (September 2018)	0	0	0
Total No. received since project commencement	16	1	0

Email  
message

Environmental  
Resources  
Management

**To** Ramboll Hong Kong, Limited (ENPO)

**From** ERM- Hong Kong, Limited

**Ref/Project number** Contract No. HY/2012/08 Tuen Mun–Chek Lap  
Kok Link–Northern Connection Sub-sea Tunnel  
Section

**Subject** Notification of Exceedance for Air Quality  
Impact Monitoring

**Date** 7 September 2018

2507, 25/F One Harbourfront  
18 Tak Fung Street  
Hung Hom, Kowloon  
Hong Kong  
Telephone: (852) 2271 3000  
Facsimile: (852) 2723 5660



**ERM**

---

Dear Sir or Madam,

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

0212330\_7September2018\_1hrTSP\_Station ASR1

One Action Level Exceedance was recorded on 7 September 2018.

Regards,

A handwritten signature in black ink that reads "Jasmine". The signature is written in a cursive, flowing style.

Dr Jasmine Ng  
Environmental Team Leader

---

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ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08  
 TUEN MUN – CHEK LAP KOK LINK –  
 NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

Air Quality Impact Monitoring  
 Notification of Exceedance

<b>Log No.</b>	0212330_7September2018_1hrTSP_Station ASR1 [Total No. of Exceedances = 1]	
<b>Date</b>	7 September 2018 (Measured) 17 September 2018 (Laboratory results received by ERM)	
<b>Monitoring Station</b>	ASR1, ASR5, ASR6, ASR10 and AQMS1	
<b>Parameter(s) with Exceedance(s)</b>	1-hr TSP	
<b>Action Levels</b>	24-hr TSP ( $\mu\text{g}/\text{m}^3$ )	ASR1 = 213 ASR5 = 238 AQMS1 = 213 ASR6 = 238 ASR10 = 214
	1-hr TSP ( $\mu\text{g}/\text{m}^3$ )	ASR1 = 331 ASR5 = 340 AQMS1 = 335 ASR6 = 338 ASR10 = 337
<b>Limit Levels</b>	1-hr TSP ( $\mu\text{g}/\text{m}^3$ )	500
	24-hr TSP ( $\mu\text{g}/\text{m}^3$ )	260
<b>Measured Levels</b>	Action Level Exceedance for 1-hr TSP is observed at ASR1 ( $392 \mu\text{g}/\text{m}^3$ ) during 0857 - 0957 hrs.	
<b>Works Undertaken (at the time of monitoring event)</b>	On 7 September 2018, TBM tunnel works were carried out on site.	
<b>Possible Reason for Action or Limit Level Exceedance(s)</b>	<p>The exceedance is unlikely to be due to the Project, in view of the following:</p> <ul style="list-style-type: none"> <li>• According to the construction information provided by the Contractor, TBM tunnel works were carried out on site. No ground construction works were carried out.</li> <li>• The exceedance is unlikely to be due to the project as dust suppression measures were implemented properly on site. Water spraying was applied on site to prevent dust. Water spraying record is provided in Annex A.</li> </ul> <p>Based on the above, the exceedances are unlikely to be due to the project.</p>	

<b>Actions Taken/ To Be Taken</b>	<p>According to the construction information provided by the Contractor, no ground construction works were carried out on 7 September 2018. Water spraying was applied to prevent dust. Photos taken during AQM were provided in Annex A. No significant dust impact was observed at ASR1. Follow-up site inspection was carried out on 21 September 2018. Dust suppression measures were properly implemented during the site inspections. Photos are provided in Annex A. Based on the above, no additional action is required.</p> <p>The Contractor has been reminded to implement the required mitigation measures as per the EP, approved EIA and Updated EM&amp;A Manual including watering to maintain all exposed road surfaces and dust sources wet, use of sprinklers for water spraying, covering the materials having the potential to create dust by clean tarpaulin, use of water truck and watering on all exposed soil within the Project site) throughout the construction period. The Contractor was also reminded to ensure all dust mitigation measures are provided at Portion N-A and Portion N-C, where the construction works are carried out.</p>
<b>Remarks</b>	<p>The monitoring results, wind data and the locations of air quality monitoring stations are attached.</p>



**Annex A      Photos provided by the Contractor**

\*Note: Photos taken on 7/9/2018



Water spraying was applied frequently on site. (Works Area Portion N-A)



Exposed soil at Portion N-A was covered by tarpaulin sheets. (Works Area Portion N-A)





**Annex A      Photos taken during AQM**

\*Note: Photos taken on 7/9/2018



ASR1



ASR1





## Annex A Photos taken during site inspection

\*Note: Photos taken on 21/9/2018



Water spraying are applied frequently.



