

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

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

11 June 2020

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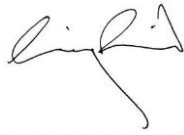
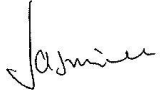



Contract No. HY/2012/08 Tuen Mun – Chek Lap Kok Link – Northern Connection Sub-sea Tunnel Section

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

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Client: DBJV		Project No: 0212330			
Summary: This document presents the Seventy-ninth Monthly EM&A Report for Tuen Mun – Chek Lap Kok Link Northern Connection Sub-sea Tunnel Section.		Date: 11 June 2020			
		Approved by: 			
		<i>Mr Craig Reid Partner</i>			
		Certified by: 			
		<i>Dr Jasmine Ng ET Leader</i>			
	79 th Monthly EM&A Report	VAR	JN	CAR	11/06/20
Revision	Description	By	Checked	Approved	Date
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. We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.		Distribution			
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12 June 2020

By Fax (2293 6300) and By Post

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

Attention: Mr. Roger Man

Dear Mr. Man,

**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
79th Monthly EM&A Report for May 2020 (EP-354/2009/D)**

Reference is made to the Monthly EM&A Report for May 2020 (ET's ref.: "0212330_79th Monthly EM&A_20200611.doc") certified by the ET Leader and provided to us via e-mail on 11 June 2020.

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,



Manson Yeung
Independent Environmental Checker
Tuen Mun – Chek Lap Kok Link

c.c.

HyD	Mr. Patrick Ng	(By Fax: 3188 6614)
HyD	Mr. Andy Ho	(By Fax: 3188 6614)
AECOM	Mr. Conrad Ng	(By Fax: 3922 9797)
ERM	Dr. Jasmine Ng	(By Fax: 2723 5660)
DBJV	Mr. Bryan Lee	(By Fax: 2293 7499)

Internal: DY, YH, ENPO Site

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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 Contract commenced on 1 November 2013 and will tentatively be completed in 2020. 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 Seventy-ninth Monthly EM&A report presenting the EM&A works carried out during the period from 1 to 31 May 2020 for the *Contract No. HY/2012/08 Northern Connection Sub-sea Tunnel Section* (the “Contract”) in accordance with the Updated EM&A Manual of the TM-CLK Link Contract. As informed by the Contractor, major activities in the reporting period included:

Land-based Works

- Road & Drainage works – Portion S-A, S-B & S-C and Northern Landfall;
- UU installation – Portion S-A, S-B & S-C and Northern Landfall.

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

24-hour TSP Monitoring	10 sessions
1-hour TSP Monitoring	10 sessions
Impact Dolphin Monitoring	2 sessions
Joint Environmental Site Inspection	4 sessions

Implementation of Marine Mammal Exclusion Zone

No marine works were undertaken during the reporting period, therefore, daily 250 m marine mammal exclusion zone monitoring was not undertaken during the reporting period.

Summary of Breaches of Action/Limit Levels

Breaches of Action and Limit Levels for Air Quality

No exceedance was recorded in the air quality monitoring of this reporting month.

Breaches of Action and Limit Levels for Dolphin Monitoring

Whilst one (1) Limit Level exceedance was observed for the quarterly dolphin monitoring data between March and May 2020, no unacceptable impact from the construction activities of the TM-CLKL Northern Connection Sub-sea Tunnel Section on Chinese White Dolphins was noticeable from general observations. 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 Contract 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 in the reporting period.

Upcoming Works for the Next Reporting Month

Works to be undertaken in the next monitoring period of June 2020 include the following:

Land-based Works

- Road & Drainage works - Portion S-A, S-B & S-C and Northern Landfall;
- UU installation - Portion S-A, S-B & S-C and Northern Landfall.

Future Key Issue

Potential environmental impacts arising from the above upcoming construction activities in the next reporting month of June 2020 are mainly associated with dust and waste management issues.

1.1

BACKGROUND

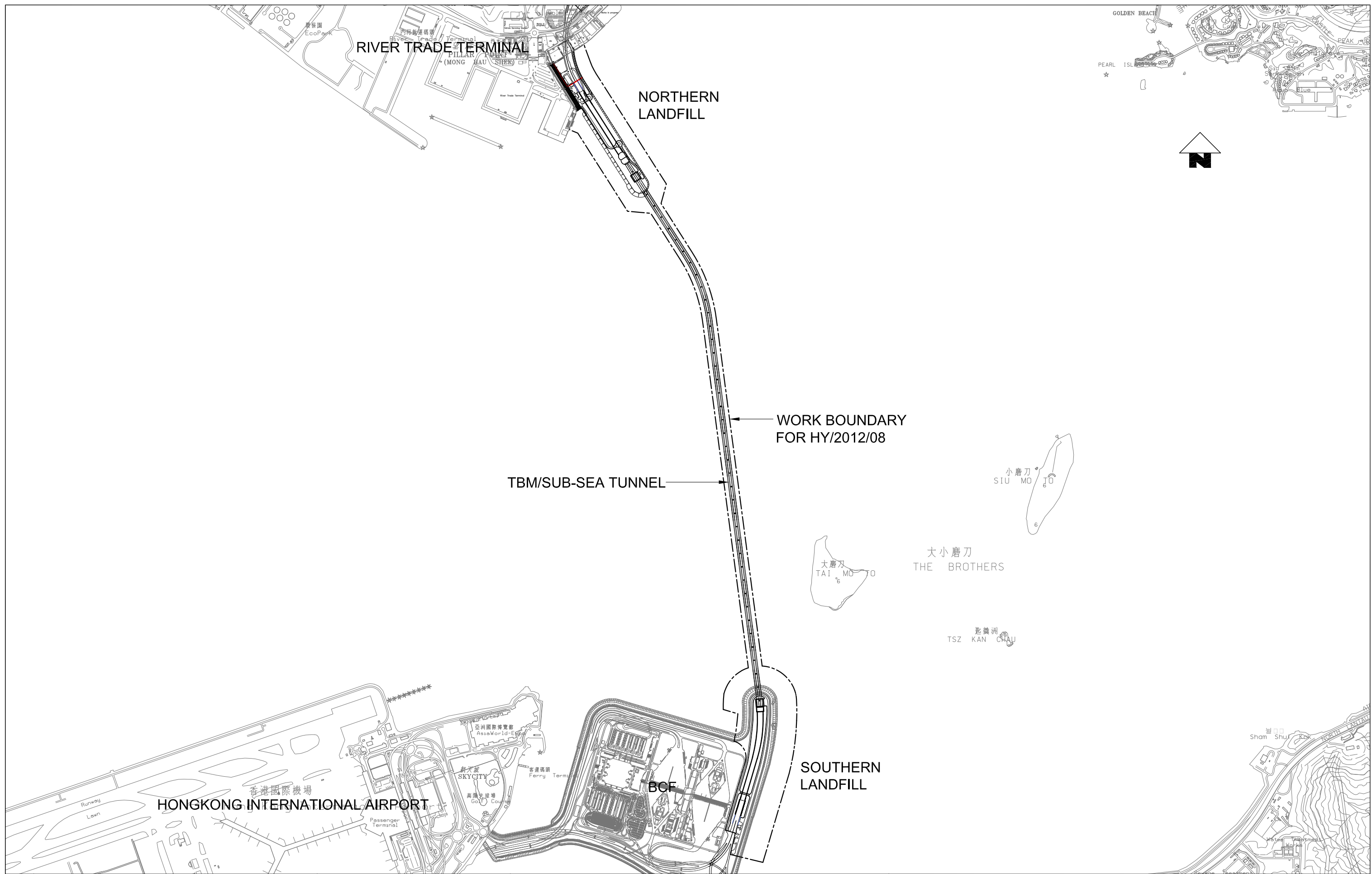
According to the findings of the Northwest New Territories (NWNT) Traffic and Infrastructure Review conducted by the Transport Department, Tuen Mun Road, Ting Kau Bridge, Lantau Link and North Lantau Highway would be operating beyond capacity after 2016. This forecast has been based on the estimated 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 in 2020. 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	PKV	
Rev.	Description	Date	Checked
A	FIRST ISSUE	11SEP13	PKV

Main Contractor

Dragages - Bouygues Joint Venture 寶嘉 - 布依格聯營

Client

HIGHWAYS DEPARTMENT

Contractor's Designer

Arup 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 Seventy-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 May 2020.

1.3 ORGANIZATION STRUCTURE

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

Table 1.1 *Contact Information of Key Personnel*

Party	Position	Name	Telephone	Fax
Highways Department	Engr 24/SD	Ken T.M. Cheng	2762 4062	3188 6614
SOR (AECOM Asia Company Limited)	Chief Resident Engineer	Roger Man	2293 6388	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
		Manson Yeung ⁽¹⁾	9700 6767	3465 2899
Contractor (Dragages – Bouygues Joint Venture)	Deputy Environmental Manager	Bryan Lee	2293 7323	2293 7499
	24-hour hotline		2293 7330	
ET (ERM-HK)	ET Leader	Jasmine Ng	2271 3311	2723 5660

(1) The role and responsibilities as the IEC of the Contract has been taken up by Mr Manson Yeung instead of Dr. F.C. Tsang since 18 May 2020

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*.

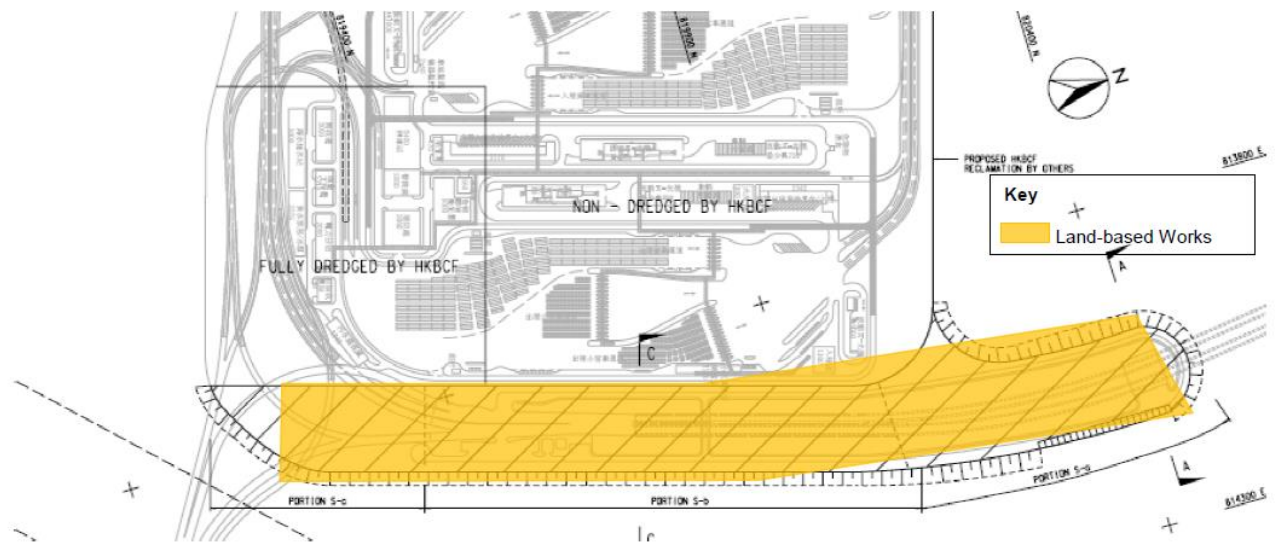
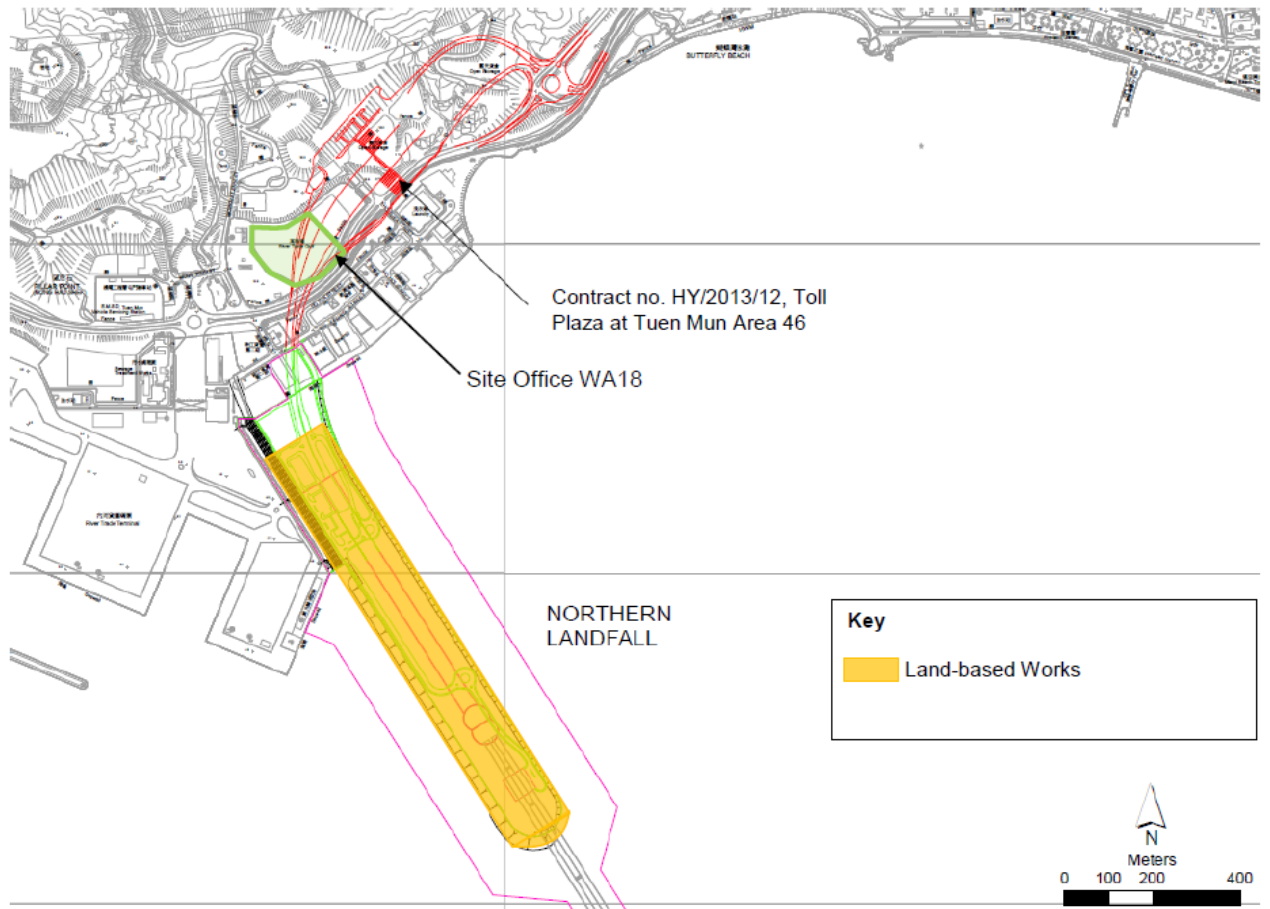
The general layout plan of the site showing the detailed works areas is shown in *Figure 1.2*. The Environmental Sensitive Receivers in the vicinity of the Contract are shown in *Figure 1.3*.

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

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

Construction Activities Undertaken
<i>Land-based Works</i>
<ul style="list-style-type: none">• Road & Drainage works - Portion S-A, S-B & S-C and Northern Landfall;• UU installation - Portion S-A, S-B & S-C and Northern Landfall.

Figure 1.2 Locations of Construction Activities – May 2020



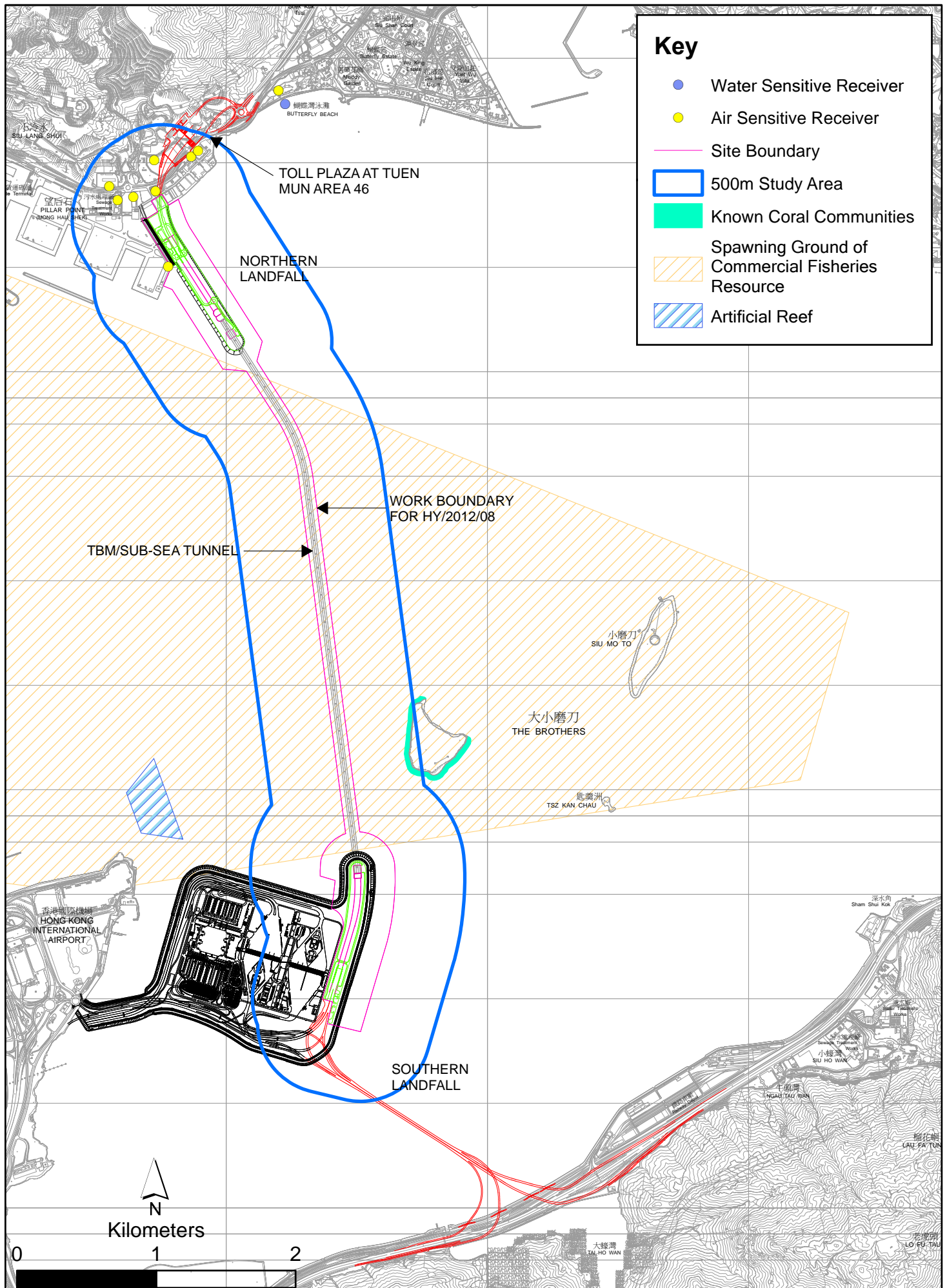


Figure 1.3 Environmental Sensitive Receivers in the vicinity of Contract No. HY/2012/08 Tuen Mun - Chek Lap Kok Link - Northern Connection Sub-Sea Tunnel Section

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 2, 5, 8, 11, 14, 17, 20, 23, 26 and 29 May 2020 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	2, 5, 8, 11, 14, 17, 20, 23, 26 and 29 May 2020	Tuen Mun Fireboat Station	Office	TSP monitoring
ASR5		Pillar Point Fire Station	Office	<ul style="list-style-type: none"> 1-hour Total Suspended Particulates (1-hour TSP, $\mu\text{g}/\text{m}^3$), 3 times in every 6 days 24-hour Total Suspended Particulates (24-hour TSP, $\mu\text{g}/\text{m}^3$), daily for 24-hour in every 6 days
AQMS1		Previous River Trade Golf	Bare ground	Enhanced TSP monitoring (commenced on 24 October 2014)
ASR6		Butterfly Beach Laundry	Office	<ul style="list-style-type: none"> 1-hour Total Suspended Particulates (1-hour TSP, $\mu\text{g}/\text{m}^3$), 3 times in every 3 days
ASR10		Butterfly Beach Park	Recreational uses	<ul style="list-style-type: none"> 24-hour Total Suspended Particulates (24-hour TSP, $\mu\text{g}/\text{m}^3$), daily for 24-hour in every 3 days

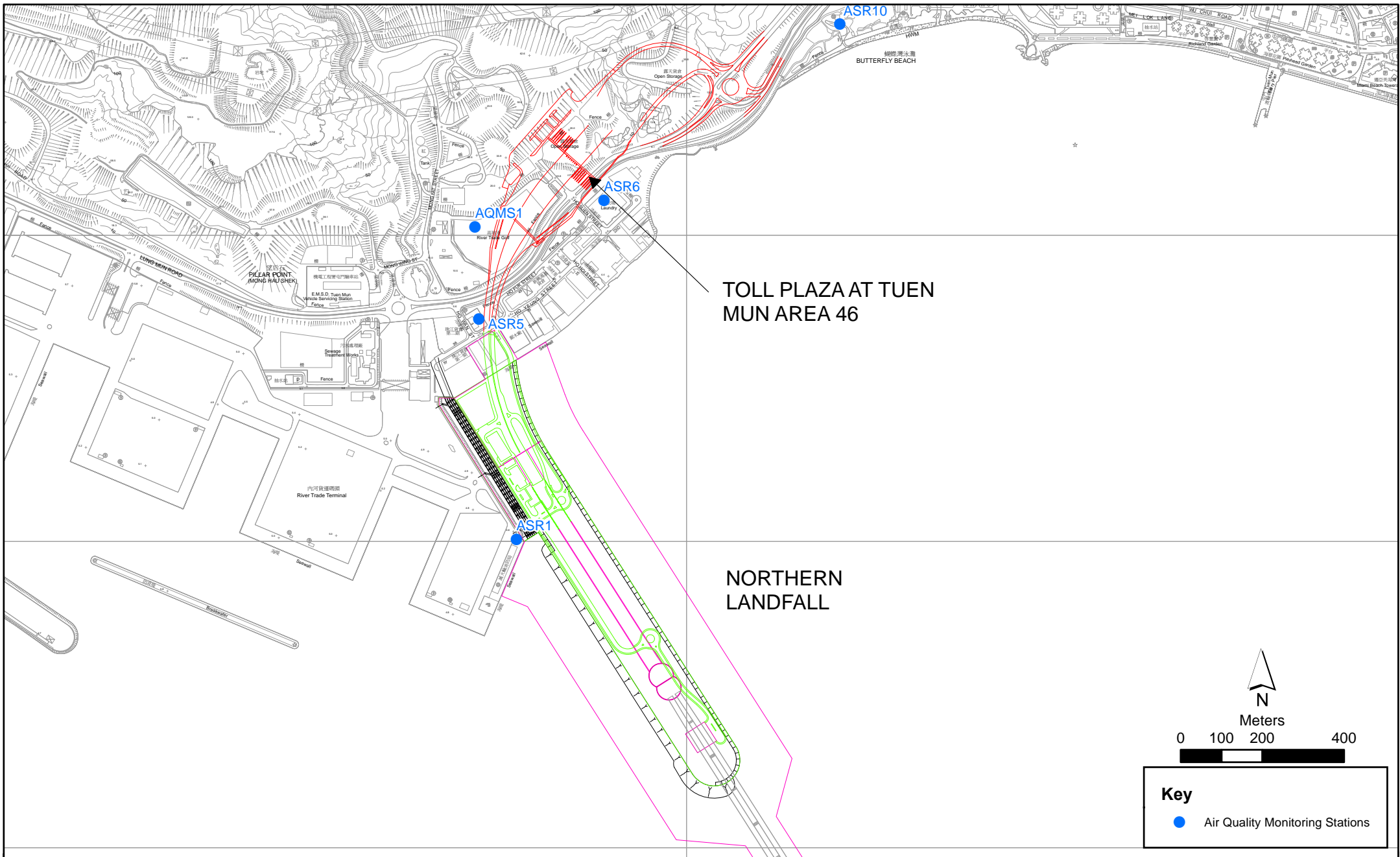


Figure 2.1

Air Quality Monitoring Stations for the Enhanced TSP Monitoring

Table 2.2 Air Quality Monitoring Equipment

Equipment	Brand and Model
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 May 2020 is provided in *Appendix F*.

