MTR Corporation Limited

Shatin to Central Link –
Hung Hom to Admiralty Section

Monthly EM&A Report No. 57

[Period from 1 to 31 January 2019]

(February 2019)

Verified by: Fredrick Leong

Position: Independent Environmental Checker

Date: 13 February 2019

MTR Corporation Limited

Shatin to Central Link –
Hung Hom to Admiralty Section

Monthly EM&A Report No. 57

[Period from 1 to 31 January 2019]

(February 2019)

Certified by: Lisa Poon

Position: Environmental Team Leader

Date: 13 February 2019

AECOM

MTR Corporation Limited

Consultancy Agreements
No. C11033B

Shatin to Central Link - Hung Hom to Admiralty Section

Monthly EM&A Report No. 57

[Period from 1 to 31 January 2019]

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Version: A	Date: 13 February 2019

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1 INTRODUCTION

1.1 Background

1.1.1 The Shatin to Central Link (SCL) is a 17km extension of the existing Ma On Shan Line (MOL) and East Rail Line (EAL) comprising (i) The East-West Corridor which extends the MOL from Tai Wai to Hung Hom via East Kowloon to connect with the West Rail Line (WRL) at Hung Hom Station (HUH) and Stabling Sidings at Hung Hom Freight Yard (HHS); and (ii) The North-South Corridor which is an extension of the East Rail Line (EAL) at Hung Hom across the harbour to Admiralty Station (ADM).

1.1.2 Shatin to Central Link – Hung Hom to Admiralty Section [SCL (HUH – ADM)] (hereafter referred to as "the Project") is part of the SCL.

1.1.3 The Environmental Impact Assessment (EIA) Report for SCL (HUH-ADM) (Register No.: AEIAR-166/2012) was approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, an Environmental Permit (EP) (EP No.: EP-436/2012) was granted on 22 March 2012 for construction and operation. Variations of environmental permit (VEP) was subsequently applied for EP-436/2012 and the latest Environmental Permit (EP No: EP-436/2012/F) was issued by Director of Environmental Protection (DEP) on 23 January 2019.

1.2 Project Programme

1.2.1 Eight civil construction works contracts of the Project have been awarded since January 2014. The construction of the Project commenced in May 2014 and is expected to complete in 2021[1]. The Project will have to interface with other infrastructure projects, including Wan Chai Development Phase II and Central-Wan Chai Bypass. **Table 1.1** summarises the information of the awarded Works Contracts.

Table 1.1 Summary of Awarded Works Contracts

Works Contract	Description	Construction Start Date	Contractor	Environmental Team
1121(1)	NSL Cross Harbour Tunnels	March 2015	Penta-Ocean – China State JV	Wellab Limited
1122	Admiralty South Overrun Tunnel	August 2016	Vinci Construction Grands Projects	AECOM Asia Co. Ltd.
1123	Exhibition Station and Western Approach Tunnels	June 2015	Leighton – China State JV	AECOM Asia Co. Ltd.
1124	Admiralty SCL Related Works	February 2017	Build King SCL 1124 JV	Action-United Environmental Services and Consulting (AUES)
1126(2)	Reprovisioning of Harbour Road Sports Centre and Wan Chai Swimming Pool	July 2014	Kaden Leader JV	Cinotech Consultants Ltd. (Cinotech)
1128	South Ventilation Building to Admiralty Tunnels	November 2014	Dragages Bouygues J.V.	AECOM Asia Co. Ltd.
1129(3)	SCL – Advance Works for NSL	May 2014	Hsin Chong Construction Co. Ltd.	AECOM Asia Co. Ltd.

[1] The commissioning date of SCL(HUH-ADM) will very likely be deferred to 2021 to allow flexibility for the topside development of the Exhibition Station, and to cater for the construction works under other infrastructure projects on Hong Kong Island.

Works Contract	Description	Construction Start Date	Contractor	Environmental Team
11227(4)	Advance Works for NSL Cross Harbour Tunnels	August 2014	Concentric-Hong Kong River Joint Venture	Cinotech Consultants Ltd. (Cinotech)

Note:
(1) The environmental team of Works Contract 1121 was taken over by Wellab Limited since 1st January 2019.
(2) Construction works under Works Contract 1126 was completed on 17 May 2015.
(3) Construction works under Works Contract 1129 was completed on 20 July 2015.
(4) Construction works in Victoria Harbour and Shek O Casting Basin under Works Contract 11227 were completed on 15 and 20 December 2014 respectively.

1.3 Purpose of the Report

1.3.1 The Environmental Monitoring and Audit (EM&A) programme for the Project commenced in May 2014. This is the fifty-seventh EM&A Report for the Project which summarises the EM&A works undertaken by the respective Contractor's ETs during the period from 1 to 31 January 2019.

2 ENVIRONMENTAL MONITORING AND AUDIT

2.1 EM&A Results

2.1.1 The EM&A Report for Works Contracts 1128, 1121, 1123, 1122 and 1124 prepared by the respective Contractor's ETs are provided in **Appendices A** to **E** respectively. The EM&A Reports provide details of the project information, EM&A requirements, impact monitoring and audit results for the corresponding Contracts.

2.1.2 A summary of the major construction activities undertaken by the respective Contractors of various Works Contracts during the reporting period are presented in **Table 2.1**.

Table 2.1 Summary of Major Construction Activities in the Reporting Period

Works Contract	Site	Construction Activities
1121	Victoria Harbour	• External Works around NOV at Hung Hom; • Internal Finishes at NOV at Hung Hom; • External Wall Finishes at NOV at Hung Hom; • Building Services Installation at NOV at Hung Hom; • Seawall Installation CCT/NOV at Hung Hom; • Cofferdam Pipe Pile Wall Extraction at Hung Hom; • Construction of Walkway inside the Immersed Tube Tunnels; • Sand Blasting at Immersion Joints inside the Immersed Tube Tunnels; • Immersion Joints Construction inside the Immersed Tube Tunnels; • Re-provision of Finger Pier at Hung Hom; • Backfilling for as-installed IMT Elements at Victoria Harbour; • Reinstatement of Breakwater at CBTS; and • Demolition of Wall 2 at ME4 Tunnel
1122	HKB & Site Surface	• Wall Concreting for L8 and L9; • Erecting Scaffolds for L8 Slab; • Sliding Doors and Access Panels Installation; • BS Installation Works for Tunnel Connection; and • Reinstatment Work on the Ground.
1123	Zone 1 – PTI Area	• Excavation and Lateral Support; and • Structure Station/Tunnel.
	Zone 2	• Excvation and Lateral Support.
	Zone 4 – Tunnel at Tonnochy Road	• Excavation and Lateral Support.
	Zone 3 – Swimming Pool Area (including W4, W5, W6 (partial), W7a and W7b)	• Excavation and Lateral Support.
	Fleming Road Junction - Area E	• Fleming Road Culvert Diverson; • Excavation and Lateral Support; • Temporary Traffic Management; and • Utilities Diversion & Protection
	Western Vent Shaft and WAT - Area C	• Structure Vent Shaft/Tunnel.
	WAT - Area B	• Structure Tunnel.
	WAT - Area A	• Structure Tunnel.
	Kai Tak Barging Point(1)	• Storage and Barging of Fill Materials.
1124	New Admiralty Station	• SCL Level – SEM Openings Post-coring Works; • Mezzanine Level – SEM Openings Post-coring Works; • Concourse Level - De-stressing & Dismantle of Flying Strut;

Works Contract	Site	Construction Activities
		• Cat ladder and Door Installation Works in North Bound; • Concourse Level - Floor Tiles and Wall Painting Carried out in SCR Waiting Area; and • Atrium – Aluminium Cladding Works.
1128	Area W2	• POC Structure Works, Retaining Wall; and • SOV Structure Works, Layer S1 Strut Removal, Corbel works.hgsaaauwwqq
	Area W3	• Reinstatement Works.
	Area W4	• Reinstatement Works.
	Area W8	**FPP** • Walkway and EEP Structure Works, D-wall Opening for Connection. **Area 2** • NIL Works, Pre-bored H-piles. **SP1 at Down-Track** • RC Lining.
	ADM – Down Track	• Walkway Concreting.

Notes:
(1) The Kai Tak Barging Point will be for storage and barging of fill materials over the whole contract period.

2.1.3 During the reporting month, impact monitoring for air quality, construction noise and water quality were conducted in accordance with the EM&A Manual. Continuous noise monitoring was not required in the reporting period according to the Continuous Noise Monitoring Plan (CNMP). No exceedances of the Action/Limit Level of 24-hour TSP, construction noise and impact water quality parameters due to the Project construction were recorded. Results of air quality, construction noise and impact water quality monitoring are summarised in **Tables 2.2**, **2.3** and **2.4** respectively. Details of the monitoring requirements, locations, equipment and methodology are presented in the EM&A Reports (**Appendices A** to **E**).

Table 2.2 Summary of 24-Hour TSP Monitoring Results in the Reporting Period

Monitoring Station ID	Location	TSP Concentration ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)	Exceedance due to the Project Construction (Yes/No)
Works Contract 1121[(1)]					
Works Contract 1122[(2)]					
Works Contract 1123[(3)]					
Works Contract 1124[(2)]					
Works Contract 1123 and 1128					
AM2	Wan Chai Sports Ground[(4)(5)]	49.1 – 80.9	160	260	No
Works Contract 1128					
AM4	Pedestrian Plaza	49.6 – 120.6	198	260	No

Note:
(1) The setup of the impact dust monitoring station at Harbourfront Horizon and the impact monitoring is currently carried out under Works Contract 1112. Upon termination of their EM&A programmes, the impact monitoring works would be taken up by Works Contract 1121.
(2) No TSP monitoring is required under this works contract.
(3) Dust monitoring at AM3 (Existing Harbour Road Sports Centre) was handed over from Works Contract 1126 to Works Contract 1123 in June 2015 and terminated on 6 May 2017 as demolition of Existing Harbour Road Sports Centre commenced on 8 May 2017.
(4) The spectator stand at Wan Chai Sports Ground was not available for impact dust monitoring, therefore impact monitoring was conducted at the existing water pump room area at Wan Chai Sports Ground.
(5) Dust monitoring at AM2 (Wan Chai Sports Ground) was handed over to Works Contract 1123 from Works Contract 1128 on 28 October 2015.

Table 2.3 Summary of Construction Noise Monitoring Results in the Reporting Period

Monitoring Station ID	Location	Noise Level ($L_{Aeq,30mins}$, dB(A))			Limit Level (dB(A))	Exceedance due to the Project Construction (Yes/No)
		Measured	Baseline	Corrected[1]		
Works Contract 1121[2]						
Works Contract 1122[2]						
Works Contract 1123						
NM2[3][4][5]	Harbour Centre	65.8 – 66.8	69.6	< Baseline	75	No
Works Contract 1124[2]						
Work Contract 1128[6]						
NM1	Hoi Kung Court	66.9 – 70.4	71	< Baseline	75	No

Note:
(1) The measured noise levels are corrected against the corresponding baseline noise levels.
(2) No construction noise monitoring is required under this works contract.
(3) The impact monitoring at NM2 was handed over from Works Contract 1126 to Works Contract 1123 in June 2015.
(4) Access to the designated monitoring location NM2 (i.e. Block A, Causeway Centre) was denied before the commencement of impact monitoring under Works Contract 1126. Alternative noise monitoring location proposed at Harbour Centre was approved by the ER and agreed by IEC. It was approved by EPD on 18 December 2017. Impact noise monitoring was carried out at Harbour Centre from 20 August 2014 onwards.
(5) Impact noise monitoring has been carrying out on 7/F of Harbour Centre between 20 August and 15 December 2014, and on 8/F from 19 December 2014 onwards.
(6) Noise monitoring at NM1 (Hoi Kung Court) was handed over from Works Contract 1129 to Works Contract 1128 in August 2015.

Table 2.4 Summary of Impact Marine Water Quality Monitoring Results in the Reporting Period [1]

Locations		Parameters		
		Depth-averaged Dissolved Oxygen (mg/L)	Depth-averaged Turbidity (NTU)	Depth-averaged Suspended Solids (mg/L)
Shek O Casting Basin (Dry Season) [2]				
Victoria Harbour (Dry Season) [3]				
21	Mean	7.4	1.9	5.6
	Range	6.9 – 8.6	1.1 – 4.5	3.3 – 7.8
34	Mean	7.4	2.6	6.3
	Range	6.9 – 8.2	1.2 – 6.5	3.0 – 7.8
9	Mean	6.4	2.2	5.0
	Range	5.2 – 7.8	0.9 – 5.5	3.0 – 7.5
Action Level		3.3	12.2	8.0
Limit Level		3.2	18.5	10.4
Exceedance (Yes/No)		No	No	No
A	Mean	7.2	2.1	5.4
	Range	6.7 – 8.5	1.1 – 4.7	3.5 – 6.8
WSD17	Mean	7.7	1.9	5.4
	Range	7.3 – 9.1	0.9 – 4.8	3.7 – 6.7
WSD9	Mean	7.6	1.8	5.4
	Range	7.1 – 9.1	0.9 – 3.9	3.3 – 6.8

Locations		Parameters		
		Depth-averaged Dissolved Oxygen (mg/L)	Depth-averaged Turbidity (NTU)	Depth-averaged Suspended Solids (mg/L)
Action Level		<2.1	5.0	6.9
Limit Level		<2	7.0	6.9
Exceedance (Yes/No)		No	No	No
C1	Mean	7.4	2.0	5.7
	Range	6.5 – 8.3	0.9 – 4.0	4.8 – 6.7
C2	Mean	7.8	1.9	5.3
	Range	7.4 – 9.3	0.8 – 4.6	3.0 – 6.8

Notes:

(1) Marine water quality monitoring was conducted in the reporting period under Works Contract 1121.

(2) Removal of earth bunds at Shek O Casting Basin under Works Contract 1121 commenced on 17 March 2017 and the removal of dock gate at Shek O Casting Basin was completed on 30 April 2017. Removal of southern dock gate at Shek O under Works Contract 1121 commenced on 8 November 2017 and was completed on 20 November 2017. A post-project water quality monitoring was hence conducted from 22 November 2017 to 18 December 2017 according to Section 9.25 of the EM&A Manual.

(3) Dredging / filling works within the Victoria Harbour commenced on 22 April 2015. Water Quality Monitoring at Station 8 and 14 is suspended as these water intakes are not in use.

2.1.4 One environmental complaint was referred by EPD under Works Contract 1128 on 16 January 2019, regarding the water discharge issue. Investigation was conducted and reported in the respective EM&A Report. No notification of summons and successful prosecutions were recorded in the reporting period. Log for environmental complaints, notification of summons and successful prosecutions is provided in **Table 2.5**.

Table 2.5 Log for Environmental Complaints, Notification of Summons and Successful Prosecutions for the Reporting Month

Works Contract	Environmental Complaints	Notification of Summons	Successful Prosecutions
1121	0	0	0
1122	0	0	0
1123	0	0	0
1124	0	0	0
1128	1	0	0

2.1.5 Regular site inspections were conducted by the Contractor's ET on a weekly basis to check the implementation of environmental pollution control and mitigation measures for the Project. No non-conformance was identified in the reporting period.

3 IMPLEMENTATION STATUS ON THE ENVIRONMENTAL PROTECTION REQUIREMENTS

3.1.1 The respective Contractors have implemented all mitigation measures and requirements as stated in the EIA Report, EM&A Manual and EP (EP-436/2012/F). The status of required submissions under the EP as of the reporting period are summarised in **Table 3.1**.

Table 3.1 Summary of EP Submissions Status

EP Condition (EP-436/2012/F)	Submission	Submission date
Condition 1.11	Notification of Commencement Date of Construction of the Project	19 Dec 2012
Condition 2.3	Notification of Setup of Community Liaison Group	22 Jun 2016
Condition 2.5	Management Organisation of Main Construction Companies	5 Jan 2017
Condition 2.6	Construction Programme and EP Submission Schedule	5 Jan 2017
Condition 2.7	Construction Noise Mitigation Measures Plan (CNMMP) Works Contract 1126: Construction Noise Mitigation Measures Plan (CNMMP) Works Contract 1123: Construction Noise Mitigation Measures Plan (CNMMP)	 9 Jun 2014 (1st Submission) 24 Apr 2015 (1st Submission) 7 Jul 2015 (2nd Submission) 2 Oct 2015 (3rd Submission) 2 June 2016 (4th Submission)
Condition 2.8	Continuous Noise Monitoring Plan (CNMP) Works Contract 1126: Continuous Noise Monitoring Plan (CNMP) Works Contract 1123: Continuous Noise Monitoring Plan (CNMP)	 9 Jun 2014 (1st Submission) 24 Apr 2015 (1st Submission) 7 Jul 2015 (2nd Submission) 2 June 2016 (3rd Submission)
Condition 2.9	Construction and Demolition Materials Management Plan (C&DMMP)	6 Jul 2012 (1st Submission) 12 Sep 2012 (2nd Submission) 15 Oct 2012 (approved)
Condition 2.10	Works Contract 11227: Silt Curtain Deployment Plan for Trial Trenching in Victoria Harbour Works Contract 1121: Silt Curtain Deployment Plan for Hung Hom Landfall and Trial Trench in Victoria Harbour Works Contract 1128: Silt Curtain Deployment Plan	11 Jul 2014 17 Feb 2015 (1st Submission) 2 Apr 2015 (2nd Submission) 27 Oct 2015 (3rd Submission) 29 March 2016 (4th Submission) 19 December 2017 and 15 January 2018 (5th Submission) 21 March 2018 (1st Submission) 13 April 2018 (2nd Submission) 17 Apri 2018 (Approved)
Condition 2.11	Works Contract 11227: Silt Screen Deployment Plan Works Contract 1121: Silt Screen Deployment Plan	11 Jul 2014 13 Feb 2015
Condition 2.12	Sediment Management Plan	6 Jul 2012 (1st Submission) 12 Sep 2012 (2nd Submission) 5 Oct 2012 (3rd Submission) 15 Oct 2012 (approved)

EP Condition (EP-436/2012/F)	Submission	Submission date
		3 Jul 2014 (4th Submission)
Condition 2.14	Visual, Landscape, Tree Planting & Tree Protection Plan	14 Nov 2012 (1st Submission) 3 Dec 2013 (2nd Submission) 21 Aug 2014 (3rd Submission) 9 Feb 2015 (4th Submission) 27 May 2016 (5th Submission) 29 Nov 2016 (6th Submission) 19 Jan 2017 (7th Submission) 11 Apr 2017 (8th Submission) 20 Apr 2017 (approved) 7 Feb 2018 (9th Submission on 1122 revised landscape plans) 7 Mar 2018 (10th Submission) 9 Mar 2018 (approved)
Condition 2.23.1	Works Contract 11227: Silt Curtain Deployment Plan for Shek O Works Contract 1121: Silt Curtain Deployment Plan for Shek O	23 Jul 2014 (1st Submission) 31 Jul 2014 (approved) 4 Feb 2015 (1st Submission) 4 Mar 2015 (2nd Submission) 9 Mar 2015 (approved)
Condition 2.24	Contamination Assessment Plan (CAP) and Contamination Assessment Report (CAR)Remedial Action Plan (RAP) for the above-ground diesel tanks for Wan Chai Swimming Pool	CAP: 25 Sep 2012 (1st Submission) 12 Nov 2012 (2nd Submission) 22 Nov 2012 (approved) CAR: 19 Mar 2013 (1st Submission) 16 Apr 2013 (2nd Submission) 21 May 2013 (3rd Submission) 7 Jun 2013 (approved)
Condition 2.26	As-built Drawings for Landscape and Visual Mitigation Measures	5th Jan 2018 (1st submission)
Condition 2.28	Operational Ground-borne Noise Mitigation Measures Plan – Batch 1	26th June 2018 (1st submission)
Condition 3.3	Baseline Monitoring Report (for noise and air quality)	4 Dec 2013 (1st Submission) 5 Feb 2014 (2nd Submission)
	Baseline Water Quality Monitoring Report	23 Sep 2014 (1st Submission) 18 Dec 2014 (2nd Submission)
	Baseline Water Quality Monitoring Report for Temporary Marine Works at Shek O Casting Basin	8 Jul 2014 (1st Submission) 11 Aug 2014 (2nd Submission)
Condition 3.4	Monthly EM&A Reports No.1 - 55 Final EM&A Review Report for Works Contract 11227 Final EM&A Review Report for Works Contract 1126 Final EM&A Review Report for Works Contract 1129 Monthly EM&A Report No.56	Reported in previous Monthly EM&A Reports 12 Feb 2015 25 Jun 2015 (1st Submission) 4 Sep 2015 (2nd Submission) 30 Sep 2015 14 Jan 2019

Appendix A

Monthly EM&A Report for January 2019 – SCL Works Contract 1128 South Ventilation Building to Admiralty Tunnels

AECOM

Dragages Bouygues J.V.

Shatin to Central Link -
Hung Hom to Admiralty Section

Works Contract 1128 -
South Ventilation Building (SOV) to Admiralty Tunnels

Monthly EM&A Report for
January 2019

[February 2019]

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Version: 0	Date: 11 February 2019

Disclaimer

This Environmental Monitoring and Audit Report is prepared for Dragages Bouygues J.V. and is given for its sole benefit in relation to and pursuant to SCL1128 and may not be disclosed to, quoted to or relied upon by any person other than Dragages Bouygues J.V. without our prior written consent. No person (other than Dragages Bouygues J.V. into whose possession a copy of this Manual comes may rely on this plan without our express written consent and Dragages Bouygues J.V. may not rely on it for any purpose other than as described above.

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EXECUTIVE SUMMARY

Shatin to Central Link Contract 1128 – South Ventilation Building (SOV) to Admiralty Tunnels (hereafter called "the Project") covers part of the construction of the Shatin to Central Link (SCL).

The Project comprises the Permanent Works and the associated temporary works necessary for TBM tunnels between SOV and Admiralty Tunnels, short sections of cut and cover tunnels near SOV and Fenwick Pier Emergency Egress Point (FPP), Re-provisioning, Remedial and Improvement Works (RRIW) for government and public bodies facilities.

The EM&A programme commenced on 17 November 2014. The impact EM&A for the Project includes air quality and noise monitoring.

This report documents the findings of EM&A works conducted in the period between 1 and 31 January 2019. As informed by the Contractor, major activities in the reporting period were:

Location	Site Activities
Area W2	• POC Structure Works, Retaining Wall • SOV Structure Works, Layer S1 strut removal, Corbel works
Area W3 – Percival Footbridge	• Reinstatement Works
Area W4 – Tunnel Approach Rest Garden	• Reinstatement Works
Area W8 (FPP)	• Walkway and EEP Structure Works, D-wall Opening for connection
Area W8 (Area2)	• NIL Works, pre-bored H-piles
Area W8 – SP1 at Down-track	• RC lining
ADM – Down-track	• Walkway concreting

Breaches of Action and Limit Levels for Air Quality

No exceedance of Action / Limit Level of air quality was recorded in the reporting month.

Breaches of Action and Limit Levels for Noise

Noise monitoring was handed-over from SCL Contract 1129 in August 2015.

No Action Level exceedance was recorded since no noise related complaint was received in the reporting month.

No exceedance of Limit Level of noise was recorded in the reporting month.

Breaches of Action and Limit Levels for Water Quality

No Action and Limit Level exceedance was recorded by the ET of Contract SCL1121 for water quality monitoring in the reporting month.

Complaint, Notification of Summons and Successful Prosecution

An environmental complaint related to water quality was received by EPD on 14 and 15 January 2019. The complaint was about milky water discharge was found at Victoria Harbour near Causeway Bay Typhoon Shelter. The investigation report was submitted to EPD on 24 January 2019.

No notification of summons and successful prosecution was received in the reporting month. The summary and cumulative statistic on environmental complaints is provided in **Appendix J**.

Reporting Changes

There was no reporting change in the reporting month.

Future Key Issues

Key issues to be considered in the coming month included:

Location	Site Activities
Area W2	• POC Structure Works, Retaining Wall
Area W2 – SOV Shaft	• SOV Structure Works, Layer S1 strut removal, Corbel works
Area W3 – Percival Footbridge	• Reinstatement Works
Area W4 –Rest Garden Reinstatement	• Reinstatement Works
Area W8 (Area1)	• Walkway and EEP Structure Works, D-wall Opening for connection
Area W8 (Area 2)	• NIL Works, pre-bored H-piles
Area W8 – SP1 at Down-track	• RC lining
ADM – Down-track	• Walkway concreting

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

1 INTRODUCTION

Dragages Bouygues J.V. (JV) was commissioned by MTR as the Civil Contractor for Works Contract 1128. AECOM Asia Company Limited (AECOM) was appointed by JV as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) programme during construction phase of the Project.

1.1 Purpose of the Report

1.1.1 This is the fifty - first monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting period between 1 and 31 January 2019.

1.2 Report Structure

1.2.1 This monthly EM&A Report is organized as follows:

- Section 1: Introduction
- Section 2: Project Information
- Section 3: Environmental Monitoring Requirement
- Section 4: Implementation Status of Environmental Mitigation Measures
- Section 5: Monitoring Results
- Section 6: Environmental Site Inspection and Audit
- Section 7: Environmental Non-conformance
- Section 8: Future Key Issues
- Section 9: Conclusions and Recommendations

2 PROJECT INFORMATION

2.1 Background

2.1.1 The Shatin to Central Link (SCL) is a 17km extension of the existing Ma On Shan Line (MOL) and East Rail Line (EAL) comprising (i) The East-West Corridor which extends the MOL from Tai Wai via East Kowloon to connect with the West Rail Line (WRL) at Hung Hom Station (HUH); and (ii) The North-South Corridor which is an extension of the East Rail Line (EAL) at Hung Hom across the harbour to Admiralty Station (ADM).

2.1.2 The Environmental Impact Assessment (EIA) Reports for SCL – Hung Hom to Admiralty Section [SCL (HUH-ADM)] (Register No.: AEIAR-166/2012) was approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, an Environmental Permit (EP) was granted on 22 March 2012, which covers SCL (HUH-ADM) EP No.: EP-436/2012), for the construction and operation. Variation of EP (VEP) was subsequently applied and the latest EP (EP No. EP-436/2012/F) was issued by the Director of Environmental Protection (DEP) on 23 January 2019.

2.1.3 The construction of the SCL is divided into different civil construction works contracts and the Project comprises the Permanent Works and the associated temporary works necessary for TBM tunnels between SOV and Admiralty Tunnels, short sections of cut and cover tunnels near SOV and Fenwick Pier Emergency Egress Point (FPP), Re-provisioning, Remedial and Improvement Works (RRIW) for government and public bodies facilities under the EP.

2.1.4 The site layout plan of the Project is shown in **Figure 1.1**.

2.2 Site Description

2.2.1 The major construction activities under Works Contract 1128 include:

(a) Taking over the 160m section of the SCL tunnels (ME4 Tunnel) constructed under the Central Wan Chai Bypass (CWB) project and construction of walkways, sealing, connection and various finishing works inside the tunnels;
(b) Construction of cut and cover tunnels connecting from South Ventilation Building (SOV) to the ME4 Tunnel;
(c) Removal of temporary reclamation and reinstatement of seawall;
(d) Construction of SOV;
(e) Bored tunnels between SOV and Exhibition Station (EXH);
(f) Construction of cut and cover tunnels connecting from the SCL tunnels under Convention Avenue by Contract 1123 to the bored tunnels as stated in sub-clause
(g) Construction of Fenwick Pier Emergency Egress Point (FPP);
(h) Bored tunnels between Fenwick Pier Emergency Egress Point (FPP) and Admiralty Station (ADM);
(i) Pile/obstruction detections and removals for construction of SCL running tunnels and for future North Island Line (NIL) running tunnels;
(j) Demolition of existing Police Officer's Club (POC);
(k) Reprovisioning of new POC;
(l) Other RRIW;
(m) Essential piling works at future Government, Institution and Community (GIC) site
(n) Diversion and modification of utilities and services;
(o) Modification, re-provisioning or reinstatement of footpath, carriageway or road features;
(p) Provisions for Designated and Interfacing Contracts;
(q) Tree felling, tree compensation, transplanting works and landscaping works;
(r) Permanent reprovisioning works at the Fleet Arcade;
(s) Miscellaneous signage; and
(t) External works comprising new and reinstated roads, footpaths, drains, landscaping, staircase, street furniture and the like.

2.3 Construction Programme and Activities

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

Location	Site Activities
Area W2	• POC Structure Works, Retaining Wall • SOV Structure Works, Layer S1 strut removal, Corbel works
Area W3 – Percival Footbridge	• Reinstatement Works
Area W4 – Tunnel Approach Rest Garden	• Reinstatement Works
Area W8 (FPP)	• Walkway and EEP Structure Works, D-wall Opening for connection
Area W8 (Area2)	• NIL Works, pre-bored H-piles
Area W8 – SP1 at Down-track	• RC lining
ADM – Down-track	• Walkway concreting

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

2.4 Project Organisation

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

Table 2.1 Contact Information of Key Personnel

Party	Role	Position	Name	Telephone	Fax
MTR	Residential Engineer (ER)	Construction Manager	Mr. Mike Bezzano	2171 3610	2171 3609
		SCL Project Environmental Team Leader	Ms. Lisa Poon	3127 6295	3127 6422
Meinhardt	Independent Environmental Checker	Independent Environmental Checker	Mr. Fredrick Leong	2859 1739	2540 1580
JV	Contractor	Project Director	Mr. Lee Ka-Leung	9745 5533	2171 3715
		Environmental Manager	Mr. Marcus Cheung	6628 2685	
AECOM	Contractor's Environmental Team (ET)	ET Leader	Mr. Y T Tang	3922 9393	2317 7609

2.5 Status of Environmental Licences, Notification and Permits

2.5.1 Relevant environmental licenses, permits and/or notifications on environmental protection for this Project and valid in the reporting month are summarized in **Table 2.2**.