Water spraying are applied frequently.

TMCLKL	HY/2012/08	7/9/2018	AQMS1	Sunny	9:08	1-hour TSP	74	ug/m3
TMCLKL	HY/2012/08	7/9/2018	AQMS1	Sunny	10:10	1-hour TSP	79	ug/m3
TMCLKL	HY/2012/08	7/9/2018	AQMS1	Sunny	11:12	1-hour TSP	55	ug/m3
TMCLKL	HY/2012/08	7/9/2018	ASR1	Sunny	8:57	1-hour TSP	392	ug/m3
TMCLKL	HY/2012/08	7/9/2018	ASR1	Sunny	9:59	1-hour TSP	120	ug/m3
TMCLKL	HY/2012/08	7/9/2018	ASR1	Sunny	11:01	1-hour TSP	60	ug/m3
TMCLKL	HY/2012/08	7/9/2018	ASR10	Sunny	8:24	1-hour TSP	58	ug/m3
TMCLKL	HY/2012/08	7/9/2018	ASR10	Sunny	9:26	1-hour TSP	48	ug/m3
TMCLKL	HY/2012/08	7/9/2018	ASR10	Sunny	10:28	1-hour TSP	69	ug/m3
TMCLKL	HY/2012/08	7/9/2018	ASR5	Sunny	8:46	1-hour TSP	104	ug/m3
TMCLKL	HY/2012/08	7/9/2018	ASR5	Sunny	9:48	1-hour TSP	105	ug/m3
TMCLKL	HY/2012/08	7/9/2018	ASR5	Sunny	10:50	1-hour TSP	129	ug/m3
TMCLKL	HY/2012/08	7/9/2018	ASR6	Sunny	8:34	1-hour TSP	76	ug/m3
TMCLKL	HY/2012/08	7/9/2018	ASR6	Sunny	9:36	1-hour TSP	119	ug/m3
TMCLKL	HY/2012/08	7/9/2018	ASR6	Sunny	10:38	1-hour TSP	108	ug/m3
TMCLKL	HY/2012/08	7/9/2018	AQMS1	Sunny	12:14	24-hour TSP	45	ug/m3
TMCLKL	HY/2012/08	7/9/2018	ASR1	Sunny	12:03	24-hour TSP	66	ug/m3
TMCLKL	HY/2012/08	7/9/2018	ASR10	Sunny	11:30	24-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	7/9/2018	ASR5	Sunny	11:52	24-hour TSP	98	ug/m3
TMCLKL	HY/2012/08	7/9/2018	ASR6	Sunny	11:41	24-hour TSP	70	ug/m3



		Wind	Wind
Date	Time	Speed	Dir
18/09/07	12:00 a	0.9	90
18/09/07	1:00 a	1.3	79
18/09/07	2:00 a	1.3	94
18/09/07	3:00 a	0.9	60
18/09/07	4:00 a	0	72
18/09/07	5:00 a	0	326
18/09/07	6:00 a	0	330
18/09/07	7:00 a	0	261
18/09/07	8:00 a	0.4	144
18/09/07	9:00 a	0.9	143
18/09/07	10:00 a	0.9	129
18/09/07	11:00 a	0.9	125
18/09/07	12:00 p	2.2	196
18/09/07	1:00 p	1.8	204
18/09/07	2:00 p	0.9	274
18/09/07	3:00 p	0.9	200
18/09/07	4:00 p	0.4	288
18/09/07	5:00 p	1.3	72
18/09/07	6:00 p	1.3	74
18/09/07	7:00 p	1.3	95
18/09/07	8:00 p	0.4	63
18/09/07	9:00 p	0.4	281
18/09/07	10:00 p	0.4	281
18/09/07	11:00 p	1.3	319

Site Location 地盤位置:

Northern Landfall

Date 日期:

日期:

02-Sep-2018

to 至

08-Sep-2018

	Time 時間	Monday 星期一	Tuesday 星期二	Wednesday 星期三	Thursday 星期四	Friday 星期五	Saturday 星期六	Sunday 星期日
1	8:00 - 9:00	✓	✓	✓	✓	✓	✓	✓
2	9:00 - 10:00	✓	✓	✓	✓	✓	✓	✓
3	10:00 - 11:00	✓	✓	✓	✓	✓	✓	✓
4	11:00 - 12:00	✓	✓	✓	✓	✓	✓	✓
5	12:00 - 13:00	✓	✓	✓	✓	✓	✓	✓
6	13:00 - 14:00	✓	✓	✓	✓	✓	✓	✓
7	14:00 - 15:00	✓	✓	✓	✓	✓	✓	✓
8	15:00 - 16:00	✓	✓	✓	✓	✓	✓	✓
9	16:00 - 17:00	✓	✓	✓	✓	✓	✓	✓
	Verified by Site Foreman 地盤科文簽署確認	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

Night shift 夜間工作 (if necessary 如需要)

	17:30 - 19:00							
	19:00 - 20:30							
	20:30 - 22:00							
	22:00 - 23:00							

\*Please - tick (✓) in the box if complete the spraying of water.  
circle (O) in the box if it is raining.