1-hour TSP at ASR1 on 14 and 17 May 2020 and 24-hour TSP at ASR1 on 2, 11, 14 and 17 May 2020 were suspended due to power shortage.

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

Station	Average ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
ASR1	97	13 - 230	331	500
ASR5	152	62 - 308	340	500
AQMS1	95	14 - 167	335	500
ASR6	128	58 - 258	338	500
ASR10	72	30 - 160	337	500

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

Station	Average ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
ASR1	44	35 - 59	213	260
ASR5	75	51 - 123	238	260
AQMS1	51	38 - 68	213	260
ASR6	59	30 - 91	238	260
ASR10	36	19 - 49	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 10 1-hour TSP and 24-hour TSP monitoring were undertaken in this reporting month. No exceedances of 1-hour and 24-hour TSP Monitoring were recorded in the air quality monitoring of 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

Post-construction water quality monitoring was completed on 11 April 2020. According to the EM&A Manual, Operational Phase Monitoring on water quality monitoring shall be performed monthly during the first year of Project operation. The proposal for operational phase monitoring on water quality monitoring was approved by EPD on 19 May 2020. The schedule for operational phase monitoring on water quality monitoring in June 2020 is provided in *Appendix F*.

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, Contract No. HY/2012/08 has taken over the responsibility for implementation of dolphin monitoring from HZMB HKLR Contract No. HY/2011/03 since October 2019.

2.3.2 Monitoring Equipment

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

Table 2.5 *Dolphin Monitoring Equipment*

Equipment	Model
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.

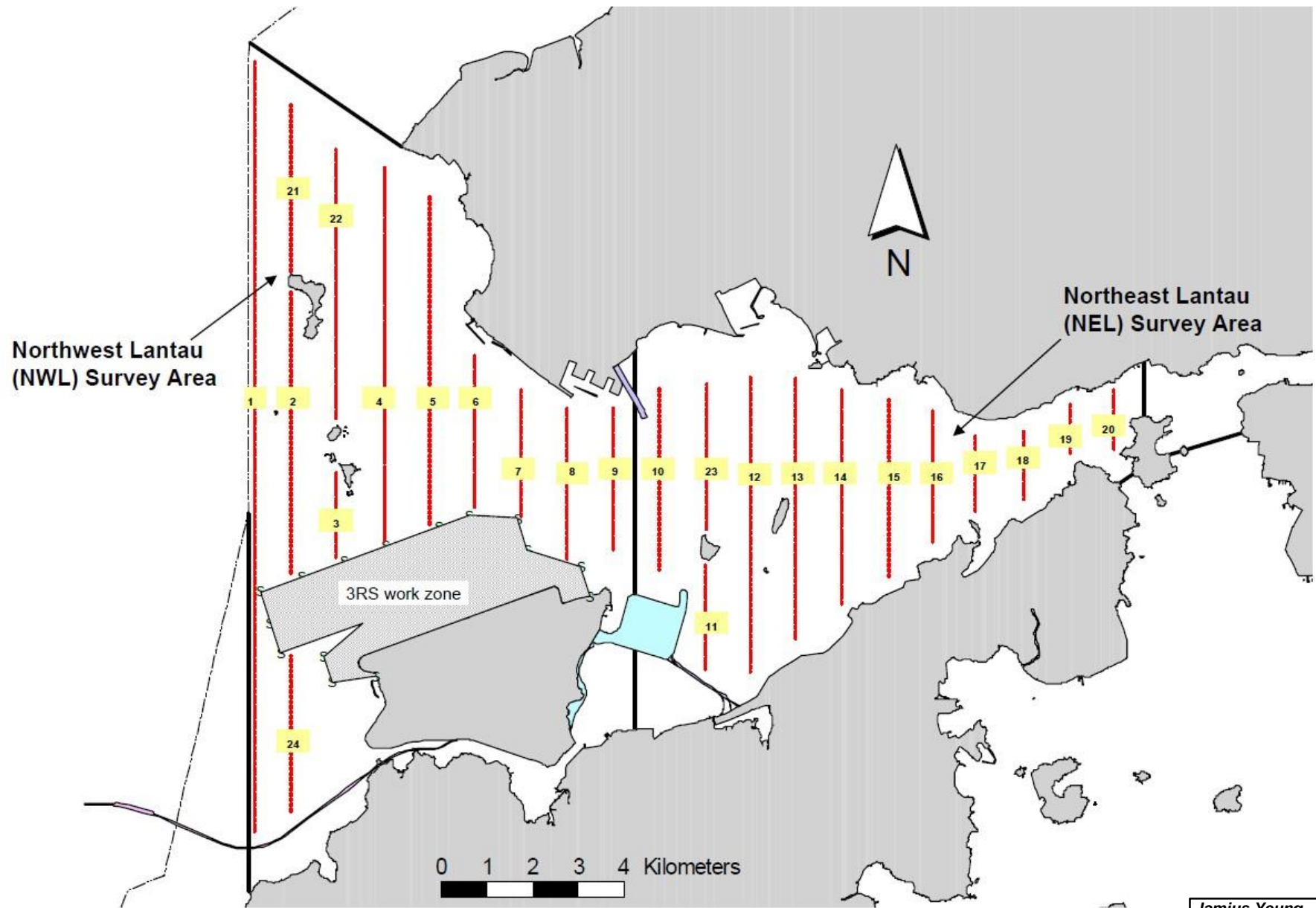


Figure 2.2

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 5, 12, 18 and 25 May 2020.

2.3.7 *Results & Observations*

A total of 254.93 km of survey effort was collected, with 100% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility) in May 2020. Among the two areas, 94.00 km and 160.93 km of survey effort were collected from NEL and NWL survey areas, respectively. The total survey effort conducted on primary and secondary lines were 188.20 km and 66.73 km respectively. The survey efforts are summarized in *Appendix I*.

No Chinese White Dolphin sighting was recorded during the two sets of surveys in May 2020.

No dolphin sighting was made in the proximity of the TM-CLKL alignment.

The southern end of transect line no. 8 was not travelled on 5 and 18 May 2020 during the dolphin monitoring due to the presence of construction boats along the transect line. Part of the transect line was not travelled due to safety concerns.

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 May 2020 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: May 5th / 12th	0.0	0.0
	Set 2: May 18th / 25th	0.0	0.0
NWL	Set 1: May 5th / 12th	0.0	0.0
	Set 2: May 18th / 25th	0.0	0.0

Note: Dolphin Encounter Rates are deduced from the Two Sets of Surveys (Two Surveys in Each Set) in May 2020 in Northeast (NEL) and Northwest Lantau (NWL)

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
Northeast Lantau	0.0	0.0	0.0	0.0

Northwest Lantau	0.9	0.0	0.0	0.0
-------------------------	-----	-----	-----	-----

Note: Overall dolphin encounter rates (sightings per 100 km of survey effort) from all four surveys are conducted in May 2020 on primary lines only as well as both primary lines and secondary lines in Northeast and Northwest Lantau.

Whilst one (1) Limit Level exceedance was observed for the quarterly dolphin monitoring data between March and May 2020, no unacceptable impact from the construction activities of the TM-CLKL Northern Connection Sub-sea Tunnel Section on Chinese White Dolphins was noticeable from general observations. 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 Contract 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.

According to the EM&A Manual, Operational Phase Monitoring on dolphin monitoring shall be undertaken based upon the frequency of forty-eight, one-day survey events at a frequency of 2 per month over a period of 24 months following cessation of the construction. The proposal for operational phase monitoring on dolphin monitoring was approved by EPD on 19 May 2020. The schedule for operational phase monitoring on dolphin monitoring in June 2020 is provided in *Appendix F*.

2.3.8 *Implementation of Marine Mammal Exclusion Zone*

No marine works were undertaken during the reporting period, therefore, daily 250 m marine mammal exclusion zone monitoring was not undertaken during the reporting period.

2.4 EM&A SITE INSPECTION

Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures under the Contract. In the reporting month, four (4) site inspections were carried out on 6, 13, 20 and 27 May 2020.

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
6 May 2020	Northern Landfall (Pumpsum) <ul style="list-style-type: none">• Chemical should be placed in drip tray.• Accumulated residuals were observed on site.	Northern Landfall (Pumpsum) <ul style="list-style-type: none">• The Contractor was reminded to place the chemical in drip tray.• The Contractor was reminded to keep better housekeeping.
13 May 2020	Carpark <ul style="list-style-type: none">• Residuals were observed on site.	Carpark <ul style="list-style-type: none">• The Contractor was reminded to keep better housekeeping.
20 May 2020	South Ventilation Building <ul style="list-style-type: none">• Accumulated residuals were observed on site.	South Ventilation Building <ul style="list-style-type: none">• The Contractor was reminded to clear accumulated residuals.
27 May 2020	Box Culvert <ul style="list-style-type: none">• NRMM label was in green color instead of blue.	Box Culvert <ul style="list-style-type: none">• The Contractor was reminded to replace the NRMM label.

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). 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 ^(a) (tonnes)	Inert Construction Waste Re-used (tonnes)	Non-inert Construction Waste ^(b) (tonnes)	Recyclable Materials ^(c) (kg)	Chemical Wastes (kg)	Marine Sediment (m ³)		
						Category L	Category M (M _p & M _f)	Mixed (L+M)
May 2020	7,015	0	536	6,740	600	0	0	0

Notes:

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

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

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

2.6 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	435068	27 June 2018	Throughout the Contract	DBJV	Northern Landfall
Construction Dust Notification	435505	12 July 2018	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
Waste Water Discharge License	WT00031435-2018	2 August 2018	31 August 2023	DBJV	Southern Landfall
Waste Water Discharge License	WT00034060-2019	25 July 2019	30 June 2024	DBJV	Northern Landfall (4 Discharge Point)
Construction Noise Permit	GW-RW0181-20	29 April 2020	14 October 2020	DBJV	Urmston Road in front of Pillar Point
Construction Noise Permit	GW-RS1137-19	26 December 2019	5 June 2020	DBJV	Southern Landfall
Construction Noise Permit	GW-RW0144-20	14 April 2020	31 August 2020	DBJV	WA23 Tsing Yi Storage Area

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*

No exceedances of 1-hour and 24-hour TSP Monitoring were recorded in the air quality monitoring of this reporting month.

Whilst one (1) Limit Level exceedance was observed for the quarterly dolphin monitoring data between March and May 2020, no unacceptable impact from the construction activities of the TM-CLKL Northern Connection Sub-sea Tunnel Section on Chinese White Dolphins was noticeable from general observations.

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 2.3*.

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*.

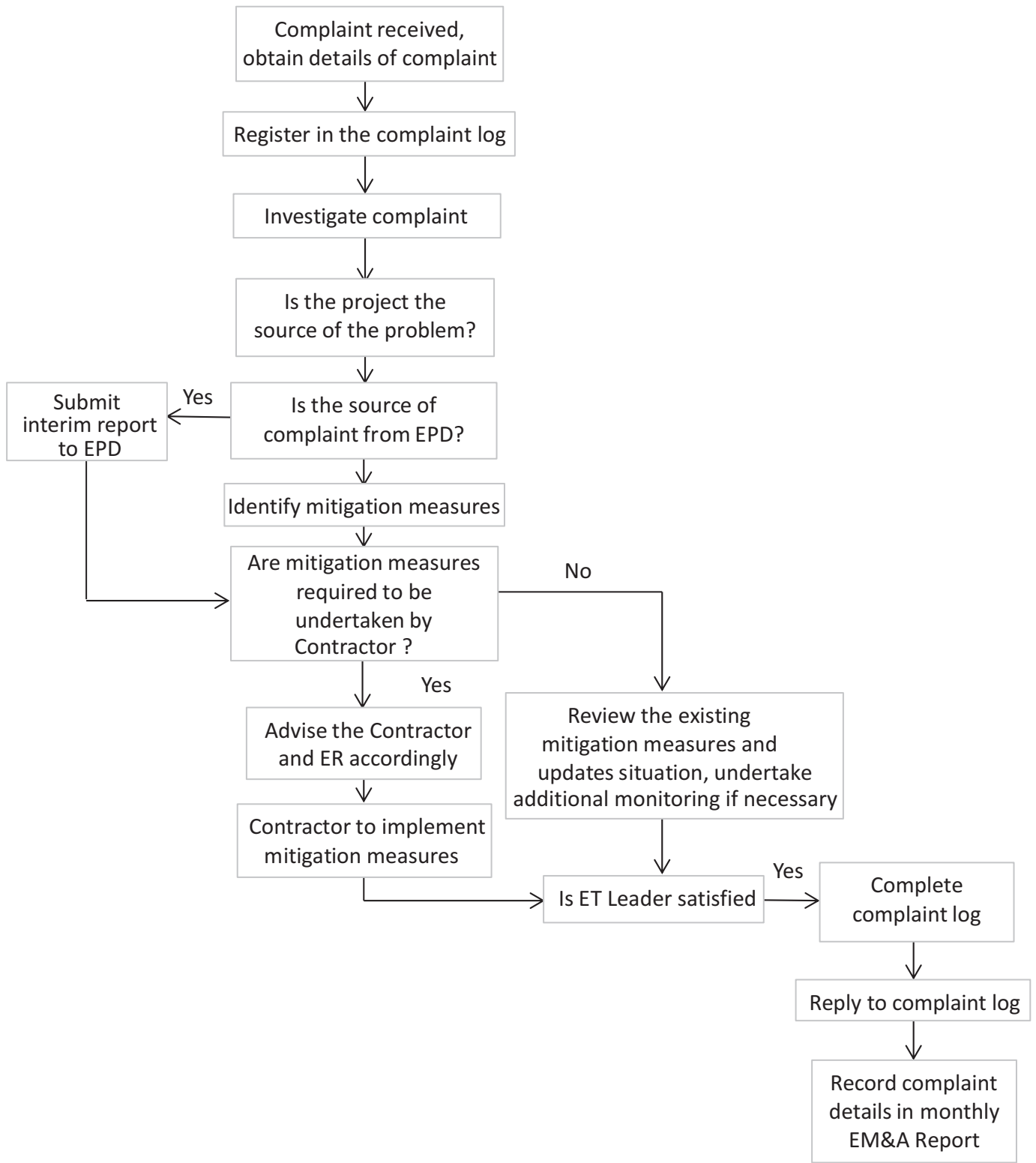


Figure 2.3

Environmental Complaint Handling Procedure

FILE: 0215660n2.cdr
DATE: 06/12/2013

Environmental
Resources
Management



3 **FUTURE KEY ISSUES**

3.1 **CONSTRUCTION ACTIVITIES FOR THE COMING MONTH**

As informed by the Contractor, the major works for the Contract in June 2020 are summarized in *Table 3.1*.

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

Works to be undertaken
<i>Land-based Works</i>
<ul style="list-style-type: none">• Road & Drainage works – Portion S-A, S-B & S-C and Northern Landfall;• UU installation - Portion S-A, S-B & S-C and Northern Landfall.

3.2 **KEY ISSUES FOR THE COMING MONTH**

Potential environmental impacts arising from the above upcoming construction activities in the next reporting month of June 2020 are mainly associated with dust and waste management issues.

3.3 **MONITORING SCHEDULE FOR THE COMING MONTH**

The tentative schedule for environmental monitoring in June 2020 is provided in *Appendix F*.

4.1*CONCLUSIONS*

This Seventy-ninth Monthly EM&A Report presents the findings of the EM&A activities undertaken during the period from 1 to 31 May 2020, 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.

No exceedances of 1-hour and 24-hour TSP Monitoring were recorded in the air quality monitoring of this reporting month.

No Chinese White Dolphin sighting was recorded during the two sets of surveys in May 2020. Whilst one (1) Limit Level exceedance was observed for the quarterly dolphin monitoring data between March and May 2020, no unacceptable impact from the construction activities of the TM-CLKL Northern Connection Sub-sea Tunnel Section on Chinese White Dolphins was noticeable from general observations.

Environmental site inspection was carried out four (4) times in May 2020. 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.

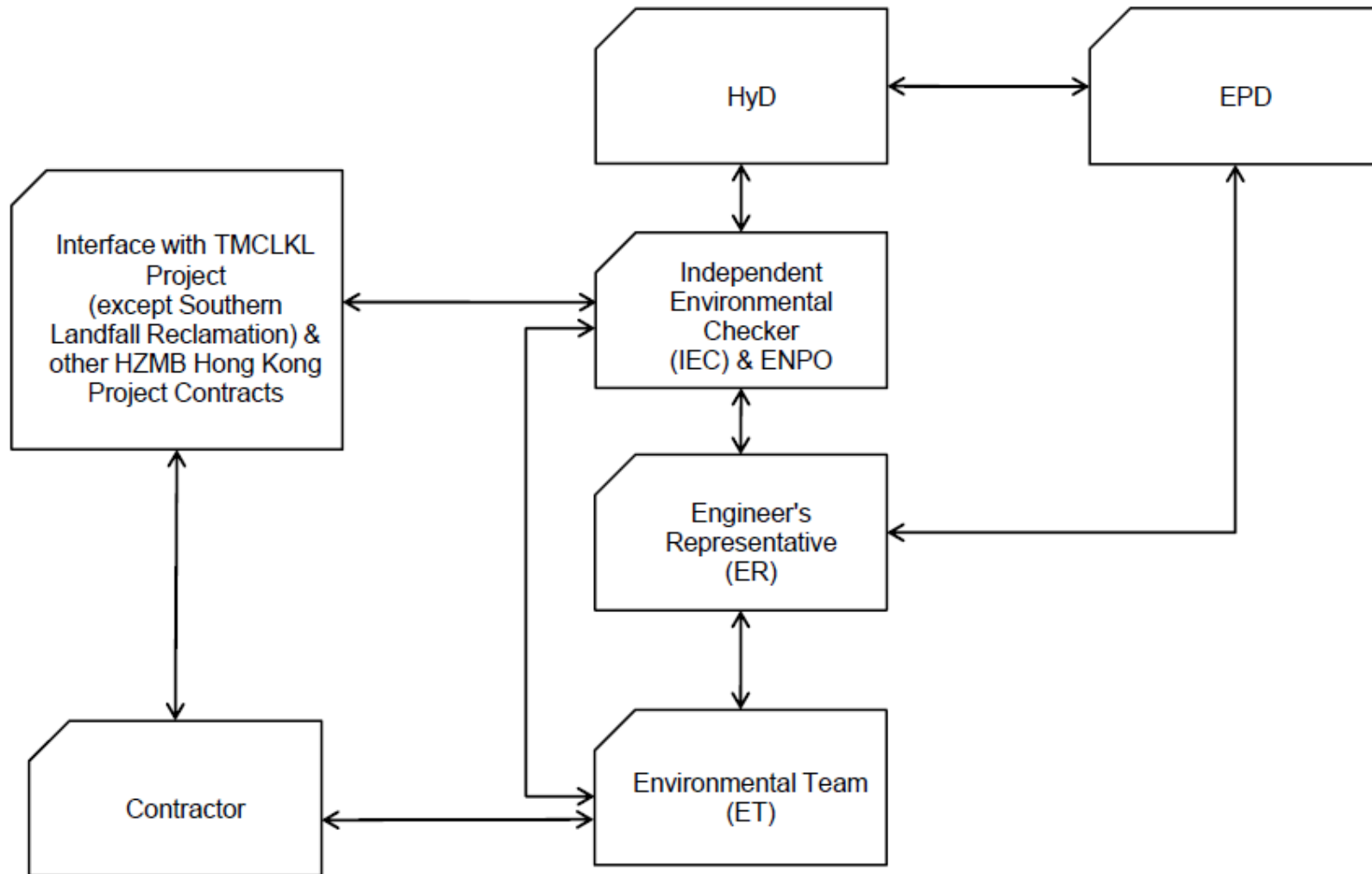
No environmental complaint was received in this reporting period.