Table 2.2 Status of Environmental Licenses, Notifications and Permits

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
Environmental Permit				
EP-436/2012/E	23 Nov 2016	23 Jan 2019	Valid until 23 Jan 2019, superseded by EP-436/2012/F	The whole SCL
EP-436/2012/F	23 Jan 2019	End of the Project	Valid	The whole SCL
Construction Noise Permit				
GW-RS0619-18	22 Jul 2018	21 Jan 2019	Valid until 21 Jan 2019	Construction site near Gloucester Road, Wan Chai (W3.5.2)
GW-RS0622-18	21 Jul 2018	17 Jan 2019	Valid until 17 Jan 2019	Construction site between Percival Street Footbridge and Causeway / Hung Hing Road Flyover (W3)
GW-RS0852-18	21 Sept 2018	20 Mar 2019	Valid	Construction Site at Gloucester Road near Hung Hing Road (W4)
GW-RS1075-18	24 Nov 2018	22 May 2019	Valid	Construction site near Lung King Street and Convention Avenue (W8, W11, W14, W21)
GW-RS1126-18	29 Nov 2018	27 May 2019	Valid	Construction site near Ex-Police Officers' Club, Causeway Bay, Hong Kong
Wastewater Discharge License				
WT00020473-2014	9 Dec 2014	31 Dec 2019	Valid	Gloucester Road near Hung Hing Road (W4)
WT00021519-2015	4 May 2015	31 May 2020	Valid	Between Percival Street Footbridge and Hung Hing Road Flyover (W3)
WT00022596-2015	22 Sep 2015	30 Sep 2020	Valid	Gloucester Road near Marsh Road Station Building (W5)
WT00022781-2015	3 Nov 2015	30 Nov 2020	Valid	Works Area at Green Zone
WT00023987-2016	10 Mar 2016	31 Mar 2020	Valid	Junction of Lung King Street and Convention Avenue (W8)
WT00023988-2016	10 Mar 2016	31 Dec 2019	Valid	Wang Shing Street (W6)
WT00023989-2016	10 Mar 2016	31 Dec 2019	Valid	Lung King Street near DSD Screening Plant (W14)

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
WT00024759-2016	21 Jun 2016	31 Dec 2019	Valid	Works Area at POC (W1 + W2)
WT00025076-2016	29 Jul 2016	31 Jul 2021	Valid	Works Area on Marsh Road near Wan Chai Sports Centre
Chemical Waste Producer Registration				
5213-135-D2551-01	16 Dec 2014	End of the Project	Valid	Gloucester Road near Hung Hing Road (W4)
5213-134-D2552-01	16 Dec 2014	End of the Project	Valid	Lung King Street near DSD Screening Plant (W14)
5111-151-D2552-02	05 Jan 2015	End of the Project	Valid	Victoria Park Road near POC (W1)
Billing Account for Construction Waste Disposal				
7020686	15 Sep 2014	End of Contract	Valid	For disposal of C&D waste to public fills and landfills
Notification Under Air Pollution Control (Construction Dust) Regulation				
378806	2 Sep 2014	End of Contract	Valid	For Wan Chai, Causeway Bay, Hong Kong Island
380227	7 Oct 2014	End of Contract	Valid	For Gloucester Road near Cross Harbour Tunnel
380228	7 Oct 2014	End of Contract	Valid	Near Convention Avenue and Fenwick Pier Street, HK Island

3 ENVIRONMENTAL MONITORING REQUIREMENTS

3.1 Construction Dust Monitoring

Monitoring Requirements

3.1.1 In accordance with the approved EM&A Manuals, 24-hour Total Suspended Particulates (TSP) level at the designated air quality monitoring station is required. Impact 24-hour TSP monitoring should be carried out for at least once every 6 days. The Action and Limit level of the air quality monitoring is provided in **Appendix D**.

Monitoring Equipment

3.1.2 24-hour TSP air quality monitoring was performed using High Volume Sampler (HVS) located at the designated monitoring stations. The HVS meets all the requirements of the EM&A Manual. Brand and model of the equipment is given in **Table 3.1**.

Table 3.1 Air Quality Monitoring Equipment

Equipment	Brand and Model
High Volume Sampler (24-hour TSP)	Andersen Total Suspended Particulate Mass Flow Controlled High Volume Air Sampler (Model No. GS 2310 (S/N:10273))
Calibration Kit	TISCH Environmental Orifice (Model TE-5025A (S/N: 0843 & 0988))

Monitoring Locations

3.1.3 Two monitoring station were set up at the proposed location in accordance with the approved EM&A Manuals for SCL(HUH-ADM) as well as the works areas of the Project. The location of the construction dust monitoring stations are summarised in **Table 3.2** and shown in **Figure 3.1**.

Table 3.2 Locations of Construction Dust Monitoring Station

ID	Air Sensitive Receiver (ASR) ID in EIA Report	Dust Monitoring Station
AM2*	EXA6	Wanchai Sports Ground
AM4	EXA4	Pedestrian Plaza

* The monitoring station at AM2 was handed-over from Contract SCL1126 in April 2015 and handed-over to Contract SCL1123 on 28 October 2015.

Monitoring Methodology

3.1.4 24-hour TSP Monitoring

(a) The HVS was installed in the vicinity of the air sensitive receivers. The following criteria were considered in the installation of the HVS as far as practicable:

(i) A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
(ii) Two samplers should not be placed less than 2m apart from each other;
(iii) The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
(iv) A minimum of 2 meters separation from walls, parapets and penthouse for rooftop sampler.
(v) A minimum of 2 meters separation from any supporting structure, measured horizontally is required.

(vi) No furnace or incinerator flues nearby.
(vii) Airflow around the sampler was unrestricted.
(viii) The sampler was located more than 20 meters from any dripline.
(ix) Any wire fence and gate, required to protect the sampler, did not obstruct the monitoring process.
(x) Permission was obtained to set up the samplers and access to the monitoring station.
(xi) A secured supply of electricity was obtained to operate the sampler.

(b) Preparation of Filter Papers

(i) Glass fibre filters, G810 were labelled and sufficient filters that were clean and without pinholes were selected.
(ii) All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ±3 °C; the relative humidity (RH) was < 50% and not variable by more than ±5%. A convenient working RH was 40%.
(iii) All filter papers were prepared and analysed by ALS Technichem (HK) Pty Ltd., which is a HOKLAS accredited laboratory and has comprehensive quality assurance and quality control programmes.

(c) Field Monitoring

(i) The power supply was checked to ensure the HVS works properly.
(ii) The filter holder and the area surrounding the filter were cleaned.
(iii) The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
(iv) The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
(v) The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied was sufficient to avoid air leakage at the edges.
(vi) Then the shelter lid was closed and was secured with the aluminium strip.
(vii) The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
(viii) A new flow rate record sheet was set into the flow recorder.
(ix) On site temperature and atmospheric pressure readings were taken and the flow rate of the HVS was checked and adjusted at around 1.3 m^3/min, and complied with the range specified in the EM&A Manual (i.e. 0.6-1.7 m^3/min).
(x) The programmable digital timer was set for a sampling period of 24 hrs, and the starting time, weather condition and the filter number were recorded.
(xi) The initial elapsed time was recorded.
(xii) At the end of sampling, on site temperature and atmospheric pressure readings were taken and the final flow rate of the HVS was checked and recorded.
(xiii) The final elapsed time was recorded.
(xiv) The sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
(xv) It was then placed in a clean envelope and sealed.
(xvi) All monitoring information was recorded on a standard data sheet.
(xvii) Filters were then sent to ALS Technichem (HK) Pty Ltd. for analysis.

(d) Maintenance and Calibration

(i) The HVS and its accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
(ii) HVSs were calibrated using TE-5025A Calibration Kit upon installation and thereafter at bi-monthly intervals.
(iii) Calibration certificate of the TE-5025A Calibration Kit and the HVSs are provided in **Appendix E**.

Monitoring Schedule for the Reporting Month

3.1.5 The schedule for environmental monitoring in January 2019 is provided in **Appendix F**.

3.2 Construction Noise Monitoring

Monitoring Requirements

3.2.1 In accordance with the EM&A Manual, impact noise monitoring should be conducted for at least once a week during the construction phase of the Project. **Table 3.3** summarises the monitoring parameters, frequency and duration of impact noise monitoring. The Action and Limit level of the noise monitoring is provided in **Appendix D**.

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

Parameter and Duration	Frequency
30-mins measurement at each monitoring station between 0700 and 1900 on normal weekdays. Leq, L_{10} and L_{90} would be recorded.	At least once per week

Monitoring Equipment

3.2.2 Noise monitoring was performed using sound level meter at each designated monitoring station. The sound level meters deployed comply with the International Electrotechnical Commission Publications (IEC) 651:1979 (Type 1) and 804:1985 (Type 1) specifications. Acoustic calibrator was deployed to check the sound level meters at a known sound pressure level. Brand and model of the equipment is given in **Table 3.4**.

Table 3.4 Noise Monitoring Equipment for Regular Noise Monitoring

Equipment	Brand and Model
Integrated Sound Level Meter	Model No. B&K2238 (S/N: 2800927)
Acoustic Calibrator	Model No. B&K 4231 (S/N: 3006428)

Monitoring Locations

3.2.3 The monitoring station for construction noise monitoring pertinent to the Project has been identified based on the approved EM&A Manual for SCL (HUH-ADM) of the Project. Location of the noise monitoring station is summarised in **Table 3.5** and shown in **Figure 3.1**.

Table 3.5 Noise Monitoring Station during Construction Phase

Identification No.	Noise Sensitive Receiver (NSR) ID in EIA Report	Noise Monitoring Station
NM1*	CH2	Hoi Kung Court

* The noise monitoring at NM1 was handed-over from SCL Contract 1129 in August 2015.

Monitoring Methodology

3.2.4 Monitoring Procedure

(a) Façade measurement was made at NM1.

(b) The battery condition was checked to ensure the correct functioning of the meter.

(c) Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:

(i) frequency weighting: A
(ii) time weighting: Fast

(iii) time measurement: $L_{eq(30\text{-minutes})}$ during non-restricted hours i.e. 0700 – 1900 on normal weekdays.

(d) Prior to and after each noise measurement, the meter was calibrated using the acoustic calibrator for 94 dB(A) at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1 dB(A), the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.

(e) During the monitoring period, the L_{eq}, L_{10} and L_{90} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.

(f) Noise measurement was paused during periods of high intrusive noise (e.g. dog barking, helicopter noise) if possible. Observations were recorded when intrusive noise was unavoidable.

(g) Noise monitoring was cancelled in the presence of fog, rain, wind with a steady speed exceeding 5m/s, or wind with gusts exceeding 10m/s.

3.2.5 Maintenance and Calibration

(a) The microphone head of the sound level meter was cleaned with soft cloth at regular intervals.

(b) The meter and calibrator were sent to the supplier or HOKLAS laboratory to check and calibrate at yearly intervals.

(c) Calibration certificates of the sound level meters and acoustic calibrators are provided in **Appendix E**.

Monitoring Schedule for the Reporting Month

3.2.6 The schedule for environmental monitoring in January 2019 is provided in **Appendix F**.

3.3 Water Quality Monitoring

Monitoring Requirements

3.3.1 In accordance with the EM&A Manual, impact water quality monitoring should be conducted during dredging and filling operation. **Table 3.6** summarises the monitoring parameters and frequency of impact water quality monitoring. The Action and Limit level of the impact water quality monitoring is provided in **Appendix D**.

Table 3.6 Water Quality Monitoring Parameters and Frequency

Parameter	Frequency
Turbidity, Suspended Solid, Dissolved Oxygen, Temperature and Salinity	Three days per week, at mid-flood and mid-ebb tides

Monitoring Equipment

3.3.2 The monitoring equipment, monitoring methodology are detailed in the monthly EM&A Reports prepared for Contract SCL1121.

Monitoring Locations

3.3.3 The monitoring station for impact water quality monitoring has been extracted from the EM&A Manual for SCL (HUH-ADM) of the Project. Location of the water monitoring station is summarised in **Table 3.7.**

Table 3.7 Monitoring Station for Impact Water Quality Monitoring

Monitoring Station	Description	Coordinates	
		Easting	Northing
Victoria Harbour			
8	Cooling Water Intake for Excelsior Hotel and World Trade Centre / No. 27 – 63 Paterson Street	837036	816008
9	Cooling Water Intake for Windsor House	837223	816150
14	Flushing Water Intake for Kowloon Station	834477	817891
21	Cooling Water Intake for East Rail Extension	836484	817642
34	Cooling Water Intake for Metropolis	836828	817844
A	Wan Chai WSD Flushing Water Intake (Reprovisioned)(1)	836268	816045
WSD9	Tai Wan WSD Flushing Water Intake(2)	837930	818357
WSD17	Quarry Bay WSD Flushing Water Intake	839863	817077
C1	Control Station 1	833977	817442
C2	Control Station 2	841088	817223

Note: 1. According to the Baseline Water Quality Monitoring Report for SCL (MKK-HUH & HUH-ADM), the original coordinates of monitoring location A (Easting: 836286, Northing: 816024) is the exact location taken from the design of reprovisioned Wan Chai Salt Water Pumping Station and Salt Water Intake Culvert. Based on actual site condition for taking water sampling, minor adjustment was made on monitoring location.

2. According to the Baseline Water Quality Monitoring Report for SCL (MKK-HUH & HUH-ADM), the original coordinates of monitoring location WSD9 (Easting: 838133, Northing: 817790) as proposed in WQMP were moved closer to sensitive receiver according to the actual site condition.

Monitoring Methodology

3.3.4 The monitoring methodology is detailed in the monthly EM&A Reports prepared for Contract SCL1121.

Monitoring Schedule for the Reporting Month

3.3.5 The monitoring schedule is detailed in the monthly EM&A Reports prepared for Contract SCL1121.

3.4 Landscape and Visual

3.4.1 As per the EM&A Manuals, the landscape and visual mitigation measures shall be implemented and site inspections should be undertaken once every two weeks during the construction period. A summary of the implementation status is presented in **Section 6.**

4 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

4.1.1 The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Reports, the EP and EM&A Manuals. The implementation status of the environmental mitigation measures during the reporting period is summarized in **Appendix C.** Status of required submissions under the EP during the reporting period is summarised in **Table 4.1**.

Table 4.1 Status of Required Submission under Environmental Permit

EP Condition	Submission	Submission Date
Condition 3.4 (EP-436/2012/E)	Monthly EM&A Report for December 2018	14 January 2019

5 MONITORING RESULTS

5.1 Construction Dust Monitoring

5.1.1 The monitoring results for 24-hour TSP are summarised in **Table 5.1**. Detailed air quality monitoring results and wind monitoring data extracted from the nearest Automatic Weather Station are presented in **Appendix G**.

Table 5.1 Summary of 24-hour TSP Monitoring Result in the Reporting Period

ID	Average ($\mu g/m^3$)	Range ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
AM2#	68.3	49.1 – 80.9	160	260
AM4	89.2	49.6 – 120.6	198	260

The monitoring station at AM2 was handed-over from Contract SCL1126 in April 2015 and handed-over to Contract SCL1123 on 28 October 2015.

5.1.2 No exceedance of Action / Limit Level of air quality was recorded in the reporting month.

5.1.3 The event and action plan is annexed in **Appendix I**.

5.1.4 Major dust sources during the monitoring included construction dust, nearby traffic emission and other nearby construction sites.

5.2 Construction Noise Monitoring

5.2.1 Noise monitoring at NM1 was handed over from SCL Contract 1129 in August 2015.

5.2.2 The monitoring results for noise are summarized in **Table 5.2** and the monitoring data is provided in **Appendix H**.

Table 5.2 Summary of Construction Noise Monitoring Results in the Reporting Period

ID	Range, dB(A), $L_{eq\ (30\ mins)}$	Limit Level, dB(A), $L_{eq\ (30\ mins)}$
NM1 (*)	<baseline	75

(*) Baseline correction will be made to the measured L_{eq} when the measured noise level exceeded the corresponding baseline noise level and presented in the table.

5.2.3 No noise complaint was received in the reporting month; hence, no Action Level exceedance was recorded.

5.2.4 No Limit Level exceedance of noise was recorded at the monitoring station in the reporting month.

5.2.5 The event and action plan is annexed in **Appendix I**.

5.2.6 Major noise sources during the monitoring included construction noise from the Project site, nearby traffic noise and the community.

5.3 Water Quality Monitoring

5.3.1 The monitoring results are reported in the monthly EM&A Report prepared for Contract SCL1121.

5.3.2 No Action and Limit Level exceedance was recorded by the ET of Contract SCL1121 for water quality monitoring in the reporting month.

5.4 Waste Management

5.4.1 C&D materials and wastes sorting were carried out on site. Receptacles were available for C&D wastes and general refuse collection.

5.4.2 As advised by the Contractor, 800.7 m^3 of inert C&D material was generated in the reporting month. 800.7 m^3 was disposed of as fill bank at TKO137. 90.6 m^3 of general refuse was generated in the reporting month. No paper/cardboard packaging material, metals and plastic was collected by recycling contractor in the reporting month. No chemical waste was collected by licensed contractor. No marine dumping was undertaken in the reporting period.

5.4.3 SCL1128 delivered the spoil to WDII C1, CWB, SCL 1121, SCL 1103, WDII C3, WDII C2, 8217, HY/2010/08, PSK226, SCL1112, Area 56A, M+ and XRL810B for beneficial use. If spoil could not be fully utilized at these sites, the spoil will be transported to Mainland China for reuse. The waste flow table is annexed in **Appendix K**.

5.4.4 The Contractor is advised to properly maintain on site C&D materials and wastes collection, sorting and recording system and maximize reuse / recycle of C&D materials and wastes. The Contractor is reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly.

5.4.5 The Contractor is reminded that chemical waste containers should be properly treated and stored temporarily in designated chemical waste storage area on site in accordance with the Code of Practise on the Packaging, Labelling and Storage of Chemical Wastes.

5.5 Landscape and Visual

5.5.1 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 4, 14 and 28 January 2019. A summary of the site inspection is provided in **Appendix C**. The observations and recommendations made during the site inspections are presented in **Table 6.1**.

6 ENVIRONMENTAL SITE INSPECTION AND AUDIT

6.1.1 Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. A summary of the mitigation measures implementation schedule is provided in **Appendix C**.

6.1.2 In the reporting month, 5 site inspections were carried out on 4, 7, 14, 21 and 28 January 2019. Joint inspection with the IEC, ER, the Contractor and the ET was conducted on 14 January 2019. No non-compliance was recorded during the site inspections. Details of observations recorded during the site inspections are presented in **Table 6.1**.

Table 6.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Air Quality	7 January 2019	Reminder • The Contractor was reminded to dampen the exposed earth surface on Area W14 in frequent manner in order to preventing dust generation.	The item was rectified by the Contractor on 9 January 2019.
Noise	Nil	Nil	Nil
Water Quality	14 January 2019	Reminder • The Contractor was reminded to ensure the desilting facility in W2 was operated properly for reducing the SS level in effluent.	The item was rectified by the Contractor on 21 January 2019.
Waste/ Chemical Management	Nil	Nil	Nil
Landscape & Visual	Nil	Nil	Nil
Permits/ Licenses	Nil	Nil	Nil

6.1.3 All of the follow-up actions requested by Contractor's ET and IEC during the site inspection were undertaken as reported by the Contractor and confirmed in the following weekly site inspection conducted during the reporting period.

7 ENVIRONMENTAL NON-CONFORMANCE

7.1 Summary of Monitoring Exceedances

7.1.1 No exceedance of Action / Limit Level of air quality was recorded in the reporting month.

7.1.2 No noise complaint was received in the reporting month; hence, no Action Level exceedance was recorded.

7.1.3 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.

7.1.4 No Action and Limit Level exceedance was recorded by the ET of Contract SCL1121 for water quality monitoring in the reporting month.

7.2 Summary of Environmental Non-Compliance

7.2.1 No environmental non-compliance was recorded in the reporting month.

7.3 Summary of Environmental Complaints

7.3.1 An environmental complaint related to water quality was received by EPD on 14 and 15 January 2019. The complaint was about milky water discharge was found at Victoria Harbour near Causeway Bay Typhoon Shelter.

7.3.2 Since the wastewater treatment facility at W2 was checked to be in good condition and the designated discharge point was not located on the improper drainage spot, it was believed that no leakage of milky water was generated from project site to the discharge point on related complaint date on 12 January 2019. It is considered that this complaint was not project related.

7.3.3 The investigation report was submitted to EPD on 24 January 2019.

7.3.4 The summary and cumulative statistics on environmental complaints is provided in **Appendix J**.

7.4 Summary of Environmental Summon and Successful Prosecutions

7.4.1 No environmental related prosecution or notification of summons was received in the reporting month. Cumulative statistics on notification of summons and successful prosecutions is provided in **Appendix J**.

8 FUTURE KEY ISSUES

8.1 Construction Programme for the Next Three Month

8.1.1 The major construction works in between February and April 2019 will be:

Location	Site Activities
Area W2	• POC Structure Works, Retaining Wall
Area W2 – SOV Shaft	• SOV Structure Works, Layer S1 strut removal, Corbel works
Area W3 – Percival Footbridge	• Reinstatement Works
Area W4 –Rest Garden Reinstatement	• Reinstatement Works
Area W8 (Area1)	• Walkway and EEP Structure Works, D-wall Opening for connection
Area W8 (Area 2)	• NIL Works, pre-bored H-piles
Area W8 – SP1 at Down-track	• RC lining
ADM – Down-track	• Walkway concreting

8.2 Key Issues for the Coming Month

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

8.3 Monitoring Schedule for the Next Three Month

8.3.1 The tentative schedules for environmental monitoring between February and April 2019 are provided in **Appendix F**.

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

9.1.1 24-hour TSP and noise monitoring were carried out in the reporting month.

9.1.2 All 24-hour TSP monitoring result complied with the Action / Limit Level at in the reporting month.

9.1.3 No noise complaint was received in the reporting month. Hence, no Action Level exceedance was recorded.

9.1.4 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.

9.1.5 No Action and Limit Level exceedance was recorded by the ET of Contract SCL1121 for water quality monitoring in the reporting month.

9.1.6 5 nos. of environmental site inspections were carried out in January 2019. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.

9.1.7 Referring to the Contractor's information, no environmental related notification of summons and successful prosecution was received in the reporting month.

9.1.8 An environmental complaint related to water quality was received by EPD on 14 and 15 January 2019. The complaint was about milky water discharge was found at Victoria Harbour near Causeway Bay Typhoon Shelter. The investigation report was submitted to EPD on 24 January 2019.

9.2 Recommendations

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

Air Quality Impact

- The Contractor was reminded to damper the exposed earth surface in frequent manner in order to preventing dust generation.

Construction Noise Impact

- No specific observation was identified in the reporting month.

Water Quality Impact

- The Contractor was reminded to ensure the desilting facility in W2 operated properly for reducing SS levels in effluent.

Chemical and Waste Management

- No specific observation was identified in the reporting month.

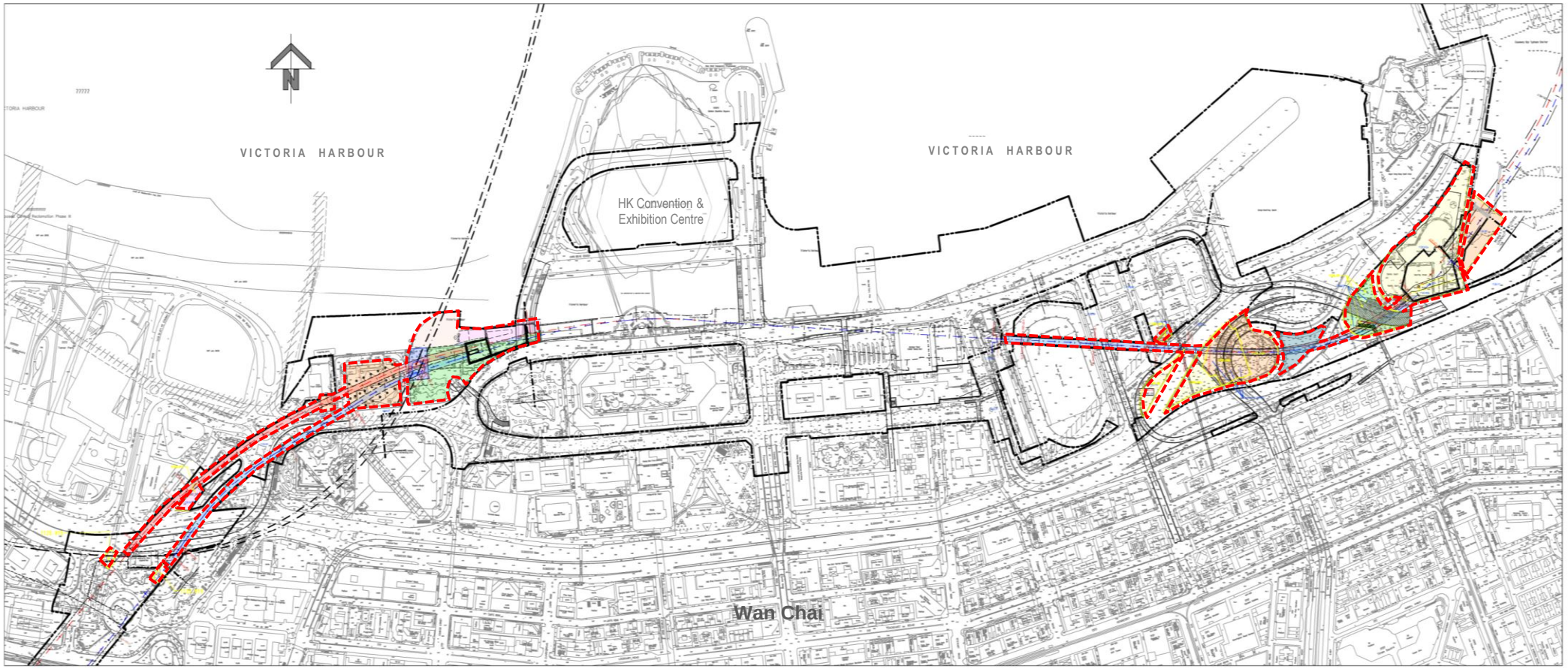
Landscape & Visual Impact

- No specific observation was identified in the reporting month.

Permits/licenses

- No specific observation was identified in the reporting month.

FIGURES



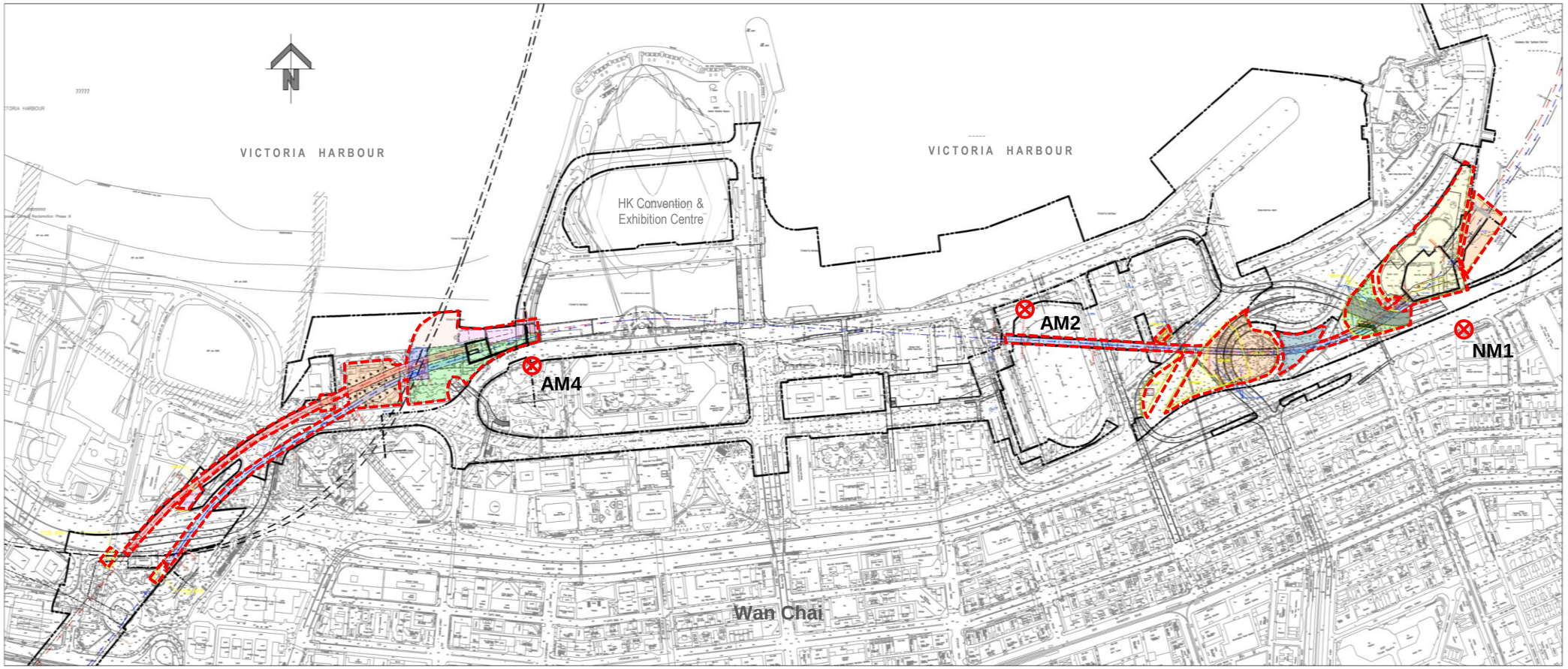
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SCL Contract 1128
South Ventilation Building to Admiralty Tunnels

AECOM

SITE LAYOUT PLAN of SCL1128

Project No.: 60331173 **Date: February 2016** **Figure 1.1**



Site Alignment

Monitoring Location

The air quality monitoring at AM2 was handed-over from Contract SCL1126 in April 2015 and handed-over to Contract SCL1123 on 28 October 2015.

* The noise monitoring at NM1 was handed-over from SCL1129 in August 2015.