\*如果 - 已經完成灑水, 請於方格內加上剔號(✓)。  
是下雨天, 請於方格內加上圓圈(O)。

Remarks:

- Pursuant to EP Clause 3.16, the Permit Holder shall undertake watering at least 8 times per day on all exposed soil within the Project site and associated work areas in North Lantau area throughout the construction phase.
- Spraying position includes the main haul road, open area, slopes, stockpiles and any other dusty materials.
- If it is raining, no water spraying is needed.
- The no of spraying will be increased due to site condition.

備註:

- 根據環境許可證 3.16 條例, 在整個施工階段內, 許可證持有人須每天至少 8 次在北大嶼山區項目工地和相關的工作區域內的所有暴露土壤灑水。
- 灑水位置包括主要運輸道路, 空曠地帶, 斜坡, 存料堆, 以及任何其他產生塵埃物料。
- 當下雨時, 地盤將不需要灑水。
- 如果地盤情況更改或有需要時, 灑水次數會相應增加。

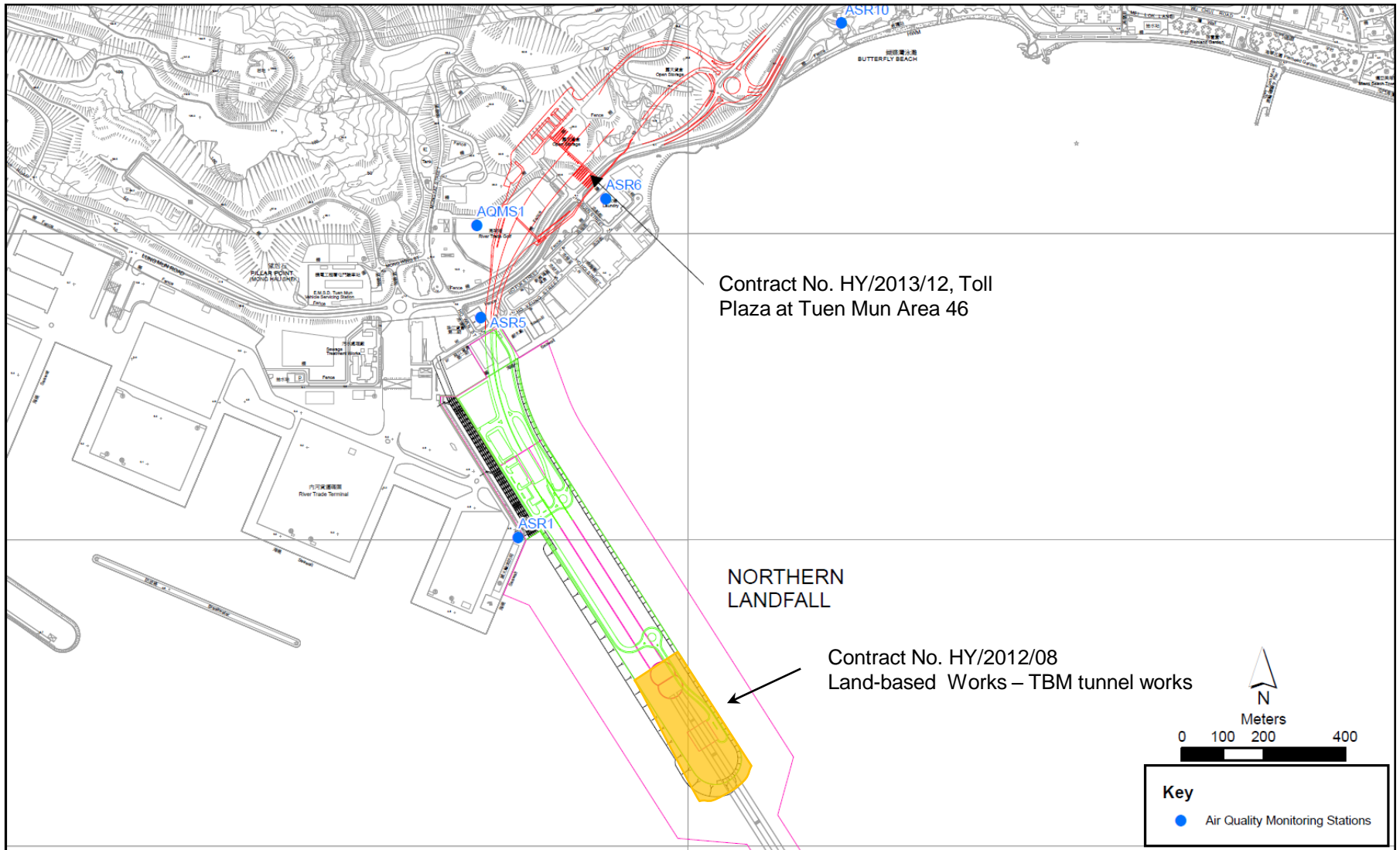


Figure 1

Indicative Construction Works Area on 7 September 2018

Email  
message

Environmental  
Resources  
Management

**To** Ramboll Hong Kong, Limited (ENPO)

**From** ERM- Hong Kong, Limited

**Ref/Project number** Contract No. HY/2012/08 Tuen Mun–Chek Lap  
Kok Link–Northern Connection Sub-sea Tunnel  
Section

**Subject** Notification of Exceedance for Air Quality  
Impact Monitoring

**Date** 5 October 2018

2507, 25/F One Harbourfront  
18 Tak Fung Street  
Hung Hom, Kowloon  
Hong Kong  
Telephone: (852) 2271 3000  
Facsimile: (852) 2723 5660



**ERM**

---


Dear Sir or Madam,

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

0212330\_28September2018\_1hrTSP\_Station ASR1  
0212330\_28September2018\_1hrTSP\_Station ASR1

One Action Level Exceedance and one Limit Level Exceedance were  
recorded on 28 September 2018.

Regards,



Dr Jasmine Ng  
Environmental Team Leader

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ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08  
 TUEN MUN – CHEK LAP KOK LINK –  
 NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

Air Quality Impact Monitoring  
 Notification of Exceedance

<b>Log No.</b>	0212330_28September2018_1hrTSP_Station ASR1 0212330_28September2018_1hrTSP_Station ASR1 [Total No. of Exceedances = 2]	
<b>Date</b>	28 September 2018 (Measured) 5 October 2018 (Laboratory results received by ERM)	
<b>Monitoring Station</b>	ASR1, ASR5, ASR6, ASR10 and AQMS1	
<b>Parameter(s) with Exceedance(s)</b>	1-hr TSP	
<b>Action Levels</b>	24-hr TSP ( $\mu\text{g}/\text{m}^3$ )	ASR1 = 213 ASR5 = 238 AQMS1 = 213 ASR6 = 238 ASR10 = 214
	1-hr TSP ( $\mu\text{g}/\text{m}^3$ )	ASR1 = 331 ASR5 = 340 AQMS1 = 335 ASR6 = 338 ASR10 = 337