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

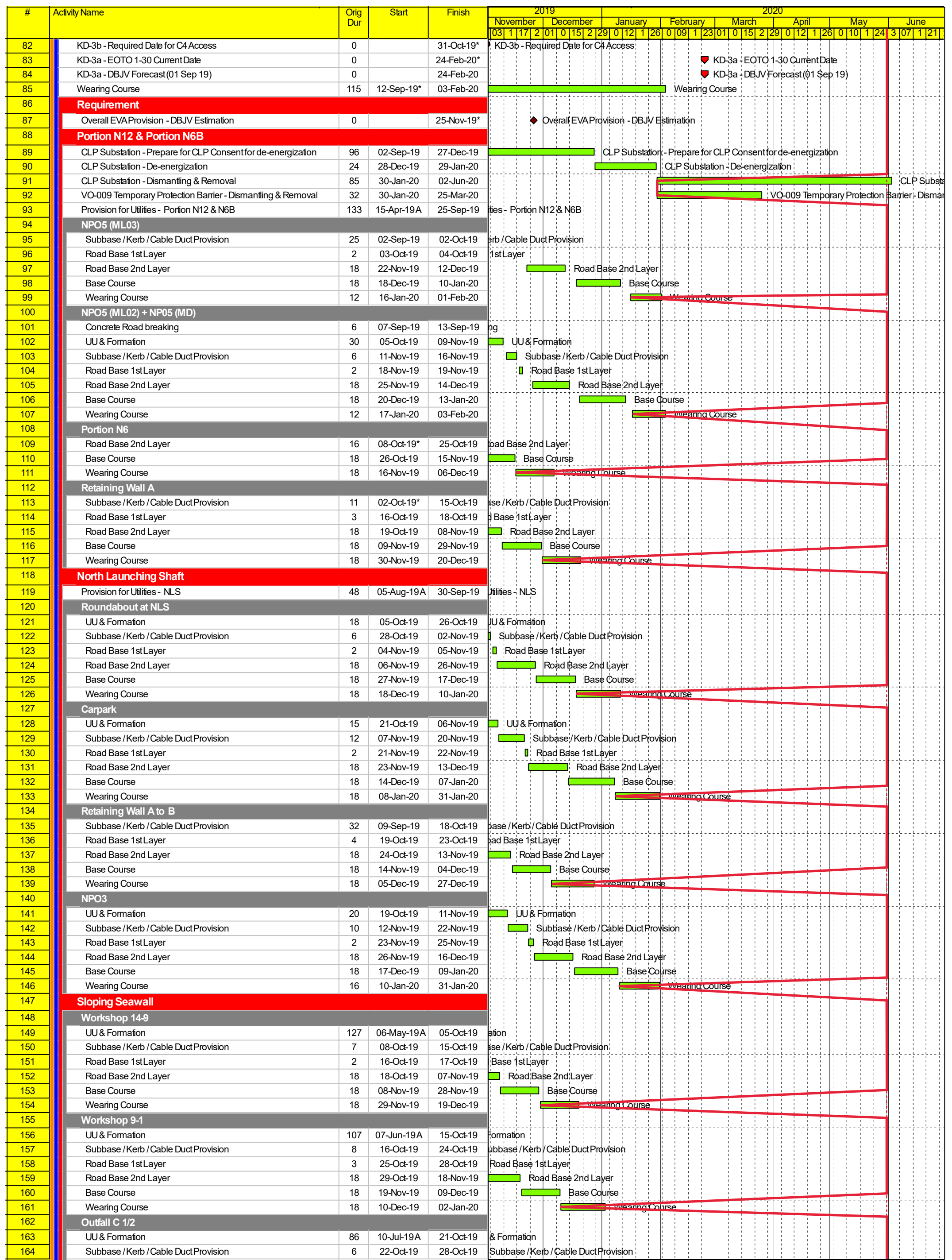


↔ Line of Communication

Appendix B

Construction Programme

#	Activity Name	Orig Dur	Start	Finish	2019												2020																			
					November				December				January				February				March				April				May				June			
					03	1	17	2	01	0	15	2	29	0	12	1	26	0	09	1	23	01	0	15	2	29	0	12	1	26	0	10	1	24	3	07
1	TMCLKL Northern Connection Sub-sea Tunnel Section																																			
2	Contract Key Dates																																			
3	[KD-2c] Stage 2c Completion - Remaining TSS & TSA	0		30-Nov-19*	[KD-2c] Stage 2c Completion - Remaining TSS & TSA																															
4	[KD-2d] Stage 2d Completion - MHS C&C Tunnel	0		15-Jan-20*	[KD-2d] Stage 2d Completion - MHS C&C Tunnel																															
5	[KD-3a] Stage 3a Completion - NLF UU/At-grade Provision	0		24-Feb-20*	[KD-3a] Stage 3a Completion - NLF UU/At-grade Provision																															
6	[KD-3b] Stage 3b Completion - NLF Provision for CLP, LV & ELV	0		30-Oct-19*	[KD-3b] Stage 3b Completion - NLF Provision for CLP, LV & ELV																															
7	[KD-3c] Stage 3c Completion - SLF UU & At-grade works provision	0		14-May-20*	[KD-3c] Stage 3c Completion - SLF UU & At-grade works provision																															
8	[KD-3d] Stage 3d Completion - SLF Provision for CLP, LV & ELV	0		08-Feb-20*	[KD-3d] Stage 3d Completion - SLF Provision for CLP, LV & ELV																															
9	[KD-3f] Stage 3f Achievement - NLS/NAR - provide access	0		21-Nov-19*	[KD-3f] Stage 3f Achievement - NLS/NAR - provide access																															
10	[KD-3g] Stage 3g Completion - SVS Tunnel	0		03-Nov-19*	[KD-3g] Stage 3g Completion - SVS Tunnel																															
11	[KD-3h] Stage 3h Completion - SVS Ventilation Duct	0		03-Feb-20*	[KD-3h] Stage 3h Completion - SVS Ventilation Duct																															
12	[KD-3i] Stage 3i Completion - South Approach Ramp	0		01-Dec-19*	[KD-3i] Stage 3i Completion - South Approach Ramp																															
13	[KD-8] Section 1 Completion - NLF Reclamation & Seawall	0		16-Jan-20*	[KD-8] Section 1 Completion - NLF Reclamation & Seawall																															
14	[KD-9] Section 2 Completion - Tunnels and Approach Ramp	0		05-May-20*	[KD-9] Section 2 Completion - Tunnels and Approach Ramp																															
15	[KD-10] Section 3A Completion - SVB	0		30-Sep-19*	[KD-10] Section 3A Completion - SVB																															
16	[KD-12] Section 4 Completion - SLF At-grade Road	0		14-May-20*	[KD-12] Section 4 Completion - SLF At-grade Road																															
17	[KD-13] Section 5 Completion - Preservation and Protection of Trees	0		14-May-20*	[KD-13] Section 5 Completion - Preservation and Protection of Trees																															
18	Portion Handover Dates																																			
19	N10 (excl Tunnel) - Handover	0		11-Dec-19*	N10 (excl Tunnel) - Handover																															
20	N11A - Handover	0		30-Nov-19*	N11A - Handover																															
21	N11B - Handover	0		30-Nov-19*	N11B - Handover																															
22	N13C, D, E, F, G, H, I - Handover	0		07-Apr-20*	N13C, D, E, F, G, H, I - Handover																															
23	N13Ji, Jii, Ki & Kii - Handover for E&M Contract scope	0		30-Nov-19*	N13Ji, Jii, Ki & Kii - Handover for E&M Contract scope																															
24	N14B - Handover	0		07-Apr-20*	N14B - Handover																															
25	N13B - Handover	0		07-Apr-20*	N13B - Handover																															
26	North Approach Ramp KD-3f																																			
27	KD-3f - DBJV Forecast (01 Sep 19)	0		19-Nov-19	KD-3f - DBJV Forecast (01 Sep 19)																															
28	[KD-3f] - EOTO 1-30 Current Date	0		19-Nov-19*	[KD-3f] - EOTO 1-30 Current Date																															
29	KD-3f - Required Date for C4 Access	0		02-Dec-19*	KD-3f - Required Date for C4 Access																															
30	North Approach Ramp																																			
31	Internal Structure																																			
32	Parapet grouting works	12	27-Aug-19A	09-Sep-19	Parapet grouting works																															
33	Parapet installation @ Bay 9 (part 1 precast)	4	10-Sep-19	13-Sep-19	Parapet installation @ Bay 9 (part 1 precast)																															
34	Utility Ladder modification	12	16-Sep-19	28-Sep-19	Utility Ladder modification																															
35	Breaking of Beams	6	30-Sep-19	08-Oct-19	Breaking of Beams																															
36	In-situ Parapet @ Bay 9 (Utility ladder location)	3	09-Oct-19	11-Oct-19	In-situ Parapet @ Bay 9 (Utility ladder location)																															
37	Road diversion to ML03 side	0	02-Oct-19*		Road diversion to ML03 side																															
38	ML02 side Sub-base backfilling	6	03-Oct-19	10-Oct-19	ML02 side Sub-base backfilling																															
39	Parapet installation (Central location)	28	11-Oct-19	12-Nov-19	Parapet installation (Central location)																															
40	Backfilling & slab topping	6	13-Nov-19	19-Nov-19	Backfilling & slab topping																															
41	Sign Gantry																																			
42	Procurement & Fabrication of Sign Gantry	41	05-Sep-19*	25-Oct-19	Procurement & Fabrication of Sign Gantry																															
43	Delivery of Sign Gantry to Site	1	26-Oct-19	26-Oct-19	Delivery of Sign Gantry to Site																															
44	Installation of Sign Gantry Beam (ML02 & ML03)	6	28-Oct-19	02-Nov-19	Installation of Sign Gantry Beam (ML02 & ML03)																															
45	North Launching Shaft KD-3f																																			
46	[KD-3f] - DBJV Forecast (01 Sep 19)	0		19-Nov-19	[KD-3f] - DBJV Forecast (01 Sep 19)																															
47	[KD-3f] - EOTO 1-30 Current Date	0		19-Nov-19*	[KD-3f] - EOTO 1-30 Current Date																															
48	[KD-3f] - Required Date for C4 Access	0		02-Dec-19*	[KD-3f] - Required Date for C4 Access																															
49	North Launching Shaft																																			
50	Thermal Barrier (Wall + OHVD Soffit + above OHVD)	70	22-Jul-19A	14-Oct-19	Thermal Barrier (Wall + OHVD Soffit + above OHVD)																															
51	VO72 - lead time	31	15-Oct-19	19-Nov-19	VO72 - lead time																															
52	Remaining North Reclamation KD-8																																			
53	[KD-8] - EOTO 1-30 Current Date	0		16-Jan-20*	[KD-8] - EOTO 1-30 Current Date																															
54	[KD-8] - DBJV Forecast (01 Sep 19)	0		16-Jan-20	[KD-8] - DBJV Forecast (01 Sep 19)																															
55	Vertical Seawall																																			
56	Access received from C4	0		28-Oct-19*	Access received from C4																															
57	Remaining Rubber Fender (VO79)	38	29-Oct-19	11-Dec-19	Remaining Rubber Fender (VO79)																															
58	Remaining Marine Facilities	12	12-Dec-19	27-Dec-19	Remaining Marine Facilities																															
59	Zone A Bay 65 to Bay 67	7	23-Oct-19	30-Oct-19	Zone A Bay 65 to Bay 67																															
60	Zone A Bay 68 to Bay 70	7	31-Oct-19	07-Nov-19	Zone A Bay 68 to Bay 70																															
61	Zone A Bay 71 to Bay 72	6	08-Nov-19	14-Nov-19	Zone A Bay 71 to Bay 72																															
62	Sloping Seawall																																			
63	Sloping Seawall coping	75	02-Sep-19	30-Nov-19	Sloping Seawall coping																															
64	Remaining Vertical Seawall coping (Westside)	34	23-Oct-19	30-Nov-19	Remaining Vertical Seawall coping (Westside)																															
65	Removal, Backfilling & Compaction																																			
66	NAR & NLS Backfilling and Formation	51	01-Aug-19A	30-Sep-19	NAR & NLS Backfilling and Formation																															
67	Zone A Fire Proofing factory dismantling	21	15-Oct-19*	07-Nov-19	Zone A Fire Proofing factory dismantling																															
68	Zone A Fire Proofing factory compaction	30	08-Nov-19	12-Dec-19	Zone A Fire Proofing factory compaction																															
69	Surcharge removal at Zone B (STP Area)	30	11-Nov-19*	14-Dec-19	Surcharge removal at Zone B (STP Area)																															
70	Zone B (STP Area) compaction (if needed)	12	16-Dec-19	31-Dec-19	Zone B (STP Area) compaction (if needed)																															
71	Zone C Gantry 2 & 3 removed	0		15-Nov-19*	Zone C Gantry 2 & 3 removed																															
72	Zone C Gantry 2 & 3 slab breaking & removal	12	16-Nov-19	29-Nov-19	Zone C Gantry 2 & 3 slab breaking & removal																															
73	Zone C Gantry 2 & 3 Compaction	18	30-Nov-19	20-Dec-19	Zone C Gantry 2 & 3 Compaction																															
74	Overall																																			
75	Sloping Seawall Echo Sounding survey	0		31-Oct-19*	Sloping Seawall Echo Sounding survey																															
76	Sloping Seawall Remedial works (if needed)	12	31-Oct-19	13-Nov-19	Sloping Seawall Remedial works (if needed)																															
77	Sloping Seawall Final Echo Sounding survey	0		13-Nov-19	Sloping Seawall Final Echo Sounding survey																															
78	Vertical seawall defect rectification	88	02-Oct-19	16-Jan-20	Vertical seawall defect rectification																															
79	NLF Demobilization & At-grade works																																			
80	KD-3b - EOTO 1-30 Current Date	0		29-Oct-19*	KD-3b - EOTO 1-30 Current Date																															
81	KD-3b - DBJV Forecast (01 Sep 19)	0		29-Oct-19*	KD-3b - DBJV Forecast (01 Sep 19)																															



#	Activity Name	Orig Dur	Start	Finish	2019												2020																			
					November				December				January				February				March				April				May				June			
					03	1	17	2	01	0	15	2	29	0	12	1	26	0	09	1	23	01	0	15	2	29	0	12	1	26	0	10	1	24	3	07
165	Road Base 1st Layer	2	29-Oct-19	30-Oct-19	Road Base 1st Layer																															
166	Road Base 2nd Layer	14	26-Nov-19	11-Dec-19	Road Base 2nd Layer																															
167	Base Course	14	16-Dec-19	03-Jan-20	Base Course																															
168	Wearing Course	12	07-Jan-20	20-Jan-20	Wearing Course																															
169	Outfall C 2/2																																			
170	UU & Formation	12	02-Nov-19	15-Nov-19	UU & Formation																															
171	Subbase /Kerb /Cable Duct Provision	6	16-Nov-19	22-Nov-19	Subbase /Kerb /Cable Duct Provision																															
172	Road Base 1st Layer	2	23-Nov-19	25-Nov-19	Road Base 1st Layer																															
173	Road Base 2nd Layer	14	28-Nov-19	13-Dec-19	Road Base 2nd Layer																															
174	Base Course	14	17-Dec-19	04-Jan-20	Base Course																															
175	Wearing Course	12	08-Jan-20	21-Jan-20	Wearing Course																															
176	Precast Segment Yard																																			
177	Roundabout/G4																																			
178	Subbase /Kerb /Cable Duct Provision	24	02-Sep-19	30-Sep-19	Subbase /Kerb /Cable Duct Provision																															
179	Road Base 1st Layer	2	02-Oct-19	03-Oct-19	Road Base 1st Layer																															
180	Road Base 2nd Layer	18	04-Oct-19	25-Oct-19	Road Base 2nd Layer																															
181	Base Course	18	26-Oct-19	15-Nov-19	Base Course																															
182	Wearing Course	18	16-Nov-19	06-Dec-19	Wearing Course																															
183	NVS & STP (Portion N7 Interface)																																			
184	North Ventilation Building																																			
185	Subbase /Kerb /Cable Duct Provision	9	02-Sep-19	11-Sep-19	Subbase /Kerb /Cable Duct Provision																															
186	Road Base 1st Layer	2	12-Sep-19	13-Sep-19	Road Base 1st Layer																															
187	Road Base 2nd Layer	18	23-Oct-19	12-Nov-19	Road Base 2nd Layer																															
188	Base Course	18	13-Nov-19	03-Dec-19	Base Course																															
189	Wearing Course	18	04-Dec-19	24-Dec-19	Wearing Course																															
190	FSD/CEDD																																			
191	Subbase /Kerb /Cable Duct Provision	18	02-Sep-19	23-Sep-19	Subbase /Kerb /Cable Duct Provision																															
192	Road Base 1st Layer	2	24-Sep-19	25-Sep-19	Road Base 1st Layer																															
193	Road Base 2nd Layer	18	26-Sep-19	18-Oct-19	Road Base 2nd Layer																															
194	Base Course	18	19-Oct-19	08-Nov-19	Base Course																															
195	Wearing Course	18	09-Nov-19	29-Nov-19	Wearing Course																															
196	Northern Landfall - Overall																																			
197	Street Furniture & Road Marking	2	04-Feb-20	24-Feb-20	Street Furniture & Road Marking																															
198	Remaining Internal Structure KD-2c																																			
199	[KD-2c]- EOTO 1-30 Current Date	0		30-Nov-19*	[KD-2c]- EOTO 1-30 Current Date																															
200	[KD-2c]- ML02 DBJV Forecast (01Sep19)	0		31-Oct-19	[KD-2c]- ML02 DBJV Forecast (01Sep19)																															
201	[KD-2c]- ML02 Required Date for C4 Access	0		31-Oct-19*	[KD-2c]- ML02 Required Date for C4 Access																															
202	[KD-2c]- Required Date for C4 Access	0		30-Nov-19*	[KD-2c]- Required Date for C4 Access																															
203	[KD-2c]- ML03 DBJV Forecast (01Sep19)	0		30-Nov-19	[KD-2c]- ML03 DBJV Forecast (01Sep19)																															
204	ML02 TSS																																			
205	ML02 TSS CP13-SVS - Thermal Barrier Wall	47	22-Jul-19A	13-Sep-19	ML02 TSS CP13-SVS - Thermal Barrier Wall																															
206	VO72 - lead time	12	16-Sep-19	28-Sep-19	VO72 - lead time																															
207	ML02 SVS																																			
208	ML02 SVS - Water Leakage 1month (TBC)	26	27-Aug-19A	26-Sep-19	ML02 SVS - Water Leakage 1month (TBC)																															
209	ML02 SVS - Thermal Barrier above OHVD	6	25-Oct-19	31-Oct-19	ML02 SVS - Thermal Barrier above OHVD																															
210	ML02 SVS - Parapet	12	18-Sep-19*	02-Oct-19	ML02 SVS - Parapet																															
211	ML02 SVS - Walkway corbel	6	03-Oct-19	10-Oct-19	ML02 SVS - Walkway corbel																															
212	ML02 SVS - Thermal Barrier OHVD Soffit	6	11-Oct-19	17-Oct-19	ML02 SVS - Thermal Barrier OHVD Soffit																															
213	ML02 SVS - Thermal Barrier Wall	6	18-Oct-19	24-Oct-19	ML02 SVS - Thermal Barrier Wall																															
214	VO72 - lead time	6	25-Oct-19	31-Oct-19	VO72 - lead time																															
215	ML02 TSA																																			
216	ML02 TSA - Thermal Barrier Wall	18	02-Sep-19	23-Sep-19	ML02 TSA - Thermal Barrier Wall																															
217	ML02 TSA - Thermal Barrier above OHVD	18	24-Sep-19	16-Oct-19	ML02 TSA - Thermal Barrier above OHVD																															
218	ML02 TSA - Thermal Barrier OHVD Soffit	24	24-Sep-19	23-Oct-19	ML02 TSA - Thermal Barrier OHVD Soffit																															
219	VO72 - lead time	10	24-Oct-19	04-Nov-19	VO72 - lead time																															
220	ML03 TSS																																			
221	ML03 TSS Entrance - Remaining OHVD	17	20-Aug-19A	07-Sep-19	ML03 TSS Entrance - Remaining OHVD																															
222	ML03 TSS CP11-SVS - Thermal Barrier OHVD Soffit	19	17-Sep-19	10-Oct-19	ML03 TSS CP11-SVS - Thermal Barrier OHVD Soffit																															
223	VO72 - lead time	12	11-Oct-19	24-Oct-19	VO72 - lead time																															
224	ML03 TSS CP11-SVS - Thermal Barrier Wall	30	19-Aug-19A	23-Sep-19	ML03 TSS CP11-SVS - Thermal Barrier Wall																															
225	ML03 TSS CP13-SVS - Thermal Barrier above OHVD	18	11-Oct-19	31-Oct-19	ML03 TSS CP13-SVS - Thermal Barrier above OHVD																															
226	ML03 SVS																																			
227	ML03 SVS - ISSG Crossing	9	09-Sep-19	19-Sep-19	ML03 SVS - ISSG Crossing																															
228	Removal of props after ISSG Crossing	6	20-Sep-19	26-Sep-19	Removal of props after ISSG Crossing																															
229	ML03 SVS - Weathertight	0		27-Sep-19*	ML03 SVS - Weathertight																															
230	ML03 SVS - Parapet	6	23-Oct-19	29-Oct-19	ML03 SVS - Parapet																															
231	ML03 SVS - Walkway corbel	6	30-Oct-19	05-Nov-19	ML03 SVS - Walkway corbel																															
232	ML03 SVS - Thermal Barrier above OHVD	9	20-Nov-19	29-Nov-19	ML03 SVS - Thermal Barrier above OHVD																															
233	ML03 SVS - Thermal Barrier OHVD Soffit	6	06-Nov-19	12-Nov-19	ML03 SVS - Thermal Barrier OHVD Soffit																															
234	ML03 SVS - Thermal Barrier Wall	6	13-Nov-19	19-Nov-19	ML03 SVS - Thermal Barrier Wall																															
235	VO72 - lead time	10	20-Nov-19	30-Nov-19	VO72 - lead time																															
236	ML03 SVS - Water Leakage 1month (TBC)	26	28-Sep-19	30-Oct-19	ML03 SVS - Water Leakage 1month (TBC)																															
237	ML03 TSA																																			
238	ML03 TSA - Corbel installation	93	21-May-19A	07-Sep-19	ML03 TSA - Corbel installation																															
239	ML03 TSA - Parapet installation	29	27-Aug-19A	30-Sep-19	ML03 TSA - Parapet installation																															
240	ML03 TSA - Walkway installation	30	02-Sep-19	09-Oct-19	ML03 TSA - Walkway installation																															
241	ML03 TSA - OHVD slab	11	20-Sep-19	03-Oct-19	ML03 TSA - OHVD slab																															
242	ML03 TSA - OHVD slab stitching	6	04-Oct-19	11-Oct-19	ML03 TSA - OHVD slab stitching																															
243	ML03 TSA - Thermal Barrier Wall	24	02-Oct-19	30-Oct-19	ML03 TSA - Thermal Barrier Wall																															
244	ML03 TSA - Thermal Barrier - OHVD Soffit	24	21-Oct-19	16-Nov-19	ML03 TSA - Thermal Barrier - OHVD Soffit																															
245	VO72 - lead time	12	18-Nov-19	30-Nov-19	VO72 - lead time																															
246	ML03 TSA - Thermal Barrier above OHVD	12	18-Nov-19	30-Nov-19	ML03 TSA - Thermal Barrier above OHVD																															

- Planned Bar
- ◆ Planned Milestone
- ◆ Key Date
- ◆ Progress Milestone
- Progress Bar

Dragages - Bouygues Joint Venture 寶嘉 - 布依格聯營

Date	Revision	Checked	Approved
22-Dec-17	RevH	WYu	
05-Feb-18	RevIAC	WYu	
07-Mar-18	RevI	WYu	
04-Jun-18	RevJ	WYu	
11-Nov-19	RevK	SPa	WYu
22-Jan-20	RevK1	SPa	WYu

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	
Air Quality									
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		✓
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		✓

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						D	C	O	
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		✓
WATER QUALITY									
<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		N/A
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		N/A

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Northern Connection Sub-sea Tunnel Section
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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
6.1	-	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		N/A
6.1	-	Use of cage type silt curtains round all grab dredgers during the HKBCF, HKLR and TM-CLKL southern reclamation works.	All areas dredging works	Contractor	TM-EIAO		Y		N/A
	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		N/A
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		N/A
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		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	
6.1 Figure 6.2b Appendix D6b	Annex A	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 - Reclamation dredging and filling for Portion 1 of HKLR;	TM-CLKL northern landfall, Portion D of HKBCF and HKLR	Contractor	TM-EIAO		Y		N/A
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		N/A
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		N/A
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		N/A
<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		N/A
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

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						D	C	O	
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		N/A
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 Guidelines. DASO permit conditions.		Y		N/A
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		N/A
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		N/A
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		N/A
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

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						D	C	O	
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 conditions.		Y		N/A
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		N/A
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		N/A
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		N/A
<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		✓
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		✓

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
6.1	-	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		✓
<i>Water Quality Monitoring</i>									
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	Post-construction water quality monitoring was completed on 11 April 2020.
ECOLOGY									
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	✓

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						D	C	O	
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		✓
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		✓
LANDSCAPE AND VISUAL									

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

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

*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	
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
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
WASTE									
12.6		The Contractor shall identify a coordinator for the management of waste.	Contract mobilisation	Contractor	TMEIA		Y		✓
12.6		The Contractor shall prepare and implement a Waste Management Plan which specifies procedures such as a ticketing system, to facilitate tracking of loads and to ensure that illegal disposal of wastes does not occur, and protocols for the maintenance of records of the quantities of wastes generated, recycled and disposed. A recording system for the amount of waste generated, recycled and disposed (locations) should be established.	Contract mobilisation	Contractor	TMEIA, Works Branch Technical Circular No. 5/99 for the Trip-ticket System for Disposal of Construction and Demolition Material		Y		✓

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

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

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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		The Contractor shall apply for and obtain the appropriate licenses for the disposal of public fill, chemical waste and effluent discharges.	Contract mobilisation	Contractor	TMEIA, Land (Miscellaneous Provisions) Ordinance (Cap 28); Waste Disposal Ordinance (Cap 354); Dumping at Sea Ordinance (Cap 466); Water Pollution Control Ordinance.		Y		✓
12.6	8.1	Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures including waste reduction, reuse and recycling.	Contract Mobilisation	Contractor	TMEIA		Y		✓
12.6	8.1	The extent of cutting operation should be optimised where possible. Earth retaining structures and bored pile walls should be proposed to minimise the extent of cutting.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	The 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		✓

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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	Stockpiled material shall be covered by tarpaulin and /or watered as appropriate to prevent windblown dust/ surface run off.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Excavated material in trucks shall be covered by tarpaulins to reduce the potential for spillage and dust generation.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Wheel washing facilities shall be used by all trucks leaving the site to prevent transfer of mud onto public roads.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	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		✓

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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	
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; f Having a capacity of <450L unless the specifications have been approved by the EPD; and w Chinese according to the instructions prescribed in Schedule 2 of the Regulations. f Clearly labelled and used solely for the storage of chemical wastes; f Enclosed with at least 3 sides; f 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; f Adequate ventilation; f Sufficiently covered to prevent rainfall entering (water collected within the bund must be tested and disposed of as chemical waste, if necessary); and f Incompatible materials are adequately separated.	All areas / throughout construction period	Contractor	TMEIA		Y		<>
12.6	8.1	Waste oils, chemicals or solvents shall not be disposed of to drain,	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Adequate numbers of portable toilets should be provided for on site workers. Portable toilets should be maintained in reasonable states, which will not deter the workers from utilising them.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Night soil should be regularly collected by licensed collectors.	All areas / throughout construction period	Contractor	TMEIA		Y		N/A