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SCL Contract 1128

South Ventilation Building to Admiralty Tunnels

AECOM

Air Quality and Noise Monitoring Loactions

Project No.: 60331173 **Date: February 2016** **Figure 3.1**

APPENDIX A

Construction Programme

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish
Total		1046	16-May-16 A	16-Jan-20
3-Months Rolling Programme_RMP_C_2 (Jan-19)		1046	16-May-16 A	16-Jan-20
Contract Dates		87	01-Feb-19	29-Apr-19
Completion Obligation		82	01-Feb-19	23-Apr-19
Specified Parts of the Works		82	01-Feb-19	23-Apr-19
01128.CD07	Ref.3D (30-Dec-18) - Complete SOV Transfer Floor slab & the Temp. Openings at SOV GL 4/A-B ready for access by DC	0		01-Feb-19*
Degree 1 Completion		59	01-Feb-19	31-Mar-19
01128.CD14	Ref.4E.D1. (19-May-19) - DT Tunnel (W.Approach to ADM) Ch D96+593 to D96+095	0		01-Feb-19*
01128.CD15	Ref.4G.D1. (26-May-19) - SOV - Transfer Floor slab and below, except Ref. 4B, 4C & 4F	0		01-Feb-19*
01128.CD20	Ref.4K.D1. (27-Dec-20) - NIL Tunnels (Up and Down Tracks)	0		01-Feb-19*
01128.CD18	Ref.4J.D1. (18-Aug-19) - FPP & Occupied by Temp. Opening at Ch U96+64 to U96+575/ D96+643 to D96+560	0		25-Mar-19*
01128.CD13	Ref.4L.D1. (31-Mar-19) - C&C DT Tunnel (FPP Area 2 & B - Ch D96+643 to D96+593)	0		31-Mar-19*
01128.CD12	Ref.4C.D1. (31-Mar-19) - DT Tunnel (SOV-EXH) Ch D97+859 - D97+250	0		31-Mar-19*
Degree 2 Completion		82	01-Feb-19	23-Apr-19
01128.CD25	Ref.4I.D2. (24-Nov-19) SOV - All Remaining Areas	0		01-Feb-19*
01128.CD21	Ref.4J.D2. (15-Sep-19) - FPP & Occupied by Temp. Opening at Ch U96+64 to U96+575/ D96+643 to D96+560	0		23-Apr-19*
Contract Completion Obligation (Baseline)		59	01-Feb-19	31-Mar-19
Specified Parts of the Works		59	01-Feb-19	31-Mar-19
01128.CO06	Ref.3D (30-Dec-18) - Complete SOV Transfer Floor slab & the Temp. Openings at SOV GL 4/A-B ready for access by DC	0		01-Feb-19*
Degree 1 Completion		0	31-Mar-19	31-Mar-19
01128.CO10	Ref.4C.D1. (31-Mar-19) - DT Tunnel (SOV-EXH) Ch D97+859 - D97+250	0		31-Mar-19*
01128.CO19	Ref.4L.D1. (31-Mar-19) - C&C DT Tunnel (FPP Area 2 & B - Ch D96+643 to D96+593)	0		31-Mar-19*
Schedule of Access Dates for Works Areas		49	01-Feb-19	21-Mar-19
Vacation Date		49	01-Feb-19	21-Mar-19
01128.VD360	1128.A1	0		01-Feb-19*
01128.VD040	1128.W2c (1)	0		01-Feb-19*
01128.VD220	1128.W8e (1)	0		21-Mar-19*
01128.VD200	1128.W8d (1)	0		21-Mar-19*
01128.VD150	1128.W7d (1)	0		21-Mar-19*
Contract Vacation Date (Baseline)		45	01-Feb-19	17-Mar-19
01128.CVD040	1128.W2c (1)	0		01-Feb-19*
01128.VD650	1128.A1	0		01-Feb-19*
01128.CVD340	4 Novc	0		17-Feb-19*
01128.CVD350	1128.W19	0		17-Feb-19*
01128.CVD150	1128.W7d (1)	0		17-Mar-19*
01128.CVD200	1128.W8d (1)	0		17-Mar-19*
Access Dates for Designation Contractors		59	01-Feb-19	01-Apr-19
1120B - Trackwork and Overhead Line System for SCL Phase 2		59	01-Feb-19	01-Apr-19
01128.DCAD010	NSL tunnel (U/T) from SCL Entrustment Works ME4 to EXH (Ch U97+941 to U97+265 & Track and Trackside areas	0	01-Feb-19*	
01128.DCAD020	NSL tunnel (D/T) from SCL Entrustment Works ME4 to EXH (Ch D97+931 to D97+250 & Track and Trackside areas	0	01-Apr-19*	
01128.DCAD030	NSL tunnel (U/T) from West Approach Tunnels to ADM (Ch U 96+664 to U96+070) - Track and Trackside areas	0	01-Apr-19*	
Programme Data		87	01-Feb-19	29-Apr-19
4.0 Schedule of Closing Access Openings for Designated Contractors		0	29-Apr-19	29-Apr-19
01128.PD060	Start Sealing up Access Openings at SOV (UP track) West End	0	29-Apr-19*	
5.0 Interface with Contract 1121		59	01-Feb-19	31-Mar-19
01128.PD130	1128 provide Access to 1121 at Interface area for tunnel construction at SCL Entrustment Works ME4 & 1121's tunnel	0	01-Feb-19*	
01128.PD140	1121 Complete the Tunnelling works & CP door at the Interface area	0		31-Mar-19*
6.0 Interface with Contract 1123		0	01-Apr-19	01-Apr-19
01128.PD200	1128 provide Access to 1123 for NSL tunnelling works at the Interface at FPP (Applicable if Option 7 is NOT exercised)	0	01-Apr-19*	
7.0 Interface with Contract 1124		0	18-Feb-19	18-Feb-19
01128.PD310	1128 provide Access to 1124 at the Interface area at ADM (Applicable if Option 10 & 14 are NOT exercised)	0	18-Feb-19*	



Primary Baseline
Actual Work
Remaining Activitiy
Baseline Milestone
Milestone

1128-3MRP190131

SCL 1128 - SOV to Admiralty Tunnels

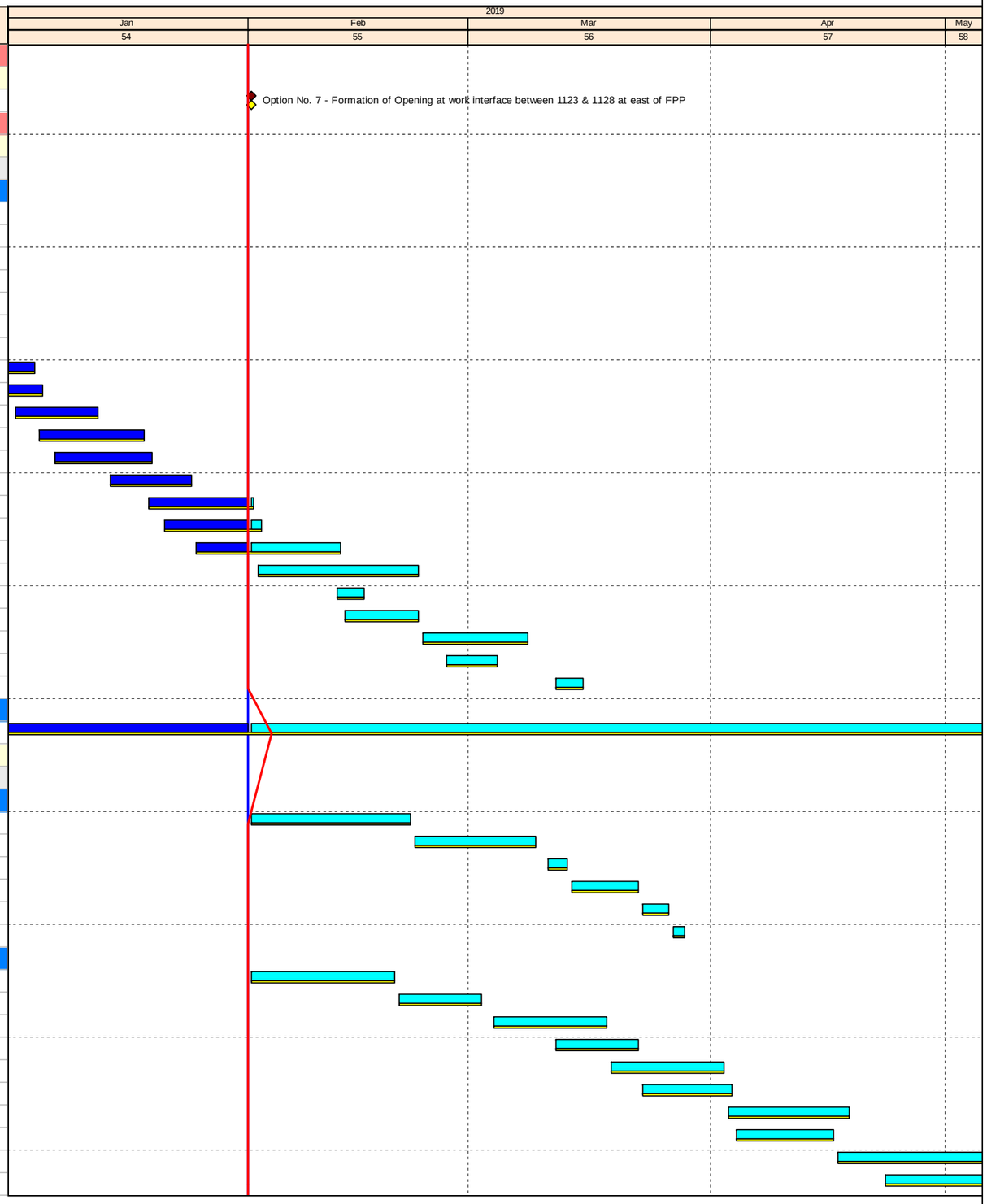
3-Months Rolling Programme (Feb 2019 to Apr 2019)

1128

Date	Revision	Checked	Approved
28-Aug-17	1128 - RMP Ver.C, Rev.2		

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish
Cost Centre A - Preliminaries		0	01-Feb-19	01-Feb-19
Options		0	01-Feb-19	01-Feb-19
01128.CCA00180	Option No. 7 - Formation of Opening at work interface between 1123 & 1128 at east of FPP	0	01-Feb-19*	
Cost Centre C - South Ventilation Building (SOV)		1025	16-May-16 A	18-Dec-19
Foundation, Excavation & Structure		1025	16-May-16 A	18-Dec-19
Excavation & Structure		1025	16-May-16 A	18-Dec-19
RC Structure		98	12-Nov-18 A	15-Mar-19
01128.CCC001256	Construct BL1 to -2mPD Zone 2 (100%)	14	12-Nov-18 A	06-Dec-18 A
01128.CCC001236	Construct BL1 to -2mPD Zone 3 (100%)	14	13-Nov-18 A	13-Dec-18 A
01128.CCC001306	S2 Strut removal - Zone 1	5	03-Dec-18 A	07-Dec-18 A
01128.CCC001376	Construct -2mPD to -Transfer Slab Zone 1 (35%)	11	07-Dec-18 A	19-Dec-18 A
01128.CCC001316	S2 Strut removal - Zone 2	7	10-Dec-18 A	17-Dec-18 A
01128.CCC001296	S2 Strut removal - Zone 3	4	17-Dec-18 A	20-Dec-18 A
01128.CCC001356	Construct -2mPD to -Transfer Slab Zone 2 (35%)	10	18-Dec-18 A	31-Dec-18 A
01128.CCC001326	Construct -2mPD to -Transfer Slab Zone 3 (20%)	12	19-Dec-18 A	04-Jan-19 A
01128.CCC001377	Construct -2mPD to -Transfer Slab Zone 1 (70%)	12	20-Dec-18 A	05-Jan-19 A
01128.CCC001357	Construct -2mPD to -Transfer Slab Zone 2 (70%)	10	02-Jan-19 A	12-Jan-19 A
01128.CCC001336	Construct -2mPD to -Transfer Slab Zone 3 (40%)	12	05-Jan-19 A	18-Jan-19 A
01128.CCC001796	Construct -2mPD to -Transfer Slab Zone 1 (85%)	12	07-Jan-19 A	19-Jan-19 A
01128.CCC001806	Construct -2mPD to -Transfer Slab Zone 2 (80%)	10	14-Jan-19 A	24-Jan-19 A
01128.CCC001826	Construct -2mPD to -Transfer Slab Zone 3 (60%)	12	19-Jan-19 A	01-Feb-19
01128.CCC001386	Construct -2mPD to -Transfer Slab Zone 1 (100%)	12	21-Jan-19 A	02-Feb-19
01128.CCC001816	Construct -2mPD to -Transfer Slab Zone 2 (90%)	10	25-Jan-19 A	12-Feb-19
01128.CCC001836	Construct -2mPD to -Transfer Slab Zone 3 (80%)	12	02-Feb-19	22-Feb-19
01128.CCC001406	S1 Strut removal - Zone 1	4	12-Feb-19	15-Feb-19
01128.CCC001366	Construct -2mPD to -Transfer Slab Zone 2 (100%)	9	13-Feb-19	22-Feb-19
01128.CCC001346	Construct -2mPD to -Transfer Slab Zone 3 (100%)	12	23-Feb-19	08-Mar-19
01128.CCC001416	S1 Strut removal - Zone 2	6	26-Feb-19	04-Mar-19
01128.CCC001746	S1 Strut removal - Zone 3	4	12-Mar-19	15-Mar-19
Tower crane TC1		1025	16-May-16 A	18-Dec-19
01128.CCC000110	Tower Crane (TC1)	1025	16-May-16 A	18-Dec-19*
ABWF Works		72	01-Feb-19	09-May-19
Site Works		72	01-Feb-19	09-May-19
Basement 3 (L3)		42	01-Feb-19	28-Mar-19
01128.CCC001426	RC Defects rectifications	12	01-Feb-19	21-Feb-19
01128.CCC001436	Granolitic screed	14	22-Feb-19	09-Mar-19
01128.CCC001446	Erect scaffolds	3	11-Mar-19	13-Mar-19
01128.CCC001456	Wall and ceiling paint	8	14-Mar-19	22-Mar-19
01128.CCC001466	Dismantle scaffolds	3	23-Mar-19	26-Mar-19
01128.CCC001476	Floor paint	2	27-Mar-19	28-Mar-19
Basement 2 (L2)		72	01-Feb-19	09-May-19
01128.CCC001486	RC Defects rectifications (50%)	10	01-Feb-19*	19-Feb-19
01128.CCC001526	RC Defects rectifications (100%)	10	20-Feb-19	02-Mar-19
01128.CCC001496	Chequer plate measurements and angles (25%)	13	04-Mar-19	18-Mar-19
01128.CCC001546	Granolitic screed (50%)	10	12-Mar-19	22-Mar-19
01128.CCC001506	Chequer plate measurements and angles (50%)	13	19-Mar-19	02-Apr-19
01128.CCC001596	Granolitic screed (100%)	10	23-Mar-19	03-Apr-19
01128.CCC001516	Chequer plate measurements and angles (75%)	13	03-Apr-19	18-Apr-19
01128.CCC001556	Erect scaffolds	10	04-Apr-19	16-Apr-19
01128.CCC001566	Wall and ceiling paint (35%)	12	17-Apr-19	06-May-19
01128.CCC001536	Chequer plate measurements and angles (100%)	13	23-Apr-19	09-May-19



Primary Baseline
Actual Work
Remaining Activitiy
Baseline Milestone
Milestone

1128-3MRP190131

SCL 1128 - SOV to Admiralty Tunnels

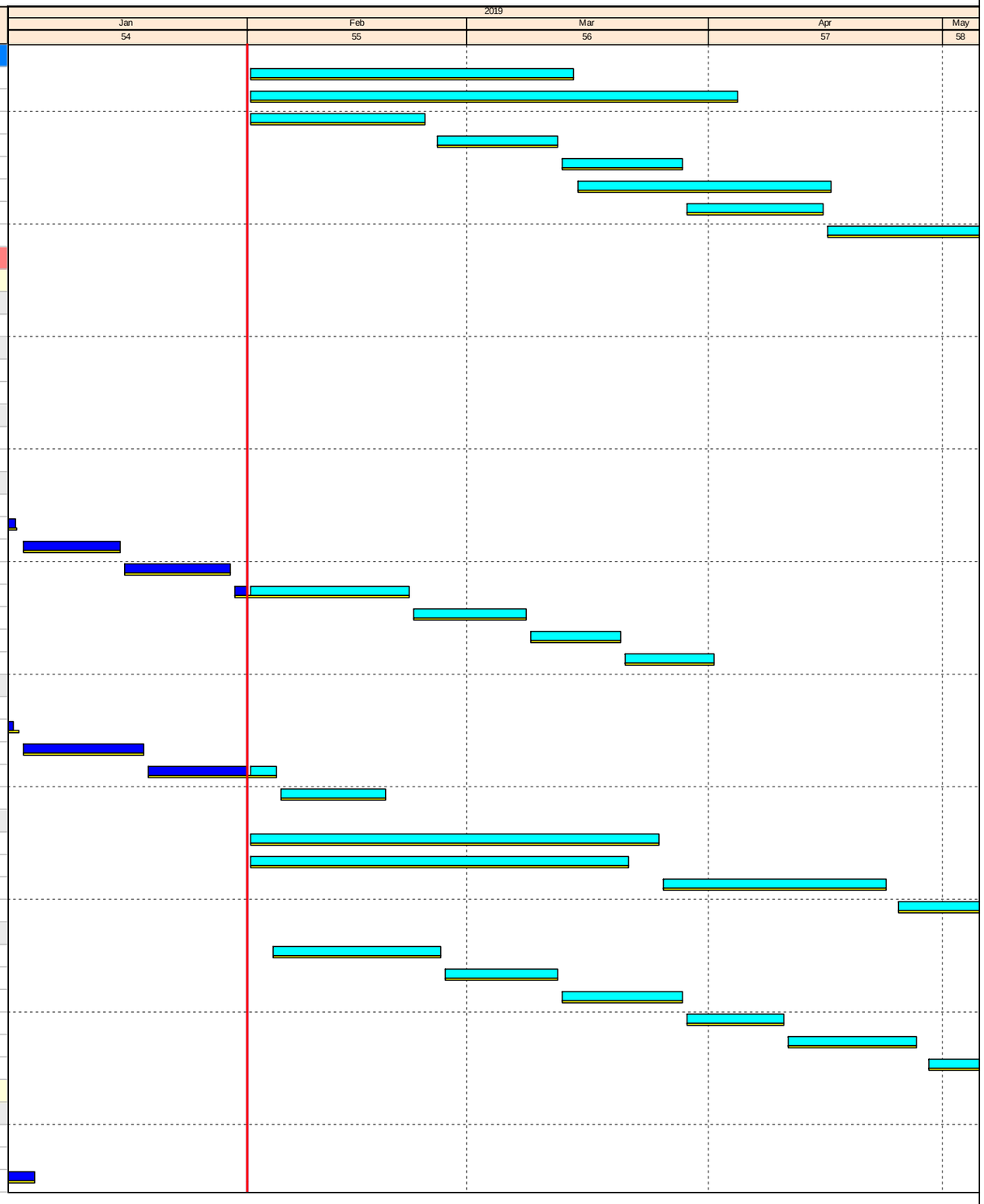
3-Months Rolling Programme (Feb 2019 to Apr 2019)

1128

Date	Revision	Checked	Approved
28-Aug-17	1128 - RMP Ver.C, Rev.2		

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish
Basement 1 (L1)		70	01-Feb-19	07-May-19
01128.CCC001726	RC defects rectifications	30	01-Feb-19*	14-Mar-19
01128.CCC00760	Remaining ABWF for remaining areas	48	01-Feb-19	04-Apr-19
01128.CCC001606	RC Defects rectifications (50%)	14	01-Feb-19*	23-Feb-19
01128.CCC001616	RC Defects rectifications (100%)	14	25-Feb-19	12-Mar-19
01128.CCC001626	Granolitic screed (50%)	14	13-Mar-19	28-Mar-19
01128.CCC001736	Granolitic screed	27	15-Mar-19	16-Apr-19
01128.CCC001696	Granolitic screed (100%)	14	29-Mar-19	15-Apr-19
01128.CCC001636	Erect scaffolds	14	16-Apr-19	07-May-19
Cost Centre E - Tunnel Boring Machine Launching Shaft (FPP)		146	22-Nov-18 A	31-May-19
Area 1		146	22-Nov-18 A	31-May-19
EEP Pipe Pile ELS & Pile Load Test		9	22-Nov-18 A	01-Dec-18 A
01128.CCE001710	Pile Load Test (100%)	9	22-Nov-18 A	01-Dec-18 A
EEP Staircase		20	28-Nov-18 A	20-Dec-18 A
01128.CCE002030	Level 3 construction (100%)	8	28-Nov-18 A	06-Dec-18 A
01128.CCE002040	Level 2 construction (100%)	12	07-Dec-18 A	20-Dec-18 A
Structure		20	03-Dec-18 A	27-Dec-18 A
01128.CCE002840	ELS for EEP - Break top concrete layer	8	03-Dec-18 A	11-Dec-18 A
01128.CCE002850	ELS for EEP - Cut Hpile, Demolish gantry footing, Weld steel lagging plate, Install Waler and Strut	13	11-Dec-18 A	27-Dec-18 A
EEP RC Structure		94	03-Dec-18 A	01-Apr-19
01128.CCE002430	ELS for EEP Structure above ground 35%	12	03-Dec-18 A	15-Dec-18 A
01128.CCE002440	ELS for EEP Structure above ground 70%	11	17-Dec-18 A	02-Jan-19 A
01128.CCE002450	ELS for EEP Structure above ground 85%	11	03-Jan-19 A	15-Jan-19 A
01128.CCE002890	ELS for EEP Structure above ground 100%	12	16-Jan-19 A	29-Jan-19 A
01128.CCE002460	EEP RC Structure above ground 50%	14	30-Jan-19 A	21-Feb-19
01128.CCE002470	EEP RC Structure above ground 100%	13	22-Feb-19	08-Mar-19
01128.CCE002480	Remove ELS and backfill to ground level 50%	10	09-Mar-19	20-Mar-19
01128.CCE002490	Remove ELS and backfill to ground level 100%	10	21-Mar-19	01-Apr-19
Convention Avenue Drainage Works		62	28-Nov-18 A	18-Feb-19
01128.CCE002670	Convention Avenue Stormwater Pipe Works (Far from W8) 20%	14	28-Nov-18 A	13-Dec-18 A
01128.CCE002680	Convention Avenue Stormwater Pipe Works (Far from W8) 40%	14	14-Dec-18 A	02-Jan-19 A
01128.CCE002690	Convention Avenue Stormwater Pipe Works (Far from W8) 60%	14	03-Jan-19 A	18-Jan-19 A
01128.CCE002700	Convention Avenue Stormwater Pipe Works (Far from W8) 80%	14	19-Jan-19 A	04-Feb-19
01128.CCE002710	Convention Avenue Stormwater Pipe Works (Far from W8) 100%	14	05-Feb-19	18-Feb-19
ABWF		88	01-Feb-19	31-May-19
01128.CCE00590	ABWF, Degree 1 Works	39	01-Feb-19	25-Mar-19
01128.CCE00580	Temp. Footpath (Work Area W11)	36	01-Feb-19	21-Mar-19
01128.CCE00600	ABWF, Degree 2 Works	21	26-Mar-19	23-Apr-19
01128.CCE00610	ABWF, Degree 3 Works	28	25-Apr-19	31-May-19
Opening Sequence (Breaking Peanut Shaft D-wall)		72	04-Feb-19	11-May-19
01128.CCE001060	Part 1 (UT) - 35%	13	04-Feb-19*	25-Feb-19
01128.CCE001070	Part 1 (UT) - 70%	13	26-Feb-19	12-Mar-19
01128.CCE002900	Part 1 (UT) - 100%	14	13-Mar-19	28-Mar-19
01128.CCE001080	Part 2 (UT) - 50%	10	29-Mar-19	10-Apr-19
01128.CCE002720	Part 2 (UT) - 100%	11	11-Apr-19	27-Apr-19
01128.CCE002730	Part 3 (UT/DT) - 25%	11	29-Apr-19	11-May-19
Area 2 & B		122	27-Nov-18 A	04-May-19
Structure		122	27-Nov-18 A	04-May-19
01128.CCE002780	DT Wall & Top Slab (75%)	12	27-Nov-18 A	10-Dec-18 A
01128.CCE01001	DT Wall & Top Slab (100%)	10	11-Dec-18 A	21-Dec-18 A
01128.CCE01280	Waterproofing 50%	9	22-Dec-18 A	04-Jan-19 A



Primary Baseline
Actual Work
Remaining Activitiy
Baseline Milestone
Milestone

1128-3MRP190131

SCL 1128 - SOV to Admiralty Tunnels

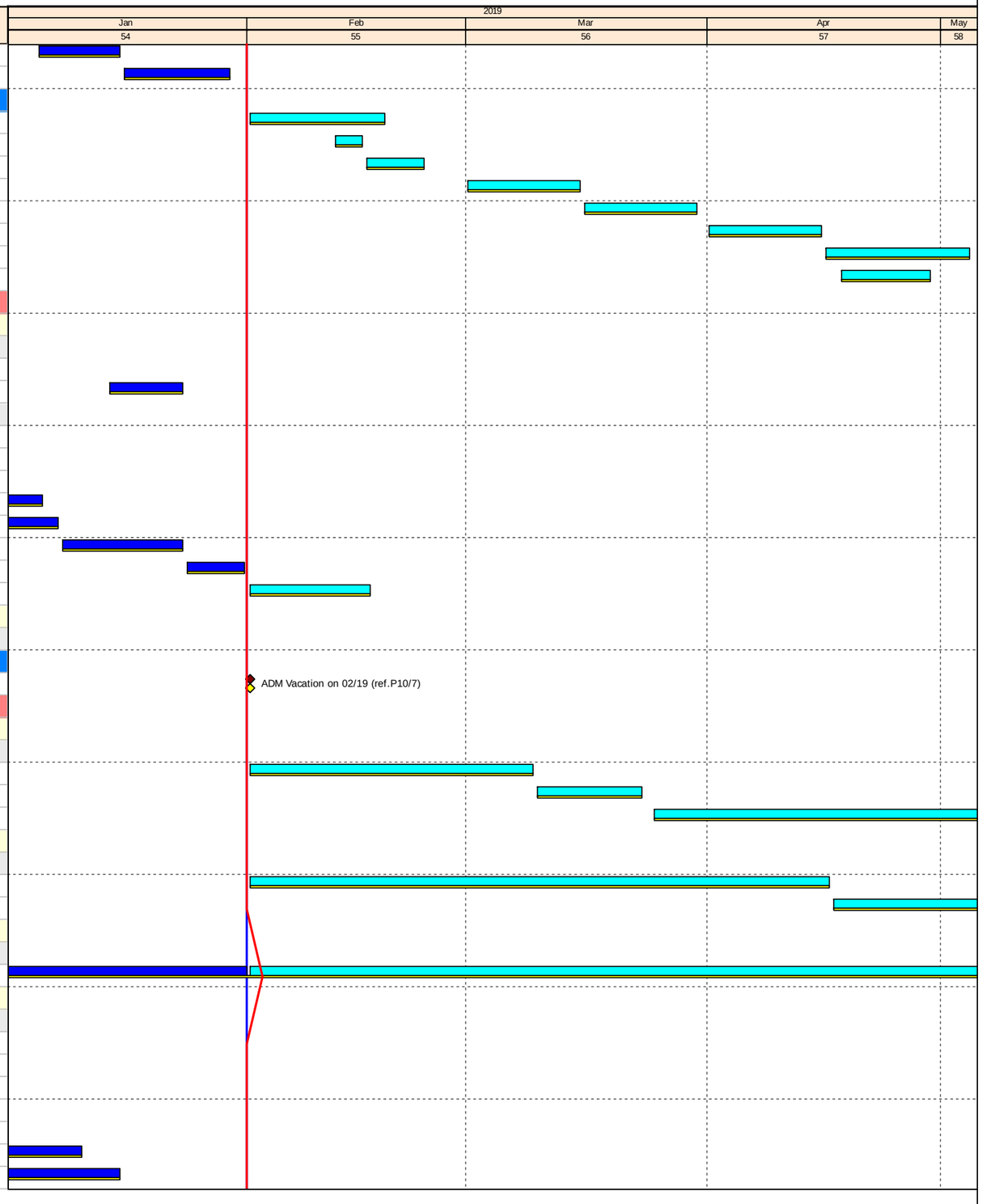
3-Months Rolling Programme (Feb 2019 to Apr 2019)