<b>Limit Levels</b>	1-hr TSP ( $\mu\text{g}/\text{m}^3$ )	500
	24-hr TSP ( $\mu\text{g}/\text{m}^3$ )	260
<b>Measured Levels</b>	Limit Level Exceedance for 1-hr TSP is observed at ASR1 (584 $\mu\text{g}/\text{m}^3$ ) during 1439 – 1539 hrs. Action Level Exceedance for 1-hr TSP is observed at ASR1 (417 $\mu\text{g}/\text{m}^3$ ) during 1541 – 1641 hrs.	
<b>Works Undertaken (at the time of monitoring event)</b>	On 28 September 2018, TBM tunnel works were carried out on site.	
<b>Possible Reason for Action or Limit Level Exceedance(s)</b>	<p>The exceedance is unlikely to be due to the Project, in view of the following:</p> <ul style="list-style-type: none"> <li>• According to the construction information provided by the Contractor, TBM tunnel works were carried out on site. No ground construction works were carried out.</li> <li>• The exceedance is unlikely to be due to the project as dust suppression measures were implemented properly on site. Water spraying was applied on site to prevent dust. Water spraying record is provided in Annex A.</li> </ul> <p>Based on the above, the exceedances are unlikely to be due to the project.</p>	

<b>Actions Taken/ To Be Taken</b>	<p>According to the construction information provided by the Contractor, no ground construction works were carried out on 28 September 2018. Water spraying was applied to prevent dust. Photos taken during AQM were provided in Annex A. No significant dust impact was observed at ASR1. Site inspection was carried out on 10 October 2018 and ASR1 was also inspected. Dust suppression measures were properly implemented during the site inspections and no significant dust impact was observed at ASR1. Photos are provided in Annex A. Based on the above, no additional action is required.</p> <p>The Contractor has been reminded to implement the required mitigation measures as per the EP, approved EIA and Updated EM&amp;A Manual including watering to maintain all exposed road surfaces and dust sources wet, use of sprinklers for water spraying, covering the materials having the potential to create dust by clean tarpaulin, use of water truck and watering on all exposed soil within the Project site) throughout the construction period.</p>
<b>Remarks</b>	<p>The monitoring results, wind data and the locations of air quality monitoring stations are attached.</p>