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

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

*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	
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		✓
CULTURAL HERITAGE									
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

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

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

Appendix D

Summary of Action and Limit Levels

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

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

Table D2 *Action and Limit Levels for Impact Dolphin Monitoring*

	North Lantau Social Cluster	
	NEL	NWL
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)*

	North Lantau Social Cluster	
	NEL	NWL
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 : 08/04/2020

Sampler

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

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454
 Service Date : 18 February 2020
 Slope (m) : 2.07134
 Intercept (b) : -0.04091
 Correlation Coefficient(r) : 0.99999

Standard Condition

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

Calibration Condition

Pa (hpa) : 1016
 Ta(K) : 298

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1 18 holes	12.0	3.469	1.695	55	55.08
2 13 holes	9.5	3.087	1.510	50	50.07
3 10 holes	6.8	2.612	1.281	44	44.07
4 7 holes	4.6	2.148	1.057	37	37.05
5 5 holes	2.5	1.583	0.784	28	28.04

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

Sampler Calibration Relationship (Linear Regression)

Slope(m): 29.595 Intercept(b): 5.420 Correlation Coefficient(r): 0.9986

Checked by: Magnum Fan

Date: 14/04/2020

High-Volume TSP Sampler
5-Point Calibration Record

Location : ASR10
 Calibrated by : P.F.Yeung
 Date : 08/04/2020

Sampler

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

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454
 Service Date : 18 February 2020
 Slope (m) : 2.07134
 Intercept (b) : -0.04091
 Correlation Coefficient(r) : 0.99999

Standard Condition

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

Calibration Condition

Pa (hpa) : 1016
 Ta(K) : 298

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1 18 holes	11.4	3.381	1.652	54	54.08
2 13 holes	9.2	3.038	1.486	50	50.07
3 10 holes	6.5	2.553	1.252	45	45.07
4 7 holes	4.4	2.101	1.034	37	37.05
5 5 holes	2.2	1.485	0.737	27	27.04

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): 29.613

Intercept(b): 6.169

Correlation Coefficient(r): 0.9943

Checked by: Magnum Fan

Date: 14/04/2020

High-Volume TSP Sampler
5-Point Calibration Record

Location : AQMS1
 Calibrated by : P.F.Yeung
 Date : 08/04/2020

Sampler

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

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454
 Service Date : 18 February 2020
 Slope (m) : 2.07134
 Intercept (b) : -0.04091
 Correlation Coefficient(r) : 0.99999

Standard Condition

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

Calibration Condition

Pa (hpa) : 1016
 Ta(K) : 298

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1 18 holes	12.0	3.469	1.695	54	54.08
2 13 holes	9.2	3.038	1.486	50	50.07
3 10 holes	6.6	2.573	1.262	44	44.07
4 7 holes	4.4	2.101	1.034	36	36.05
5 5 holes	2.4	1.551	0.769	28	28.04

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

Sampler Calibration Relationship (Linear Regression)

Slope(m): 28.778

Intercept(b): 6.516

Correlation Coefficient(r): 0.9955

Checked by: Magnum Fan

Date: 14/04/2020

High-Volume TSP Sampler
5-Point Calibration Record

Location : ASR 1
 Calibrated by : P.F.Yeung
 Date : 08/04/2020

Sampler

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

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454
 Service Date : 18 February 2020
 Slope (m) : 2.07134
 Intercept (b) : -0.04091
 Correlation Coefficient(r) : 0.99999

Standard Condition

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

Calibration Condition

Pa (hpa) : 1016
 Ta(K) : 298

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1 18 holes	11.6	3.411	1.666	52	52.08
2 13 holes	9.0	3.004	1.470	48	48.07
3 10 holes	6.7	2.592	1.271	43	43.06
4 7 holes	4.4	2.101	1.034	35	35.05
5 5 holes	2.2	1.485	0.737	27	27.04

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

Sampler Calibration Relationship (Linear Regression)

Slope(m): 27.603 Intercept(b): 6.950 Correlation Coefficient(r): 0.9971

Checked by: Magnum Fan

Date: 14/04/2020

High-Volume TSP Sampler
5-Point Calibration Record

Location : ASR 6
 Calibrated by : P.F.Yeung
 Date : 08/04/2020

Sampler

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

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454
 Service Date : 18 February 2020
 Slope (m) : 2.07134
 Intercept (b) : -0.04091
 Correlation Coefficient(r) : 0.99999

Standard Condition

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

Calibration Condition

Pa (hpa) : 1016
 Ta(K) : 298

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1 18 holes	11.8	3.440	1.681	54	54.08
2 13 holes	9.2	3.038	1.486	49	49.07
3 10 holes	6.4	2.534	1.243	45	45.07
4 7 holes	4.5	2.124	1.045	38	38.06
5 5 holes	2.4	1.551	0.769	30	30.04

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

Sampler Calibration Relationship (Linear Regression)

Slope(m): 26.126 Intercept(b): 10.743 Correlation Coefficient(r): 0.9935

Checked by: Magnum Fan

Date: 14/04/2020

Certificate of Calibration

Calibration Certification Information			
Cal. Date: February 18, 2020	Rootsmeter S/N: 438320	Ta: 294	°K
Operator: Jim Tisch		Pa: 753.1	mm Hg
Calibration Model #: TE-5025A	Calibrator S/N: 2454		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4190	3.2	2.00
2	3	4	1	1.0100	6.4	4.00
3	5	6	1	0.9020	7.9	5.00
4	7	8	1	0.8600	8.8	5.50
5	9	10	1	0.7110	12.7	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)
1.0001	0.7048	1.4173	0.9958	0.7017	0.8836
0.9959	0.9860	2.0044	0.9915	0.9817	1.2496
0.9939	1.1019	2.2410	0.9895	1.0970	1.3971
0.9927	1.1543	2.3504	0.9883	1.1492	1.4653
0.9875	1.3889	2.8347	0.9831	1.3828	1.7672
QSTD	m=	2.07134	QA	m=	1.29704
	b=	-0.04091		b=	-0.02551
	r=	0.99999		r=	0.99999

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



輝創工程有限公司

Sun Creation Engineering Limited

Calibration & Testing Laboratory

Certificate of Calibration

校正證書

Certificate No. : C193443

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC19-1283)

Date of Receipt / 收件日期 : 21 June 2019

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 : $(23 \pm 2)^{\circ}\text{C}$

Relative Humidity / 相對濕度 : $(50 \pm 25)\%$

Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 2 July 2019

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

T F Lee

Assistant Engineer

Certified By

核證

H C Chan

Engineer

Date of Issue

簽發日期

5 July 2019

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。

Sun Creation Engineering Limited - Calibration & Testing Laboratory

c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

輝創工程有限公司 - 校正及檢測實驗室

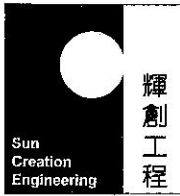
c/o 香港新界屯門興安里一號四樓

Tel/電話: (852) 2927 2606

Fax/傳真: (852) 2744 8986

E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com



Certificate of Calibration

校正證書

Certificate No. : C193443
證書編號

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

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

- Test procedure : MA130N.
- Results :

Air Velocity

Applied Value (m/s)	UUT Reading (m/s)	Measured Correction		
		Value (m/s)	Measurement Uncertainty	
			Expanded Uncertainty (m/s)	Coverage Factor
2.0	1.8	+0.2	0.2	2.0
4.0	3.8	+0.2	0.3	2.0
6.0	5.8	+0.2	0.3	2.0
8.1	7.9	+0.2	0.3	2.0
10.1	10.0	+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。局部複印本證書需先獲本實驗室書面批准。

ENVIROTECH SERVICES CO.

Calibration Report of Wind Meter

Date of Calibration : 30 December 2019

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)
3.1	3.3
2.6	2.8
1.4	1.2

Wind Direction Test

Davis (o)	Marine Compass (o)
271	270
0	0
89	90
179	180

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

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

Appendix F

EM&A Monitoring Schedules

**HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Tentative Air Quality Impact Monitoring Schedule - May 2020**

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

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					01-May	02-May
						1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM
03-May	04-May	05-May	06-May	07-May	08-May	09-May
		1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM	
10-May	11-May	12-May	13-May	14-May	15-May	16-May
	1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM		
17-May	18-May	19-May	20-May	21-May	22-May	23-May
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
24-May	25-May	26-May	27-May	28-May	29-May	30-May
		1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM	
31-May						

**HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Tentative Air Quality Impact Monitoring Schedule - June 2020**

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

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	01-Jun	02-Jun	03-Jun	04-Jun	05-Jun	06-Jun
	1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM		
07-Jun	08-Jun	09-Jun	10-Jun	11-Jun	12-Jun	13-Jun
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-Jun	15-Jun	16-Jun	17-Jun	18-Jun	19-Jun	20-Jun
		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-Jun	22-Jun	23-Jun	24-Jun	25-Jun	26-Jun	27-Jun
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-Jun	29-Jun	30-Jun				
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
Tentative Impact Dolphin Monitoring Survey Monitoring Schedule - May 2020**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					01-May	02-May
03-May	04-May	05-May	06-May	07-May	08-May	09-May
		Impact Dolphin Monitoring				
10-May	11-May	12-May	13-May	14-May	15-May	16-May
		Impact Dolphin Monitoring				
17-May	18-May	19-May	20-May	21-May	22-May	23-May
	Impact Dolphin Monitoring					
24-May	25-May	26-May	27-May	28-May	29-May	30-May
	Impact Dolphin Monitoring					
31-May						

**HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Tentative Operational Phase Dolphin Monitoring Survey Monitoring Schedule - June 2020**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	01-Jun	02-Jun	03-Jun	04-Jun	05-Jun	06-Jun
		Operational Phase Dolphin Monitoring				
07-Jun	08-Jun	09-Jun	10-Jun	11-Jun	12-Jun	13-Jun
		Operational Phase Dolphin Monitoring				
14-Jun	15-Jun	16-Jun	17-Jun	18-Jun	19-Jun	20-Jun
		Operational Phase Dolphin Monitoring				
21-Jun	22-Jun	23-Jun	24-Jun	25-Jun	26-Jun	27-Jun
		Operational Phase Dolphin Monitoring				
28-Jun	29-Jun	30-Jun				

The schedule is subject to agreement from the EPD on the monitoring times. The schedule will be revised in view of adverse(safety,weather etc) conditions.

**HY/2012/08 - Tuen Mun - Chek Lap Kok Link - Northern Landfall
Operational Phase Marine Water Quality Monitoring (WQM) Schedule (June 2020)**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Jun	2-Jun	3-Jun	4-Jun	5-Jun	6-Jun
7-Jun	8-Jun	9-Jun	10-Jun	11-Jun	12-Jun	13-Jun
14-Jun	15-Jun	16-Jun	17-Jun	18-Jun	19-Jun	20-Jun
21-Jun	22-Jun	23-Jun	24-Jun	25-Jun	26-Jun	27-Jun
			ebb tide 13:26 - 16:56 flood tide 6:15 - 9:45			
28-Jun	29-Jun	30-Jun				

The schedule is subject to agreement from the EPD on the monitoring times. The schedule will be revised in view of adverse(safety,weather etc) conditions.

Appendix G

Impact Air Quality Monitoring Results

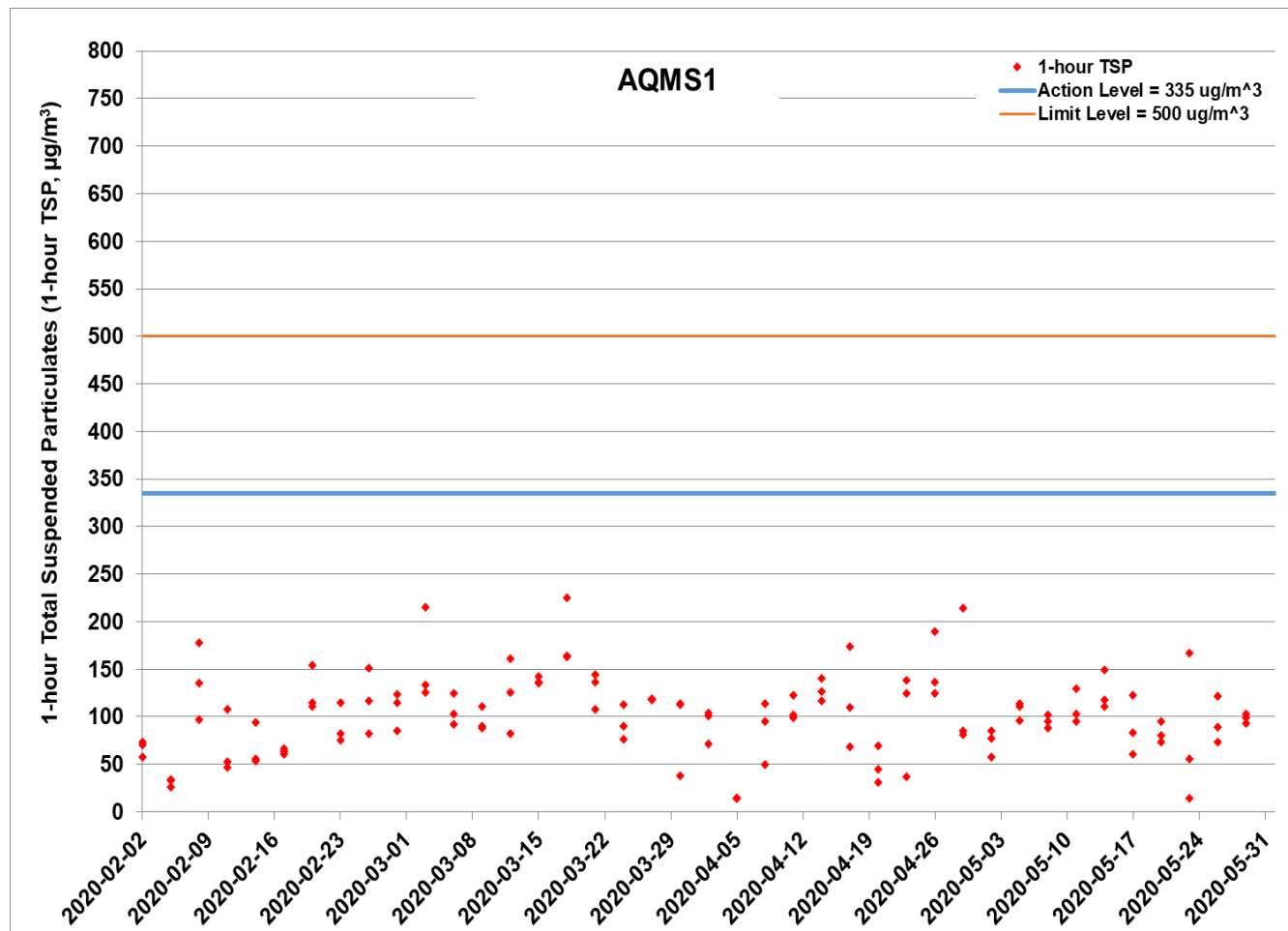


Figure G.1 Impact Monitoring – 1-hour Total Suspended Particulates ($\mu\text{g}/\text{m}^3$) at AQMS1 between 1 February 2020 and 31 May 2020 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Road and Drainage Works at Northern Landfall and Southern Landfall, UU installation at Northern Landfall and Southern Landfall and Fireboard installation in Tunnel (1/2/2020 – 31/5/2020)

Ref: 0212330_Impact AQM graphs_May 2020.xlsx



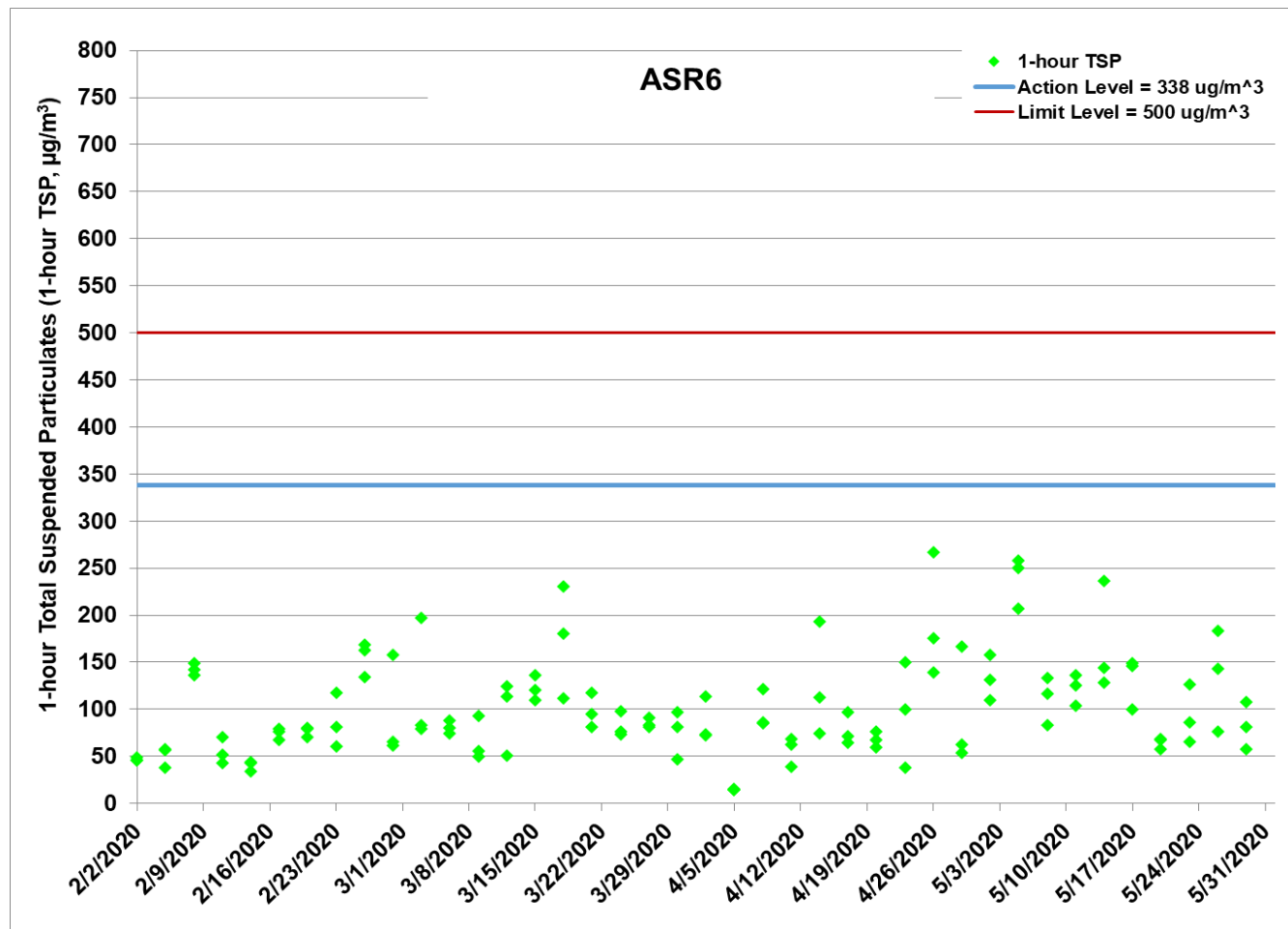


Figure G.2 Impact Monitoring – 1-hour Total Suspended Particulates ($\mu\text{g}/\text{m}^3$) at ASR6 between 1 February 2020 and 31 May 2020 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Road and Drainage Works at Northern Landfall and Southern Landfall, UU installation at Northern Landfall and Southern Landfall and Fireboard installation in Tunnel (1/2/2020 – 31/5/2020)

Ref: 0212330_Impact AQM graphs_May 2020.xlsx



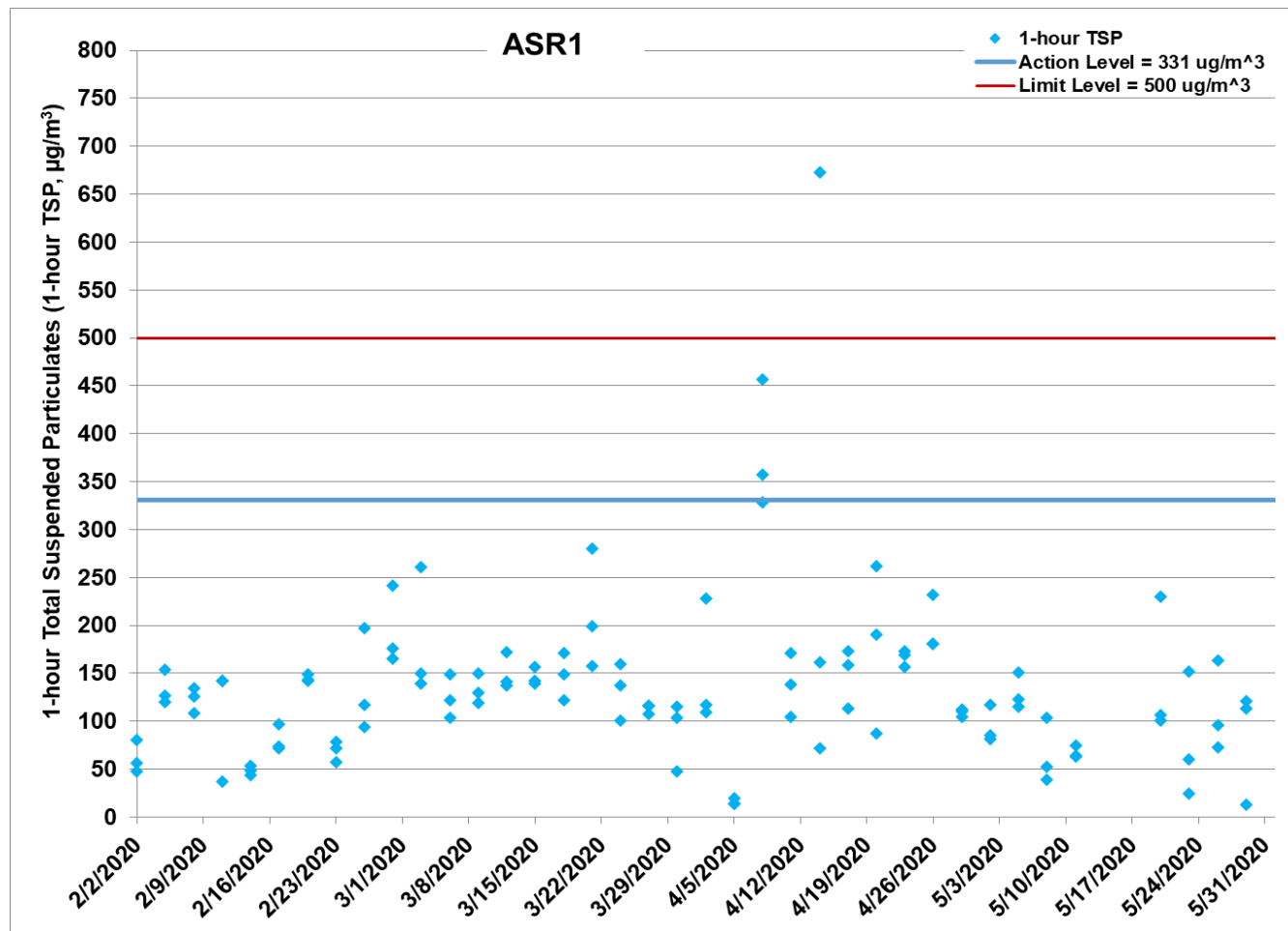


Figure G.3 Impact Monitoring – 1-hour Total Suspended Particulates ($\mu\text{g}/\text{m}^3$) at ASR1 between 1 February 2020 and 31 May 2020 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Road and Drainage Works at Northern Landfall and Southern Landfall, UU installation at Northern Landfall and Southern Landfall and Fireboard installation in Tunnel (1/2/2020 – 31/5/2020)