1128

Date	Revision	Checked	Approved
28-Aug-17	1128 - RMP Ver.C, Rev.2		

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish
01128.CCE01300	Waterproofing 100%	9	05-Jan-19 A	15-Jan-19 A
01128.CCE01290	Backfill Soil	12	16-Jan-19 A	29-Jan-19 A
NIL Works		68	01-Feb-19	04-May-19
01128.CCE01055	Backfilling NIL	9	01-Feb-19	18-Feb-19
01128.CCE01310	Supporting Wall (5 nos.)	4	12-Feb-19*	15-Feb-19
01128.CCE01320	UT Opening Concreting	7	16-Feb-19	23-Feb-19
01128.CCE00522	Pre-bored H-Pile for NIL (25%)	13	01-Mar-19*	15-Mar-19
01128.CCE002050	Pre-bored H-Pile for NIL (50%)	13	16-Mar-19	30-Mar-19
01128.CCE002060	Pre-bored H-Pile for NIL (75%)	12	01-Apr-19	15-Apr-19
01128.CCE002910	Pre-bored H-Pile for NIL (100%)	12	16-Apr-19	04-May-19
01128.CCE01330	DT Opening Concreting	6	18-Apr-19	29-Apr-19*
Cost Centre F - FPP to ADM TBM Tunnels		62	27-Nov-18 A	16-Feb-19
Stage 2 - FPP to Adm DT		62	27-Nov-18 A	16-Feb-19
West DT Cast-insitu Tunnel Lining Connecting to ADM		47	27-Nov-18 A	23-Jan-19 A
01128.CCF00508	Dismantle lining formwork and removal/transfer on surface	15	27-Nov-18 A	14-Dec-18 A
01128.CCF00509	Walkway casting	9	14-Jan-19 A	23-Jan-19 A
Sump Pit (SP1, Ch D96+270)		58	01-Dec-18 A	16-Feb-19
01128.CCF00516	Bottom Excavation (80%)	8	01-Dec-18 A	10-Dec-18 A
01128.CCF002801	Bottom Excavation (100%)	8	11-Dec-18 A	19-Dec-18 A
01128.CCF002861	Bottom Section - Blinding and Waterproofing Installation	7	19-Dec-18 A	28-Dec-18 A
01128.CCF002841	Coring of pipe connecting to tunnel 50%	12	20-Dec-18 A	05-Jan-19 A
01128.CCF002871	Bottom Section - Slab Rebar Fixing / Formwork / Concrete Casting	8	28-Dec-18 A	07-Jan-19 A
01128.CCF002901	Wall and Slab - Rebar Fixing / Formwork / Concrete Casting	14	08-Jan-19 A	23-Jan-19 A
01128.CCF002881	Top Section - Waterproofing Installation	7	24-Jan-19 A	31-Jan-19 A
01128.CCF002891	Top Section - Slab Rebar Fixing / Formwork / Concrete Casting	16	01-Feb-19	16-Feb-19
Associated Works		0	01-Feb-19	01-Feb-19
Grouting - Admiralty Station (UT/DT Entries, TWL near ADM)		0	01-Feb-19	01-Feb-19
Site Vacation		0	01-Feb-19	01-Feb-19
01128.CCF00900	ADM Vacation on 02/19 (ref.P10/7)	0		01-Feb-19*
Cost Centre G - Police Officers' Club (RRIW)		444	05-Jul-18 A	16-Jan-20
Design Submission		73	01-Feb-19	10-May-19
Permanent Concrete Deck for POC EVA		73	01-Feb-19	10-May-19
01128.FDS00910	Stage 1 - Draft Detailed Design Submission Preparation & Submission with ICE (4.1)	29	01-Feb-19*	09-Mar-19
01128.FDS00920	Stage 1 - DDDS Review & Comments by Engineer	14	10-Mar-19	23-Mar-19
01128.FDS00930	Stage 2 - Detailed Design Submission Preparation & Submission with ICE	36	25-Mar-19	10-May-19
Site Preparation		88	01-Feb-19	24-May-19
Critical Submission		88	01-Feb-19	24-May-19
01128.CCG00010	Prepare & Submit shop drawings for Lift	60	01-Feb-19*	16-Apr-19
01128.CCG00020	Comment shop drawings	28	17-Apr-19*	24-May-19
Foundation & Excavation		444	05-Jul-18 A	16-Jan-20
Tower crane TC2		444	05-Jul-18 A	16-Jan-20
01128.CCG001010	Utilization of Tower Crane, TC2	444	05-Jul-18 A	16-Jan-20
C&S Works (Below Ground Level Soffit)		116	23-Nov-18 A	18-Apr-19
Substructure		116	23-Nov-18 A	18-Apr-19
01128.CCG0052	Basement Wall to +4.1mPD 100%	5	23-Nov-18 A	06-Dec-18 A
01128.CCG0054	Tank Base Slab Construction 100%	8	26-Nov-18 A	03-Dec-18 A
01128.CCG0055	Tank Wall and Top Slab 50%	8	05-Dec-18 A	13-Dec-18 A
01128.CCG0058	Ground Slab Construction 25%	14	11-Dec-18 A	28-Dec-18 A
01128.CCG0056	Tank Wall and Top Slab 100%	8	13-Dec-18 A	21-Dec-18 A
01128.CCG001210	Ground Wall Construction 20%	12	27-Dec-18 A	10-Jan-19 A
01128.CCG0059	Ground Slab Construction 40%	14	29-Dec-18 A	15-Jan-19 A



Primary Baseline
Actual Work
Remaining Activitiy
Baseline Milestone
Milestone

1128-3MRP190131

SCL 1128 - SOV to Admiralty Tunnels

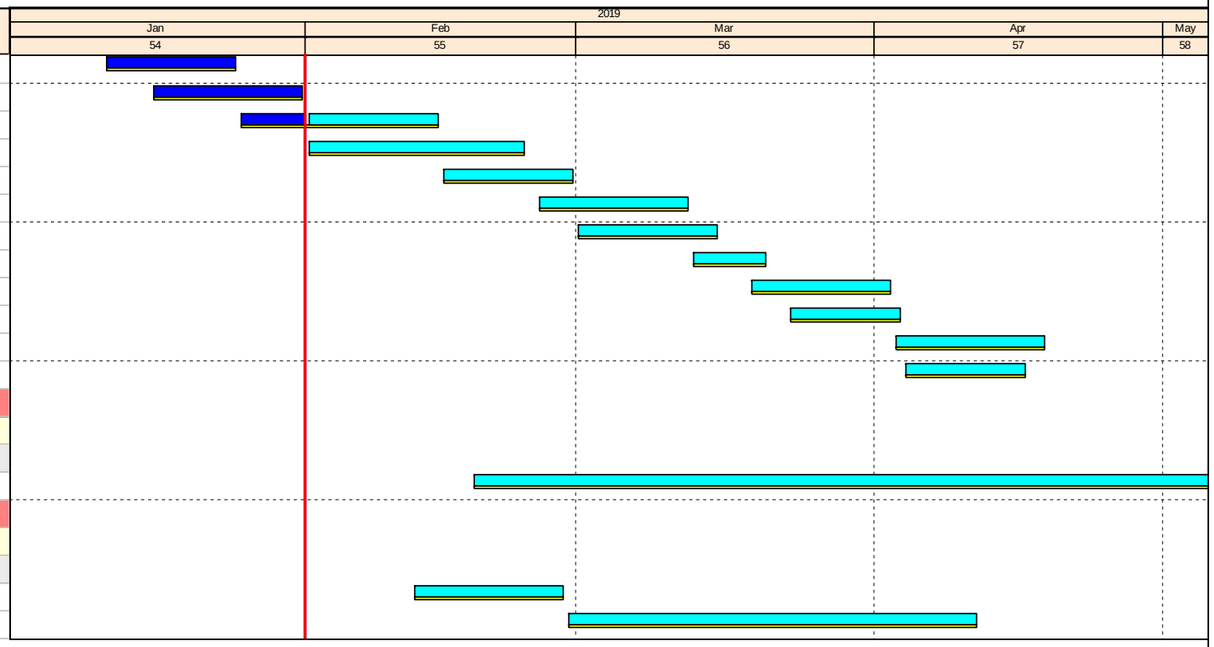
3-Months Rolling Programme (Feb 2019 to Apr 2019)

1128

Date	Revision	Checked	Approved
28-Aug-17	1128 - RMP Ver.C, Rev.2		

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish
01128.CCG001220	Ground Wall Construction 40%	12	11-Jan-19 A	24-Jan-19 A
01128.CCG0060	Ground Slab Construction 60%	14	16-Jan-19 A	31-Jan-19 A
01128.CCG001230	Ground Wall Construction 60%	12	25-Jan-19 A	14-Feb-19
01128.CCG001200	Ground Slab Construction 80%	14	01-Feb-19	23-Feb-19
01128.CCG001300	Ground Wall Construction 80%	12	15-Feb-19	28-Feb-19
01128.CCG001290	Ground Slab Construction 100%	14	25-Feb-19	12-Mar-19
01128.CCG001240	Ground Wall Construction 100%	13	01-Mar-19	15-Mar-19
01128.CCG001190	Mass fill concreting in basement (215 m3)	7	13-Mar-19	20-Mar-19
01128.CCG001250	Swimming Pool Base Slab Construction 50%	13	19-Mar-19	02-Apr-19
01128.CCG001270	1/F Slab Construction 50%	10	23-Mar-19	03-Apr-19
01128.CCG001260	Swimming Pool Base Slab Construction 100%	13	03-Apr-19	18-Apr-19
01128.CCG001280	1/F Slab Construction 100%	10	04-Apr-19	16-Apr-19
Cost Centre H - Other RRIW Works		248	18-Feb-19	31-Dec-19
W4 Rest Garden Reinstatement		248	18-Feb-19	31-Dec-19
Near Gloucester Road		248	18-Feb-19	31-Dec-19
01128.CCH06730	Reinstatement Works	248	18-Feb-19*	31-Dec-19
Cost Centre I - Enabling Works		50	12-Feb-19	11-Apr-19
Piling Works for HKAPA Extension		50	12-Feb-19	11-Apr-19
Bored Piles at Sewage Screening Plant		50	12-Feb-19	11-Apr-19
01128.CCI00280	Pile Test - Full Coring	14	12-Feb-19*	27-Feb-19
01128.CCI00270	Reinstatement	36	28-Feb-19	11-Apr-19



Primary Baseline
Actual Work
Remaining Activitiy
Baseline Milestone
Milestone

1128-3MRP190131

SCL 1128 - SOV to Admiralty Tunnels

3-Months Rolling Programme (Feb 2019 to Apr 2019)

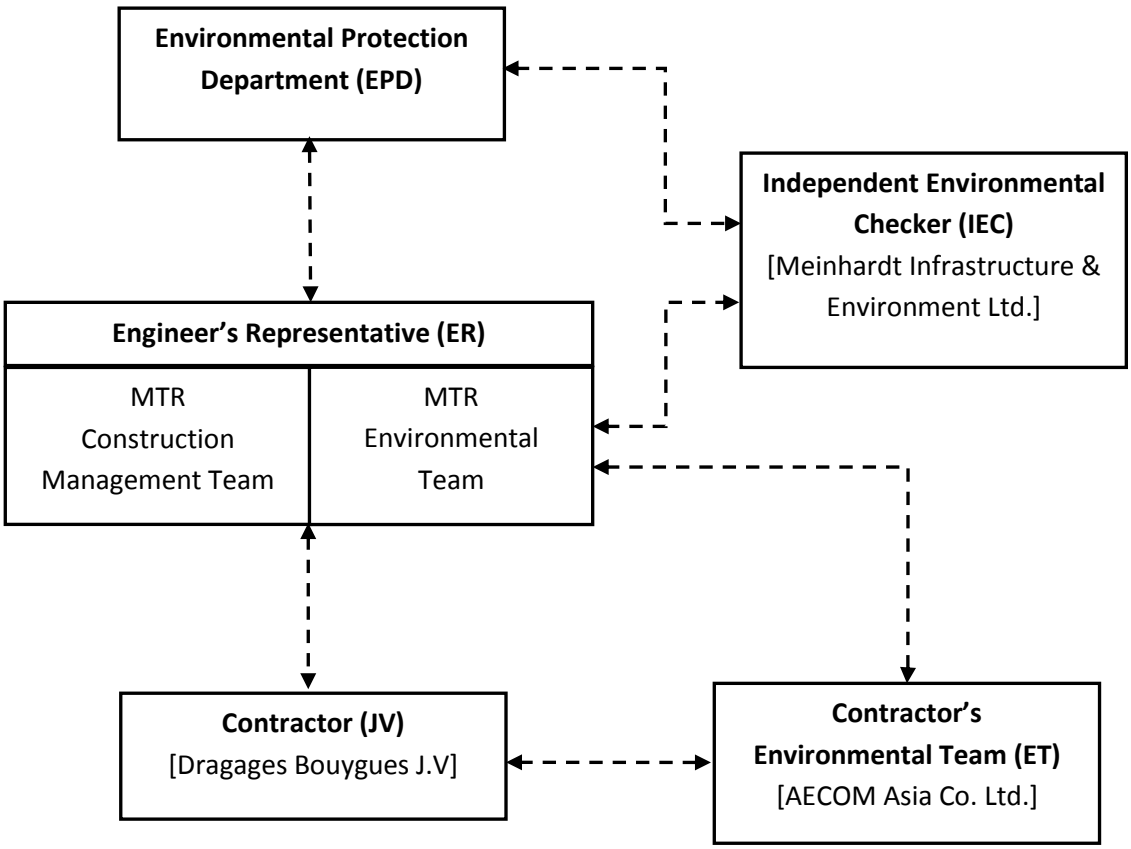
1128

Date	Revision	Checked	Approved
28-Aug-17	1128 - RMP Ver.C, Rev.2		

APPENDIX B

Project Organization Structure

Appendix B Project Organisation Structure



APPENDIX C

Implementation Schedule of Environmental Mitigation Measures

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Cultural Heritage Impact						
S4.93 & Table 4.2	Erection of decorative and sensibly designed hoarding along the boundary of the works area	To mitigate the temporary visual impact due to surface works.	Contractor	Works Areas in Causeway Bay and Wan Chai, and Works Shaft in Admiralty	Construction Phase	V
Ecological Impact						
S5.134	Accidental chemical spillage and construction site run-off to the receiving water bodies, mitigation measures such as removing the pollutants before discharge into storm drain and paving the section of construction road between the wheel washing bay and the public road as suggested in Sections 11.216 and 11.219 to 11.256 of the EIA Report shall be adopted.	To minimize the contamination of wastewater discharge	Contractor	All land based works areas	Construction Phase	N/A
Landscape and Visual Impact						
Construction Phase						
Table 7.9	CM1 - Trees unavoidably affected by the works shall be transplanted as far as possible in accordance with ETWB TC(W) 3/2006 – Tree Preservation.	Transplanting and reuse of affected trees.	MTR	Works Sites	Construction Phase	V
Table 7.9	CM2a - Compensatory tree planting shall be provided in accordance with ETWB TC(W) 3/2006 – Tree Preservation to compensate for felled trees and maintained until end of the establishment period.	Compensation for the removal of existing trees due to the Project.	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM2b - Compensatory shrub planting shall be provided to compensate for the loss of shrub planting in amenity areas.	Compensation for the removal of existing shrub planting due to the Project.	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM3 - Control of night-time lighting glare	Minimize the night time glare due to the Project during construction phase	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM4 - Erection of decorative screen hoarding compatible with the surrounding setting.	Minimize the visual impact of the Project during construction phase	MTR	Works Sites	Construction Phase	V
Table 7.9	CM5 - Management of facilities on work sites which give control on the height and disposition/arrangement of all facilities on the works site to minimize visual impact to adjacent VSRs	Control of height and deposition/ arrangement of temporary facilities in works areas	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM6 - All hard and soft landscape areas disturbed temporarily during construction shall be reinstated on like-to-like basis to the satisfaction of the relevant Government Departments.	Reinstatement of temporary works areas.	MTR	Works Sites	Construction Phase	N/A
/	All retained/exist trees shall be properly protected during construction period.	Tree protection	Contractor	Works areas	Construction phase	V
Air Quality						
/	Emission from Vehicles and Plants • All vehicles shall be shut down in intermittent use. • Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke. • All diesel fuelled construction plant within the works areas shall be powered by ultra low sulphur diesel fuel (ULSD)	Reduce air pollution emission from construction vehicles and plants	Contractor	Works areas	Construction phase	V V V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Construction Dust Impact						
Table 8.5	Barging facilities: (i) Transportation of spoils to the barging point – Pave all road surfaces within the barging facilities and provide watering once along with the haul road for every working hours to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.0 L/m^2 once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.0L/m^2 to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual. (ii) Unloading of spoil materials – Undertake the unloading process within a 3-sided screen with top tipping hall. Provide water spraying and flexible dust curtains at the discharge point for dust suppression. (iii) Vehicles leaving the barging facilities – Pass vehicles through the wheel washing facilities provided at site exits.	To minimize dust impacts	Contractor	All barging points	Construction phase	N/A N/A N/A
S8.63	For concrete batching plant, the requirements and mitigation measures stipulated in the *Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93)* shall be followed and implemented.	To minimize dust impact	Contractor	Concrete Batching Plant	Construction phase	N/A
Table 8.6	During operation of concrete batching plant: (i) Unloading of aggregates from the tipper trucks to receiving hopper – unload the aggregates from the tipper trucks to the receiving hopper equipped with enclosures on 3 sides and top cover, and water spraying system. (ii) Unloading of cement and PFA from tankers into the silo – Directly load the cement and PFA into the silo via a flexible duct. Install dust collectors at cement/PFA silos. (iii) Storage of aggregates in overhead storage bins – Store the aggregates in fully enclosed overhead storage bins. Cover the top of overhead storage bins with cladding. Install water spraying system at the top of storage bins for watering the aggregates, and fully enclose aggregates storage bins. (iv) Weighing and batching of cementitious materials – Perform the whole process of weighing and mixing in a fully enclosed environment. Equip all the mixers with dust collectors. (v) Loading of concrete from mixer into transit mixer of a truck – Directly load the concrete from the mixer into the transit mixer of a truck in “wet form”. (vi) Tipper trucks and cement tankers leaving the Concrete Batching Plant – Haul road within the site is unpaved. Install wheel washing pit at the gate of the concrete batching plant. (vii) Transportation of materials within the plant – Provide watering twice a day would be provided.	To minimize dust impacts	Contractor	Concrete Batching Plant	Construction phase	N/A
S8.89	Watering once every working hour on active works areas, exposed areas and paved haul roads to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.7 L/m2 for Kowloon side and 1.0 L/m2 for Hong Kong side once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.7 L/m2 for Kowloon side and 1.0 L/m2 for Hong Kong side to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual.	To minimize dust impact	Contractor	Works areas	Construction Phase	V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S8.89	Enclosing the unloading process at barging point by a 3-sided screen with top tipping hall, provision of water spraying and flexible dust curtains to reduce dust emission	To minimize dust impact	Contractor	All barging points	Construction phase	N/A
S8.90	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: • Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. • Use of frequent watering for particularly dusty construction areas and areas close to ASRs. • Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. • Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. • Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. • Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. • Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. • Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit. • Imposition of speed controls for vehicles on site haul roads. • Where possible, routing of vehicles and positioning of construction plant shall be at the maximum possible distance from ASRs. • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. • Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise	To minimize dust impacts	Contractor	Works areas	Construction phase	@ V V V V V V V V V V
/	***Dust suppression measures (con't)*** • De-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement	To minimize dust impacts	Contractor	Works areas	Construction phase	V
Airborne Noise Impact						
Construction Phase						
S9.55	The following good site practices shall be implemented: • Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program • Silencers or mufflers on construction equipment shall be utilized and shall be properly maintained during the construction program • Mobile plant, if any, shall be sited as far from NSRs as possible • Machines and plant (such as trucks) that may be in intermittent use shall be shut down between work periods or shall be throttled down to a minimum • Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs • Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities	To minimize construction noise impact	Contractor	Works areas	Construction phase	V V V V V N/A
/	• Install movable noise barriers, acoustic mat or full enclosure, screen the noisy plants during operation • Air compressors shall be fitted with valid noise emission labels during operation	To minimize construction noise impact	Contractor	Works areas	Construction phase	V V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S9.56 & Table 9.16	The following quiet PME shall be used: • Crane lorry, mobile • Crane, mobile • Asphalt paver • Backhoe with hydraulic breaker • Breaker, excavator mounted (hydraulic) • Hydraulic breaker • Concrete lorry mixer • Poker, vibrator, hand-held • Concrete pump • Crawler crane, mobile • Mobile crane • Dump truck • Excavator • Truck • Rock drill • Lorry • Wheel loader • Roller vibratory	To minimize construction noise impact	Contractor	Works areas at: • Hung Hom • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunnel	Construction phase	N/A V N/A V N/A N/A N/A N/A N/A N/A V V V V N/A N/A N/A N/A
S9.58 – S9.59 & Table 9.17	Movable noise barrier shall be used for the following PME: • Air compressor • Asphalt paver • Backhoe with hydraulic breaker • Bar bender • Bar bender and cutter (electric) • Breaker, excavator mounted • Concrete pump • Concrete pump, stationary/lorry mounted • Excavator • Generator • Grout pump • Hand held breaker • Hydraulic breaker • Saw, concrete	To minimize construction noise impact	Contractor	Works areas at: • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunnel	Construction phase	N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
S9.60 & Table 9.17	Noise insulating fabric shall be used for • Drill rig, rotary type • Piling, diaphragm wall, bentonite filtering plant • Piling, diaphragm wall, grab and chisel • Piling, diaphragm wall, hydraulic extractor • Piling, large diameter bored, grab and chisel • Piling, hydraulic extractor • Piling, earth auger, auger • Rock drill, crawler mounted (pneumatic)	To minimize construction noise impact	Contractor	Works areas at: • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunnel	Construction phase	N/A N/A N/A N/A N/A N/A N/A N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Water Quality Impact						
Construction Phase						
S11.216	The following mitigation measures are proposed to minimize the potential water quality impacts from the construction works at or close to the seafront: • Temporary storage of construction materials (e.g. equipment, filling materials, chemicals and fuel) and temporary stockpile of construction and demolition materials shall be located well away from the seawater front and storm drainage during carrying out of the works. • Stockpiling of construction and demolition materials and dusty materials shall be covered and located away from the seawater front and storm drainage. • Construction debris and spoil shall be covered up and/or disposed of as soon as possible to avoid being washed into the nearby receiving waters.	To minimize release of construction wastes from construction works at or close to the seafront	Contractor	Construction works at or close to the seafront	Construction Phase	V V N/A
S11.222 to 11.245	The site practices outlined in ProPECC PN 1/94 “Construction Site Drainage” shall be followed where practicable. <u>Surface Run-off</u> • Surface run-off from construction sites shall be discharged into storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sedimentation basins. Channels or earth bunds or sand bag barriers shall be provided on site to properly direct stormwater to such silt removal facilities. Perimeter channels at site boundaries shall be provided where necessary to intercept storm run-off from outside the site so that it will not wash across the site. Catchpits and perimeter channels shall be constructed in advance of site formation works and earthworks. • Silt removal facilities, channels and manholes shall be maintained and the deposited silt and grit shall be removed regularly, at the onset of and after each rainstorm to prevent local flooding. Any practical options for the diversion and re-alignment of drainage shall comply with both engineering and environmental requirements in order to provide adequate hydraulic capacity of all drains. Minimum distances of 100 m shall be maintained between the discharge points of construction site runoff and the existing saltwater intakes. • Construction works shall be programmed to minimize soil excavation works in rainy seasons (April to September). If excavation in soil cannot be avoided in these months or at any time of year when rainstorms are likely, for the purpose of preventing soil erosion, temporary exposed slope surfaces shall be covered e.g. by tarpaulin, and temporary access roads shall be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels shall be provided (e.g. along the crest / edge of excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements shall always be in place in such a way that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm. • Earthworks final surfaces shall be well compacted and the subsequent permanent work or surface protection shall be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels shall be provided where necessary. • Measures shall be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they shall be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations shall be discharged into storm drains via silt removal facilities. • Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites shall be covered with tarpaulin or similar fabric during rainstorms. • Manholes (including newly constructed ones) shall 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. Discharge of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system. • Good site practices shall be adopted to remove rubbish and litter from construction sites so as to prevent the rubbish and litter from spreading from the site area. It is recommended to clean the construction sites on a regular basis.	To minimize water quality impacts from construction site runoff and general construction activities	Contractor	Works areas	Construction Phase	V @ V N/A V V V V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	Boring and Drilling Water • Water used in ground boring and drilling for site investigation or rock / soil anchoring shall as far as practicable be re-circulated after sedimentation. When there is a need for final disposal, the wastewater shall be discharged into storm drains via silt removal facilities. Wheel Washing Water • All vehicles and plant shall be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay shall be provided at every site exit if practicable and wash-water shall have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road shall be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains. Bentonite Slurries • Bentonite slurries used in diaphragm wall and bore-pile construction shall be reconditioned and used again wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the bentonite slurries shall either be dewatered or mixed with inert fill material for disposal to a public filling area. • If the used bentonite slurry is intended to be disposed of through the public drainage system, it shall be treated to the respective effluent standards applicable to foul sewer, storm drains or the receiving waters as set out in the TM-DSS. Water for Testing & Sterilization of Water Retaining Structures and Water Pipes • Water used in water testing to check leakage of structures and pipes shall be used for other purposes as far as practicable. Surplus unpolluted water will be discharged into storm drains. • Sterilization is commonly accomplished by chlorination. Specific advice from EPD shall be sought during the design stage of the works with regard to the disposal of the sterilizing water. The sterilizing water shall be used again wherever practicable. Acid Cleaning, Etching and Pickling Wastewater • Acidic wastewater generated from acid cleaning, etching, pickling and similar activities shall be neutralized to within the pH range of 6 to 10 before discharging into foul sewers. If there is no public foul sewer in the vicinity, the neutralized wastewater shall be tankered off site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters. Wastewater from Site Facilities • Wastewater collected from any temporary canteen kitchens, including that from basins, sinks and floor drains, shall be discharged into foul sewer via grease traps. In case connection to the public foul sewer is not feasible, wastewater generated from kitchens or canteen, if any, shall be collected in a temporary storage tank. A licensed waste collector shall be deployed to clean the temporary storage tank on a regular basis. • Drainage serving an open oil filling point shall be connected to storm drains via petrol interceptors with peak storm bypass. • Vehicle and plant servicing areas, vehicle wash bays and lubrication bays shall as far as possible be located within roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor. Oil leakage or spillage shall be contained and cleaned up immediately. Waste oil shall be collected and stored for recycling or disposal in accordance with the Waste Disposal Ordinance.					V V V N/A N/A N/A N/A N/A V
S11.246 & 11.247	Construction work force sewage discharges on site are expected to be discharged to the nearby existing trunk sewer or sewage treatment facilities. If disposal of sewage to public sewerage system is not feasible, appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. The Contractor shall also be responsible for waste disposal and maintenance practices. Notices shall be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.	To minimize water quality impacts due to sewage generated from construction workforce	Contractor	Works areas	Construction Phase	N/A
S11.248	In case seepage of uncontaminated groundwater occurs, groundwater shall be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process shall also be discharged into the storm system via silt traps.	To minimize impact from discharge of uncontaminated groundwater	Contractor	Works areas	Construction Phase	V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S11.249	If land contaminated site is identified from the Stage 2 SI work (refer to Sections 11.188 to 11.191 of the EIA Report), the following mitigation measures shall be implemented for the identified contaminated area. Any transient pile of contaminated soil / material shall be minimized and shall be bottom-lined, bunded and covered with impervious membrane during rain event to avoid generation of contaminated runoff. Appropriate intercepting channels and partial shelters shall be provided where necessary to prevent rainwater from collecting within trenches or footing excavations. Any contaminated water and wastewater generated from the decontamination process shall not be directly discharged to public sewers or site drainage. They shall be treated or tanked away as necessary for proper disposal in compliance with the TM-DSS.	To control site run-off generated from any potential contaminated works areas.	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
S11.250 & S11.251	No direct discharge of groundwater from contaminated areas shall be adopted. If land contamination impact and generation of contaminated groundwater is identified from the Stage 2 SI works (refer to Sections 11.189 to 11.192 of the EIA Report), the following mitigation measures shall be adopted. Any contaminated groundwater shall be either properly treated in compliance with the requirements of the TM-DSS or properly recharged into the ground. If wastewater treatment is deployed for treating the contaminated groundwater, the wastewater treatment unit shall deploy suitable treatment processes (e.g. oil interceptor / activated carbon) to reduce the pollution level to an acceptable standard and remove any prohibited substances (such as TPH) to an undetectable range. All treated effluent from the wastewater treatment plant shall meet the requirements as stated in TM-DSS and shall be discharged into the foul sewers. If groundwater recharging wells are deployed, the recharging wells shall be installed as appropriate for recharging the contaminated groundwater back into the ground. The recharging wells shall be selected at places where the groundwater quality will not be affected by the recharge operation as indicated in Section 2.3 of the TM-DSS. The baseline groundwater quality shall be determined prior to the selection of the recharge wells, and submit a working plan (including the laboratory analytical results showing the quality of groundwater at the proposed recharge location(s) as well as the pollutant levels of groundwater to be recharged) to EPD for agreement. Pollution levels of groundwater to be recharged shall not be higher than pollutant levels of ambient groundwater at the recharge well. Prior to recharge, any prohibited substance such as TPH products shall be removed as necessary by installing the petrol interceptor. The Contractor shall apply for a discharge licence under the WPCO through the Regional Office of EPD for groundwater recharge operation or discharge of treated groundwater.	To minimize potential water quality impact from discharge of contaminated groundwater	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
S11.252	The following good site practices shall be adopted for the proposed barging points: • all vessels shall be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash • all hopper barges shall be fitted with tight fitting seals to their bottom openings to prevent leakage of material • construction activities shall not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site • loading of barges and hoppers shall be controlled to prevent splashing of material into the surrounding water. Barges or hoppers shall not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation	To minimize water quality impacts generated from the barging points.	Contractor	Barging points	Construction Phase	N/A N/A N/A N/A
S11.253	There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas shall be treated so that it satisfies all the standards listed in the TM-DSS. Minimum distances of 100 m shall be maintained between the discharge points of construction site effluent and the existing seawater intakes. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., can minimise water consumption and reduce the effluent discharge volume. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring shall be carried out in accordance with the WPCO license which is under the ambit of Regional Office (RO) of EPD.	To minimize water quality impact from effluent discharges from construction sites	Contractor	All construction works areas	Construction Phase	V