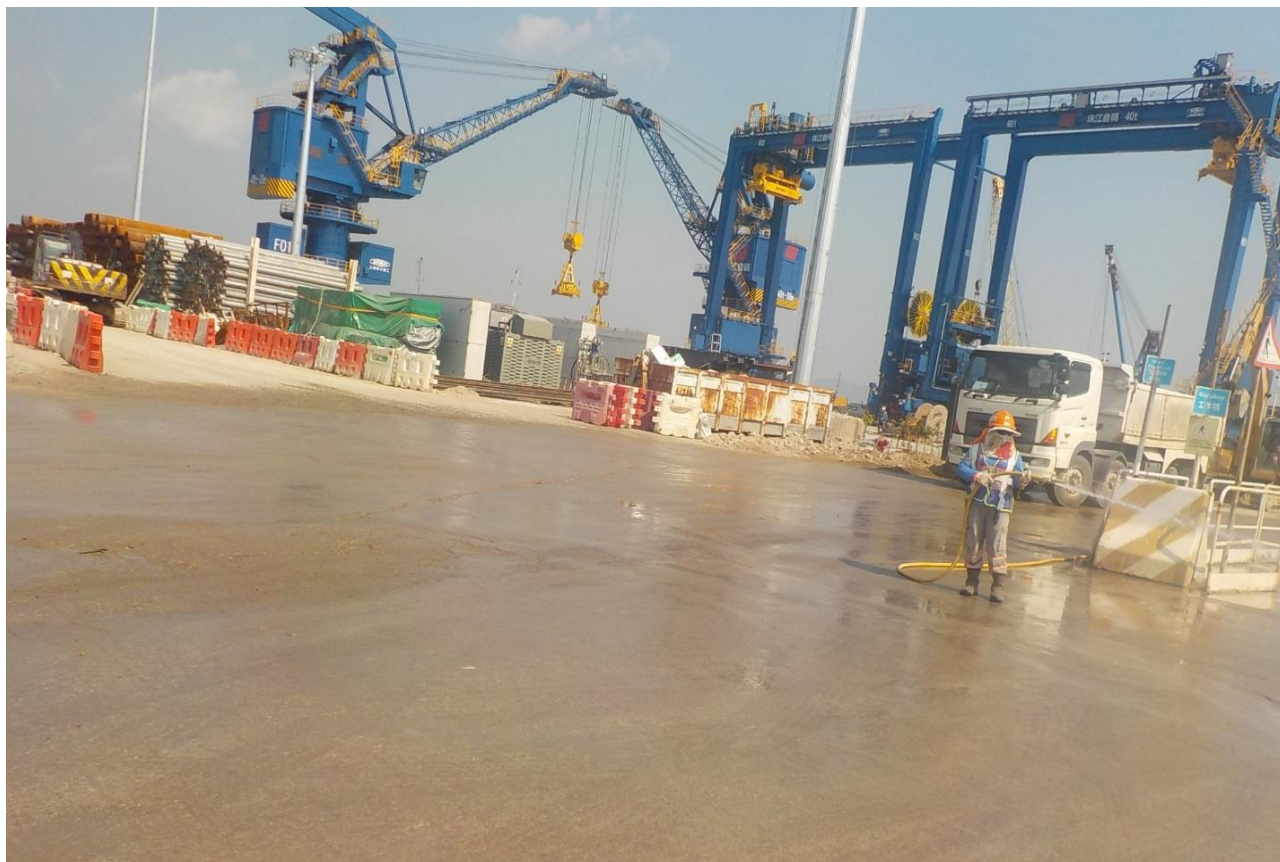


**Annex A Photos provided by the Contractor**

\*Note: Photos taken on 28/9/2018



Water spraying was applied frequently on site. (Works Area Portion N-A)



Water spraying was applied frequently on site. (Works Area Portion N-A)





**Annex A      Photos taken during AQM**

\*Note: Photos taken on 28/9/2018



ASR1



ASR1





## Annex A Photos taken during site inspection

\*Note: Photos taken on 10/10/2018



Water spraying was applied frequently on site. (Works Area Portion N-A)



Water spraying was applied frequently on site. (Works Area Portion N-B)