Ref: 0212330_Impact AQM graphs_May 2020.xlsx



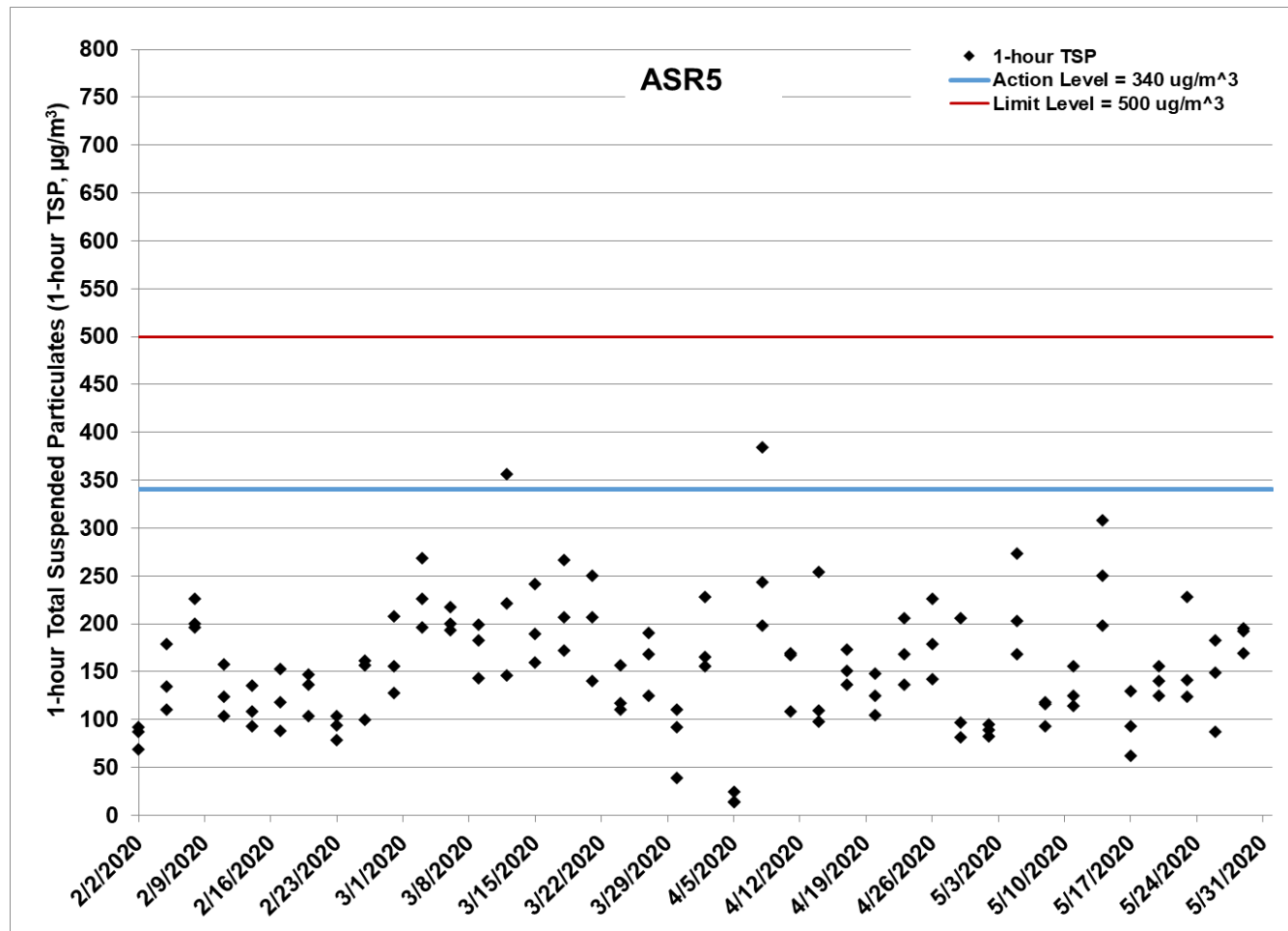


Figure G.4 Impact Monitoring - 1-hour Total Suspended Particulates ($\mu\text{g}/\text{m}^3$) at ASR5 between 1 February 2020 and 31 May 2020 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Road and Drainage Works at Northern Landfall and Southern Landfall, UU installation at Northern Landfall and Southern Landfall and Fireboard installation in Tunnel (1/2/2020 - 31/5/2020)

Ref: 0212330_Impact AQM graphs_May 2020.xlsx



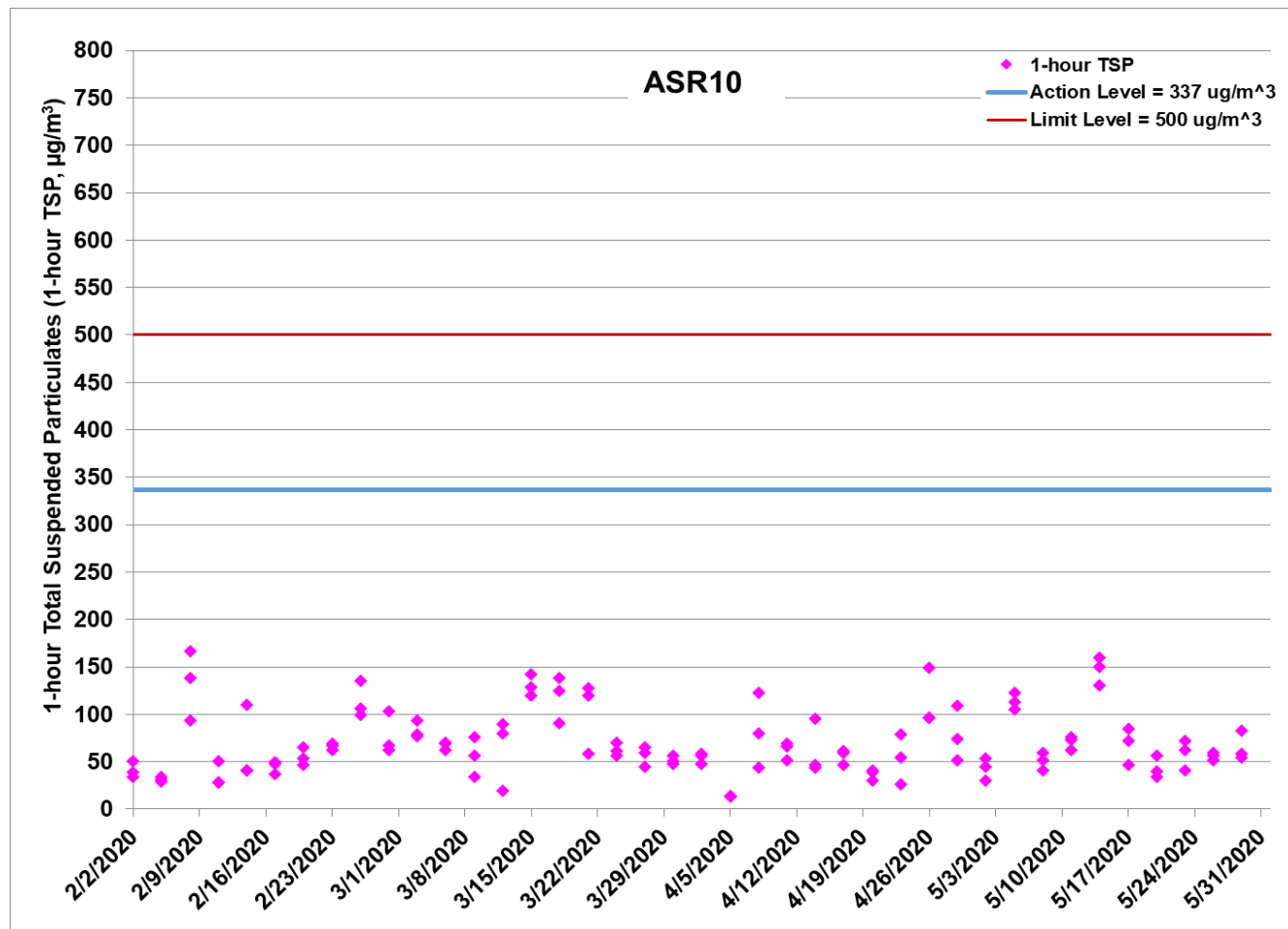


Figure G.5 Impact Monitoring - 1-hour Total Suspended Particulates ($\mu\text{g}/\text{m}^3$) at ASR10 between 1 February 2020 and 31 May 2020 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Road and Drainage Works at Northern Landfall and Southern Landfall, UU installation at Northern Landfall and Southern Landfall and Fireboard installation in Tunnel (1/2/2020 - 31/5/2020)

Ref: 0212330_Impact AQM graphs_May 2020.xlsx



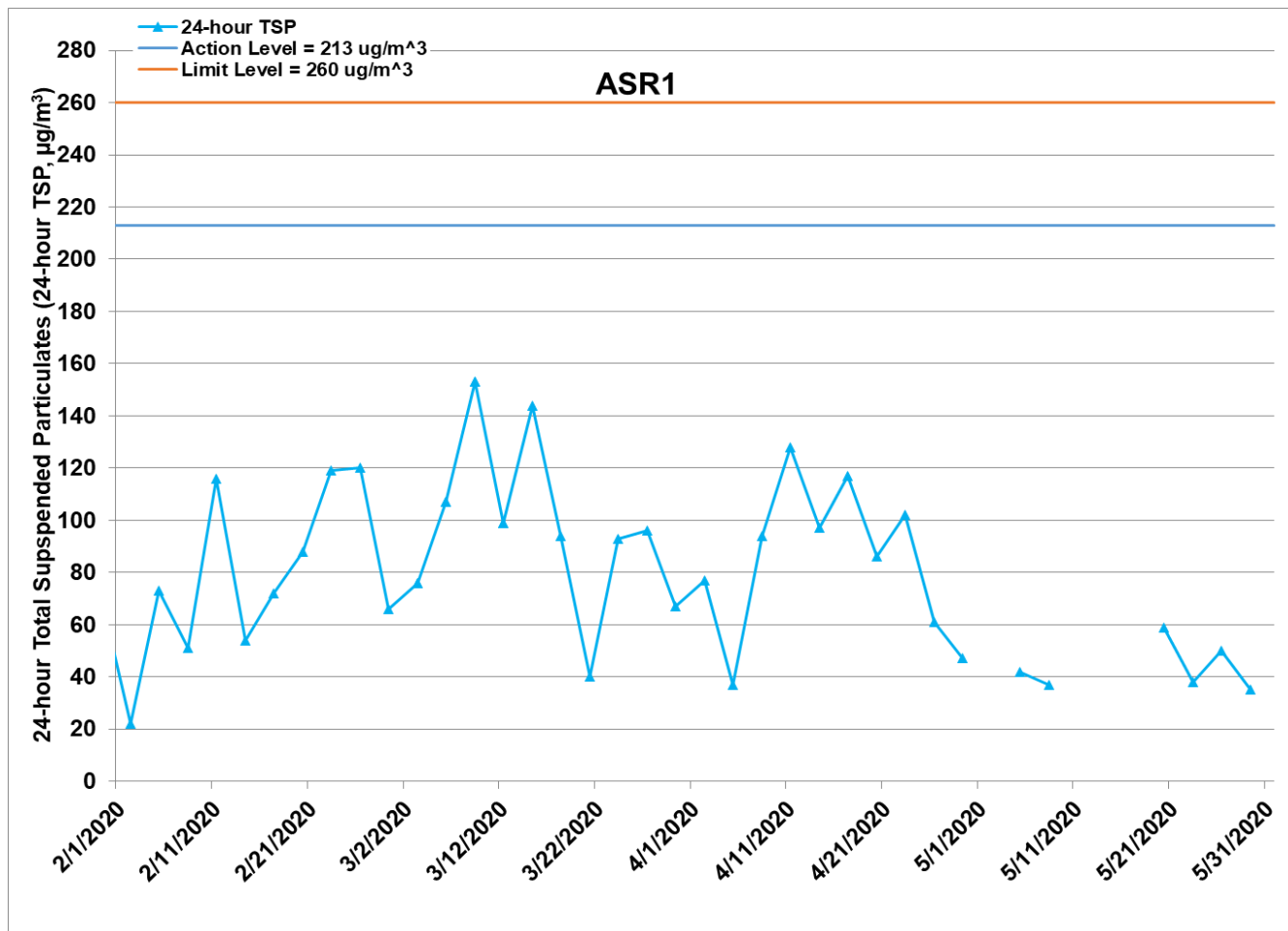


Figure G.6 Impact Monitoring – 24-hour Total Suspended Particulates ($\mu\text{g}/\text{m}^3$) at ASR1 between 1 February 2020 and 31 May 2020 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Road and Drainage Works at Northern Landfall and Southern Landfall, UU installation at Northern Landfall and Southern Landfall and Fireboard installation in Tunnel (1/2/2020 – 31/5/2020)

Ref: 0212330_Impact AQM graphs_May 2020.xlsx



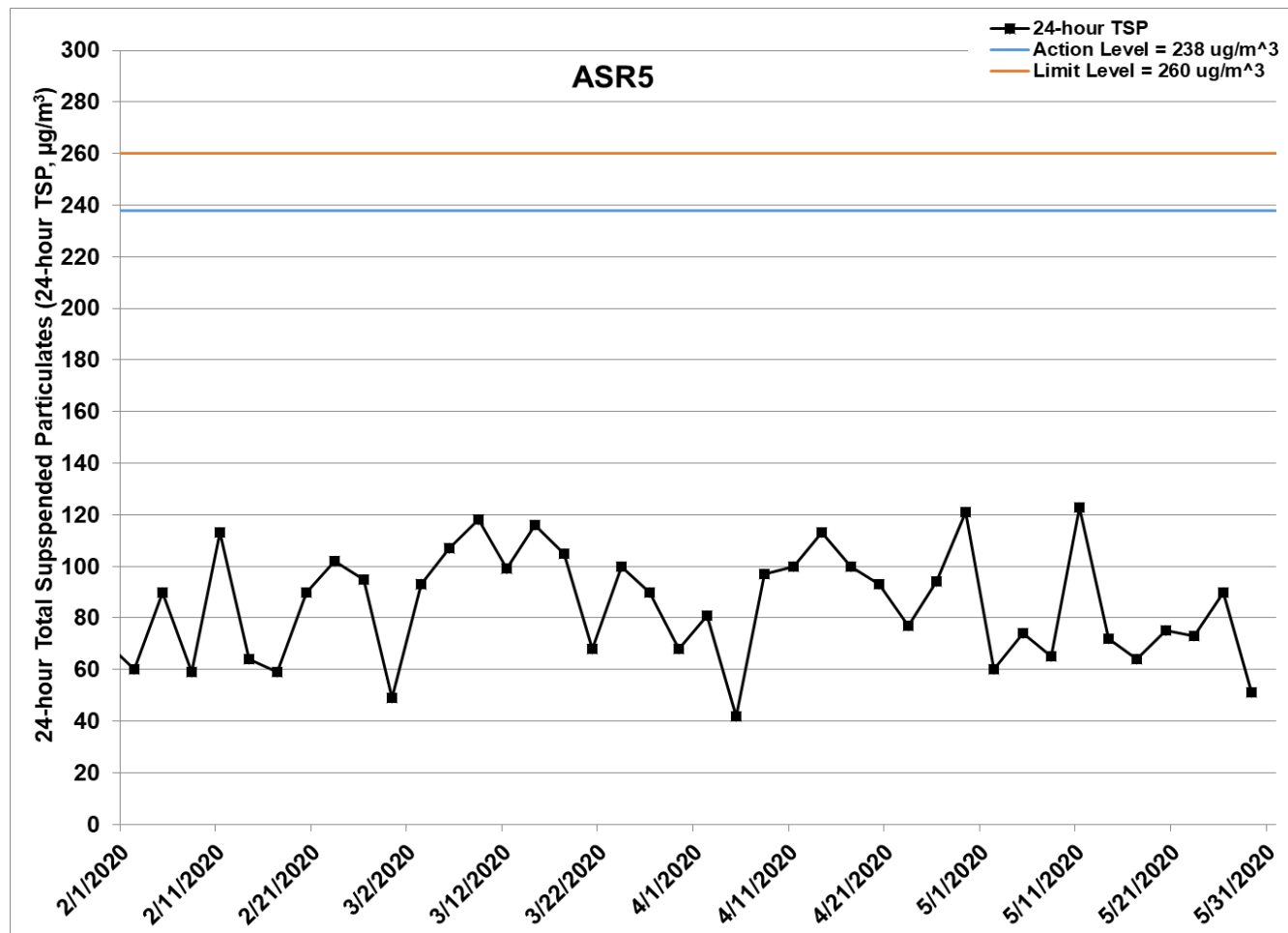


Figure G.7 Impact Monitoring - 24-hour Total Suspended Particulates ($\mu\text{g}/\text{m}^3$) at ASR5 between 1 February 2020 and 31 May 2020 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Road and Drainage Works at Northern Landfall and Southern Landfall, UU installation at Northern Landfall and Southern Landfall and Fireboard installation in Tunnel (1/2/2020 - 31/5/2020)

Ref: 0212330_Impact AQM graphs_May 2020.xlsx



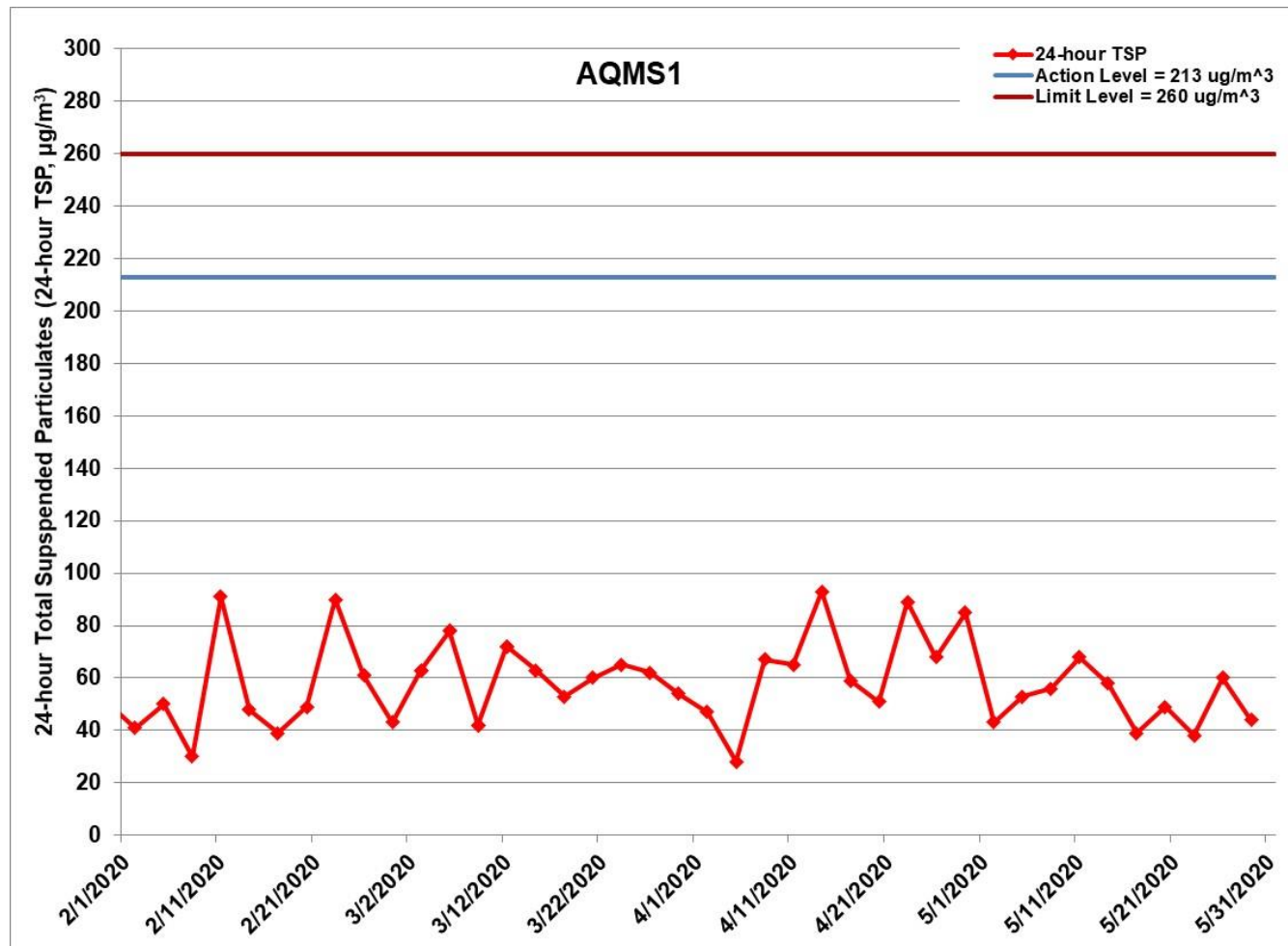


Figure G.8 Impact Monitoring - 24-hour Total Suspended Particulates ($\mu\text{g}/\text{m}^3$) at AQMS1 between 1 February 2020 and 31 May 2020 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Road and Drainage Works at Northern Landfall and Southern Landfall, UU installation at Northern Landfall and Southern Landfall and Fireboard installation in Tunnel (1/2/2020 - 31/5/2020)

Ref: 0212330_Impact AQM graphs_May 2020.xlsx



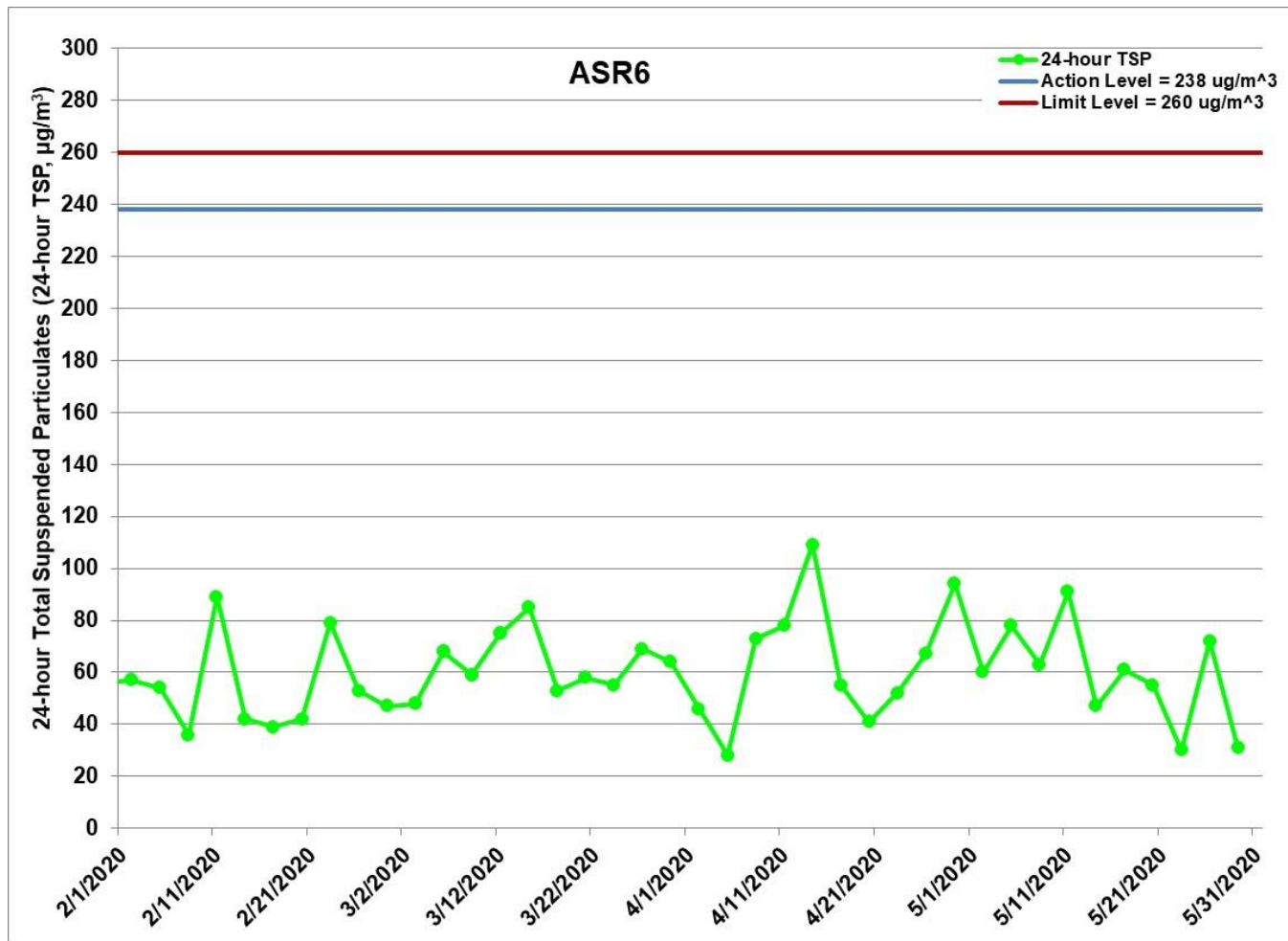


Figure G.9 Impact Monitoring – 24-hour Total Suspended Particulates ($\mu\text{g}/\text{m}^3$) at ASR6 between 1 February 2020 and 31 May 2020 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Road and Drainage Works at Northern Landfall and Southern Landfall, UU installation at Northern Landfall and Southern Landfall and Fireboard installation in Tunnel (1/2/2020 – 31/5/2020)