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EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S11.254	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation shall be observed and complied with for control of chemical wastes.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	V
S11.255	Any service shop and maintenance facilities shall be located on hard standings within a bunded area, and sumps and oil interceptors shall be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage shall only be undertaken within the areas appropriately equipped to control these discharges.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	N/A
S11.256	Disposal of chemical wastes shall be carried out in compliance with the Waste Disposal Ordinance. The "Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes" published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: • Suitable containers shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport. • Chemical waste containers shall be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents. • Storage area shall be selected at a safe location on site and adequate space shall be allocated to the storage area.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	V V V
Waste Management Implications						
Construction Phase						
S12.75	***Good Site Practices and Waste Reduction Measures*** • Prepare a Waste Management Plan (WMP) approved by the Engineer/Supervising Officer of the Project based on current practices on construction sites; • Training of site personnel in, site cleanliness, proper waste management and chemical handling procedures; • Provision of sufficient waste disposal points and regular collection of waste; • Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and • Separation of chemical wastes for special handling and appropriate treatment.	To reduce waste management impacts	Contractor	All Work Sites	Construction Phase	V V V N/A N/A V
S12.76	***Good Site Practices and Waste Reduction Measures (con't)*** • Sorting of demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions (i.e. soil, broken concrete, metal etc.); • Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; • Encourage collection of aluminum cans by providing separate labeled bins to enable this waste to be segregated from other general refuse generated by the workforce; • Proper storage and site practices to minimize the potential for damage or contamination of construction materials; • Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; and • Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	N/A V N/A V V V
S12.77	***Good Site Practices and Waste Reduction Measures (con't)*** The Contractor shall prepare and implement a WMP as part of the EMP in accordance with ETWB TCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. Such a management plan shall incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	The EMP shall be submitted to the Engineer for approval. The Contractor shall implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP shall be reviewed regularly and updated by the Contractor, preferably in a monthly basis.					
S12.78	***Good Site Practices and Waste Reduction Measures (con't)*** C&D materials would be reused in other local concurrent projects as far as possible. If all reuse outlets are exhausted during the construction phase, the C&D materials would be disposed of at Taishan, China as a last resort.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	V
S12.79	***Storage, Collection and Transportation of Waste*** Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include: • Waste, such as soil, shall be handled and stored well to ensure secure containment, thus minimizing the potential of pollution; • Maintain and clean storage areas routinely; • Stockpiling area shall be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and • Different locations shall be designated to stockpile each material to enhance reuse.	To minimize potential adverse environmental impacts arising from waste storage	Contractor	Work Sites	Construction Phase	V V V V
S12.80	***Storage, Collection and Transportation of Waste (con't)*** Waste haulier with appropriate permits shall be employed by the Contractor for the collection and transportation of waste from works areas to respective disposal outlets. The following suggestions shall be enforced to minimize the potential adverse impacts: • Remove waste in timely manner • Waste collectors shall only collect wastes prescribed by their permits • Impacts during transportation, such as dust and odour, shall be mitigated by the use of covered trucks or in enclosed containers • Obtain relevant waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28) • Waste shall be disposed of at licensed waste disposal facilities • Maintain records of quantities of waste generated, recycled and disposed	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	Work Sites	Construction Phase	V V V V V V
S12.81	***Storage, Collection and Transportation of Waste (con't)*** • Implementation of trip ticket system with reference to DevB TC(W) No.6/2010 to monitor disposal of waste and to control fly-tipping at PFRFs or landfills. A recording system for the amount of waste generated, recycled and disposed (including disposal sites) shall be proposed.	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.83 – 12.86	***Sorting of C&D Materials*** • Sorting to be performed to recover the inert materials, reusable and recyclable materials before disposal off-site. • Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. • The C&D materials shall at least be segregated into inert and non-inert materials, in which the inert portion could be reused and recycled as far as practicable before delivery to PFRFs as mentioned for beneficial use in other projects. While opportunities for reusing the non-inert portion shall be investigated before disposal of at designated landfills. • Possibility of reusing the spoil in the Project will be continuously investigated in the detailed design and construction stages, it includes backfilling to cut and cover construction works for the Hung Hom south and north approach tunnels.	To minimize potential adverse environmental impacts during the handling, transportation and disposal of C&D materials	Contractor	Work Sites	Construction Phase	V V V V
S12.88	***Sediments*** • The basic requirements and procedures for excavated / dredged sediment disposal specified under ETWB TC(W) No. 34/2002 shall be followed. MFC is managing the disposal facilities in Hong Kong for the dredged and excavated sediment, while EPD is the authority of issuing marine dumping permit under the Dumping at Sea Ordinance.	To ensure the sediment to be disposed of in an authorized and least impacted way	Contractor	All works areas with sediments concern	Construction Phase	N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S12.89	***Sediments (con't)*** • The contractor for the excavation / dredging works shall apply for the site allocations of marine sediment disposal based on the prior agreement with MFC/CEDD. A request for reservation of sediment disposal space have been submitted to MFC for onward discussions of disposal approach and feasible disposal sites and the letter is attached in Appendix 12.6. The Project proponent shall also be responsible for the application of all necessary permits from relevant authorities, including the dumping permit as required under DASO from EPD, for the disposal of dredged and excavated sediment prior to the commencement of the excavation works.	To determine the best handling and disposal option of the sediments	MTR / Contractor	All works areas with sediments concern	Detailed Design Stage and Construction Phase	N/A
S12.91 – 12.94	***Sediments (con't)*** • Stockpiling of contaminated sediments shall be avoided as far as possible. If temporary stockpiling of contaminated sediments is necessary, the excavated sediment shall be covered by tarpaulin and the area shall be placed within earth bunds or sand bags to prevent leachate from entering the ground, nearby drains and/or surrounding water bodies. The stockpiling areas shall be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas shall be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, shall be collected and discharged according to the Water Pollution Control Ordinance (WPCO). • In order to minimise the potential odour / dust emissions during excavation and transportation of the sediment, the excavated sediments shall be wetted during excavation / material handling and shall be properly covered when placed on trucks or barges. Loading of the excavated sediment to the barge shall be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water. • The barge transporting the sediments to the designated disposal sites shall be equipped with tight fitting seals to prevent leakage and shall not be filled to a level that would cause overflow of materials or laden water during loading or transportation. In addition, monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as specified by the DEP. • In order to minimise the exposure to contaminated materials, workers shall, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities shall also be provided on site.	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A
S12.95	***Sediments (con't)*** • A possible arrangement for Type 3 disposal is by geosynthetic containment. A geosynthetic containment method is a method whereby the sediments are sealed in geosynthetic containers and, at the disposal site, the containers would be dropped into the designated contaminated mud pit where they would be covered by further mud disposal and later by the mud pit capping, thereby meeting the requirements for fully confined mud disposal. The technology is readily available for the manufacture of the geosynthetic containers to the project-specific requirements. Similar disposal methods have been used for projects in Europe, the USA and Japan and the issues of fill retention by the geosynthetic fabrics, possible rupture of the containers and sediment loss due to impact of the container on the seabed have been addressed.	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A
/	***Accidental spillage*** To prevent accidental spillage of chemicals, the following is recommended: • Proper storage and handling facilities will be provided. • All the tanks, containers, storage area will be bunded and the locations will be locked as far as possible from the sensitive watercourse and stormwater drains. • The contractor will register as a chemical waste producer if chemical wastes would be generated. Storage of chemical waste arising from the construction activities will be stored with suitable labels and warnings. • Disposal of chemical wastes will be conducted in compliance with the requirements as stated in the Waste disposal (Chemical Waste) (General) Regulation.	To minimize potential adverse environmental impacts arising from accidental spillage	Contractor	Work Sites	Construction Phase	V V V N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S12.97	***Containers for Storage of Chemical Waste*** The Contractor shall register with EPD as a chemical waste producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Containers used for storage of chemical waste shall: • Be compatible with the chemical wastes being stored, maintained in good condition and securely sealed; • Have a capacity of less than 450 litters unless the specifications have been approved by EPD; and • Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation.	To register with EPD as a Chemical waste producer and store chemical waste in appropriate containers	Contractor	Work Sites	Construction Phase	V N/A V
S12.98	***Chemical Waste Storage Area*** • Be clearly labeled to indicate corresponding chemical characteristics of the chemical waste and used for storage of chemical waste only; • Be enclosed on at least 3 sides; • Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest; • Have adequate ventilation; • Be covered to prevent rainfall from entering; and • Be properly arranged so that incompatible materials are adequately separated.	To prepare appropriate storage areas for chemical waste at works areas	Contractor	Work Sites	Construction Phase	V V V V V V
S12.99	***Chemical Waste*** • Lubricants, waste oils and other chemical wastes would be generated during the maintenance of vehicles and mechanical equipments. Used lubricants shall be collected and stored in individual containers which are fully labelled in English and Chinese and stored in a designated secure place.	To clearly label the chemical waste at works areas	Contractor	Work Sites	Construction Phase	N/A
S12.100	***Collection and Disposal of Chemical Waste*** ***A trip-ticket system shall be operated in accordance with the Waste Disposal*** *(Chemical Waste) (General) Regulation* to monitor all movements of chemical waste. The Contractor shall employ a licensed collector to transport and dispose of the chemical wastes, to either the approved CWTC at Tsing Yi, or another licensed facility, in accordance with the *Waste Disposal (Chemical Waste) (General) Regulation*.	To monitor the generation, reuse and disposal of chemical waste	Contractor	Work Sites	Construction Phase	N/A
S12.101	***General Refuse*** General refuse shall be stored in enclosed bins or compaction units separate from C&D materials and chemical waste. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D materials and chemical wastes. Preferably, an enclosed and covered area shall be provided to reduce the occurrence of wind-blown light material.	To properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.102	***General Refuse (con't)*** The recyclable component of general refuse, such as aluminum cans, paper and cleansed plastic containers shall be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste shall be set up by the Contractor. The Contractor shall also be responsible for arranging recycling companies to collect these materials.	To facilitate recycling of recyclable portions of refuse	Contractor	Work Sites	Construction Phase	V
S12.103	***General Refuse (con't)*** The Contractor shall carry out an education programme for workers in avoiding, reducing, reusing and recycling of materials generation. Posters and leaflets advising on the use of the bins shall also be provided in the sites as reminders.	To raise workers' awareness on recycling issue	Contractor	Work Sites	Construction Phase	V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Land Contamination Impact						
S13.23–13.24	For construction works at sites under the current stage of site investigation (Stage 1 SI): • Precautionary measures such as visual inspection are recommended to be undertaken during construction activities that disturb soil. The inspection process shall involve a visual observation of excavated soils for discolouration and the presence of oils, together with identifying the presence of odours, which may also indicate soil and/or groundwater contamination. • If soil materials suspected to be contaminated are encountered during excavation, sampling and testing shall be undertaken to verify the presence of contamination. The soil extracted during demolition, excavation and cut & cover construction shall be temporary stockpiled. Shall concentrations of contaminants of concern (COCs) exceed relevant RBRGs as indicated by laboratory analyses, remediation works shall be undertaken with reference to the Contamination Assessment Report (CAR) and Remediation Action Plans (RAP).	To act as a general precautionary measure to screen soils for the presence contamination during excavation works for Cut-and-Cover.	Contractor	Within Project Boundary where signs of contamination is identified	During excavation works for Cut-and-Cover	N/A
S13.30	For some sites with currently no SI proposed (i.e. sites ID 2-02, 2-18, 2-22, 2-23, 2-27, 2-28), to be conservative, visual inspection shall be conducted during demolition and excavation to detect any abnormal colour, smell or other characteristics of the soil, due to the nearby land use and/ or construction method. If abnormal colour, smell or other characteristics of contamination are identified for any of these sites, sampling and testing shall be undertaken to verify the presence of contamination. The soil extracted during demolition, excavation and cut & cover construction shall be temporary stockpiled. Should the concentrations of contaminants of concern (COCs) exceed relevant RBRGs as indicated by laboratory analyses, remediation works shall be undertaken with reference to the CAR and RAP.	To act as a general precautionary measure to screen soils for the presence contamination during excavation works for Cut-and-Cover.	Contractor	Areas with no SI proposed (Sites ID 2-02, 2-18, 2-22, 2-23, 2-27, 2-28)	During excavation works for Cut-and-Cover	N/A
S13.36 – 13.38	For areas inaccessible for proper site appraisal and investigation (Stage 2 SI) (i) Site 2-15 • Upon site access being granted, visual inspection shall be carried out where intrusive works and soil excavation is encountered, for attention on any potential contamination due to its current operation • A supplementary CAP shall then be submitted to EPD for endorsement. • A CAR/RAP shall be prepared and submitted to EPD for endorsement on completion of the SI and analytical testing. • Shall remediation be undertaken a Remediation Report (RR) shall be prepared and submitted to EPD for endorsement to demonstrate that the decontamination work is adequate and is carried out in accordance with the endorsed CAR and RAP. Information such as soil treatment/ disposal records (including trip tickets), confirmatory sampling results, and photographs shall be included in the aforesaid RR. • No construction work shall be carried out prior to the endorsement of the RR by EPD.	To identify areas with land contamination concern, report laboratory results and propose remediation measures if necessary. To ensure remediation works have been undertaken to before the commencement of any construction works of the Project.	Contractor	Areas unable to be accessed during Stage 1 SI (Site 2-15)	After land resumption and prior to the construction works commencement at the site	N/A
S13.39	Potential Remediation of Contaminated Soil • Excavation profiles must be properly designed and executed with attention to the relevant requirements for environment, health and safety; • Excavation shall be carried out during dry season as far as possible to minimise contaminated runoff from contaminated soils; • Supply of suitable clean backfill material is needed after excavation; • If remediation is required with chemical oxidation proposed as a contaminant mass reduction technology, chemicals will be securely and separately stored away from sources of ignition or oxidisable items. Handling will be undertaken by personnel with appropriate training and personal protective equipment (PPE). • Vehicles containing any excavated materials shall be suitably covered to limit potential dust emissions or contaminated wastewater run-off, and truck bodies and tailgates shall be sealed to prevent any discharge during transport or during wet conditions; • Speed control for the trucks carrying contaminated materials shall be enforced; • Vehicle wheel and body washing facilities at the site's exit points shall be established and used; and • Pollution control measures for air emissions e.g. from biopile blower, noise emissions e.g. from blower, and water discharges e.g. runoff control shall be implemented and complied with relevant regulations and guidelines.	To remediate contaminated soil	Contractor	Identified contaminated sites	Site remediation	N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S13. 40	In order to minimize the potential adverse effects on health and safety of construction workers during the course of site remediation, the Occupation Safety and Health Ordinance (OSHO) (Chapter 509) and its subsidiary Regulations shall be followed by all site personnel working on the site at all times. In addition, the following basic health and safety measures shall be implemented as far as possible: • Set up a list of safety measures for site workers; • Provide written information and training on safety for site workers; • Keep a log-book and plan showing the contaminated zones and clean zones; • Maintain a hygienic working environment; • Avoid dust generation; • Provide face and respiratory protection gear to site workers; • Provide personal protective clothing (e.g. chemical resistant jackboot, liquid tight gloves) to site workers; and • Provide first aid training and materials to site workers.	To minimise the potentially adverse effects on health and safety of construction workers during the course of site remediation.	Contractor	Identified contaminated sites	Site remediation and prior to construction phase	N/A

Legend: V = implemented;
x = not implemented;
@ = partially implemented;
N/A = not applicable

APPENDIX D

Summary of Action and Limit Levels

Appendix D – Summary of Action and Limit Levels

Table 1 Action and Limit Levels for 24-hour TSP

ID	Location	Action Level	Limit Level
AM4	Pedestrian Plaza	198 $\mu g/m^3$	260 $\mu g/m^3$

Table 2 Action and Limit Levels for Construction Noise (0700 – 1900 hrs of normal weekdays)

ID	Location	Action Level	Limit Level
NM1*	Hoi Kung Court	When one documented complaint is received	75 dB(A)

* The noise monitoring at NM1 was handed-over from SCL Contract 1129 in August 2015.

Table 3 Action and Limit Levels for Water Quality (Dry Season)

Parameter	Action Level	Limit Level
WSD Salt Water Intake (Station 14, A, WSD9 & WSD17)		
DO in mg/L	<2.1	<2
SS in mg/L	6.9	6.9
Turbidity in NTU	5.0	7.0
Cooling Water Intake (Station 8, 9, 21 & 34)		
DO in mg/L	3.3	3.2
SS in mg/L	8.0	10.4
Turbidity in NTU	12.2	18.5

Table 4 Action and Limit Levels for Water Quality (Wet Season)

Parameter	Action Level	Limit Level
WSD Salt Water Intake (Station 14, A, WSD9 & WSD17)		
DO in mg/L	<2.1	<2
SS in mg/L	6.0	6.0
Turbidity in NTU	4.7	6.5
Cooling Water Intake (Station 8, 9, 21 & 34)		
DO in mg/L	2.8	2.7
SS in mg/L	6.9	9.1
Turbidity in NTU	11.3	17.2

APPENDIX E

Calibration Certificates of Equipments

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station	Pedestrian Plaza	Operator:	Choi Wing Ho
Cal. Date:	5-Nov-18	Next Due Date:	5-Jan-19
Equipment No.:	A-001-70T	Serial No.	10273

Ambient Condition			
Temperature, Ta (K)	300	Pressure, Pa (mmHg)	761.9

Orifice Transfer Standard Information					
Serial No:	843	Slope, mc	2.00314	Intercept, bc	-0.01725
Last Calibration Date:	26-Dec-17	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	26-Dec-18				

Calibration of TSP Sampler

Resistance Plate No.	Orfice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) **X-axis**	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) **Y-axis**
18	7.3	2.70	1.35	44.0	43.91
13	5.9	2.42	1.22	38.0	37.92
10	4.4	2.09	1.05	30.0	29.94
7	3.5	1.87	0.94	25.0	24.95
5	2.4	1.55	0.78	18.0	17.96

By Linear Regression of Y on X

Slope , mw = **45.4867** **Intercept, bw =** **-17.7158**

Correlation Coefficient* = **0.9996**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m^3/min

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = IC \times [(Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; $IC = (mw \times Qstd + bw) \times [(760 / Pa) \times (Ta / 298)]^{1/2}$ = **41.50**

Remarks: _____

QC Reviewer: WS CHAN Signature: _____ Date: 05/11/18

D:\HVS Calibration Certificate (Existing)\60

Station **Pedestrian Plaza**

Cal. Date: **5-Nov-18**

Next Due Date: **5-Jan-19**

Set Point (IC) **41.50**

IC (CFM)	Qstd (m^3/min)
24	0.917
25	0.939
26	0.961
27	0.983
28	1.005
29	1.027
30	1.049
31	1.071
32	1.093
33	1.115
34	1.137
35	1.159
36	1.181
37	1.203
38	1.225
39	1.247
40	1.269
41	1.291
42	1.313
43	1.335
44	1.357
45	1.379
46	1.401
47	1.423
48	1.445
49	1.467
50	1.489
51	1.511
52	1.533
53	1.555
54	1.577
55	1.599
56	1.621
57	1.643
58	1.665
59	1.687
60	1.709
61	1.731
62	1.753
63	1.774
64	1.796
65	1.818

TISCH Environmental

RECALIBRATION DUE DATE:
December 26, 2018

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	December 26, 2017	**Rootsmeter S/N:** 438320	**Ta:** 291	°K
Operator:	Jim Tisch		**Pa:** 763.3	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **0843**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4140	3.2	2.00
2	3	4	1	1.0010	6.4	4.00
3	5	6	1	0.8910	7.9	5.00
4	7	8	1	0.8480	8.8	5.50
5	9	10	1	0.7030	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)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
1.0241	0.7243	1.4342	0.9958	0.7042	0.8732
1.0198	1.0188	2.0283	0.9916	0.9906	1.2349
1.0178	1.1423	2.2677	0.9896	1.1107	1.3807
1.0166	1.1988	2.3783	0.9885	1.1656	1.4481
1.0113	1.4386	2.8684	0.9834	1.3988	1.7464
QSTD	**m=**	**2.00314**	**QA**	**m=**	**1.25433**
	b=	**-0.01725**		**b=**	**-0.01050**
	r=	**0.99996**		**r=**	**0.99996**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
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= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

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

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9009

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station	Pedestrian Plaza	Operator:	Choi Wing Ho
Cal. Date:	4-Jan-19	Next Due Date:	4-Mar-19
Equipment No.:	A-001-70T	Serial No.	10273

Ambient Condition			
Temperature, Ta (K)	293	Pressure, Pa (mmHg)	765.8

Orifice Transfer Standard Information					
Serial No:	988	Slope, mc	2.01748	Intercept, bc	-0.02651
Last Calibration Date:	22-May-18	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	22-May-19				

Calibration of TSP Sampler

Resistance Plate No.	Orfice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) **X - axis**	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) **Y-axis**
18	7.1	2.70	1.35	45.0	45.56
13	5.8	2.44	1.22	38.0	38.47
10	4.4	2.12	1.07	30.0	30.37
7	3.5	1.89	0.95	25.0	25.31
5	2.5	1.60	0.81	17.0	17.21

By Linear Regression of Y on X

Slope , mw = **51.5110** **Intercept, bw =** **-24.2070**

Correlation Coefficient* = **0.9991**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m^3/min

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = IC \times [(Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; $IC = (mw \times Qstd + bw) \times [(760 / Pa) \times (Ta / 298)]^{1/2}$ = **42.24**

Remarks: _____

QC Reviewer: NS CHAN Signature: _____ Date: 04/01/19

Station **Pedestrian Plaza**

Cal. Date: **4-Jan-19**

Next Due Date: **4-Mar-19**

Set Point (IC) **42.24**

IC (CFM)	Qstd (m^3/min)
24	0.936
25	0.955
26	0.975
27	0.994
28	1.014
29	1.033
30	1.052
31	1.072
32	1.091
33	1.111
34	1.130
35	1.149
36	1.169
37	1.188
38	1.208
39	1.227
40	1.246
41	1.266
42	1.285
43	1.305
44	1.324
45	1.344
46	1.363
47	1.382
48	1.402
49	1.421
50	1.441
51	1.460
52	1.479
53	1.499
54	1.518
55	1.538
56	1.557
57	1.576
58	1.596
59	1.615
60	1.635
61	1.654
62	1.674
63	1.693
64	1.712
65	1.732

TISCH Environmental

RECALIBRATION DUE DATE:
May 22, 2019

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	May 22, 2018	**Rootsmeter S/N:** 438320	**Ta:** 296	°K
Operator:	Jim Tisch		**Pa:** 749.3	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **0988**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3840	3.2	2.00
2	3	4	1	0.9840	6.4	4.00
3	5	6	1	0.8790	7.9	5.00
4	7	8	1	0.8420	8.7	5.50
5	9	10	1	0.6900	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)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
0.9883	0.7141	1.4090	0.9957	0.7195	0.8889
0.9841	1.0001	1.9926	0.9915	1.0076	1.2570
0.9821	1.1173	2.2278	0.9895	1.1257	1.4054
0.9811	1.1652	2.3365	0.9884	1.1739	1.4740
0.9758	1.4141	2.8179	0.9831	1.4247	1.7777
QSTD	**m=**	**2.01748**	**QA**	**m=**	**1.26331**
	b=	**-0.02651**		**b=**	**-0.01673**
	r=	**0.99988**		**r=**	**0.99988**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
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= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

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

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9009

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CERTIFICATE OF CALIBRATION

Certificate No.: 18CA0914 03 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2238	,	4188
Serial/Equipment No.:	2800927	,	2791211
Adaptors used:	-	,	-

Item submitted by

Customer Name:	AECOM ASIA CO., LTD.
Address of Customer:	-
Request No.:	-
Date of receipt:	14-Sep-2018

Date of test: 17-Sep-2018

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	23-Aug-2019	CIGISMEC
Signal generator	DS 360	33873	24-Apr-2019	CEPREI
Signal generator	DS 360	61227	23-Apr-2019	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	55 ± 10 %
Air pressure:	1005 ± 5 hPa

Test specifications

1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.

2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.

3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory: Feng Junqi **Date:** 18-Sep-2018 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

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SOILS & MATERIALS ENGINEERING CO., LTD.
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CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 18CA0914 03 **Page** 2 **of** 2

1, Electrical Tests

The electrical tests were perfomed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertanity (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	1.0	2.1
	Lin	Pass	2.0	2.2
Linearity range for Leq	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
Frequency weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100μs rectangular pulse	Pass	0.3	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor $1/10^3$ at 4kHz	Pass	0.3	
	1 ms burst duty factor $1/10^4$ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertanity (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: Fung Chi Yip **Date:** 17-Sep-2018

Checked by: Shek Kwong Tat **Date:** 18-Sep-2018

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

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HOKLAS 028
CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 18CA0406 02-02 **Page:** 1 **of** 2

Item tested

Description:	Acoustical Calibrator (Class 1)
Manufacturer:	B & K
Type/Model No.:	4231
Serial/Equipment No.:	3006428 / N004.03
Adaptors used:	-

Item submitted by

Curstomer:	AECOM ASIA CO LIMITED
Address of Customer:	-
Request No.:	-
Date of receipt:	06-Apr-2018

Date of test: 09-Apr-2018

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	11-Apr-2018	SCL
Preamplifier	B&K 2673	2743150	05-May-2018	CEPREI
Measuring amplifier	B&K 2610	2346941	03-May-2018	CEPREI
Signal generator	DS 360	33873	25-Apr-2018	CEPREI
Digital multi-meter	34401A	US36087050	25-Apr-2018	CEPREI
Audio analyzer	8903B	GB41300350	21-Apr-2018	CEPREI
Universal counter	53132A	MY40003662	22-Apr-2018	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	50 ± 10 %
Air pressure:	1005 ± 5 hPa

Test specifications

1. The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
2. The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
3. The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on **page 2** of this certificate.

Approved Signatory: Feng Jun Qi **Date:** 11-Apr-2018 **Company Chop:** SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the conditon of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

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CERTIFICATE OF CALIBRATION

(Continuation Page)

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

(Output level in dB re 20 μPa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.20	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz **STF = 0.015 dB**

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz **Actual Frequency = 999.96 Hz**

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz **TND = 0.4 %**

Estimated expanded uncertainty 0.7 %

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: Fung Chi Yip **Date:** 09-Apr-2018

Checked by: Lam Tze Wai **Date:** 11-Apr-2018

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

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APPENDIX F

EM&A Monitoring Schedules

Shatin to Central Link Contract 1128 - South Ventilation Building to Admiralty Tunnels
Impact Monitoring Schedule for January 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1-Jan	2-Jan	3-Jan	4-Jan	5-Jan
				Air Quality	Noise	
6-Jan	7-Jan	8-Jan	9-Jan	10-Jan	11-Jan	12-Jan
			Air Quality	Noise		
13-Jan	14-Jan	15-Jan	16-Jan	17-Jan	18-Jan	19-Jan
		Air Quality	Noise			
20-Jan	21-Jan	22-Jan	23-Jan	24-Jan	25-Jan	26-Jan
	Air Quality	Noise				Air Quality
27-Jan	28-Jan	29-Jan	30-Jan	31-Jan		
	Noise			Air Quality		

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

Air Quality Monitoring Station
AM4 Pedestrian Plaza

Monitoring Frequency
24-hr TSP Once every 6 days

Noise Monitoring Station
NM1

Monitoring Frequency
Once per week

Shatin to Central Link Contract 1128 - South Ventilation Building to Admiralty Tunnels
Tentative Impact Monitoring Schedule for February 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1-Feb	2-Feb
3-Feb	4-Feb	5-Feb	6-Feb	7-Feb	8-Feb	9-Feb
	Air Quality				Noise	Air Quality
10-Feb	11-Feb	12-Feb	13-Feb	14-Feb	15-Feb	16-Feb
	Noise				Air Quality	
17-Feb	18-Feb	19-Feb	20-Feb	21-Feb	22-Feb	23-Feb
				Air Quality	Noise	
24-Feb	25-Feb	26-Feb	27-Feb	28-Feb		
			Air Quality	Noise		

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

Air Quality Monitoring Station
AM4 Pedestrian Plaza

Monitoring Frequency
24-hr TSP Once every 6 days

Noise Monitoring Station
NM1

Monitoring Frequency
Once per week

Shatin to Central Link Contract 1128 - South Ventilation Building to Admiralty Tunnels
Tentative Impact Monitoring Schedule for March 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1-Mar	2-Mar
3-Mar	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	9-Mar
		Air Quality	Noise			
10-Mar	11-Mar	12-Mar	13-Mar	14-Mar	15-Mar	16-Mar
	Air Quality	Noise				Air Quality
17-Mar	18-Mar	19-Mar	20-Mar	21-Mar	22-Mar	23-Mar
	Noise				Air Quality	
24-Mar	25-Mar	26-Mar	27-Mar	28-Mar	29-Mar	30-Mar
				Air Quality	Noise	
31-Mar						

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

Air Quality Monitoring Station
AM4 Pedestrian Plaza

Noise Monitoring Station
NM1

Monitoring Frequency
24-hr TSP Once every 6 days

Monitoring Frequency
Once per week

Shatin to Central Link Contract 1128 - South Ventilation Building to Admiralty Tunnels
Tentative Impact Monitoring Schedule for April 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr
			Air Quality	Noise		
7-Apr	8-Apr	9-Apr	10-Apr	11-Apr	12-Apr	13-Apr
		Air Quality	Noise			
14-Apr	15-Apr	16-Apr	17-Apr	18-Apr	19-Apr	20-Apr
	Air Quality	Noise		Air Quality		
21-Apr	22-Apr	23-Apr	24-Apr	25-Apr	26-Apr	27-Apr
			Air Quality	Noise		
28-Apr	29-Apr	30-Apr				
		Air Quality				