TMCLKL	HY/2012/08	28/9/2018	AQMS1	Sunny	13:48	1-hour TSP	109	ug/m3
TMCLKL	HY/2012/08	28/9/2018	AQMS1	Sunny	14:50	1-hour TSP	130	ug/m3
TMCLKL	HY/2012/08	28/9/2018	AQMS1	Sunny	15:52	1-hour TSP	139	ug/m3
TMCLKL	HY/2012/08	28/9/2018	ASR1	Sunny	13:37	1-hour TSP	252	ug/m3
TMCLKL	HY/2012/08	28/9/2018	ASR1	Sunny	14:39	1-hour TSP	584	ug/m3
TMCLKL	HY/2012/08	28/9/2018	ASR1	Sunny	15:41	1-hour TSP	417	ug/m3
TMCLKL	HY/2012/08	28/9/2018	ASR10	Sunny	13:02	1-hour TSP	103	ug/m3
TMCLKL	HY/2012/08	28/9/2018	ASR10	Sunny	14:04	1-hour TSP	87	ug/m3
TMCLKL	HY/2012/08	28/9/2018	ASR10	Sunny	15:06	1-hour TSP	103	ug/m3
TMCLKL	HY/2012/08	28/9/2018	ASR5	Sunny	13:25	1-hour TSP	314	ug/m3
TMCLKL	HY/2012/08	28/9/2018	ASR5	Sunny	14:27	1-hour TSP	184	ug/m3
TMCLKL	HY/2012/08	28/9/2018	ASR5	Sunny	15:29	1-hour TSP	234	ug/m3
TMCLKL	HY/2012/08	28/9/2018	ASR6	Sunny	13:14	1-hour TSP	201	ug/m3
TMCLKL	HY/2012/08	28/9/2018	ASR6	Sunny	14:16	1-hour TSP	148	ug/m3
TMCLKL	HY/2012/08	28/9/2018	ASR6	Sunny	15:18	1-hour TSP	187	ug/m3
TMCLKL	HY/2012/08	28/9/2018	AQMS1	Sunny	16:54	24-hour TSP	67	ug/m3
TMCLKL	HY/2012/08	28/9/2018	ASR1	Sunny	16:43	24-hour TSP	167	ug/m3
TMCLKL	HY/2012/08	28/9/2018	ASR10	Sunny	16:08	24-hour TSP	52	ug/m3
TMCLKL	HY/2012/08	28/9/2018	ASR5	Sunny	16:31	24-hour TSP	133	ug/m3
TMCLKL	HY/2012/08	28/9/2018	ASR6	Sunny	16:20	24-hour TSP	96	ug/m3








<b>Meteorological Data for Impact Monitoring in the reporting period</b>			
<b>Date (yy-mm-dd)</b>	<b>Time (24hrs)</b>	<b>Average of Wind Speed (m/s)</b>	<b>Average of Wind Direction(degree)</b>
18/09/28	0:00	0.4	320
18/09/28	1:00	0.4	310
18/09/28	2:00	0	-
18/09/28	3:00	0.4	43
18/09/28	4:00	0.4	47
18/09/28	5:00	0.4	12
18/09/28	6:00	0.9	40
18/09/28	7:00	0.9	47
18/09/28	8:00	1.8	12
18/09/28	9:00	1.8	49
18/09/28	10:00	2.2	53
18/09/28	11:00	1.8	36
18/09/28	12:00	2.2	314
18/09/28	13:00	2.2	312
18/09/28	14:00	2.7	301
18/09/28	15:00	2.7	297
18/09/28	16:00	2.7	282
18/09/28	17:00	1.3	297
18/09/28	18:00	1.3	338
18/09/28	19:00	1.8	296
18/09/28	20:00	1.8	340
18/09/28	21:00	2.2	348
18/09/28	22:00	1.8	348
18/09/28	23:00	1.3	292

Site Location 地盤位置:

Northern Landfall

Date 日期:

23 - Sep - 2018 to 至 29 - Sep - 2018

	Time 時間	Monday 星期一	Tuesday 星期二	Wednesday 星期三	Thursday 星期四	Friday 星期五	Saturday 星期六	Sunday 星期日
1	8:00 – 9:00	✓	✓	✓	✓	✓	✓	✓
2	9:00 – 10:00	✓	✓	✓	✓	✓	✓	✓
3	10:00 – 11:00	✓	✓	✓	✓	✓	✓	✓
4	11:00 – 12:00	✓	✓	✓	✓	✓	✓	✓
5	12:00 – 13:00	✓	✓	✓	✓	✓	✓	✓
6	13:00 – 14:00	✓	✓	✓	✓	✓	✓	✓
7	14:00 – 15:00	✓	✓	✓	✓	✓	✓	✓
8	15:00 – 16:00	✓	✓	✓	✓	✓	✓	✓
9	16:00 – 17:00	✓	✓	✓	✓	✓	✓	✓
	Verified by Site Foreman 地盤科文簽署確認							

Night shift 夜間工作 (if necessary 如需要)

17:30 – 19:00								
19:00 – 20:30								
20:30 – 22:00								
22:00 – 23:00								

\*Please - tick (✓) in the box if complete the spraying of water.  
circle (O) in the box if it is raining.