Ref: 0212330_Impact AQM graphs_May 2020.xlsx



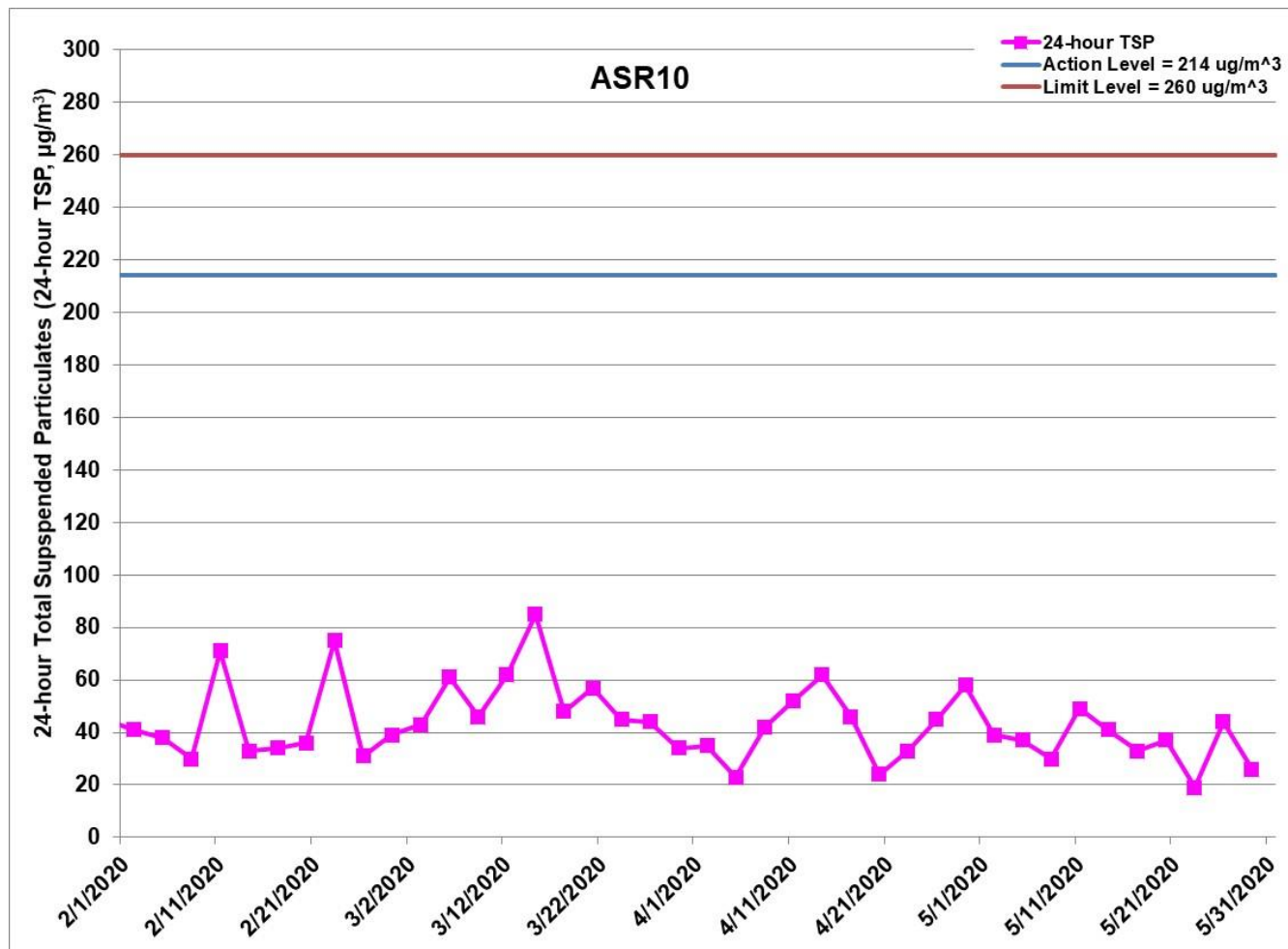


Figure G.10 Impact Monitoring - 24-hour Total Suspended Particulates ($\mu\text{g}/\text{m}^3$) at ASR10 between 1 February 2020 and 31 May 2020 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Road and Drainage Works at Northern Landfall and Southern Landfall, UU installation at Northern Landfall and Southern Landfall and Fireboard installation in Tunnel (1/2/2020 - 31/5/2020)

Ref: 0212330_Impact AQM graphs_May 2020.xlsx



Project	Contract	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2020-05-02	ASR10	Sunny	13:12	1-hour TSP	45	ug/m3
TMCLKL	HY/2012/08	2020-05-02	ASR10	Sunny	14:14	1-hour TSP	30	ug/m3
TMCLKL	HY/2012/08	2020-05-02	ASR10	Sunny	15:16	1-hour TSP	54	ug/m3
TMCLKL	HY/2012/08	2020-05-02	ASR6	Sunny	13:23	1-hour TSP	158	ug/m3
TMCLKL	HY/2012/08	2020-05-02	ASR6	Sunny	14:25	1-hour TSP	110	ug/m3
TMCLKL	HY/2012/08	2020-05-02	ASR6	Sunny	15:27	1-hour TSP	131	ug/m3
TMCLKL	HY/2012/08	2020-05-02	ASR5	Sunny	13:35	1-hour TSP	82	ug/m3
TMCLKL	HY/2012/08	2020-05-02	ASR5	Sunny	14:37	1-hour TSP	89	ug/m3
TMCLKL	HY/2012/08	2020-05-02	ASR5	Sunny	15:39	1-hour TSP	95	ug/m3
TMCLKL	HY/2012/08	2020-05-02	ASR1	Sunny	13:46	1-hour TSP	81	ug/m3
TMCLKL	HY/2012/08	2020-05-02	ASR1	Sunny	14:48	1-hour TSP	85	ug/m3
TMCLKL	HY/2012/08	2020-05-02	ASR1	Sunny	15:50	1-hour TSP	117	ug/m3
TMCLKL	HY/2012/08	2020-05-02	AQMS1	Sunny	13:57	1-hour TSP	58	ug/m3
TMCLKL	HY/2012/08	2020-05-02	AQMS1	Sunny	14:59	1-hour TSP	77	ug/m3
TMCLKL	HY/2012/08	2020-05-02	AQMS1	Sunny	16:01	1-hour TSP	85	ug/m3
TMCLKL	HY/2012/08	2020-05-05	ASR10	Sunny	13:13	1-hour TSP	123	ug/m3
TMCLKL	HY/2012/08	2020-05-05	ASR10	Sunny	14:15	1-hour TSP	105	ug/m3
TMCLKL	HY/2012/08	2020-05-05	ASR10	Sunny	15:17	1-hour TSP	113	ug/m3
TMCLKL	HY/2012/08	2020-05-05	ASR6	Sunny	13:24	1-hour TSP	258	ug/m3
TMCLKL	HY/2012/08	2020-05-05	ASR6	Sunny	14:26	1-hour TSP	207	ug/m3
TMCLKL	HY/2012/08	2020-05-05	ASR6	Sunny	15:28	1-hour TSP	250	ug/m3
TMCLKL	HY/2012/08	2020-05-05	ASR5	Sunny	13:37	1-hour TSP	273	ug/m3
TMCLKL	HY/2012/08	2020-05-05	ASR5	Sunny	14:39	1-hour TSP	168	ug/m3
TMCLKL	HY/2012/08	2020-05-05	ASR5	Sunny	15:41	1-hour TSP	203	ug/m3
TMCLKL	HY/2012/08	2020-05-05	ASR1	Sunny	13:48	1-hour TSP	123	ug/m3
TMCLKL	HY/2012/08	2020-05-05	ASR1	Sunny	14:50	1-hour TSP	115	ug/m3
TMCLKL	HY/2012/08	2020-05-05	ASR1	Sunny	15:52	1-hour TSP	151	ug/m3
TMCLKL	HY/2012/08	2020-05-05	AQMS1	Sunny	13:59	1-hour TSP	111	ug/m3
TMCLKL	HY/2012/08	2020-05-05	AQMS1	Sunny	15:01	1-hour TSP	96	ug/m3
TMCLKL	HY/2012/08	2020-05-05	AQMS1	Sunny	16:03	1-hour TSP	114	ug/m3
TMCLKL	HY/2012/08	2020-05-08	ASR10	Sunny	8:20	1-hour TSP	41	ug/m3

Project	Contract	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2020-05-08	ASR10	Sunny	9:22	1-hour TSP	59	ug/m3
TMCLKL	HY/2012/08	2020-05-08	ASR10	Sunny	10:24	1-hour TSP	52	ug/m3
TMCLKL	HY/2012/08	2020-05-08	ASR6	Sunny	8:30	1-hour TSP	83	ug/m3
TMCLKL	HY/2012/08	2020-05-08	ASR6	Sunny	9:32	1-hour TSP	133	ug/m3
TMCLKL	HY/2012/08	2020-05-08	ASR6	Sunny	10:34	1-hour TSP	117	ug/m3
TMCLKL	HY/2012/08	2020-05-08	ASR5	Sunny	8:41	1-hour TSP	118	ug/m3
TMCLKL	HY/2012/08	2020-05-08	ASR5	Sunny	9:43	1-hour TSP	116	ug/m3
TMCLKL	HY/2012/08	2020-05-08	ASR5	Sunny	10:45	1-hour TSP	93	ug/m3
TMCLKL	HY/2012/08	2020-05-08	ASR1	Sunny	8:53	1-hour TSP	52	ug/m3
TMCLKL	HY/2012/08	2020-05-08	ASR1	Sunny	9:55	1-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	2020-05-08	ASR1	Sunny	10:57	1-hour TSP	104	ug/m3
TMCLKL	HY/2012/08	2020-05-08	AQMS1	Sunny	9:04	1-hour TSP	88	ug/m3
TMCLKL	HY/2012/08	2020-05-08	AQMS1	Sunny	10:06	1-hour TSP	95	ug/m3
TMCLKL	HY/2012/08	2020-05-08	AQMS1	Sunny	11:08	1-hour TSP	102	ug/m3
TMCLKL	HY/2012/08	2020-05-11	ASR10	Sunny	8:18	1-hour TSP	73	ug/m3
TMCLKL	HY/2012/08	2020-05-11	ASR10	Sunny	9:22	1-hour TSP	62	ug/m3
TMCLKL	HY/2012/08	2020-05-11	ASR10	Sunny	10:24	1-hour TSP	76	ug/m3
TMCLKL	HY/2012/08	2020-05-11	ASR6	Sunny	8:28	1-hour TSP	104	ug/m3
TMCLKL	HY/2012/08	2020-05-11	ASR6	Sunny	9:30	1-hour TSP	136	ug/m3
TMCLKL	HY/2012/08	2020-05-11	ASR6	Sunny	10:32	1-hour TSP	125	ug/m3
TMCLKL	HY/2012/08	2020-05-11	ASR5	Sunny	8:39	1-hour TSP	125	ug/m3
TMCLKL	HY/2012/08	2020-05-11	ASR5	Sunny	9:41	1-hour TSP	156	ug/m3
TMCLKL	HY/2012/08	2020-05-11	ASR5	Sunny	10:43	1-hour TSP	114	ug/m3
TMCLKL	HY/2012/08	2020-05-11	ASR1	Sunny	8:50	1-hour TSP	64	ug/m3
TMCLKL	HY/2012/08	2020-05-11	ASR1	Sunny	9:52	1-hour TSP	63	ug/m3
TMCLKL	HY/2012/08	2020-05-11	ASR1	Sunny	10:54	1-hour TSP	75	ug/m3
TMCLKL	HY/2012/08	2020-05-11	AQMS1	Sunny	9:02	1-hour TSP	95	ug/m3
TMCLKL	HY/2012/08	2020-05-11	AQMS1	Sunny	10:04	1-hour TSP	130	ug/m3
TMCLKL	HY/2012/08	2020-05-11	AQMS1	Sunny	11:06	1-hour TSP	103	ug/m3
TMCLKL	HY/2012/08	2020-05-14	ASR10	Sunny	8:05	1-hour TSP	131	ug/m3
TMCLKL	HY/2012/08	2020-05-14	ASR10	Sunny	9:07	1-hour TSP	160	ug/m3

Project	Contract	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2020-05-14	ASR10	Sunny	10:09	1-hour TSP	150	ug/m3
TMCLKL	HY/2012/08	2020-05-14	ASR6	Sunny	8:16	1-hour TSP	128	ug/m3
TMCLKL	HY/2012/08	2020-05-14	ASR6	Sunny	9:18	1-hour TSP	144	ug/m3
TMCLKL	HY/2012/08	2020-05-14	ASR6	Sunny	10:20	1-hour TSP	236	ug/m3
TMCLKL	HY/2012/08	2020-05-14	ASR5	Sunny	8:27	1-hour TSP	308	ug/m3
TMCLKL	HY/2012/08	2020-05-14	ASR5	Sunny	9:29	1-hour TSP	198	ug/m3
TMCLKL	HY/2012/08	2020-05-14	ASR5	Sunny	10:31	1-hour TSP	250	ug/m3
TMCLKL	HY/2012/08	2020-05-14	AQMS1	Sunny	8:52	1-hour TSP	111	ug/m3
TMCLKL	HY/2012/08	2020-05-14	AQMS1	Sunny	9:54	1-hour TSP	118	ug/m3
TMCLKL	HY/2012/08	2020-05-14	AQMS1	Sunny	10:56	1-hour TSP	149	ug/m3
TMCLKL	HY/2012/08	2020-05-17	ASR10	Sunny	8:11	1-hour TSP	85	ug/m3
TMCLKL	HY/2012/08	2020-05-17	ASR10	Sunny	9:13	1-hour TSP	72	ug/m3
TMCLKL	HY/2012/08	2020-05-17	ASR10	Sunny	10:15	1-hour TSP	47	ug/m3
TMCLKL	HY/2012/08	2020-05-17	ASR6	Sunny	8:23	1-hour TSP	146	ug/m3
TMCLKL	HY/2012/08	2020-05-17	ASR6	Sunny	9:25	1-hour TSP	149	ug/m3
TMCLKL	HY/2012/08	2020-05-17	ASR6	Sunny	10:27	1-hour TSP	100	ug/m3
TMCLKL	HY/2012/08	2020-05-17	ASR5	Sunny	8:34	1-hour TSP	130	ug/m3
TMCLKL	HY/2012/08	2020-05-17	ASR5	Sunny	9:36	1-hour TSP	93	ug/m3
TMCLKL	HY/2012/08	2020-05-17	ASR5	Sunny	10:38	1-hour TSP	62	ug/m3
TMCLKL	HY/2012/08	2020-05-17	AQMS1	Sunny	8:50	1-hour TSP	123	ug/m3
TMCLKL	HY/2012/08	2020-05-17	AQMS1	Sunny	9:52	1-hour TSP	83	ug/m3
TMCLKL	HY/2012/08	2020-05-17	AQMS1	Sunny	10:54	1-hour TSP	61	ug/m3
TMCLKL	HY/2012/08	2020-05-20	ASR10	Cloudy	8:10	1-hour TSP	40	ug/m3
TMCLKL	HY/2012/08	2020-05-20	ASR10	Cloudy	9:12	1-hour TSP	34	ug/m3
TMCLKL	HY/2012/08	2020-05-20	ASR10	Cloudy	10:14	1-hour TSP	56	ug/m3
TMCLKL	HY/2012/08	2020-05-20	ASR6	Cloudy	8:20	1-hour TSP	68	ug/m3
TMCLKL	HY/2012/08	2020-05-20	ASR6	Cloudy	9:22	1-hour TSP	58	ug/m3
TMCLKL	HY/2012/08	2020-05-20	ASR6	Cloudy	10:24	1-hour TSP	67	ug/m3
TMCLKL	HY/2012/08	2020-05-20	ASR5	Cloudy	8:32	1-hour TSP	156	ug/m3
TMCLKL	HY/2012/08	2020-05-20	ASR5	Cloudy	9:34	1-hour TSP	125	ug/m3
TMCLKL	HY/2012/08	2020-05-20	ASR5	Cloudy	10:26	1-hour TSP	140	ug/m3

Project	Contract	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2020-05-20	ASR1	Cloudy	8:44	1-hour TSP	230	ug/m3
TMCLKL	HY/2012/08	2020-05-20	ASR1	Cloudy	9:46	1-hour TSP	101	ug/m3
TMCLKL	HY/2012/08	2020-05-20	ASR1	Cloudy	10:48	1-hour TSP	106	ug/m3
TMCLKL	HY/2012/08	2020-05-20	AQMS1	Cloudy	8:55	1-hour TSP	80	ug/m3
TMCLKL	HY/2012/08	2020-05-20	AQMS1	Cloudy	9:57	1-hour TSP	73	ug/m3
TMCLKL	HY/2012/08	2020-05-20	AQMS1	Cloudy	10:59	1-hour TSP	95	ug/m3
TMCLKL	HY/2012/08	2020-05-23	ASR10	Cloudy	8:00	1-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	2020-05-23	ASR10	Cloudy	9:02	1-hour TSP	62	ug/m3
TMCLKL	HY/2012/08	2020-05-23	ASR10	Cloudy	10:04	1-hour TSP	72	ug/m3
TMCLKL	HY/2012/08	2020-05-23	ASR6	Cloudy	8:10	1-hour TSP	86	ug/m3
TMCLKL	HY/2012/08	2020-05-23	ASR6	Cloudy	9:12	1-hour TSP	126	ug/m3
TMCLKL	HY/2012/08	2020-05-23	ASR6	Cloudy	10:14	1-hour TSP	65	ug/m3
TMCLKL	HY/2012/08	2020-05-23	ASR5	Cloudy	8:23	1-hour TSP	141	ug/m3
TMCLKL	HY/2012/08	2020-05-23	ASR5	Cloudy	9:25	1-hour TSP	228	ug/m3
TMCLKL	HY/2012/08	2020-05-23	ASR5	Cloudy	10:27	1-hour TSP	124	ug/m3
TMCLKL	HY/2012/08	2020-05-23	ASR1	Cloudy	8:35	1-hour TSP	60	ug/m3
TMCLKL	HY/2012/08	2020-05-23	ASR1	Cloudy	9:37	1-hour TSP	24	ug/m3
TMCLKL	HY/2012/08	2020-05-23	ASR1	Cloudy	10:39	1-hour TSP	152	ug/m3
TMCLKL	HY/2012/08	2020-05-23	AQMS1	Cloudy	8:47	1-hour TSP	14	ug/m3
TMCLKL	HY/2012/08	2020-05-23	AQMS1	Cloudy	9:49	1-hour TSP	167	ug/m3
TMCLKL	HY/2012/08	2020-05-23	AQMS1	Cloudy	10:51	1-hour TSP	56	ug/m3
TMCLKL	HY/2012/08	2020-05-26	ASR10	Sunny	8:02	1-hour TSP	59	ug/m3
TMCLKL	HY/2012/08	2020-05-26	ASR10	Sunny	9:04	1-hour TSP	52	ug/m3
TMCLKL	HY/2012/08	2020-05-26	ASR10	Sunny	10:06	1-hour TSP	56	ug/m3
TMCLKL	HY/2012/08	2020-05-26	ASR6	Sunny	08:13	1-hour TSP	76	ug/m3
TMCLKL	HY/2012/08	2020-05-26	ASR6	Sunny	09:15	1-hour TSP	143	ug/m3
TMCLKL	HY/2012/08	2020-05-26	ASR6	Sunny	10:17	1-hour TSP	183	ug/m3
TMCLKL	HY/2012/08	2020-05-26	ASR5	Sunny	8:25	1-hour TSP	87	ug/m3
TMCLKL	HY/2012/08	2020-05-26	ASR5	Sunny	9:27	1-hour TSP	149	ug/m3
TMCLKL	HY/2012/08	2020-05-26	ASR5	Sunny	10:29	1-hour TSP	183	ug/m3
TMCLKL	HY/2012/08	2020-05-26	ASR1	Sunny	8:38	1-hour TSP	163	ug/m3

Project	Contract	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2020-05-26	ASR1	Sunny	9:40	1-hour TSP	96	ug/m3
TMCLKL	HY/2012/08	2020-05-26	ASR1	Sunny	10:42	1-hour TSP	73	ug/m3
TMCLKL	HY/2012/08	2020-05-26	AQMS1	Sunny	8:50	1-hour TSP	122	ug/m3
TMCLKL	HY/2012/08	2020-05-26	AQMS1	Sunny	9:52	1-hour TSP	73	ug/m3
TMCLKL	HY/2012/08	2020-05-26	AQMS1	Sunny	10:54	1-hour TSP	89	ug/m3
TMCLKL	HY/2012/08	2020-05-29	ASR10	Sunny	8:11	1-hour TSP	83	ug/m3
TMCLKL	HY/2012/08	2020-05-29	ASR10	Sunny	9:13	1-hour TSP	55	ug/m3
TMCLKL	HY/2012/08	2020-05-29	ASR10	Sunny	10:15	1-hour TSP	58	ug/m3
TMCLKL	HY/2012/08	2020-05-29	ASR6	Sunny	8:22	1-hour TSP	108	ug/m3
TMCLKL	HY/2012/08	2020-05-29	ASR6	Sunny	9:24	1-hour TSP	81	ug/m3
TMCLKL	HY/2012/08	2020-05-29	ASR6	Sunny	10:26	1-hour TSP	58	ug/m3
TMCLKL	HY/2012/08	2020-05-29	ASR5	Sunny	8:34	1-hour TSP	169	ug/m3
TMCLKL	HY/2012/08	2020-05-29	ASR5	Sunny	9:36	1-hour TSP	192	ug/m3
TMCLKL	HY/2012/08	2020-05-29	ASR5	Sunny	10:38	1-hour TSP	195	ug/m3
TMCLKL	HY/2012/08	2020-05-29	ASR1	Sunny	8:45	1-hour TSP	113	ug/m3
TMCLKL	HY/2012/08	2020-05-29	ASR1	Sunny	9:47	1-hour TSP	13	ug/m3
TMCLKL	HY/2012/08	2020-05-29	ASR1	Sunny	10:49	1-hour TSP	121	ug/m3
TMCLKL	HY/2012/08	2020-05-29	AQMS1	Sunny	8:57	1-hour TSP	103	ug/m3
TMCLKL	HY/2012/08	2020-05-29	AQMS1	Sunny	9:59	1-hour TSP	99	ug/m3
TMCLKL	HY/2012/08	2020-05-29	AQMS1	Sunny	11:01	1-hour TSP	93	ug/m3
TMCLKL	HY/2012/08	2020-05-02	ASR10	Sunny	16:18	24-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	2020-05-02	ASR6	Sunny	16:29	24-hour TSP	60	ug/m3
TMCLKL	HY/2012/08	2020-05-02	ASR5	Sunny	16:41	24-hour TSP	60	ug/m3
TMCLKL	HY/2012/08	2020-05-02	AQMS1	Sunny	17:03	24-hour TSP	43	ug/m3
TMCLKL	HY/2012/08	2020-05-05	ASR10	Sunny	16:19	24-hour TSP	37	ug/m3
TMCLKL	HY/2012/08	2020-05-05	ASR6	Sunny	16:30	24-hour TSP	78	ug/m3
TMCLKL	HY/2012/08	2020-05-05	ASR5	Sunny	16:43	24-hour TSP	74	ug/m3
TMCLKL	HY/2012/08	2020-05-05	ASR1	Sunny	16:54	24-hour TSP	42	ug/m3
TMCLKL	HY/2012/08	2020-05-05	AQMS1	Sunny	17:05	24-hour TSP	53	ug/m3
TMCLKL	HY/2012/08	2020-05-08	ASR10	Sunny	11:26	24-hour TSP	30	ug/m3
TMCLKL	HY/2012/08	2020-05-08	ASR6	Sunny	11:36	24-hour TSP	63	ug/m3