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

Air Quality Monitoring Station
AM4 Pedestrian Plaza

Monitoring Frequency
24-hr TSP Once every 6 days

Noise Monitoring Station
NM1

Monitoring Frequency
Once per week

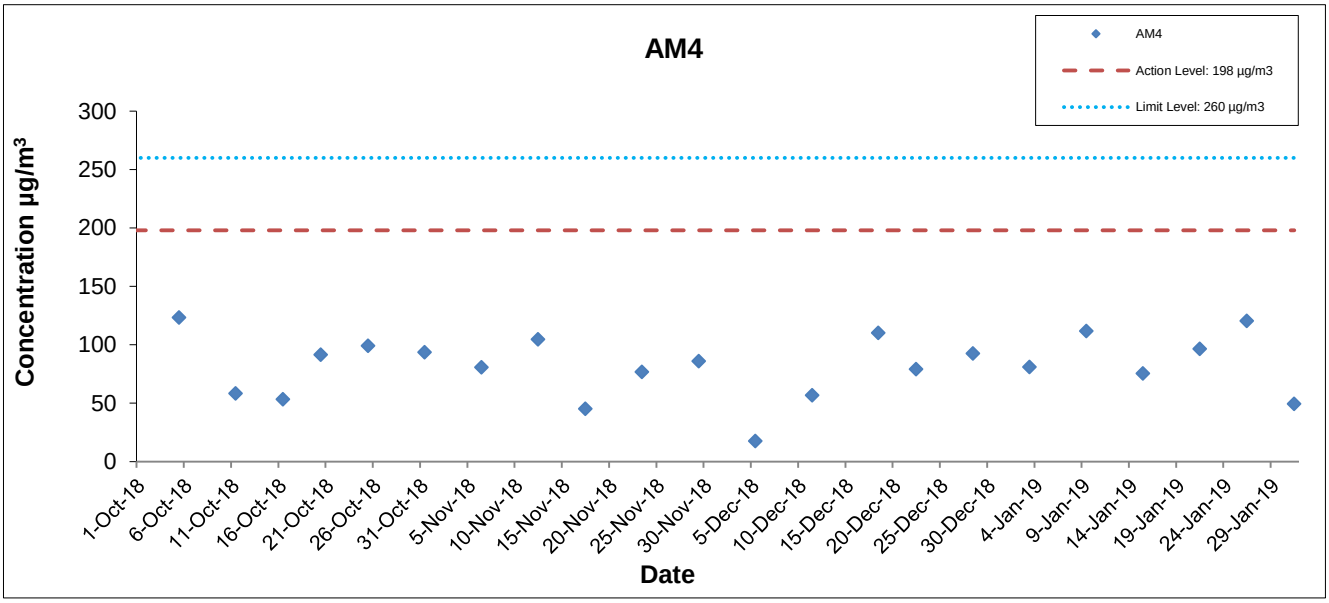
APPENDIX G

Air Quality Monitoring Results and their Graphical Presentations

Appendix G
Air Quality Monitoring Results

24-hour TSP Monitoring Results at Station AM4 (Pedestrian Plaza)

Start		End		Weather	Air	Atmospheric	Flow Rate (m^3/min.)		Av. flow	Total vol.	Filter Weight (g)		Particulate	Elapse Time		Sampling	Conc.
Date	Time	Date	Time	Condition	Temp. (^oC)	Pressure (hPa)	Initial	Final	(m^3/min)	(m^3)	Initial	Final	weight(g)	Initial	Final	Time(hrs.)	($\mu g/m^3$)
3-Jan-2019	0:00	4-Jan-2019	0:00	Fine	17.3	1024.3	1.31	1.31	1.31	1890.7	2.6424	2.7956	0.1532	23241.00	23265.00	24.00	81.0
9-Jan-2019	0:00	10-Jan-2019	0:00	Fine	18.7	1022.3	1.31	1.31	1.31	1890.7	2.6491	2.8607	0.2116	23265.00	23289.00	24.00	111.9
15-Jan-2019	0:00	16-Jan-2019	0:00	Cloudy	21.1	1018.8	1.31	1.31	1.31	1890.7	2.6287	2.7719	0.1432	23289.00	23313.00	24.00	75.7
21-Jan-2019	0:00	22-Jan-2019	0:00	Fine	20.0	1021.8	1.31	1.31	1.31	1890.7	2.6563	2.8390	0.1827	23313.00	23337.00	24.00	96.6
26-Jan-2019	0:00	27-Jan-2019	0:00	Sunny	21.2	1023.1	1.31	1.31	1.31	1890.7	2.6860	2.9140	0.2280	23313.00	23337.00	24.00	120.6
31-Jan-2019	0:00	1-Feb-2019	0:00	Cloudy	18.6	1020.3	1.31	1.31	1.31	1890.7	2.6747	2.7684	0.0937	23337.00	23361.00	24.00	49.6
																Average	**89.2**
																Minimum	**49.6**
																Maximum	**120.6**



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Shatin Central Link Contract No. 1128
South Ventilation Building to Admiralty Tunnels

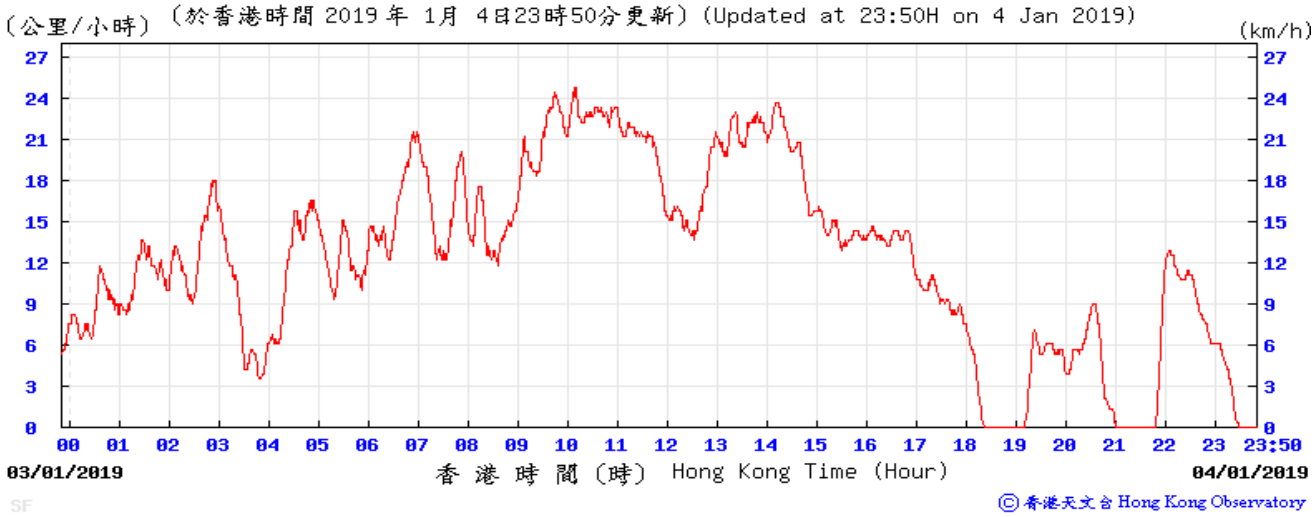
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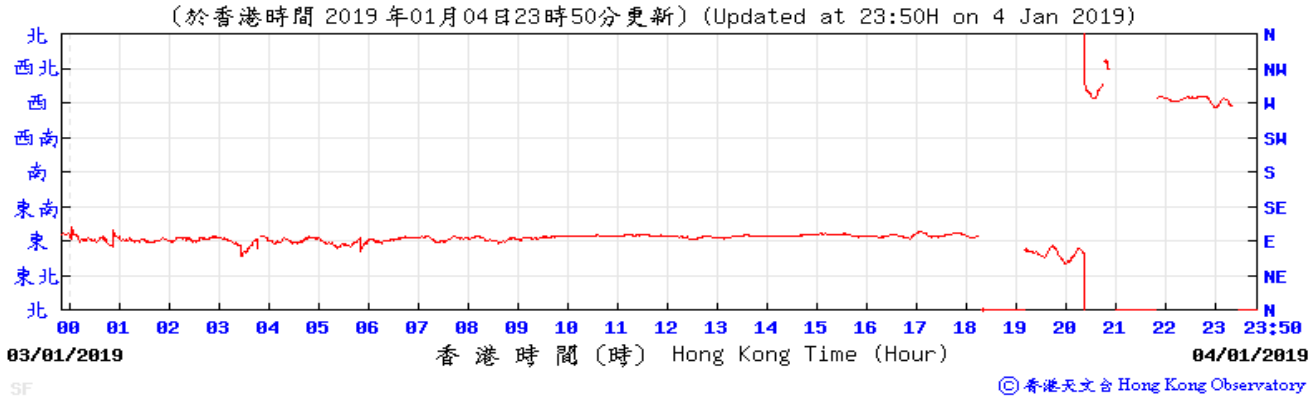
Graphical Presentation of Impact 24-hr TSP Monitoring Results

Date: February 2019

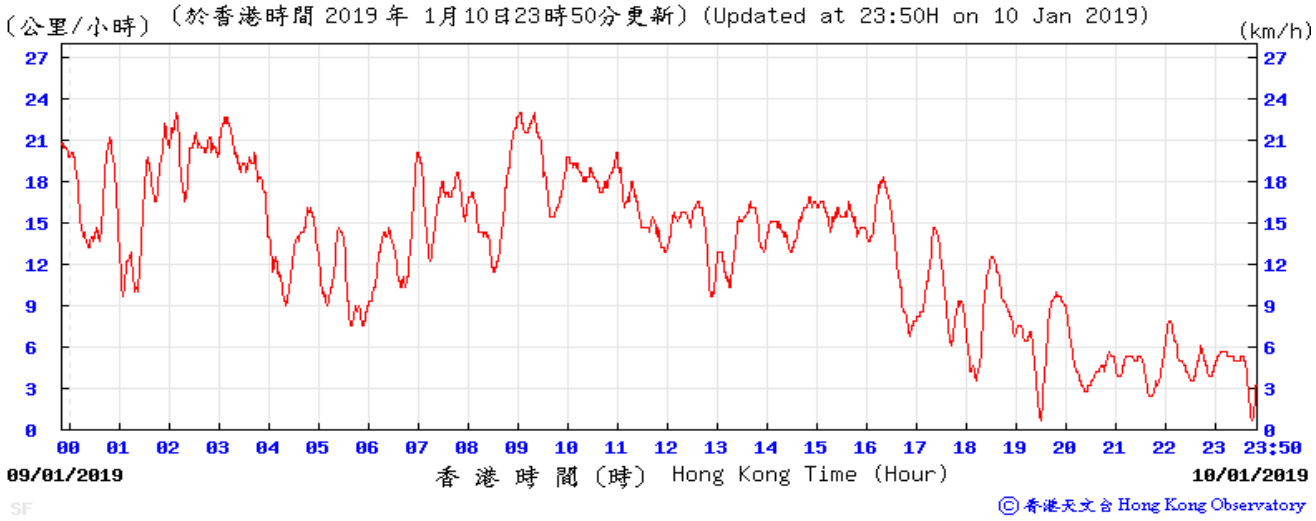
Appendix G

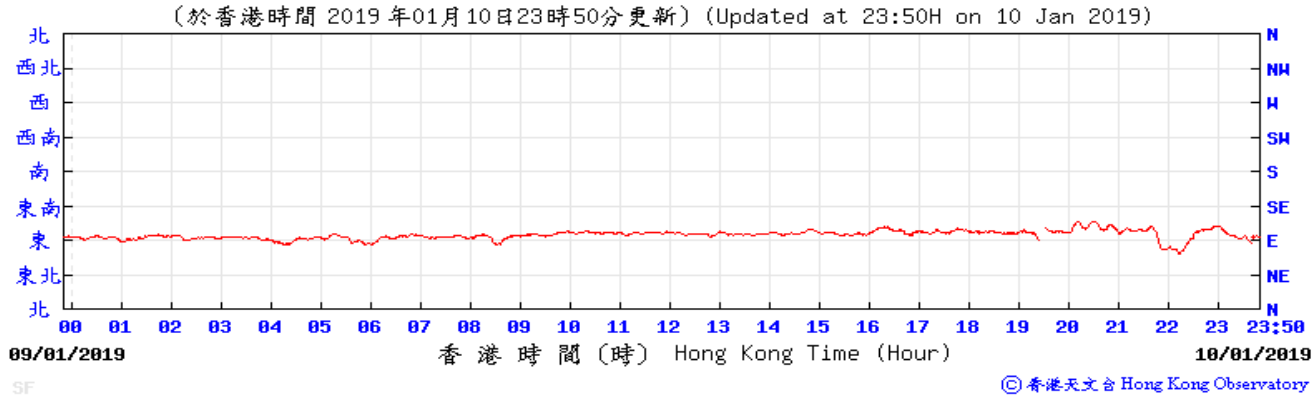
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, January 2019



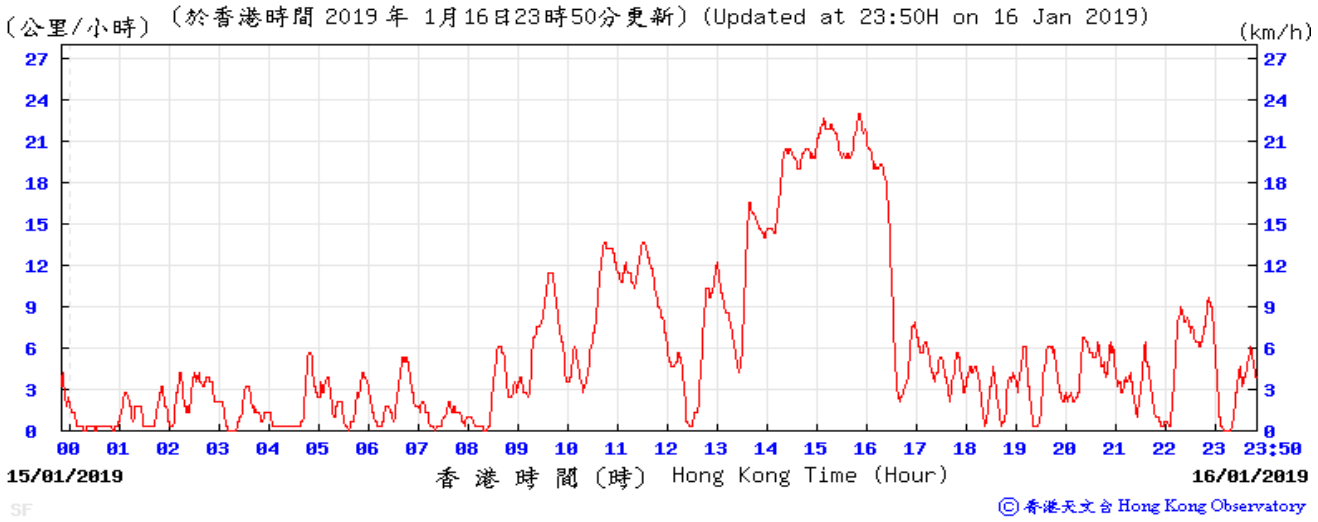


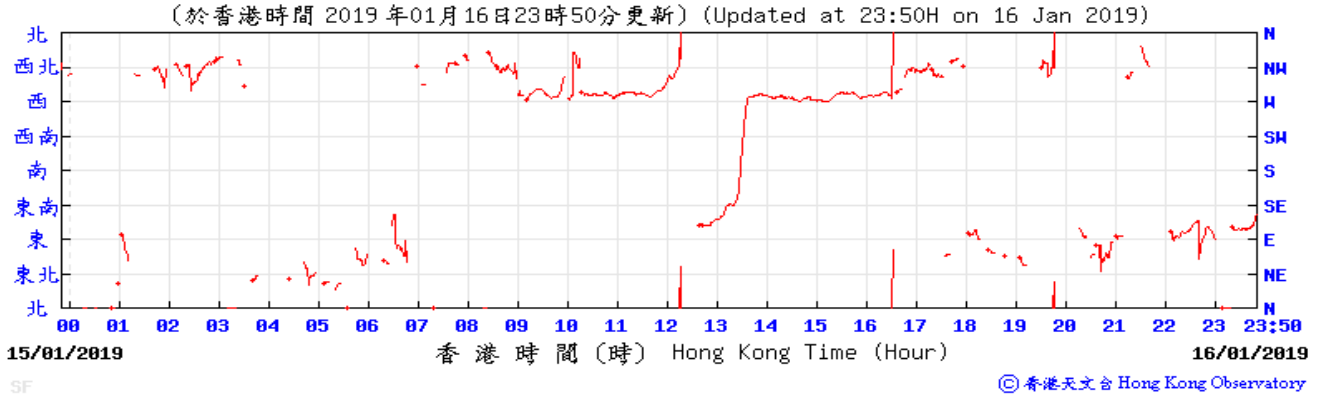
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, January 2019



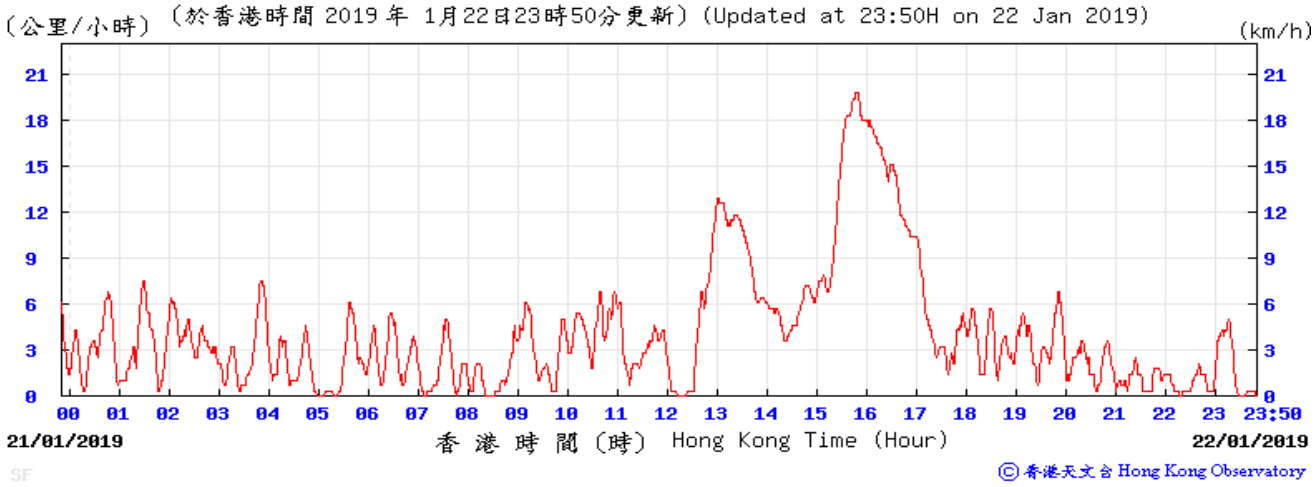


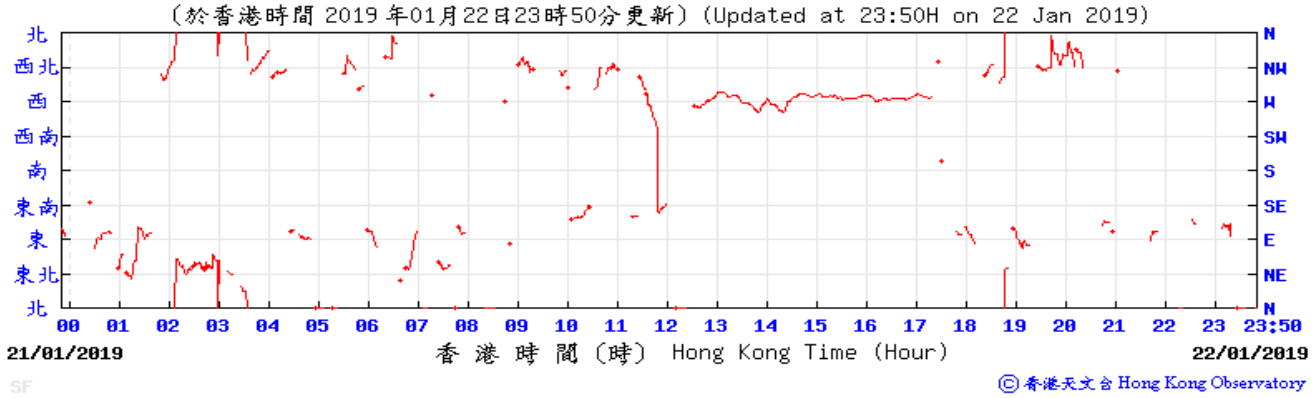
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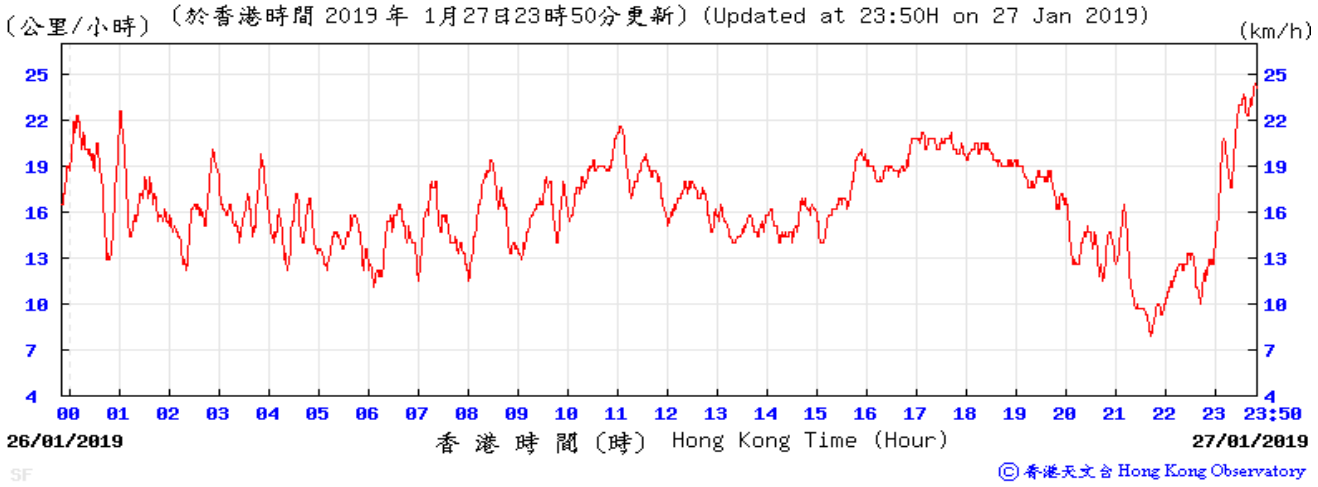


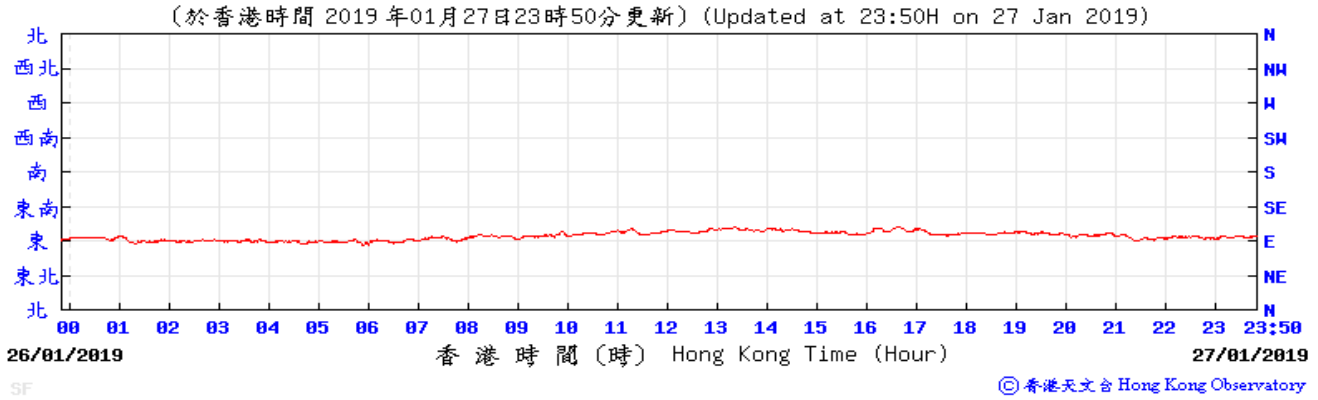
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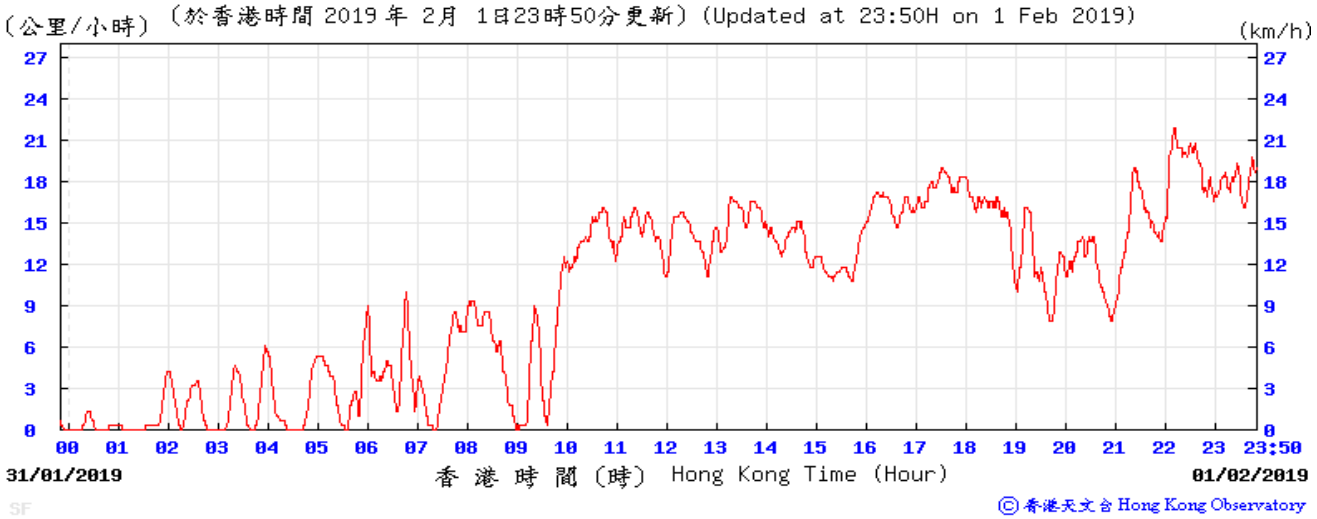


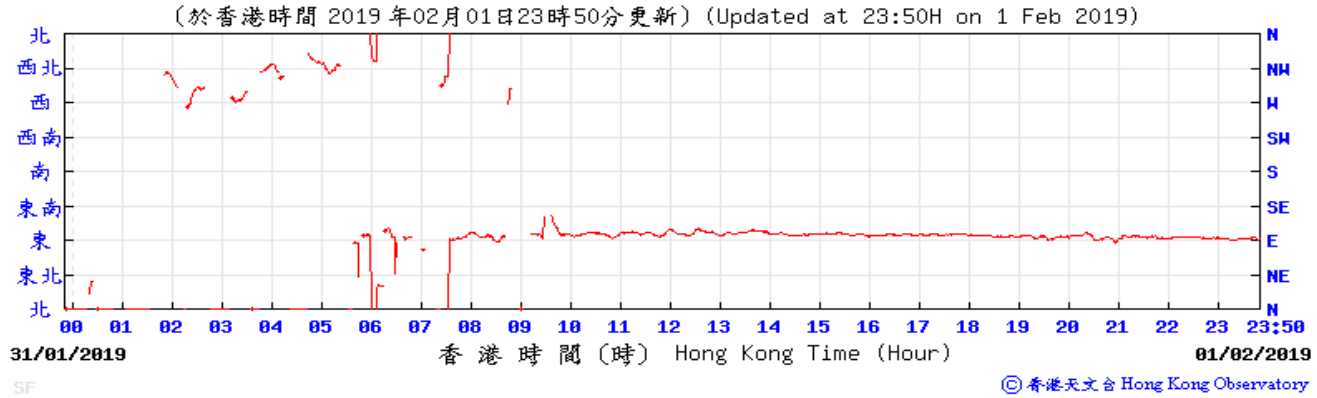
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, January 2019





Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, January 2019





APPENDIX H

Noise Monitoring Results and their Graphical Presentations

Appendix H Regular Construction Noise Monitoring Results

Daytime Noise Monitoring Results at Station NM1 (Hoi Kung Court)

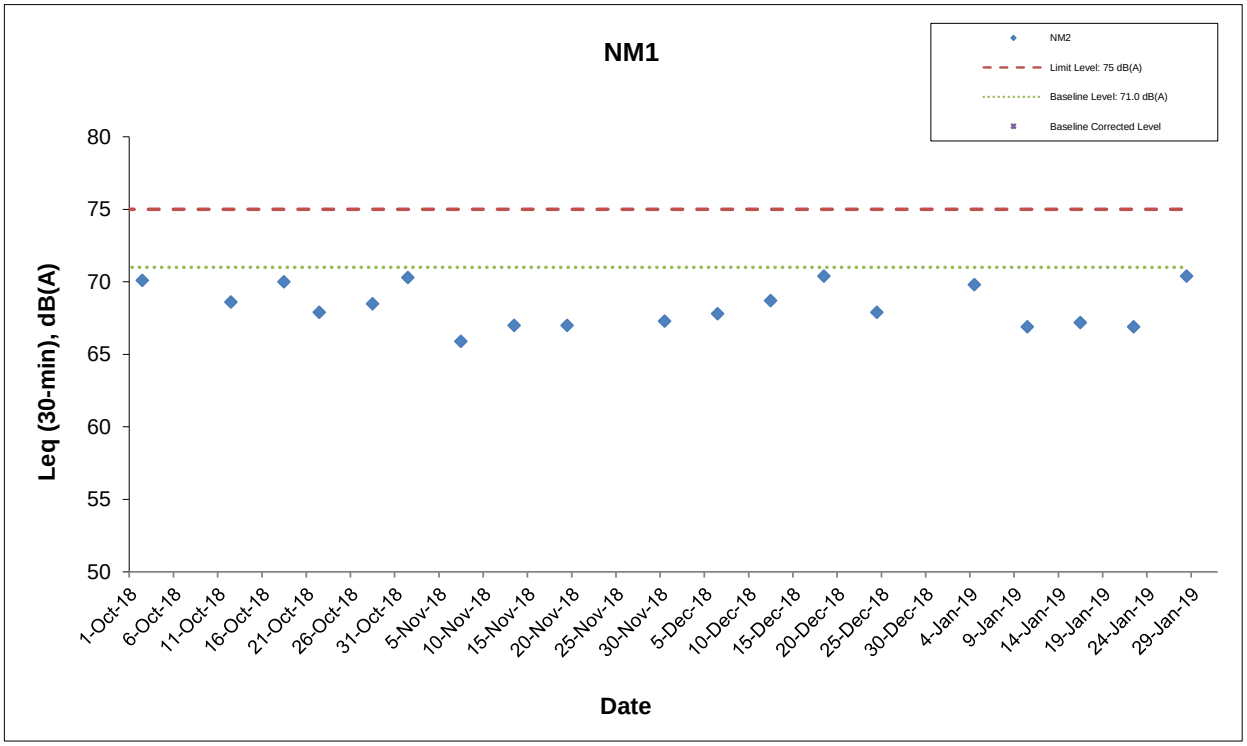
Date	Weather Condition	Noise Level for 30-min, dB(A)+				Baseline Corrected Level, dB(A)	Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	L90	L10	Leq				
04-Jan-2019	Fine	13:29	67.4	72.3	69.8	<Baseline	71.0	75	N
10-Jan-2019	Sunny	15:05	63.4	67.4	66.9	<Baseline	71.0	75	N
16-Jan-2019	Fine	14:30	63.7	68.6	67.2	<Baseline	71.0	75	N
22-Jan-2019	Sunny	14:40	63.3	68.2	66.9	<Baseline	71.0	75	N
28-Jan-2019	Cloudy	15:30	68.5	73.0	70.4	<Baseline	71.0	75	N

+ - Façade measurement

++ - Free field measurement

* - Limit Level of 70dB(A) applies to education institutes while 65dB(A) applies during school examination period.