\*如果 - 已經完成灑水, 請於方格內加上剔號(✓)。  
是下雨天, 請於方格內加上圓圈(O)。

Remarks:

- Pursuant to EP Clause 3.16, the Permit Holder shall undertake watering at least 8 times per day on all exposed soil within the Project site and associated work areas in North Lantau area throughout the construction phase.
- Spraying position includes the main haul road, open area, slopes, stockpiles and any other dusty materials.
- If it is raining, no water spraying is needed.
- The no of spraying will be increased due to site condition.

備註:

- 根據環境許可證 3.16 條例, 在整個施工階段內, 許可證持有人須每天至少 8 次在北大嶼山區項目工地和相關的工作區域內的所有暴露土壤灑水。
- 灑水位置包括主要運輸道路, 空曠地帶, 斜坡, 存料堆, 以及任何其他產生塵埃物料。
- 當下雨時, 地盤將不需要灑水。
- 如果地盤情況更改或有需要時, 灑水次數會相應增加。



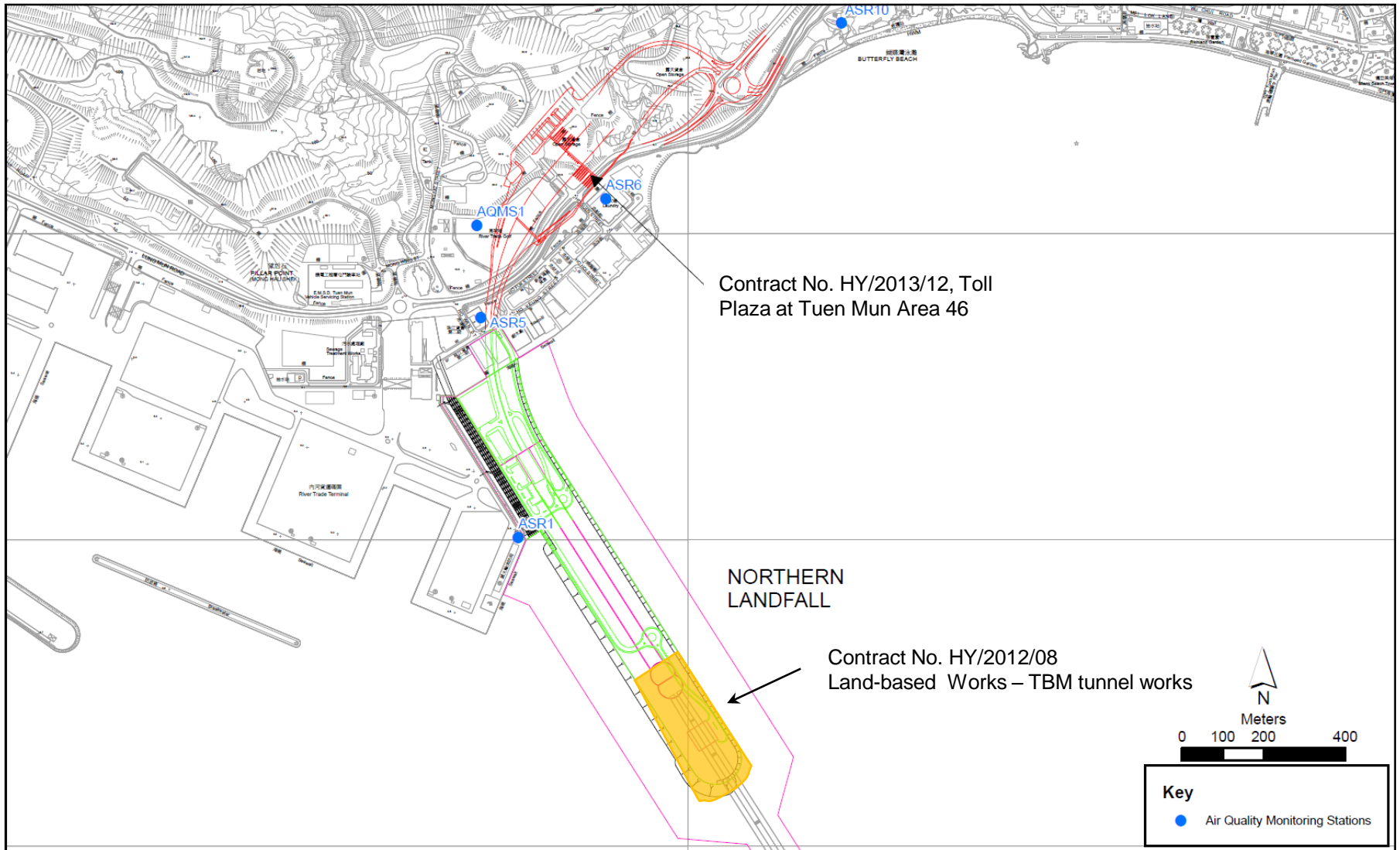


Figure 1

Indicative Construction Works Area on 28 September 2018

Appendix L

## Waste Flow Table

**Monthly Summary Waste Flow Table**

Name of Department: HyD

Contract No. / Works Order No.: HY/2012/08

**Monthly Summary Waste Flow Table for September 2018** [to be submitted not later than the 15<sup>th</sup> day of each month following reporting month] (All quantities shall be rounded off to 3 decimal places.)

Month	Monthly Break-down of <u>Inert</u> Construction & Demolition Materials (i.e. Public Fill Materials)				
	(a)=(b)+(c)+(d)+(e) Total Quantity Generated	(b) Hard Rock and Large Broken Concrete	(c) Reused in the Contract	(d) Reused in other Projects	(e) Disposed of as Public Fill
	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)
Sub-total	1221.977	0.000	0.000	0.000	1221.977
Jan-2018	7.165	0.000	0.000	0.000	7.165
Feb-2018	1.762	0.000	0.000	0.000	1.762
Mar-2018	66.457	0.000	0.000	62.274	4.183
Apr-2018	123.942	0.000	0.000	50.648	73.294
May-2018	127.964	0.000	0.000	62.822	65.142
Jun-2018	102.987	0.000	0.000	55.385	47.602
Half Year Sub-total	430.277	0.000	0.000	231.129	199.148
Jul-2018	43.768	0.000	0.000	0.000	43.768
Aug-2018	17.087	0.000	0.000	40.722	17.087
Sep-2018	39.763	0.000	0.000	11.276	28.487
Oct-2018					
Nov-2018					
Dec-2018					
Project Total Quantities	1793.594	0.000	0.000	283.127	1510.465