Project	Contract	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2020-05-08	ASR5	Sunny	11:47	24-hour TSP	65	ug/m3
TMCLKL	HY/2012/08	2020-05-08	ASR1	Sunny	11:59	24-hour TSP	37	ug/m3
TMCLKL	HY/2012/08	2020-05-08	AQMS1	Sunny	12:10	24-hour TSP	56	ug/m3
TMCLKL	HY/2012/08	2020-05-11	ASR10	Sunny	11:26	24-hour TSP	49	ug/m3
TMCLKL	HY/2012/08	2020-05-11	ASR6	Sunny	11:34	24-hour TSP	91	ug/m3
TMCLKL	HY/2012/08	2020-05-11	ASR5	Sunny	11:45	24-hour TSP	123	ug/m3
TMCLKL	HY/2012/08	2020-05-11	AQMS1	Sunny	12:08	24-hour TSP	68	ug/m3
TMCLKL	HY/2012/08	2020-05-14	ASR10	Sunny	11:11	24-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	2020-05-14	ASR6	Sunny	11:22	24-hour TSP	47	ug/m3
TMCLKL	HY/2012/08	2020-05-14	ASR5	Sunny	11:33	24-hour TSP	72	ug/m3
TMCLKL	HY/2012/08	2020-05-14	AQMS1	Sunny	11:58	24-hour TSP	58	ug/m3
TMCLKL	HY/2012/08	2020-05-17	ASR10	Sunny	11:17	24-hour TSP	33	ug/m3
TMCLKL	HY/2012/08	2020-05-17	ASR6	Sunny	11:29	24-hour TSP	61	ug/m3
TMCLKL	HY/2012/08	2020-05-17	ASR5	Sunny	11:40	24-hour TSP	64	ug/m3
TMCLKL	HY/2012/08	2020-05-17	AQMS1	Sunny	11:56	24-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	2020-05-20	ASR10	Cloudy	11:16	24-hour TSP	37	ug/m3
TMCLKL	HY/2012/08	2020-05-20	ASR6	Cloudy	11:26	24-hour TSP	55	ug/m3
TMCLKL	HY/2012/08	2020-05-20	ASR5	Cloudy	11:38	24-hour TSP	75	ug/m3
TMCLKL	HY/2012/08	2020-05-20	ASR1	Cloudy	11:50	24-hour TSP	59	ug/m3
TMCLKL	HY/2012/08	2020-05-20	AQMS1	Cloudy	12:01	24-hour TSP	49	ug/m3
TMCLKL	HY/2012/08	2020-05-23	ASR10	Cloudy	11:06	24-hour TSP	19	ug/m3
TMCLKL	HY/2012/08	2020-05-23	ASR6	Cloudy	11:16	24-hour TSP	30	ug/m3
TMCLKL	HY/2012/08	2020-05-23	ASR5	Cloudy	11:29	24-hour TSP	73	ug/m3
TMCLKL	HY/2012/08	2020-05-23	ASR1	Cloudy	11:41	24-hour TSP	38	ug/m3
TMCLKL	HY/2012/08	2020-05-23	AQMS1	Cloudy	11:53	24-hour TSP	38	ug/m3
TMCLKL	HY/2012/08	2020-05-26	ASR10	Sunny	11:08	24-hour TSP	44	ug/m3
TMCLKL	HY/2012/08	2020-05-26	ASR6	Sunny	11:19	24-hour TSP	72	ug/m3
TMCLKL	HY/2012/08	2020-05-26	ASR5	Sunny	11:31	24-hour TSP	90	ug/m3
TMCLKL	HY/2012/08	2020-05-26	ASR1	Sunny	11:44	24-hour TSP	50	ug/m3
TMCLKL	HY/2012/08	2020-05-26	AQMS1	Sunny	11:56	24-hour TSP	60	ug/m3
TMCLKL	HY/2012/08	2020-05-29	ASR10	Sunny	11:17	24-hour TSP	26	ug/m3

Project	Contract	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2020-05-29	ASR6	Sunny	11:28	24-hour TSP	31	ug/m3
TMCLKL	HY/2012/08	2020-05-29	ASR5	Sunny	11:40	24-hour TSP	51	ug/m3
TMCLKL	HY/2012/08	2020-05-29	ASR1	Sunny	11:51	24-hour TSP	35	ug/m3
TMCLKL	HY/2012/08	2020-05-29	AQMS1	Sunny	12:03	24-hour TSP	44	ug/m3

Appendix H

Meteorological Data

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)
20/05/02	0:00	0.9	52
20/05/02	1:00	1.3	55
20/05/02	2:00	0.9	58
20/05/02	3:00	0.9	36
20/05/02	4:00	0.9	15
20/05/02	5:00	0	14
20/05/02	6:00	0	86
20/05/02	7:00	0.4	59
20/05/02	8:00	0.9	77
20/05/02	9:00	0.9	55
20/05/02	10:00	0.9	62
20/05/02	11:00	1.3	141
20/05/02	12:00	2.2	205
20/05/02	13:00	2.2	194
20/05/02	14:00	2.2	195
20/05/02	15:00	2.7	206
20/05/02	16:00	2.2	213
20/05/02	17:00	1.3	197
20/05/02	18:00	1.3	94
20/05/02	19:00	1.8	72
20/05/02	20:00	0.9	63
20/05/02	21:00	0.9	77
20/05/02	22:00	0.9	58
20/05/02	23:00	0.9	79
20/05/03	0:00	0.4	43
20/05/03	1:00	0	35
20/05/03	2:00	0	24
20/05/03	3:00	0	323
20/05/03	4:00	0	209
20/05/03	5:00	0.4	205
20/05/03	6:00	0.4	266
20/05/03	7:00	0	168
20/05/03	8:00	0.4	271
20/05/03	9:00	2.2	199
20/05/03	10:00	2.7	191
20/05/03	11:00	2.7	191
20/05/03	12:00	3.1	205
20/05/03	13:00	3.1	192
20/05/03	14:00	2.2	196
20/05/03	15:00	0.9	263
20/05/03	16:00	1.8	202
20/05/03	17:00	0.4	267
20/05/03	18:00	0.4	281
20/05/03	19:00	1.3	75
20/05/03	20:00	1.3	58
20/05/03	21:00	0.9	74
20/05/03	22:00	0.4	301
20/05/03	23:00	0.4	290
20/05/05	0:00	0.4	205
20/05/05	1:00	0.4	215
20/05/05	2:00	1.3	171
20/05/05	3:00	0	220
20/05/05	4:00	0.4	218
20/05/05	5:00	0.9	185
20/05/05	6:00	0.4	174
20/05/05	7:00	0.9	181

20/05/05	8:00	1.8	207
20/05/05	9:00	2.2	206
20/05/05	10:00	1.8	199
20/05/05	11:00	1.3	290
20/05/05	12:00	1.3	268
20/05/05	13:00	2.2	242
20/05/05	14:00	2.7	195
20/05/05	15:00	2.2	223
20/05/05	16:00	1.8	229
20/05/05	17:00	2.2	198
20/05/05	18:00	3.1	194
20/05/05	19:00	2.7	193
20/05/05	20:00	2.7	193
20/05/05	21:00	0.9	248
20/05/05	22:00	1.3	205
20/05/05	23:00	2.2	193
20/05/06	0:00	1.3	200
20/05/06	1:00	0.4	253
20/05/06	2:00	0.4	274
20/05/06	3:00	0.4	278
20/05/06	4:00	0.9	269
20/05/06	5:00	0	125
20/05/06	6:00	0	84
20/05/06	7:00	0.4	46
20/05/06	8:00	0.9	97
20/05/06	9:00	0.4	90
20/05/06	10:00	0.4	35
20/05/06	11:00	1.3	125
20/05/06	12:00	2.2	211
20/05/06	13:00	2.2	194
20/05/06	14:00	2.7	206
20/05/06	15:00	2.7	197
20/05/06	16:00	2.7	213
20/05/06	17:00	2.7	211
20/05/06	18:00	2.7	212
20/05/06	19:00	1.8	207
20/05/06	20:00	0.4	187
20/05/06	21:00	0.9	127
20/05/06	22:00	0.9	114
20/05/06	23:00	1.3	133
20/05/08	0:00	1.8	133
20/05/08	1:00	1.8	126
20/05/08	2:00	1.3	126
20/05/08	3:00	0.9	162
20/05/08	4:00	0.9	128
20/05/08	5:00	0.4	168
20/05/08	6:00	0.9	127
20/05/08	7:00	0.9	139
20/05/08	8:00	1.3	127
20/05/08	9:00	0.9	153
20/05/08	10:00	1.3	90
20/05/08	11:00	1.3	134
20/05/08	12:00	1.8	145
20/05/08	13:00	1.8	130
20/05/08	14:00	1.8	164
20/05/08	15:00	2.2	234
20/05/08	16:00	2.7	214
20/05/08	17:00	2.7	201

20/05/08	18:00	1.8	159
20/05/08	19:00	1.3	167
20/05/08	20:00	0.4	150
20/05/08	21:00	0.9	131
20/05/08	22:00	1.3	145
20/05/08	23:00	1.3	131
20/05/09	0:00	0.9	149
20/05/09	1:00	0.4	139
20/05/09	2:00	0	210
20/05/09	3:00	0.4	250
20/05/09	4:00	0.4	250
20/05/09	5:00	0.4	234
20/05/09	6:00	0.4	225
20/05/09	7:00	0.4	179
20/05/09	8:00	0.9	194
20/05/09	9:00	1.8	210
20/05/09	10:00	0.9	87
20/05/09	11:00	0.9	100
20/05/09	12:00	2.2	207
20/05/09	13:00	1.8	206
20/05/09	14:00	2.2	212
20/05/09	15:00	2.2	195
20/05/09	16:00	1.8	201
20/05/09	17:00	1.3	128
20/05/09	18:00	0.9	133
20/05/09	19:00	1.3	140
20/05/09	20:00	0.9	141
20/05/09	21:00	0.9	135
20/05/09	22:00	0.9	134
20/05/09	23:00	0.4	149
20/05/11	0:00	0	275
20/05/11	1:00	0.4	99
20/05/11	2:00	0.9	143
20/05/11	3:00	0.4	303
20/05/11	4:00	0	83
20/05/11	5:00	0	101
20/05/11	6:00	0	75
20/05/11	7:00	0	84
20/05/11	8:00	0.4	225
20/05/11	9:00	0.9	233
20/05/11	10:00	1.3	195
20/05/11	11:00	1.3	264
20/05/11	12:00	2.2	200
20/05/11	13:00	1.8	226
20/05/11	14:00	1.8	212
20/05/11	15:00	1.3	220
20/05/11	16:00	1.3	261
20/05/11	17:00	0.9	74
20/05/11	18:00	1.3	61
20/05/11	19:00	0.9	59
20/05/11	20:00	0.4	57
20/05/11	21:00	0.4	276
20/05/11	22:00	3.6	344
20/05/11	23:00	1.8	313
20/05/12	0:00	0.9	34
20/05/12	1:00	0.4	23
20/05/12	2:00	0.4	281
20/05/12	3:00	0.9	267

20/05/12	4:00	0.4	306
20/05/12	5:00	0	200
20/05/12	6:00	0	165
20/05/12	7:00	0	201
20/05/12	8:00	0	221
20/05/12	9:00	0	241
20/05/12	10:00	0.9	138
20/05/12	11:00	1.3	199
20/05/12	12:00	1.8	192
20/05/12	13:00	1.8	281
20/05/12	14:00	1.8	263
20/05/12	15:00	1.3	278
20/05/12	16:00	2.2	281
20/05/12	17:00	1.3	265
20/05/12	18:00	0.9	281
20/05/12	19:00	0.4	100
20/05/12	20:00	0.4	66
20/05/12	21:00	0	17
20/05/12	22:00	0	4
20/05/12	23:00	0	334
20/05/14	0:00	3.1	79
20/05/14	1:00	3.1	59
20/05/14	2:00	2.7	75
20/05/14	3:00	1.8	77
20/05/14	4:00	1.8	50
20/05/14	5:00	1.8	61
20/05/14	6:00	1.8	79
20/05/14	7:00	1.8	94
20/05/14	8:00	2.2	63
20/05/14	9:00	2.2	95
20/05/14	10:00	2.2	99
20/05/14	11:00	2.2	93
20/05/14	12:00	2.7	83
20/05/14	13:00	3.1	101
20/05/14	14:00	3.1	87
20/05/14	15:00	3.1	98
20/05/14	16:00	2.7	84
20/05/14	17:00	2.7	98
20/05/14	18:00	2.7	82
20/05/14	19:00	2.7	85
20/05/14	20:00	2.7	80
20/05/14	21:00	3.1	89
20/05/14	22:00	2.7	88
20/05/14	23:00	2.7	95
20/05/15	0:00	2.7	87
20/05/15	1:00	1.8	84
20/05/15	2:00	1.8	90
20/05/15	3:00	1.8	90
20/05/15	4:00	1.3	90
20/05/15	5:00	1.3	89
20/05/15	6:00	0.9	69
20/05/15	7:00	1.3	97
20/05/15	8:00	1.8	100
20/05/15	9:00	2.7	92
20/05/15	10:00	1.8	101
20/05/15	11:00	1.8	86
20/05/15	12:00	2.2	84
20/05/15	13:00	2.2	91

20/05/15	14:00	2.7	80
20/05/15	15:00	3.1	133
20/05/15	16:00	3.1	125
20/05/15	17:00	2.7	105
20/05/15	18:00	3.1	110
20/05/15	19:00	2.2	99
20/05/15	20:00	2.2	101
20/05/15	21:00	1.8	91
20/05/15	22:00	1.3	80
20/05/15	23:00	1.3	86
20/05/17	0:00	0	82
20/05/17	1:00	0	81
20/05/17	2:00	0.9	81
20/05/17	3:00	0.9	110
20/05/17	4:00	0	60
20/05/17	5:00	0	3
20/05/17	6:00	0	326
20/05/17	7:00	0	305
20/05/17	8:00	0.4	143
20/05/17	9:00	0.9	133
20/05/17	10:00	1.8	228
20/05/17	11:00	2.2	192
20/05/17	12:00	1.8	199
20/05/17	13:00	1.3	199
20/05/17	14:00	2.7	191
20/05/17	15:00	1.3	298
20/05/17	16:00	1.3	250
20/05/17	17:00	0.9	273
20/05/17	18:00	0.9	276
20/05/17	19:00	1.8	202
20/05/17	20:00	1.8	218
20/05/17	21:00	1.8	210
20/05/17	22:00	0.9	89
20/05/17	23:00	1.8	303
20/05/18	0:00	2.7	325
20/05/18	1:00	0.4	290
20/05/18	2:00	0.4	209
20/05/18	3:00	0	305
20/05/18	4:00	0	321
20/05/18	5:00	0.4	78
20/05/18	6:00	0.9	50
20/05/18	7:00	1.3	79
20/05/18	8:00	0.9	66
20/05/18	9:00	1.3	192
20/05/18	10:00	1.8	273
20/05/18	11:00	1.8	281
20/05/18	12:00	0.4	281
20/05/18	13:00	1.3	88
20/05/18	14:00	1.8	92
20/05/18	15:00	1.8	84
20/05/18	16:00	1.3	83
20/05/18	17:00	0.9	279
20/05/18	18:00	0.9	86
20/05/18	19:00	0.9	63
20/05/18	20:00	1.3	71
20/05/18	21:00	0.4	15
20/05/18	22:00	0.4	28
20/05/18	23:00	0	34

20/05/20	0:00	0.9	43
20/05/20	1:00	0.9	80
20/05/20	2:00	0.4	82
20/05/20	3:00	0.4	49
20/05/20	4:00	0.4	48
20/05/20	5:00	0	45
20/05/20	6:00	0	56
20/05/20	7:00	0.4	34
20/05/20	8:00	1.3	96
20/05/20	9:00	2.2	85
20/05/20	10:00	2.2	82
20/05/20	11:00	2.7	90
20/05/20	12:00	3.1	84
20/05/20	13:00	2.7	99
20/05/20	14:00	2.7	93
20/05/20	15:00	3.1	88
20/05/20	16:00	3.1	98
20/05/20	17:00	2.7	95
20/05/20	18:00	3.1	79
20/05/20	19:00	3.1	97
20/05/20	20:00	3.6	82
20/05/20	21:00	3.6	84
20/05/20	22:00	3.6	93
20/05/20	23:00	3.1	98
20/05/21	0:00	1.8	101
20/05/21	1:00	2.2	97
20/05/21	2:00	1.8	81
20/05/21	3:00	0.4	267
20/05/21	4:00	0.4	3
20/05/21	5:00	0.9	358
20/05/21	6:00	0.4	46
20/05/21	7:00	0.9	54
20/05/21	8:00	0.9	55
20/05/21	9:00	1.3	55
20/05/21	10:00	0.9	56
20/05/21	11:00	0.4	41
20/05/21	12:00	0.9	55
20/05/21	13:00	0.9	47
20/05/21	14:00	2.2	213
20/05/21	15:00	4	203
20/05/21	16:00	3.6	191
20/05/21	17:00	0.9	213
20/05/21	18:00	0	214
20/05/21	19:00	1.3	194
20/05/21	20:00	1.3	202
20/05/21	21:00	1.3	209
20/05/21	22:00	2.2	211
20/05/21	23:00	2.2	191
20/05/23	0:00	0	17
20/05/23	1:00	0	52
20/05/23	2:00	0	38
20/05/23	3:00	0.9	59
20/05/23	4:00	0.9	86
20/05/23	5:00	1.8	83
20/05/23	6:00	1.3	86
20/05/23	7:00	1.3	98
20/05/23	8:00	1.3	93
20/05/23	9:00	2.2	97

20/05/23	10:00	2.2	95
20/05/23	11:00	1.3	95
20/05/23	12:00	1.3	81
20/05/23	13:00	1.3	100
20/05/23	14:00	0.9	84
20/05/23	15:00	1.3	99
20/05/23	16:00	1.3	97
20/05/23	17:00	1.3	86
20/05/23	18:00	2.2	80
20/05/23	19:00	2.2	83
20/05/23	20:00	2.7	89
20/05/23	21:00	2.7	86
20/05/23	22:00	2.2	84
20/05/23	23:00	2.7	88
20/05/24	0:00	2.2	94
20/05/24	1:00	1.8	93
20/05/24	2:00	1.3	35
20/05/24	3:00	0.9	37
20/05/24	4:00	0.9	55
20/05/24	5:00	0.9	28
20/05/24	6:00	0.9	55
20/05/24	7:00	0.9	74
20/05/24	8:00	0.9	70
20/05/24	9:00	1.3	87
20/05/24	10:00	1.3	96
20/05/24	11:00	0.9	133
20/05/24	12:00	0.9	145
20/05/24	13:00	0.9	86
20/05/24	14:00	1.3	145
20/05/24	15:00	1.3	86
20/05/24	16:00	1.3	83
20/05/24	17:00	1.8	135
20/05/24	18:00	0.9	58
20/05/24	19:00	1.3	91
20/05/24	20:00	1.8	86
20/05/24	21:00	1.8	94
20/05/24	22:00	2.2	84
20/05/24	23:00	2.2	93
20/05/26	0:00	1.3	67
20/05/26	1:00	0.9	63
20/05/26	2:00	0.4	39
20/05/26	3:00	0	339
20/05/26	4:00	0	343
20/05/26	5:00	0	272
20/05/26	6:00	0	280
20/05/26	7:00	0	199
20/05/26	8:00	0	148
20/05/26	9:00	0.4	146
20/05/26	10:00	1.8	235
20/05/26	11:00	1.8	236
20/05/26	12:00	1.3	217
20/05/26	13:00	1.8	221
20/05/26	14:00	1.3	269
20/05/26	15:00	0.9	290
20/05/26	16:00	0.9	282
20/05/26	17:00	0	50
20/05/26	18:00	0.9	273
20/05/26	19:00	0.9	276

20/05/26	20:00	0.4	288
20/05/26	21:00	0	294
20/05/26	22:00	0	2
20/05/26	23:00	0.4	276
20/05/27	0:00	0	318
20/05/27	1:00	0.4	317
20/05/27	2:00	0	288
20/05/27	3:00	0	312
20/05/27	4:00	0	311
20/05/27	5:00	0.4	314
20/05/27	6:00	0	267
20/05/27	7:00	0	47
20/05/27	8:00	0	130
20/05/27	9:00	0.4	83
20/05/27	10:00	0.4	127
20/05/27	11:00	0.9	136
20/05/27	12:00	1.3	228
20/05/27	13:00	0.9	159
20/05/27	14:00	0.9	218
20/05/27	15:00	0.9	113
20/05/27	16:00	1.8	264
20/05/27	17:00	1.8	261
20/05/27	18:00	1.3	259
20/05/27	19:00	0.9	263
20/05/27	20:00	0.9	317
20/05/27	21:00	0.9	31
20/05/27	22:00	0.4	28
20/05/27	23:00	0.9	23
20/05/29	0:00	1.8	83
20/05/29	1:00	1.3	97
20/05/29	2:00	1.3	84
20/05/29	3:00	1.3	73
20/05/29	4:00	0.9	93
20/05/29	5:00	1.3	97
20/05/29	6:00	0.9	96
20/05/29	7:00	1.8	83
20/05/29	8:00	1.8	84
20/05/29	9:00	1.8	87
20/05/29	10:00	1.8	95
20/05/29	11:00	2.2	114
20/05/29	12:00	2.7	136
20/05/29	13:00	2.7	116
20/05/29	14:00	2.7	101
20/05/29	15:00	2.7	132
20/05/29	16:00	2.7	112
20/05/29	17:00	1.8	100
20/05/29	18:00	0.9	86
20/05/29	19:00	0.9	74
20/05/29	20:00	1.8	128
20/05/29	21:00	0.9	77
20/05/29	22:00	0.9	77
20/05/29	23:00	0.9	91
20/05/30	0:00	0.9	59
20/05/30	1:00	1.3	139
20/05/30	2:00	0.4	122
20/05/30	3:00	0.4	138
20/05/30	4:00	0.4	309
20/05/30	5:00	0.9	5

20/05/30	6:00	2.2	293
20/05/30	7:00	1.3	297
20/05/30	8:00	1.3	283
20/05/30	9:00	0.9	287
20/05/30	10:00	0.4	271
20/05/30	11:00	0.4	195
20/05/30	12:00	0.4	39
20/05/30	13:00	0.9	75
20/05/30	14:00	0.9	41
20/05/30	15:00	0.9	80
20/05/30	16:00	0.9	77
20/05/30	17:00	0.4	39
20/05/30	18:00	0.4	71
20/05/30	19:00	0.4	62
20/05/30	20:00	0.9	42
20/05/30	21:00	0.9	44
20/05/30	22:00	0.4	14
20/05/30	23:00	0.4	346