Appendix H Regular Construction Noise Monitoring Results



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Shatin Central Link Contract No. 1128
South Ventilation Building to Admiralty Tunnels

Graphical Presentation of Impact Noise Monitoring Results

Date: February 2019

APPENDIX I

Event Action Plan

Appendix I Event Action Plan

Event / Action Plan for Construction Dust Monitoring

EVENT	ACTION			
	ET	**IEC**	**ER**	**Contractor**
ACTION LEVEL				
Exceedance for one sample	1. Inform the Contractor, IEC and ER; 2. Discuss with the Contractor and IEC on the remedial measures required; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency	1. Check monitoring data submitted by the ET; 2. Check Contractor's working method; 3. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of exceedance in writing.	1. Identify source(s), investigate the causes of exceedance and propose remedial measures; 2. Implement remedial measures; 3. Amend working methods agreed with the ER as appropriate.
Exceedance for two or more consecutive samples	1. Inform the Contractor, IEC and ER; 2. Discuss with the ER, IEC and Contractor on the remedial measures required; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency to daily; 5. If exceedance continues, arrange meeting with the IEC, ER and Contractor; 6. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by the ET; 2. Check Contractor's working method; 3. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Review and agree on the remedial measures proposed by the Contractor; 3. Supervise Implementation of remedial measures.	1. Identify source and investigate the causes of exceedance; 2. Submit proposals for remedial measures to the ER with a copy to ET and IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal as appropriate.

Appendix I Event Action Plan

EVENT	ACTION			
	ET	**IEC**	**ER**	**Contractor**
LIMIT LEVEL				
Exceedance for one sample	1. Inform the Contractor, IEC, EPD and ER; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency to daily; 4. Discuss with the ER, IEC and contractor on the remedial measures and assess the effectiveness.	1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with the ET, ER and Contractor on possible remedial measures; 4. Review and advise the ER and ET on the effectiveness of Contractor's remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Review and agree on the remedial measures proposed by the Contractor; 3. Supervise implementation of remedial measures.	1. Identify source(s) and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to ER with a copy to ET and IEC within three working days of notification; 4. Implement the agreed proposals; 5. Amend proposal if appropriate.
Exceedance for two or more consecutive samples	1. Notify Contractor, IEC, EPD and ER ; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency to daily; 4. Carry out analysis of the Contractor's working procedures with the ER to determine possible mitigation to be implemented; 5. Arrange meeting with the IEC and ER to discuss the remedial measures to be taken; 6. Review the effectiveness of the Contractor's remedial measures and keep IEC, EPD and ER informed of the results; 7. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with ET, ER, and Contractor on the potential remedial measures; 4. Review and advise the ER and ET on the effectiveness of Contractor's remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; 3. Supervise the implementation of remedial measures; 4. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Identify source(s) and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to the ER with a copy to the IEC and ET within three working days of notification; 4. Implement the agreed proposals; 5. Revise and resubmit proposals if problem still not under control; 6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Appendix I Event Action Plan

Event and Action Plan for Construction Noise Monitoring

EVENT	ACTION			
	ET	IEC	ER	Contractor
Exceedance of Action Level	1. Notify the Contractor, IEC and ER; 2. Discuss with the ER, IEC and Contractor on the remedial measures required; and 3. Increase monitoring frequency to check mitigation effectiveness.	1. Review the investigation results submitted by the contractor; and 2. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor.	1. Confirm receipt of notification of complaint in writing; 2. Review and agree on the remedial measures proposed by the Contractor; and 3. Supervise implementation of remedial measures.	1. Investigate the complaint and propose remedial measures; 2. Report the results of investigation to the IEC, ET and ER; 3. Submit noise mitigation proposals to the ER with copy to the IEC and ET within 3 working days of notification; and 4. Implement noise mitigation proposals.
Exceedance of Limit Level	1. Notify the Contractor, IEC, EPD and ER ; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency; 4. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 5. Arrange meeting with the IEC and ER to discuss the remedial measures to be taken; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7. Review the effectiveness of Contractor's remedial measures and keep IEC, EPD and ER informed of the results; and 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with the ER, ET and Contractor on the potential remedial measures; and 4. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor.	1. Confirm receipt of notification of exceedance in writing; 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; 3. Supervise the implementation of remedial measures; and 4. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Identify source and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to the ER with copy to the IEC and ET within 3 working days of notification; 4. Implement the agreed proposals; 5. Revise and resubmit proposals if problem still not under control; and 6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

APPENDIX J

Cumulative Statistics of Exceedances, Complaints, Notification of Summons and Successful Prosecutions

Appendix J

Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

	Date Received	Subject	Status	Total no. received in this month	Total no. received since project commencement
Environmental complaints	16 January 2019 (referred by EPD on 16 January 2019)	Detail of Complaint: A complaint regarding to milky water discharge was observed at Victoria Harbour near to Causeway Bay Typhoon Shelter on 12 January 2019.	Closed	1	10
Notification of summons	-	-	-	0	0
Successful Prosecutions	-	-	-	0	0

APPENDIX K

Waste Flow Table

SCL Contract 1128 **Appendix K - Monthly Summary C&D Material Flow Table**

Latest Programme for Generation & Import of Materials in each Reporting Period	Quantity for off-site disposal of / reused Inert C&D materials (m^3)																		Quantity for off-site disposal of Non-inert C&D materials					Quantities of Marine Dumping (Sediment)	
	Inert C&D material (m^3)																		Metals (kg)	Paper / Cardboard (kg)	Plastics (kg)	Chemical Waste (kg)	General Waste (m^3)	Disposed as MD at Hung Hom Barging Point	
					Reused in Other Projects																			Type 1	Type 2
	TKO137FB(1)	TKO137SF(2)	TM38FB(3)	CWPFBP(4)	WDII C1 (5)	CWB (6)	SCL1121 (7)	SCL 1103 (8)	WDII C3 (9)	WDII C2 (10)	8217 (11)	HY/2010/08 (12)	SCL 1112 (13)	Area 56A (14)	M+ (15)	XRL 810B (16)	PSK226 (17)	Reused in Mainland	**Total (m^3)**	Total	Total	Total	Total	Total	(m^3)	(m^3)
2019/01	800.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	800.7	0	0	0	0	90.6	0	0
2019/02																										
2019/03																										
2019/04																										
2019/05																										
2019/06																										
2019 Sub-total	**800.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**800.7**	**0.0**	**0.0**	**0.0**	**0.0**	**90.6**	**0.0**	**0.0**
2019/07																										
2019/08																										
2019/09																										
2019/10																										
2019/11																										
2019/12																										
2019 Total	**800.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**800.7**	**0.0**	**0.0**	**0.0**	**0.0**	**90.6**	**0.0**	**0.0**

Remark: ***Assume the density is 2 tonnes per cubic metre for inert C&D materials, general waste and marine sediment.**

1	**TKO137FB**	**Fill Bank at Tseung Kwan O Area 137**
2	**TKO137SF**	**Sorting Facilities at Tseung Kwan O Area 137**
3	**TM38FB**	**Fill Bank at Tuen Mun**
4	**CWPFBP**	**Chai Wan Public Fill Barging Point**
5	**WDII C1**	**HK/2009/01 Wan Chai Development Phase II - Central - Wan Chai Bypass at Hong Kong Convention and Exhibition Centre**
6	**CWB**	**HK/2009/15 Central – Wan Chai Bypass - Tunnel (Causeway Bay Typhoon Shelter Section)**
7	**SCL1121**	**Cross Harbour Tunnels**
8	**SCL1103**	**Hin Keng to Diamond Hill tunnels and Fung Tak Public Transport Interchange**
9	**WDII C3**	**Wan Chai development Phase II - Central-Wan Chai Bypass at Wan Chai West**
10	**WDII C2**	**HK/2009/02 Wan Chai Development Phase 2, Central - WanChai Bypass at Wan Chai East**
11	**8217**	**Backfilling of the Shek Yam Construction Adit**
12	**CWB-HY/2010/08**	**Wan Chai Bypass — Tunnel (Slip Road 8 Section)**
13	**SCL 1112**	**Hung Hom Station & Stabling Sidings**
14	**Area 56A**	**Construction site at Area 56A, Kau To, Sha Tin**
15	**M+**	**Main Works Contract for M+ Museum Project**
16	**XRL 810B**	**West Kowloon Terminus Station South**
17	**PSK226**	**J3698 PSK226 - Proposed Residential Development at T.P.T.L. 226 Pak Shek Kok (Gammon)**

Appendix B

Monthly EM&A Report for January 2019 – SCL Works Contract 1121 NSL Cross Harbour Tunnels

MTR Corporation Limited

Shatin to Central Link –
Hung Hom to Admiralty Section

Monthly EM&A Report No. 47

[Period from 1 to 31 January 2019]

Works Contract 1121 – NSL Cross Harbour Tunnels

(February 2019)

Certified by: Dr. Priscilla Choy

Position: Environmental Team Leader

Date: 13th February 2019

Penta Ocean – China State Joint Venture

Shatin to Central Link – Contract 1121 NSL Cross Harbour Tunnels

Monthly Environmental Monitoring and Audit Report for January 2019

(version 1.0)

Certified By

Dr. Priscilla Choy
(Environmental Team Leader)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

WELLAB accepts no responsibility for changes made to this report by third parties.

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EXECUTIVE SUMMARY

Introduction

1. This is the 47th monthly Environmental Monitoring and Audit (EM&A) Report prepared by Wellab Limited for **MTR Shatin to Central Link (SCL) Works Contract 1121 – NSL Cross Harbour Tunnels.** This report documents the findings of EM&A Works conducted from 1 to 31 January 2019.

Summary of Construction Works undertaken during Reporting Month

2. The major site activities undertaken in the reporting month include:

Victoria Harbour

- External Works around NOV at Hung Hom;
- Internal Finishes at NOV at Hung Hom;
- External Wall Finishes at NOV at Hung Hom;
- Building Services Installation at NOV at Hung Hom;
- Seawall installation CCT/NOV at Hung Hom;
- Cofferdam Pipe Pile Wall Extraction at Hung Hom;
- Construction of walkway inside the Immersed Tube Tunnels;
- Sand Blasting at Immersion Joints inside the Immersed Tube Tunnels;
- Immersion Joints Construction inside the Immersed Tube Tunnels;
- Re-provision of Finger Pier at Hung Hom;
- Backfilling for as-installed IMT elements at Victoria Harbour;
- Reinstatement of Breakwater at CBTS; and
- Demolition of Wall 2 at ME4 Tunnel

Environmental Monitoring and Audit Progress

3. A summary of the monitoring activities in this reporting period is listed below:

Regular Water Quality Monitoring

- Water Quality Monitoring at each monitoring station (Shek O Casting Basin)(1) 0 times
- Water Quality Monitoring at each monitoring station (Victoria Harbour) 13 times

Remarks:
(1) Removal of southern dock gate had been completed on 20 November 2017. No water quality monitoring was carried out in Shek O during the reporting month.

Post-Project Water Quality Monitoring

- Post-Project Water Quality Monitoring at each monitoring station (Shek O Casting Basin)(2) 0 times

Remarks:
(2) A post-project water quality monitoring had been completed on 18 December 2017 in Shek O for four weeks.

Waste Management

4. Wastes generated from this Project include inert construction and demolition (C&D) materials and non-inert C&D materials. Details of waste management data is presented in Section 5 and **Appendix K**.

Landscape and Visual

5. Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 7 and 21 January 2019. Most of the necessary mitigation measures have been implemented and recommended follow-up actions have been discharged by the Contractor. Details of the audit findings and implementation status are presented in Section 6.

Environmental Site Inspection

6. Joint weekly site inspections were conducted by representatives of the Contractor, Engineer and Contractor's ET on 2, 7, 14, 21 and 28 January 2019. The representative of the IEC joined the site inspection on 21 January 2019. Details of the audit findings and implementation status are presented in Section 6.

Environmental Exceedance/Non-conformance/Complaint/Summons and Successful Prosecution

7. No exceedance of the Action and Limit Levels of regular water quality monitoring was recorded during the reporting period.

8. No exceedance of the Action and Limit Levels of post-project water quality monitoring was recorded during the reporting period.

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

10. No environmental complaint and no notification of summon / successful prosecutions were received in this reporting period.

Reporting Changes

11. No reporting changes in this reporting period.

Future Key Issues

12. Major site activities for the coming reporting month will include:

Victoria Harbour

- External Works around NOV at Hung Hom;
- Internal Finishes at NOV at Hung Hom;
- External Wall Finishes at NOV at Hung Hom;
- Building Services Installation at NOV at Hung Hom;
- Construction of walkway inside the Immersed Tube Tunnels;
- Sand Blasting at Immersion Joints inside the Immersed Tube Tunnels
- Immersion Joints Construction inside the Immersed Tube Tunnels
- Re-provision of Finger Pier at Hung Hom;
- Backfilling for as-installed IMT elements at Victoria Harbour;
- Reinstatement of Breakwater at CBTS; and
- Demolition of Wall 2 at ME4 Tunnel.

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

1 INTRODUCTION

1.1 Wellab Limited was appointed by Penta Ocean – China State Joint Venture (PCJV) as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) programme during construction phase of the MTR Shatin to Central Link (SCL)Works Contract 1121 – NSL Cross Harbour Tunnels (hereafter referred to as the Project).

Purpose of the Report

1.2 This is the 47th EM&A report which summarises the impact monitoring results and audit findings for the EM&A programme during the reporting period from 1 to 31 January 2019. The major construction works for Contract 1121 commenced on 2 March 2015.

Structure of the Report

1.3 The structure of the report is as follows:

Section 1: **Introduction -** details the scope and structure of the report.

Section 2: **Project Information** - summarises background and scope of the project, site description, project organization and contact details, construction programme, the construction works undertaken and the status of Environmental Permits/Licenses during the reporting period.

Section 3: **Environmental Monitoring Requirement -** summarises the monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations, Action and Limit Levels, Event / Action Plans, environmental mitigation measures as recommended in the EIA report and relevant environmental requirements.

Section 4: **Implementation Status on Environmental Mitigation Measures -** summarises the implementation of environmental protection measures during the reporting period.

Section 5: **Monitoring Results** - summarises the monitoring results obtained in the reporting period.

Section 6: **Environmental Site Inspection -** summarises the audit findings of the weekly site inspections undertaken within the reporting period.

Section 7: **Environmental Non-conformance -** summarises any monitoring exceedance, environmental complaints and environmental summons within the reporting period.

Section 8: **Future Key Issues -** summarises the impact forecast and monitoring schedule for the next three months.

Section 9: **Conclusions and Recommendations**

2 PROJECT INFORMATION

Background

2.1 The Shatin to Central Link – Hung Hom to Admiralty Section (hereafter referred to as SCL (HUH-ADM)) is an approximately 6km extension of the East Rail Line including a rail harbor crossing from Hung Hom across the harbor to Admiralty on Hong Kong Island. It is a Designated Project under the Environmental Impact Assessment Ordinance (Cap. 499) (EIAO).

2.2 The Environmental Impact Assessment (EIA) Report for SCL – Hung Hom to Admiralty Section [SCL (HUH-ADM)] (Register No.: AEIAR-166/2012) was approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, Environmental Permits (EP) (EP No: EP-436/2012) was granted on 22 March 2012 for their construction and operation.

2.3 Various Environmental Review Reports (ERR) / Supplementary Information Paper had been submitted for the following purposes:

Table 2.1 Environmental Review Reports/Supplementary Information Paper for this Project

Environmental Review Reports / Supplementary Information Paper	Date of Submission to EPD	Purpose(s)
Environmental Review Report – Design Changes of North Ventilation Building and Shek O Casting Basin	February 2014	To identify and assess the likely environmental issues pertinent to the proposed design changes at North Ventilation (NOV) Building and Shek O Casting Basin, and to identify any additional environmental mitigation measures that may be required for compliance with environmental standards.
Environmental Review Report – Variation for IMT Extension	February 2015	To identify and assess the likely environmental issues pertinent to the proposed alternative scheme of IMT extension.
Supplementary Information Paper for Optimized Scheme for IMT Construction in CBTS	January 2016	To demonstrate that no unacceptable impacts would be resulted from the Optimized Scheme in CBTS.
Environmental Review Report of Dredging Scenarios	November 2016	To demonstrate that unacceptable water quality impact is not anticipated from an alternative dredging option (including (i) using two smaller closed grab dredgers instead of one large closed grab dredger; and (ii) proposed daily production rate) within the open Victoria Harbour outside Causeway Bay Typhoon Shelter (CBTS)

Environmental Review Report – Arrangement of the fixed plant noise Sources at NOV	31 December 2018	To update the Fixed Plant Noise Sources at North Ventilation Building, Plant Rooms and Emergency Access (NOV)

2.4 Variation of environmental permit (VEP) was subsequently applied for EP-436/2012 and the latest Environmental Permit (EP No: EP-436/2012/F) was issued by Director of Environmental Protection (DEP) on 23 January 2019.

2.5 The construction of the SCL (HUH-ADM) has been divided into a series of civil construction Works Contracts and this Works Contract 1121 comprises of the Permanent Works and the associated Temporary works required for the construction of the North Ventilation Building (NOV) at the Hung Hom Landfall, and construction of cut & cover tunnel and Immersed Tunnel (IMT) sections extending across the harbour from the NOV to the Causeway Bay Typhoon Shelter (CBTS). This construction contract was awarded to Penta Ocean – China State Joint Venture (PCJV) in December 2014.

General Site Description

2.6 The site layout plans for the Works Contract 1121 are shown in **Figure 1a-1b**.

Construction Programme and Activities

2.7 A summary of the major construction activities undertaken in this reporting period is shown as follows. The tentative construction programme is presented in **Appendix A**.

Victoria Harbour

- External Works around NOV at Hung Hom;
- Internal Finishes at NOV at Hung Hom;
- External Wall Finishes at NOV at Hung Hom;
- Building Services Installation at NOV at Hung Hom;
- Seawall installation CCT/NOV at Hung Hom;
- Cofferdam Pipe Pile Wall Extraction at Hung Hom;
- Construction of walkway inside the Immersed Tube Tunnels;
- Sand Blasting at Immersion Joints inside the Immersed Tube Tunnels;
- Immersion Joints Construction inside the Immersed Tube Tunnels;
- Re-provision of Finger Pier at Hung Hom;
- Backfilling for as-installed IMT elements at Victoria Harbour;
- Reinstatement of Breakwater at CBTS; and
- Demolition of Wall 2 at ME4 Tunnel

Project Organisation

2.8 The project organizational chart and contact details are shown in **Figure 2.**

Status of Environmental Licences, Notification and Permits

2.9 A summary of the relevant permits, licences, and/or notifications on environmental protection for this Project is presented in **Table 2.2**.

Table 2.2 Summary of the Status of Environmental Licences, Notification and Permits

Permit / License No.	Valid Period		Status
	From	To	
Environmental Permit (EP)			
EP-436/2012/F	23/01/2019	N/A	Valid
SP License			
L-3-248(1)	10/09/2015	09/09/2017	Valid
Notification pursuant to Air Pollution Control (Construction Dust) Regulation			
EPD Ref no.: 384777	28/01/2015	N/A	Valid
EPD Ref no.: 384550	21/01/2015	N/A	Valid
EPD Ref no.: 384281	14/01/2015	N/A	Valid
Billing Account for Construction Waste Disposal			
Account No. 7021499	20/01/2015	N/A	Valid
Registration of Chemical Waste Producer			
Waste Producer No. 5213-147-P3174-03	02/03/2015	N/A	Valid
Waste Producer No. 5213-213-P3172-01	09/02/2015	N/A	Valid
Waste Producer No. 5111-197-P3174-01	27/02/2015	N/A	Valid
Marine Dumping Permit			
-	-	-	-
Effluent Discharge License under Water Pollution Control Ordinance			
WT00021844-2015	25/06/2015	30/06/2020	Valid
WT00021891-2015	19/08/2015	31/08/2020	Valid
WT00022449-2015	29/09/2015	30/06/2020	Valid
Construction Noise Permit (CNP)			
GW-RS-0723-18	18/08/2018	15/02/2019	Valid
GW-RE0800-18	05/12/2018	04/01/2019	Expired on 04/01/2019

Summary of EM&A Requirements

2.10 The EM&A programme under Works Contract 1121 requires regular dust and water quality monitoring as well as environmental site audits. The EM&A requirements are described in the following sections, including:

- All monitoring parameters;
- Action and Limit levels for all environmental parameters;

- Event / Action Plans;
- Environmental mitigation measures, as recommended in the Project EIA study final report; and
- Environmental requirements in contract documents.

2.11 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in Section 6 of this report.

2.12 This report presents the monitoring results, observations, locations, equipment, period, methodology and QA/QC procedures of the required monitoring parameters, namely marine water quality monitoring as well as audit works for the Project in the reporting month.

3 ENVIRONMENTAL MONITORING REQUIREMENTS

Regular Construction Dust Monitoring

3.1 In accordance with the EM&A Manual, the setup of the impact dust monitoring station at Harbourfront Horizon and the impact monitoring is currently carried out by the MTR Contract 1112. Upon termination of their EM&A programmes, the impact monitoring works would be taken up by this Project.

Regular Water Quality Monitoring

3.2 In accordance with the EM&A Manual and the ERRs, marine water quality monitoring should be carried out during the dredging and filling operation, and IMT construction within CBTS (for Station 9 only); and throughout the construction period of removal of earth bunds at Northern and Southern gates.

3.3 Water Quality Monitoring at Station 8 and 14 is suspended as the water intakes are not in use. The statuses of the intakes will be kept in view such that once the water intakes are occupied, water quality monitoring will resume. In the presence of temporary reclamation in the Causeway Bay Typhoon Shelter (CBTS) under this Project, only Dissolved Oxygen (DO) level monitoring would be maintained at Station 8 for checking of potential odour concern.

3.4 The water quality monitoring stations and control stations of Project are shown in **Figure 3**. The co-ordinates of the monitoring stations are listed in **Table 3.1**. As shown in **Table 3.1**, the locations are classified as Impact Station and Control Station according to their functions.

Table 3.1 Water Quality Monitoring Stations

Station	Description	Coordinates	
		Easting	North
Shek O Casting Basin			
GB3	Turtle Cove Beach	841120	810280
C3	Control Station for ebb tide	841200	806210
C4	Control Station for flood tide	843330	807320
Victoria Harbour			
8	Cooling Water Intake for Excelsior Hotel and World Trade Centre / No. 27 – 63 Paterson Street	837036	816008
9	Cooling Water Intake for Windsor House	837223	816150
14	Flushing Water Intake for Kowloon Station	834477	817891
21	Cooling Water Intake for East Rail Extension	836484	817642
34	Cooling Water Intake for Metropolis	836828	817844
A	Wan Chai WSD Flushing Water Intake (Reprovisioned)[(1)]	836268	816045
WSD9	Tai Wan WSD Flushing Water Intake[(2)]	837930	818357
WSD17	Quarry Bay WSD Flushing Water Intake	839863	817077
C1	Control Station 1	833977	817442
C2	Control Station 2	841088	817223

Note:
(1) According to the Baseline Water Quality Monitoring Report for SCL (MKK-HUH & HUH-ADM), the original coordinates of monitoring location A (Easting: 836286, Northing: 816024) is the exact location taken from the design of reprovisioned Wan Chai Salt Water Pumping Station and Salt Water Intake Culvert. Based on actual site condition for taking water sampling, minor adjustment was made on monitoring location.
(2) According to the Baseline Water Quality Monitoring Report for SCL (MKK-HUH & HUH-ADM), the original coordinates of monitoring location WSD9 (Easting: 838133, Northing: 817790) as proposed in WQMP were moved closer to sensitive receiver according to the actual site condition.

Monitoring Parameter, Frequency and Programme

3.5 Water quality monitoring was conducted in accordance with the requirements stipulated in the approved SCL(HUH-ADM) EM&A Manual and the ERRs. **Table 3.2** summarized the monitoring frequency and water quality parameters for the impact monitoring. The monitoring schedule for this reporting period is shown in **Appendix C**.

Table 3.2 Water Quality Impact Monitoring Programme

	Impact Monitoring
Monitoring Period	Victoria Harbour During the dredging and filling operation CBTS (Station 9 only) During IMT construction within CBTS Shek O Casting Basin Throughout the construction period of removal of earth bunds at Northern and Southern gates.
Monitoring Frequency(1)	3 Days in a Week, at mid-flood and mid-ebb tides
Monitoring Locations(3)	GB3, C3, C4, 8, 9, 14, 21, 34, A, WSD9, WSD17, C1 and C2
Monitoring Parameters(2)	DO, temperature, turbidity, pH, salinity and SS
Intervals between 2 Sets of Monitoring	Not less than 36 hours
Tidal Range	Individual flood and ebb tides not less than 0.5m

Notes:
1. For selection of tides for in-situ measurement and water sampling, tidal range of individual flood and ebb tides should be not less than 0.5 m.
2. Turbidity, DO, pH, temperature and salinity should be measured in situ whereas SS should be determined by laboratory.
3. Water Quality Monitoring at Station 8 and 14 is suspended as the water intakes are not in use.

Monitoring Equipment and Methodology

pH Measurement Instrument

3.6 The instrument consisted of a potentiometer, a glass electrode, a reference electrode and a temperature-compensating device. It is readable to 0.1pH in a range of 0 to 14. Standard buffer solutions of at least pH 7 and pH 10 is used for calibration of the instrument before and after use.

Dissolved Oxygen and Temperature Measuring Equipment

3.7 The Dissolved Oxygen (DO) measuring equipment is portable and weatherproof. It is completed with cable and senor, and a DC power source. The equipment is capable of measuring:

- a DO level in the range of 0 - 20 $mg \cdot L^{-1}$ and 0 - 200% saturation; and
- a temperature of 0 - 45 degree Celsius (°C).

3.8 It has a membrane electrode with automatic temperature compensation complete with a cable.

3.9 Should salinity compensation not be built-in to the DO equipment, in-situ salinity should be measured to calibrate the DO measuring equipment prior to each DO measurement.

Turbidity Measurement Instrument

3.10 The turbidity measuring instrument is a portable and weatherproof using a DC power source. It has a photoelectric sensor capable of measuring turbidity between 0 - 1000 NTU (for example, Hach model 2100P or an approved similar instrument).

Sampler

3.11 A water sampler was required for SS monitoring. It comprises a transparent PVC cylinder, with a capacity of not less than 2 litres, which can be effectively sealed with latex cups at both ends. The sampler has a positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler is at the selected water depth (for example, Kahlsico Water Sampler or an approved similar instrument).

Water Depth Detector

3.12 A portable, battery-operated echo sounder is used for the determination of water depth at each monitoring station. This unit can either be hand-held or affixed to the bottom of the work boat, if the same vessel is to be used throughout the monitoring programme.

Salinity

3.13 A portable salinometer capable of measuring salinity in the range of 0 - 40 parts per thousand (ppt) is provided for measuring salinity of the water at each monitoring station.

Sample Containers and Storage

3.14 Water samples for SS monitoring were stored in high density polythene bottles with no preservative added, packed in ice (cooled to 4 °C without being frozen) and delivered to the laboratory and analyzed as soon as possible after collection.

Monitoring Position Equipment

3.15 A hand-held or boat-fixed type digital Differential Global Positioning System (DGPS) with way point bearing indication and Radio Technical Commission for maritime (RTCM) Type 16 error message "screen pop-up" facilities (for real-time auto-display of error messages and DGPS corrections from the Hong Kong Hydrographic Office), or other equipment instrument of similar accuracy, was provided and used during marine water monitoring to ensure the monitoring vessel at the correct location before taking measurements.

Calibration of In-Situ Instruments

3.16 The pH meter, DO meter and turbidimeter was checked and calibrated before use. DO meter and turbidimeter was certified by a laboratory accredited under HOKLAS or any other international accreditation scheme, and subsequently re-calibrated at 3 monthly intervals throughout all stages of the water quality monitoring. Responses of sensors and electrodes were checked with certified standard solutions before each use. Wet bulb calibration for a DO meter was carried out before measurement at each monitoring location.

3.17 **Table 3.3** summarizes the equipment used in the water quality monitoring program. The calibration certificates for the in-situ instruments are presented in **Appendix E**.

Table 3.3 Water Quality Monitoring Equipment

Equipment	Model and Make	Qty.
Water Sampler	Kahlsico Water-Bottle Model 135DW 150	2
YSI EXO1 Multiparameter Sondes	SW-08-09	1
YSI EXO1 Multiparameter Sondes	SW-08-15	1
YSI EXO1 Multiparameter Sondes	SW-08-132	1
YSI EXO1 Multiparameter Sondes	SW-08-159	1
Monitoring Position Equipment	"Magellan" Handheld GPS Model GPS-320	2
Water Depth Detector	Fishfinder 140	2

3.18 Sufficient stocks of spare parts were maintained for replacements when necessary. Backup monitoring equipment were made available so that monitoring can proceed uninterrupted even when some equipment are under maintenance, calibration, etc.