Month	Actual Quantities of <u>Non-inert</u> Construction Waste Generated Monthly								
	Metals		Paper/ cardboard packaging		Plastics (see Note 3)		Chemical Waste		Others, e.g. General Refuse disposed at Landfill
	(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000ton)
	generated	recycled	generated	recycled	generated	recycled	generated	Disposed	generated
Sub-total	619.380	619.380	4.150	4.150	6.870	6.870	33.150	33.150	8.259
Jan-2018	241.500	241.500	0.200	0.200	0.000	0.000	2.800	2.800	0.272
Feb-2018	256.940	256.940	0.200	0.200	0.000	0.000	0.000	0.000	0.258
Mar-2018	229.360	229.360	0.000	0.000	0.000	0.000	2.000	2.000	0.459
Apr-2018	195.550	195.550	0.000	0.000	0.000	0.000	8.600	8.600	0.281
May-2018	93.010	93.010	0.300	0.300	0.000	0.000	10.400	10.400	0.686
Jun-2018	0.000	0.000	0.000	0.000	1.060	1.060	0.000	0.000	0.408
Half Year Sub-total	1016.36	1016.36	0.700	0.700	1.060	1.060	23.800	23.800	2.364
Jul-2018	0.000	0.000	0.000	0.000	0.770	0.770	0.000	0.000	0.768
Aug-2018	573.96	573.96	0.300	0.300	0.000	0.000	0.000	0.000	0.749
Sep-2018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.445
Oct-2018									
Nov-2018									
Dec-2018									
Project Total Quantities	2209.70	2209.70	5.150	5.150	8.700	8.700	58.950	58.950	12.585



Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*				
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed of as Public Fill
(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)
2300.000	0.000	0.000	300.000	2000.000

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*				
Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	General Refuse disposed of at Landfill
(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 ton)
2000.000	6.000	8.500	50.000	12.000

- Notes:
- (1) The performance targets are given in the **ER Appendix 8J Clause 14** and the EM & A Manual(s).
  - (2) The waste flow table shall also include C&D materials to be imported for use at the Site.
  - (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
  - (4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m<sup>3</sup>. (**ER Part 8 Clause 8.8.5 (d) (ii)** refers).