Appendix I

Impact Dolphin Monitoring Survey

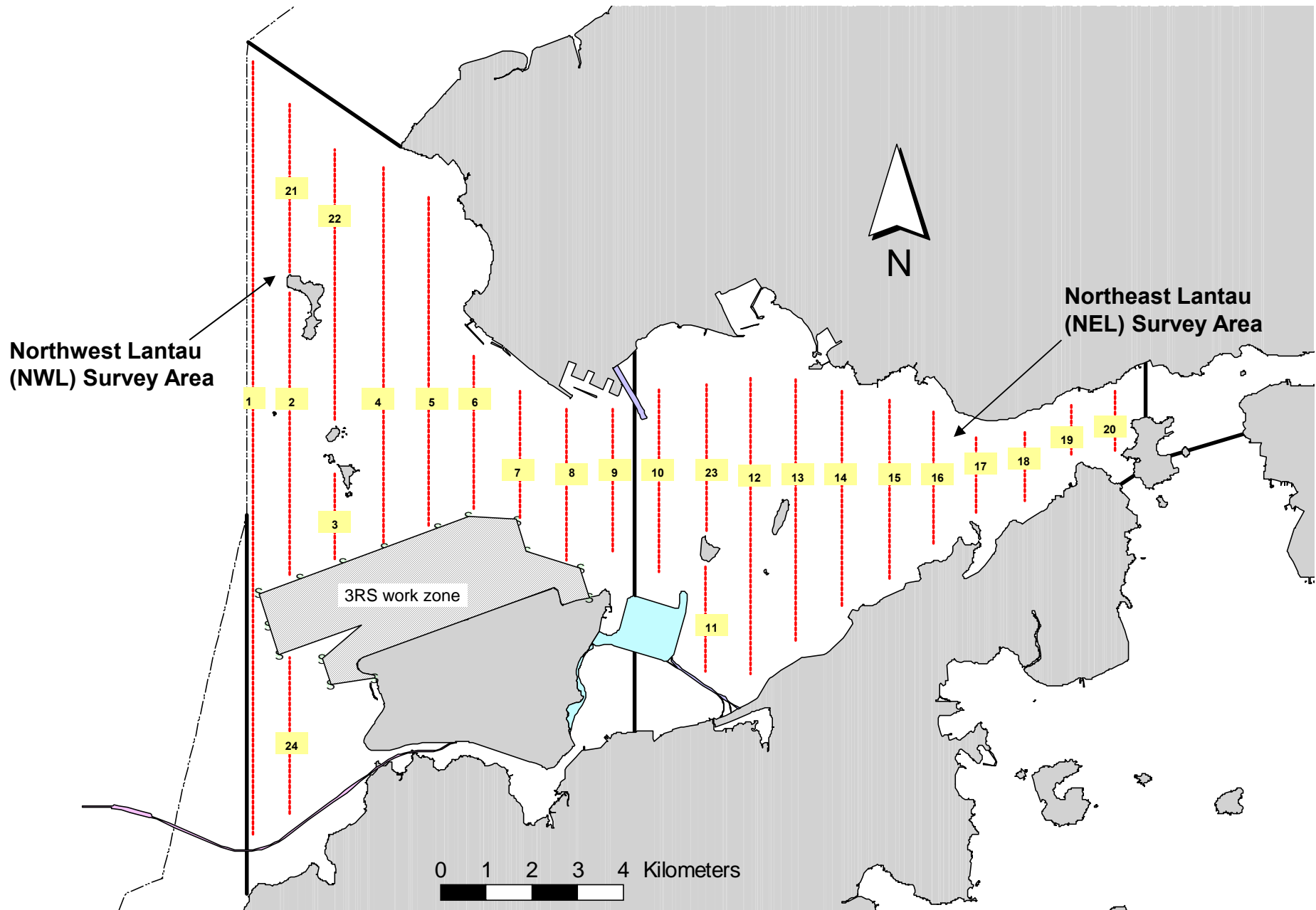


Figure 1. Transect Line Layout in Northwest and Northeast Lantau Survey Areas

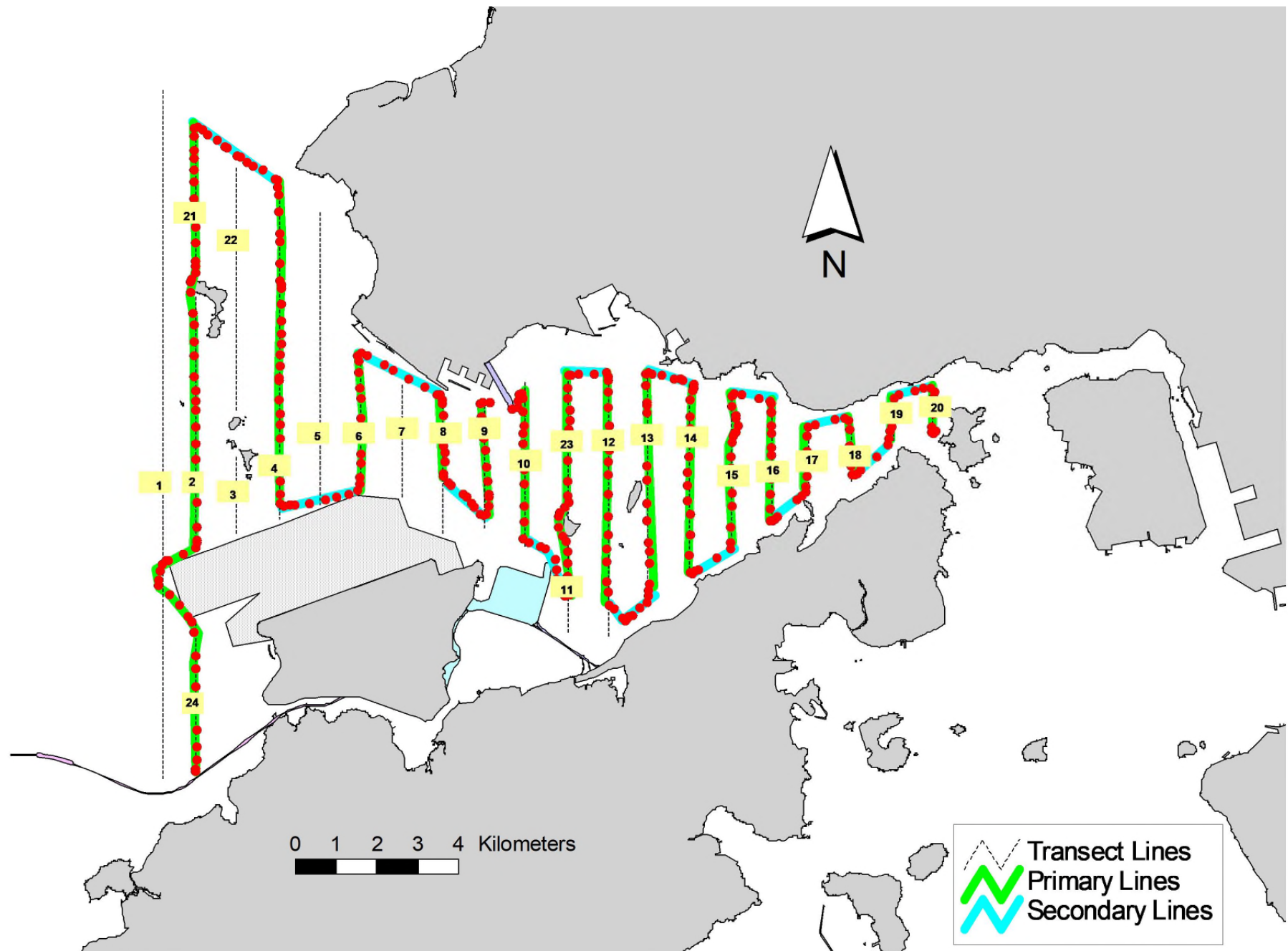


Figure 2. Survey Route on May 5th, 2020

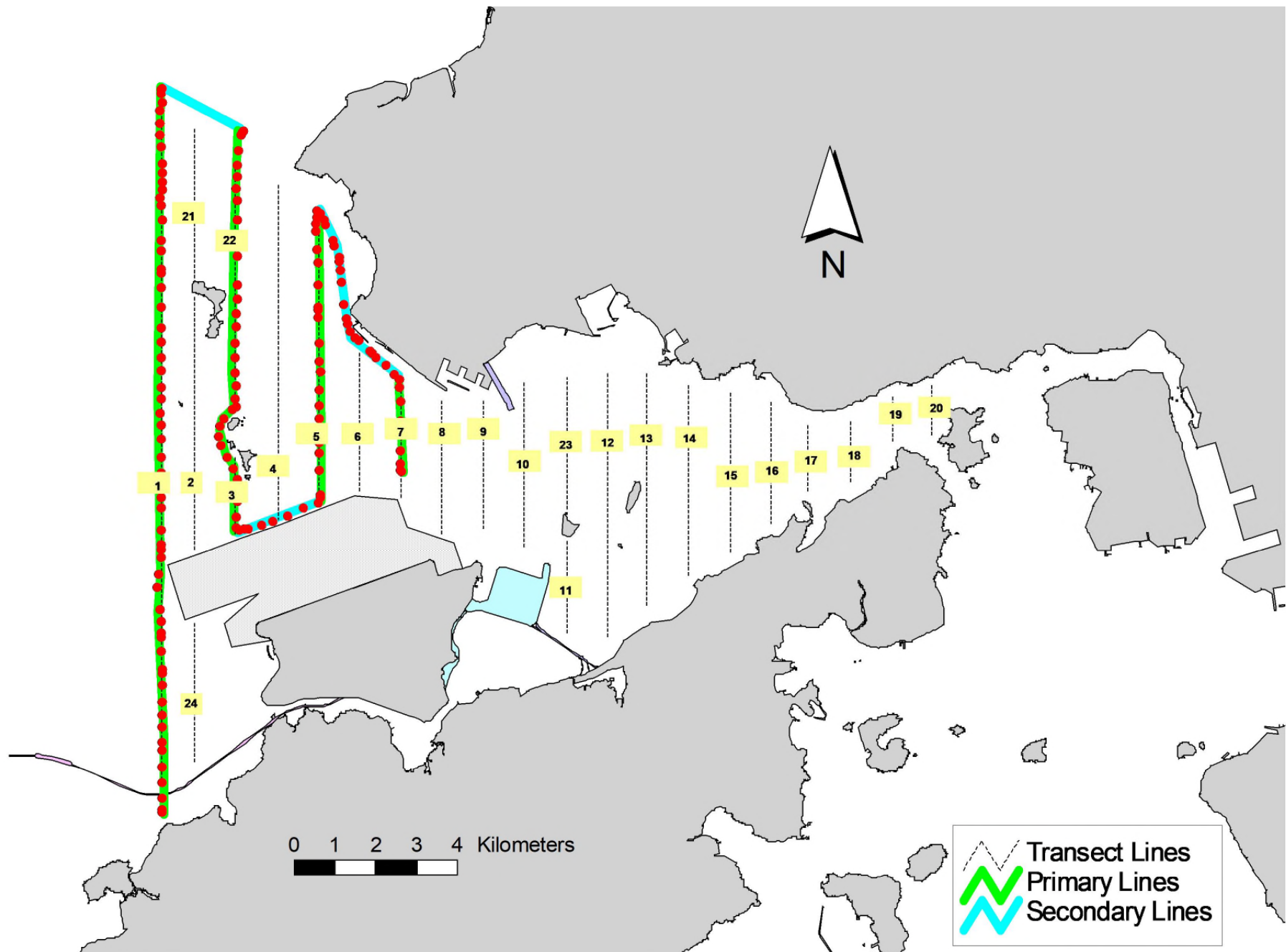


Figure 3. Survey Route on May 12th, 2020

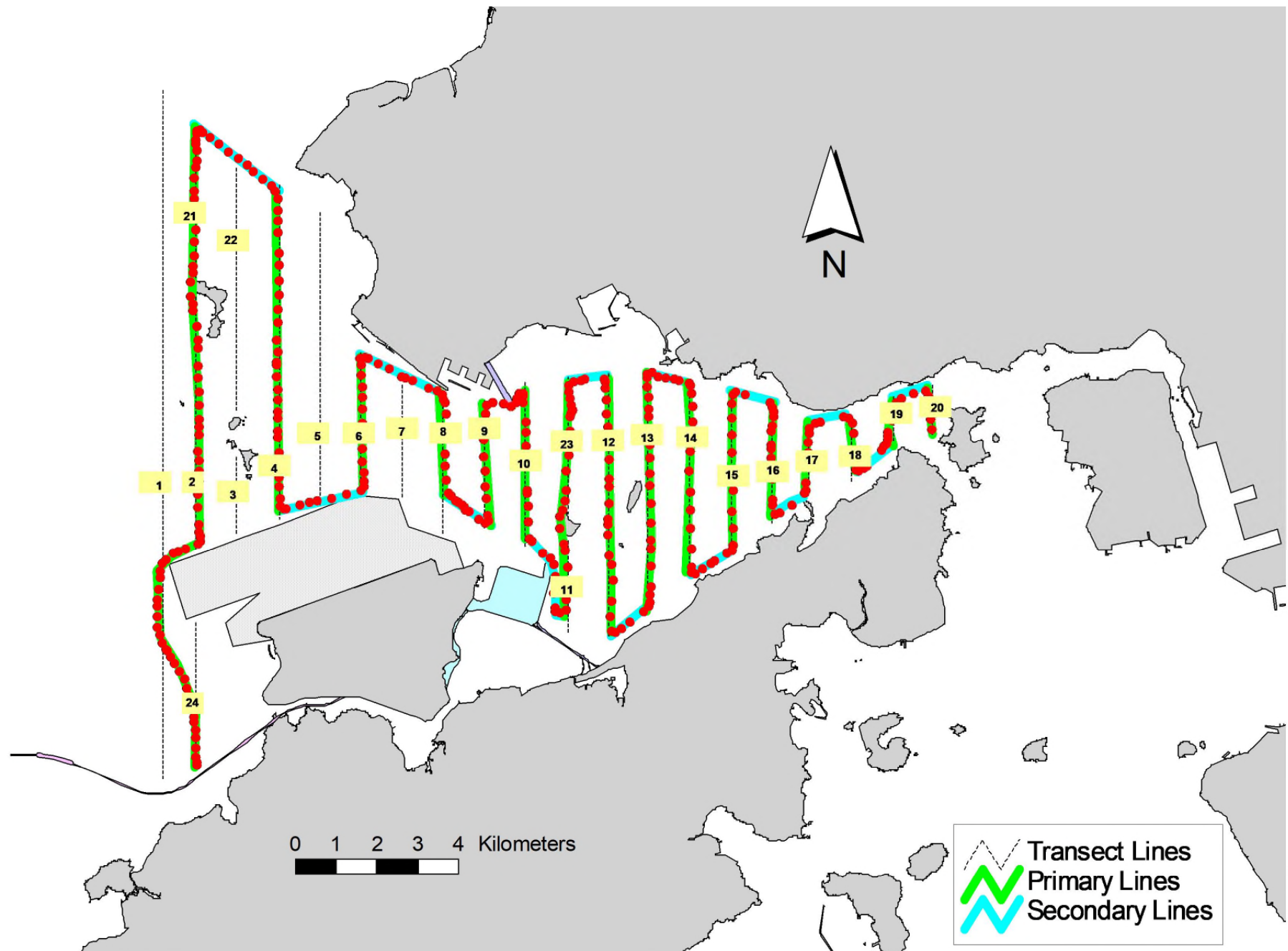


Figure 4. Survey Route on May 18th, 2020

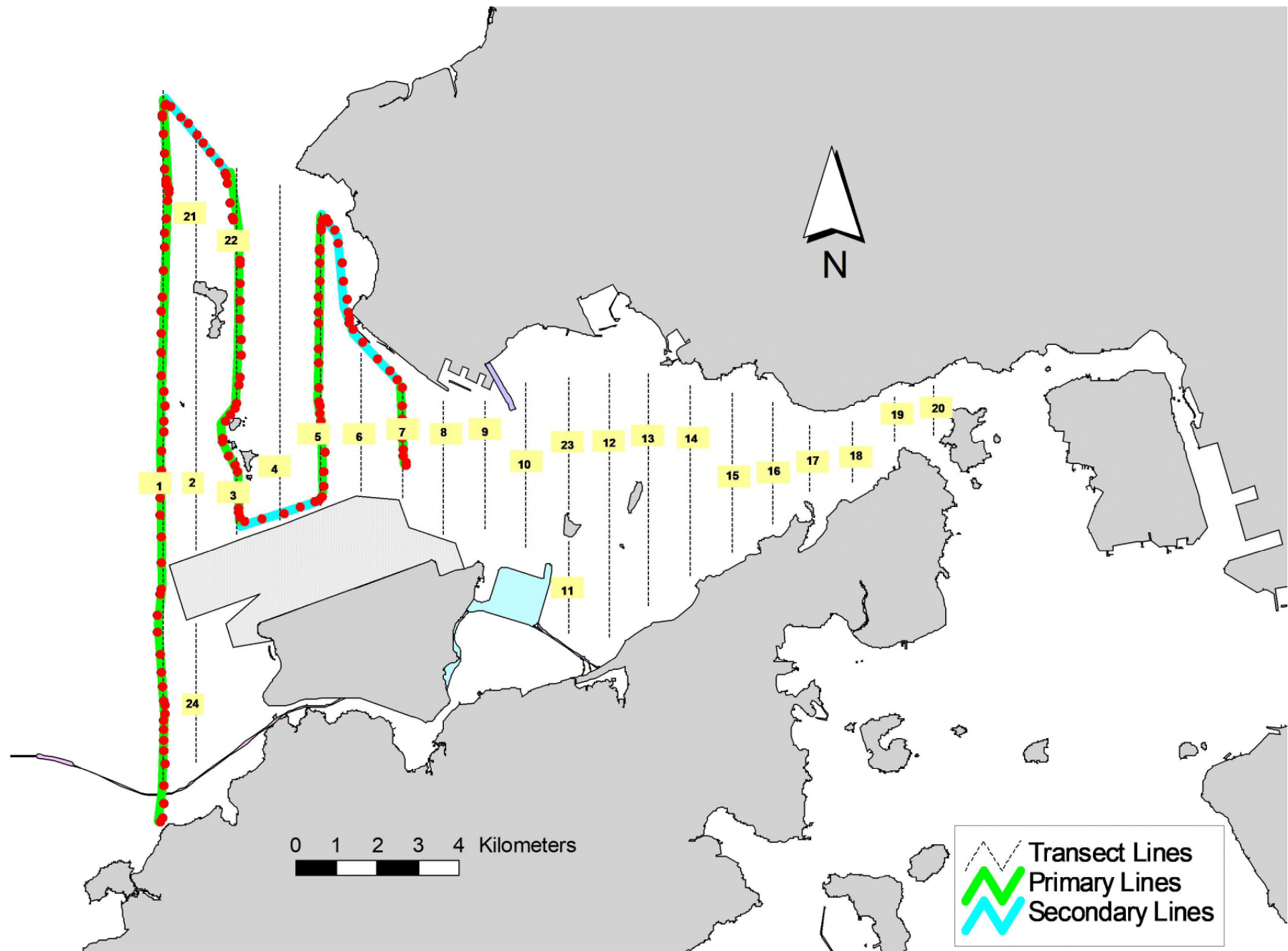


Figure 5. Survey Route on May 25th, 2020

Appendix I. TMCLKL Survey Effort Database (May 2020)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
5-May-20	NW LANTAU	2	7.25	SPRING	STANDARD36826	TMCLKL	P
5-May-20	NW LANTAU	3	20.75	SPRING	STANDARD36826	TMCLKL	P
5-May-20	NW LANTAU	3	11.20	SPRING	STANDARD36826	TMCLKL	S
5-May-20	NE LANTAU	2	24.87	SPRING	STANDARD36826	TMCLKL	P
5-May-20	NE LANTAU	3	9.60	SPRING	STANDARD36826	TMCLKL	P
5-May-20	NE LANTAU	2	9.29	SPRING	STANDARD36826	TMCLKL	S
5-May-20	NE LANTAU	3	3.34	SPRING	STANDARD36826	TMCLKL	S
12-May-20	NW LANTAU	2	32.61	SPRING	STANDARD36826	TMCLKL	P
12-May-20	NW LANTAU	2	6.74	SPRING	STANDARD36826	TMCLKL	S
12-May-20	NW LANTAU	3	1.85	SPRING	STANDARD36826	TMCLKL	S
18-May-20	NW LANTAU	1	1.50	SPRING	STANDARD36826	TMCLKL	P
18-May-20	NW LANTAU	2	9.00	SPRING	STANDARD36826	TMCLKL	P
18-May-20	NW LANTAU	3	16.13	SPRING	STANDARD36826	TMCLKL	P
18-May-20	NW LANTAU	2	5.20	SPRING	STANDARD36826	TMCLKL	S
18-May-20	NW LANTAU	3	7.27	SPRING	STANDARD36826	TMCLKL	S
18-May-20	NE LANTAU	1	6.72	SPRING	STANDARD36826	TMCLKL	P
18-May-20	NE LANTAU	2	23.97	SPRING	STANDARD36826	TMCLKL	P
18-May-20	NE LANTAU	3	4.22	SPRING	STANDARD36826	TMCLKL	P
18-May-20	NE LANTAU	1	3.53	SPRING	STANDARD36826	TMCLKL	S
18-May-20	NE LANTAU	2	8.46	SPRING	STANDARD36826	TMCLKL	S
25-May-20	NW LANTAU	1	1.31	SPRING	STANDARD36826	TMCLKL	P
25-May-20	NW LANTAU	2	26.44	SPRING	STANDARD36826	TMCLKL	P
25-May-20	NW LANTAU	3	3.83	SPRING	STANDARD36826	TMCLKL	P
25-May-20	NW LANTAU	2	9.85	SPRING	STANDARD36826	TMCLKL	S

Appendix J

Event and Action Plan

Event and Action Plan for Impact Air Monitoring

	Action			
	ET (a)	IEC (a)	SOR (a)	Contractor(s)
Action Level Exceedance				
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.				

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

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

EVENT	ACTION			
	ET	IEC	SOR	Contractor
	3. Identify source(s) of impact; 4. Inform the IEC, SOR and Contractor of findings; 5. Check monitoring data; 6. Repeat review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary. 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.	Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures. 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. 5. Supervise / Audit the implementation of additional monitoring and/or any other mitigation measures and advise SOR the results and findings accordingly.	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. 3. Supervise the implementation of additional monitoring and/or any other mitigation measures.	potential mitigation measures. 3. Jointly submit with ET to IEC a proposal of additional dolphin monitoring and/or any other mitigation measures when necessary. 4. Implement the agreed additional dolphin monitoring and/or any other mitigation measures.

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 Contract commencement
1-hr TSP	Action	0	109
	Limit	0	13
24-hr TSP	Action	0	10
	Limit	0	4
Water Quality	Action	0	167
	Limit	0	19
Impact Dolphin Monitoring	Action	0	11
	Limit	1	19

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 (May 2020)	0	0	0
Total No. received since Contract commencement	17	1	0

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 May 2020 [to be submitted not later than the 15th 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	3008.812	0.000	336.902	889.467	1782.443
Jan-2020	174.69	0.000	0.000	0.000	174.69
Feb-2020	1.455	0.000	0.000	0.000	1.455
Mar-2020	3.252	0.000	0.000	0.000	3.252
Apr-2020	4.200	0.000	0.000	0.000	4.200
May-2020	7.015	0.000	0.000	0.000	7.015
Jun-2020					
Half Year Sub-total					
Jul-2020					
Aug-2020					
Sep-2020					
Oct-2020					
Nov-2020					
Dec-2020					
Project Total Quantities	3199.424	0.000	336.902	889.467	1973.055

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	9890.77	9890.77	14.64	14.64	16.84	16.84	85.807	85.807	21.943
Jan-2020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.54
Feb-2020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.349
Mar-2020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.226
Apr-2020	22.14	22.14	1.30	1.30	0.00	0.00	6.40	6.40	0.521
May-2020	6.2	6.2	0.54	0.54	0.00	0.00	0.6	0.6	0.536
Jun-2020									
Half Year Sub-total									
Jul-2020									
Aug-2020									
Sep-2020									
Oct-2020									
Nov-2020									
Dec-2020									
Project Total Quantities	9919.11	9919.11	16.48	16.48	16.84	16.84	92.608	92.608	27.115

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)
3200.000	0.000	350.000	1000.000	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)
10000.00	20.00	18.00	95.00	30.000

- 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 m³. (**ER Part 8 Clause 8.8.5 (d) (ii)** refers).