Laboratory Measurement / Analysis for Marine Water

3.19 Duplicate samples from each independent sampling event are required by EPD for all parameters. Analysis of suspended solids was carried out in a HOKLAS or other international accredited laboratory. Sufficient water samples were collected at the monitoring stations for carrying out the laboratory SS determinations, with detection limit shown in **Table 3.4**. The SS determination work was started within 24 hours after collection of the water samples. The analyses followed the standard methods according to **Table 3.4** and as described in "American Public Health Association (APHA) Standard Methods for the Examination of Water and Wastewater", 19th edition, unless otherwise specified.

Table 3.4 Analytical Methods to be applied to Marine Water Quality Samples

Determinant	Standard Method	Detection Limit
Suspended Solids (mg/L)	APHA 2540 D	0.1 mg/L

3.20 Quality Control Reports as attached in **Appendix F** are available for the SS analyzed in the HOKLAS-accredited laboratory, WELLAB Ltd.

Action and Limit Levels

3.21 The action and limit levels for water quality monitoring are presented in **Appendix B**.

Event and Action Plan

3.22 Should non-compliance of the criteria occur, action in accordance with the Event and Action Plan in **Appendix I** shall be carried out.

Landscape and Visual

3.23 In accordance with the EM&A Manual, the landscape and visual mitigation measures shall be implemented and a site inspection shall be conducted once every two weeks throughout the construction period. The implementation status is summarised in **Table 6.1** of Section 6.

4 IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS

4.1 The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Report, the Environmental Permit, EM&A Manual and the ERR. The implementation status of the environmental mitigation measures of the reporting period is summarized in **Appendix J**. Status of required submissions under the Environmental Permit (EP) of the reporting period is presented in **Table 4.1**.

Table 4.1 Status of Required Submissions under EP

EP Condition	Submission	Submission Date
Condition 3.4	Monthly EM&A Report (December 2018)	14 January 2019

5 MONITORING RESULTS

Water Quality Monitoring

5.1 All water quality monitoring was conducted as scheduled in the reporting month. Thirteen (13) sets of water quality monitoring was carried out at the designated monitoring stations in Victoria Harbour in this reporting period.

5.2 A post-project water quality monitoring had been completed on 18 December 2017 in Shek O for four weeks.

5.3 The water quality impact monitoring schedule for this reporting period is shown in **Appendix C**.

5.4 The monitoring results together with graphical presentations are shown in **Appendix D**.

5.5 Under consultancy agreement no. C11033B, Action and Limit Levels for water quality monitoring at the monitoring stations in **Table 3.2** were established in the baseline water quality monitoring conducted by AECOM during June and July 2014. Action and Limit Levels for water quality is summarised in **Appendix B**.

5.6 No exceedance of Action and Limit Levels of regular water quality monitoring was recorded during the reporting period.

5.7 No exceedance of Action and Limit Levels of post-project water quality monitoring was recorded during the reporting period.

Waste Management

5.8 Waste generated from this Project includes inert construction and demolition (C&D) materials, non-inert C&D materials and marine sediments. Non-inert C&D materials are made up of C&D waste which cannot be reused or recycled and has to be disposed of at the designated landfill sites. With reference to relevant handling records of this Project, the quantities of different types of waste generated in the reporting month are summarised in **Table 5.1**. Details of waste management data is presented in **Appendix K**.

5.9 0 m^3 inert C&D materials were generated during the reporting month by this Project. No inert C&D materials were received from SCL Contract 1111 and 1112 respectively. No inert C&D materials were received from SCL Contract 1114, 1123 and 1128. Inert C&D materials received from SCL Contracts was collected and stored on-site and 1,324 m^3 of these inert C&D materials were reused in the other Projects. No chemical waste was collected by licensed collector during the reporting month. 0 kg metal, 0 kg paper/cardboard packaging and no plastics were generated during the reporting month.

5.10 0 m^3 Type 1 sediments (Category L) were generated from construction activities of this Project during this reporting period. No Type 1 sediments (Category L) were received from SCL Contract 1111, 1112 and 1128. Such materials were collected and 0 m^3 was disposed at Capping of the exhausted Confined Marine Disposal Facility at South Cheung Chau in the reporting period.

5.11 No contaminated materials - Type 1 (dedicated sites) and 0 m^3 Type 2 - Confined Marine Disposal (Category M) sediments were generated from construction activities of this Project during this reporting period. No contaminated materials - Type 1 (dedicated sites) and Type 2 - Confined Marine Disposal (Category M) sediments were received

from SCL Contract 1111, 1112 and 1128. Such materials were collected and 0 m^3 was disposed at Capping of the exhausted Confined Marine Disposal Facility at South of The Brothers (or East of Sha Chau) in the reporting period.

5.12 No contaminated materials - Type 3 (Special Treatment Disposal) sediments were generated from construction activities of this Project during this reporting period.

Table 5.1 Quantities of Waste Generated from the Project

Reporting Month	Quantity						
	C&D Materials (inert) [a]	Sediments (in bulk volume)	C&D Materials (non-inert)[b]				
			General Refuse	Chemical Waste	Recycled materials		
					Paper/ cardboard	Plastics	Metals
January 2019	0 *m^3*	0 *m^3*	113 *tonne*	0 *kg*	0 *kg*	0 *kg*	0 *kg*

Notes:
(a) Inert C&D materials include soft materials, rocks and artificial hard materials to be delivered to TKO 137 and TM 38 public fill reception sites or, alternatively, receptor sites to be identified for beneficial reuse as proposed by the Contractor.
(b) Non-inert C&D materials include C&D waste which cannot be reused or recycled and has to be disposed of at North East New Territories (NENT) Landfill. It also includes steel, paper/cardboard packaging waste, plastics. Steel materials generated from the project are grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials.

Landscape and Visual

5.13 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 7 and 21 January 2019. The observations and recommendations made during the audit sessions are summarized in **Table 6.1**.

6 ENVIRONMENTAL SITE INSPECTIONA

Site Audit

6.1 Site audit was carried out by ET on weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site. The summaries of site audit are attached in **Appendix H**.

6.2 Site audits were conducted on 2, 7, 14, 21 and 28 January 2019 by ET. A joint site audit with the representative with IEC, ER, the Contractor was carried out on 21 January 2019. The details of observations during site audit can refer to **Table 6.1**.

Implementation Status of Environmental Mitigation Measures

6.3 According to the EIA Study Report, Environmental Permit and the EM&A Manual of the Project, the mitigation measures detailed in the documents are recommended to be implemented during the construction phase. An updated summary of the Environmental Mitigation Implementation Schedule (EMIS) is provided in **Appendix J**.

6.4 During site inspections in the reporting month, no non-conformance was identified. The observations and recommendations made during the audit sessions are summarized in **Table 6.1**.

Table 6.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Water Quality	02, 07, 14 January 2019	Reminder / Observation: The Contractor was reminded to closely monitor the pH of treated water and make sure that the AquaSed is functioning properly at Hung Hom site. And the sediment in sedimentation tank inside the IMT should be cleaned regularly.	The observation was observed to be improved/rectified by the Contractor during the audit session on 21 January 2019.
Noise	--	--	--
Landscape and Visual	--	--	--
Air Quality	24 December 2018	Reminder: A new NRMM label should be provided to the fork lift inside the IMT.	The observation was observed to be improved/rectified by the Contractor during the audit session on 02 January 2019.
	07 January 2019	Reminder: A three-side dust curtain should be provided to the tipping hall during the operation at Hung Hom site.	The observation was observed to be improved/rectified by the Contractor during the audit session on 14 January 2019.
	07 January 2019	Reminder: Stockpile of dusty material at mud pit should be covered by the impervious sheet for dust suppression at Hung Hom site.	The observation was observed to be improved/rectified by the Contractor during the audit session on 14 January 2019.
	28 January 2019	Reminder: A fading NRMM label on the excavator should be replaced near the NOV building at Hung Hom site.	Follow up action will be reported in the next reporting month.
Waste / Chemical Management	21 January 2019	Reminder: Drip tray should be provided to chemical container to prevent oil leakage at Hung Hom site.	The observation was observed to be improved/rectified by the Contractor during the audit session on 28 January 2019.

Parameters	Date	Observations and Recommendations	Follow-up
Permits/ Licenses	--	--	--

7 ENVIRONMENTAL NON-CONFORMANCE

Summary of Exceedances

7.1 No exceedance of Action and Limit Levels of water quality was recorded during the reporting period. The summary of exceedance is provided in **Appendix G**.

Summary of Environmental Non-Compliance

7.2 No environmental non-compliance was recorded in the reporting month.

Summary of Environmental Complaint

7.3 No environmental complaint was received in the reporting month. The Cumulative Complaint Log since the commencement of the Project is presented in **Appendix L**. The investigation status and result is also reported in **Appendix L**.

Summary of Environmental Summon and Successful Prosecution

7.4 There was no successful environmental prosecution and no notification of summons received in this reporting period. The Cumulative Log for environmental summon and successful prosecution since the commencement of the Project is presented in **Appendix L**.

8 FUTURE KEY ISSUES

Construction Programme for the Next Month

8.1 A tentative construction programme is provided in **Appendix A**. The major construction activities in the coming month will include:

Victoria Harbour

- External Works around NOV at Hung Hom;
- Internal Finishes at NOV at Hung Hom;
- External Wall Finishes at NOV at Hung Hom;
- Building Services Installation at NOV at Hung Hom;
- Construction of walkway inside the Immersed Tube Tunnels;
- Sand Blasting at Immersion Joints inside the Immersed Tube Tunnels
- Immersion Joints Construction inside the Immersed Tube Tunnels
- Re-provision of Finger Pier at Hung Hom;
- Backfilling for as-installed IMT elements at Victoria Harbour;
- Reinstatement of Breakwater at CBTS; and
- Demolition of Wall 2 at ME4 Tunnel.

Key Issues in the Next Month

8.2 Potential environmental impacts arising from the above construction activities are mainly associated with construction dust, noise, water quality and waste management in Hung Hom.

Monitoring Schedule in the Next Month

8.3 The tentative schedule of regular water quality monitoring at all the monitoring locations in the next reporting period is presented in **Appendix C**. The regular water quality monitoring will be conducted at the same monitoring locations in the next reporting period. Also, a post-project water quality monitoring had been completed on 18 December 2017 in Shek O for four weeks.

9 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

9.1 The Environmental Monitoring and Audit (EM&A) Report presents the EM&A works undertaken during the period from 1 to 31 January 2019 in accordance with EM&A Manual and the requirement under EP.

9.2 No exceedance of the Action and Limit Levels of regular water quality monitoring was recorded at the designated monitoring stations during the reporting month.

9.3 5 times of joint weekly site inspections were conducted by representatives of the Contractor, Engineer and Contractor's ET and 2 times of bi-weekly inspection of the implementation of landscape and visual mitigation measures were conducted during the reporting period.

9.4 No environmental complaint and no notification of summon / successful prosecution were received during the reporting month.

9.5 The ET will keep track on the EM&A programme to ensure compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

Recommendations

9.6 According to the environmental audit performed in the reporting month, the following recommendations were made:

Air Quality

- Valid Non-road Mobile Machinery (NRMM) labels should be provided to regulated machines.
- Stockpile of dusty material should be covered or sprayed with water for dust suppression.
- A three-side dust curtain should be provided to the tipping hall during the operation at Hung Hom site.

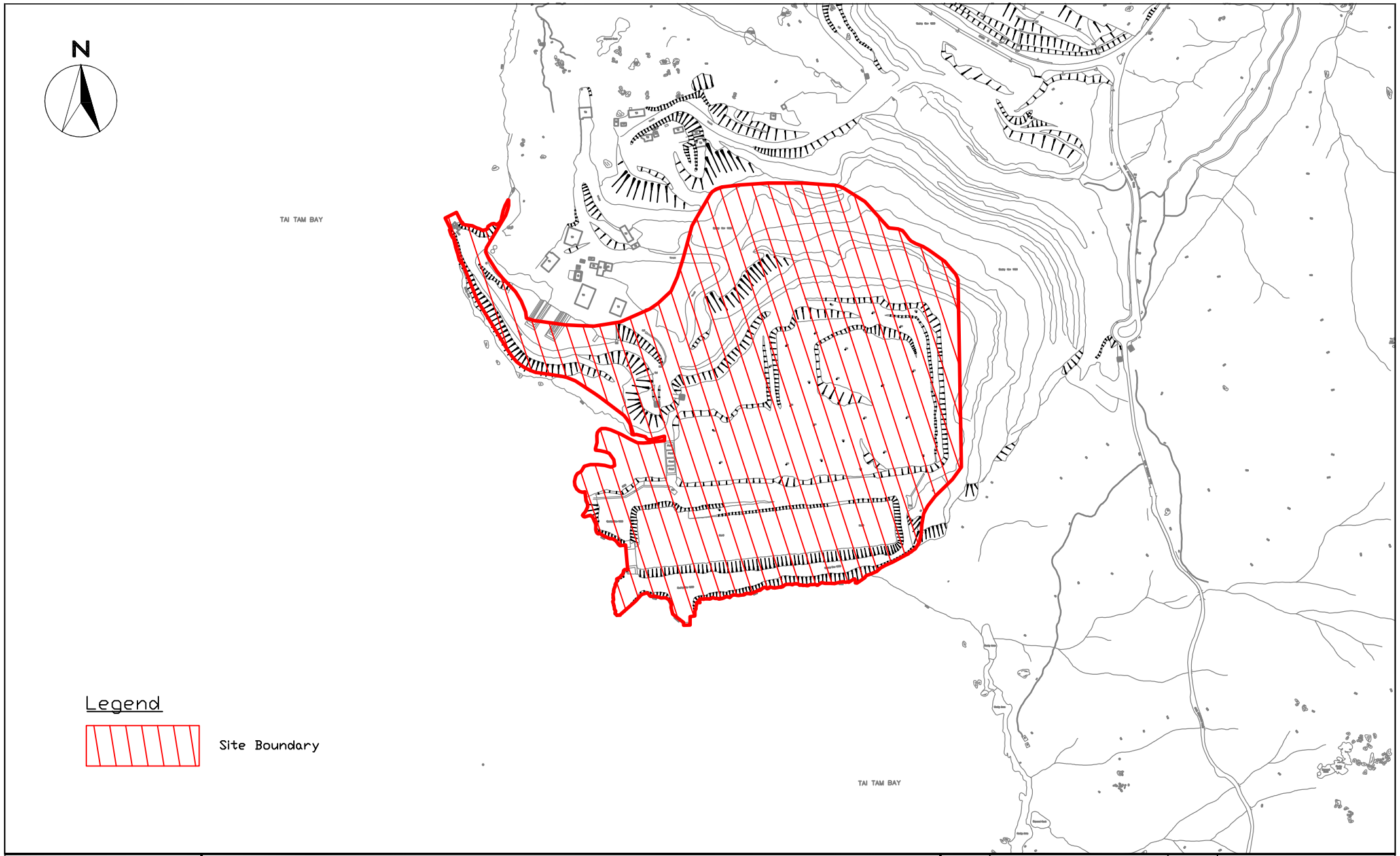
Water Quality

- The Contractor was reminded to closely monitor the pH of treated water and make sure that the AquaSed is functioning properly at Hung Hom site. And the sediment in sedimentation tank inside the IMT should be cleaned regularly.

Waste & Chemical Management

- Drip tray should be provided to chemical container to prevent oil leakage at Hung Hom site.

FIGURES

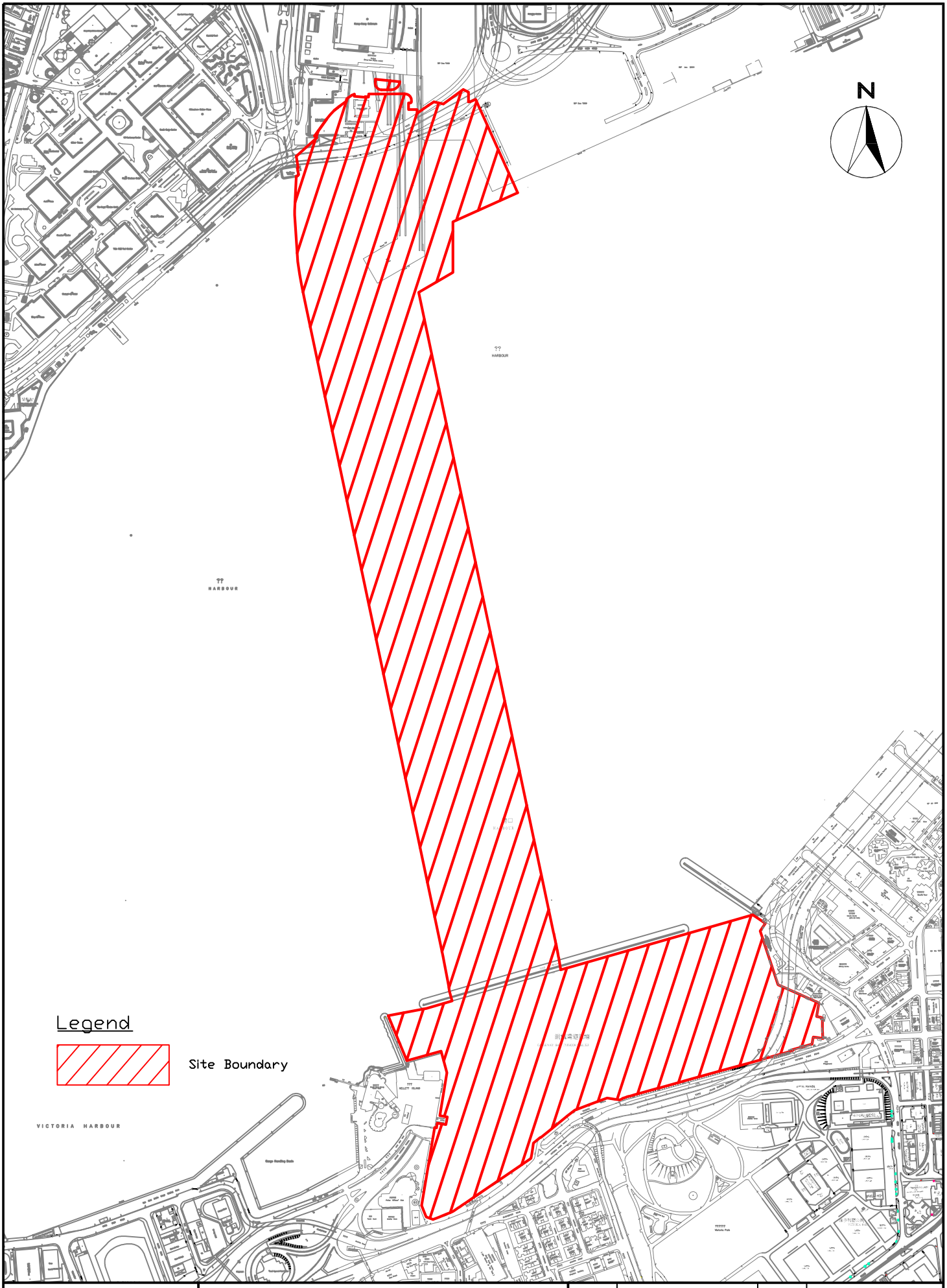


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SCL 1121 - NSL Cross Harbour Tunnels

Site Layout Plan (Shek O)

SCALE	1:150	DATE	12/2014
CHECK	CHECK	DRAWN	VW
JOB No.	MA14047	FIGURE NO.	1a
		REV	-



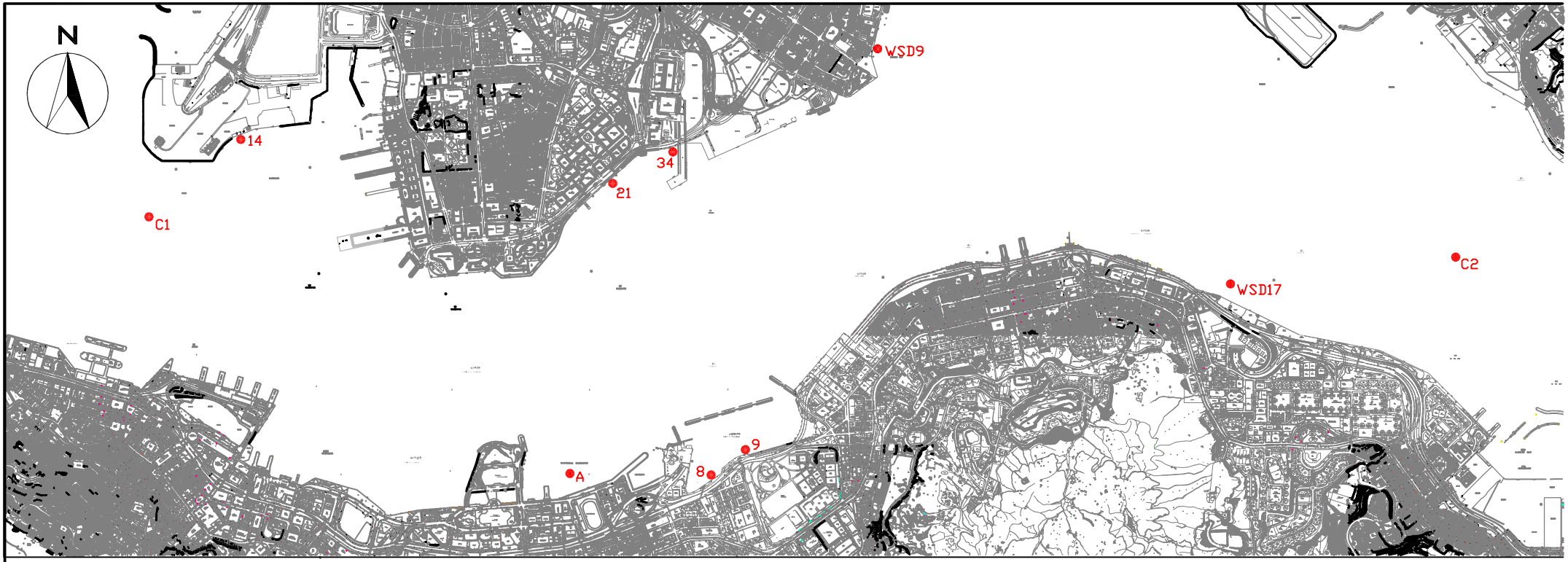
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SCL 1121 - NSL Cross Harbour Tunnels

Site Layout Plan
(Victoria Harbour)

SCALE	1:220	DATE	1/2015
CHECK	JF	DRAWN	VW
JOB No.	MA14047	FIGURE NO.	1b
		REV	-

F:/Project_drawings



COORDINATE	EASTING	NORTHING
A	836268	816045
14	834477	817891
WSD9	837930	818357
WSD17	839863	817077
C1	833977	817442
C2	841088	817223
8	837036	816008
9	837223	816150
21	836484	817642
34	836828	817844

LEGEND

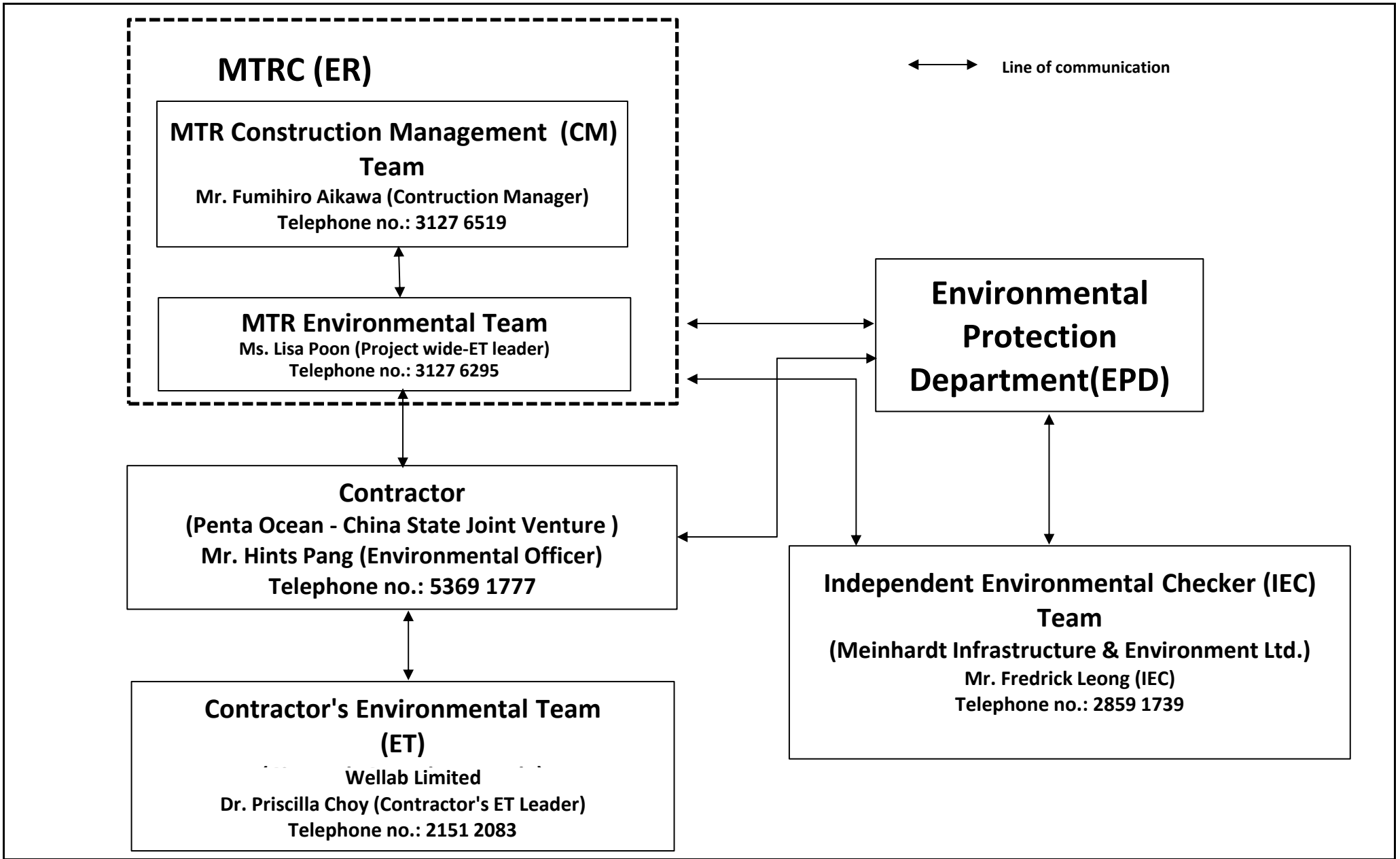
Water Quality Monitoring Station

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SCL 1121 - NSL Cross Harbour Tunnels

Locations of Water Quality Monitoring station in the Victoria Harbour

SCALE	1:30	DATE	1/2015
CHECK	JF	DRAWN	VW
JOB No.	MA14047	FIGURE NO. 3	REV –



Title	Scale	Project No.
SCL Contract 1121 The Shatin to Central Link - NSL Cross Harbour Tunnels Project Organisation for Environmental Works	N.T.S	MA14047
	Date: Oct-18	Figure: 2

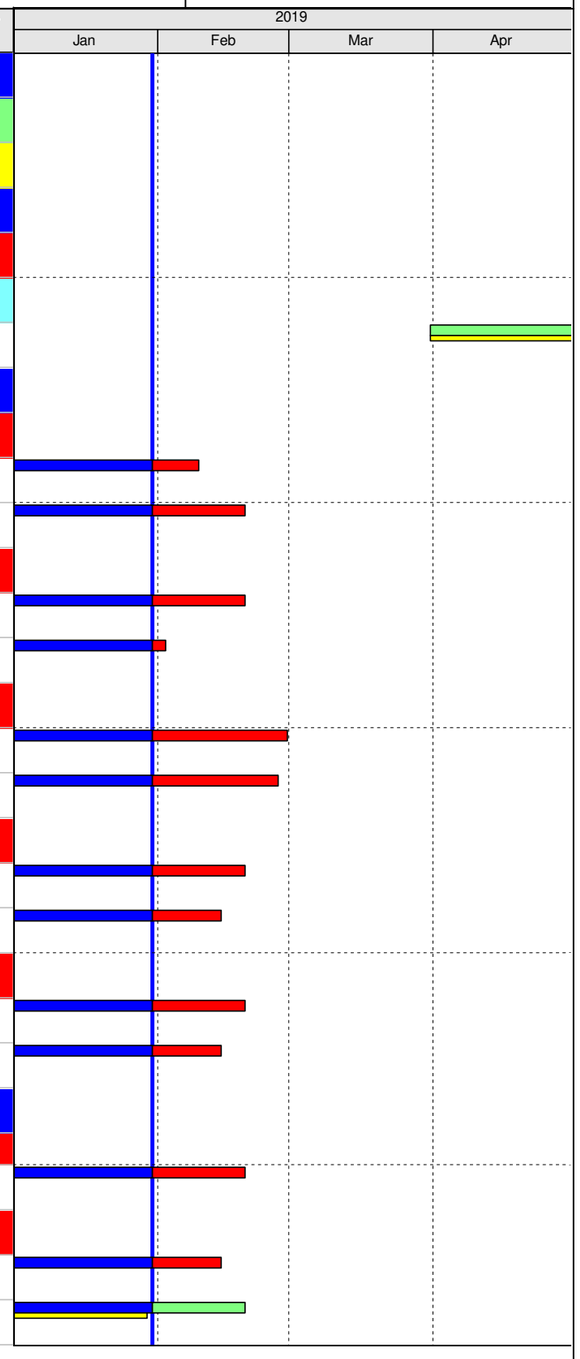
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APPENDIX A
TENTATIVE CONSTRCUTION PROGRAMME

五洋建設－中國建築聯營
Penta-Ocean – China State Joint Venture

MTRC Shatin to Central Link Contract 1121
NSL Cross Harbour Tunnel

Activity ID	Activity Name	Total Qty	Completed Qty	BL1 Start	BL1 Finish	BL Duration	Rem. Dur.	Start	Finish	Total Float	Physical % Complete
1121 - 51- 3M Rolling Programme (02- 04/2019) [Update as of Jan 19]				06-Nov-17	27-Oct-19	584	217	11-Oct-17 A	27-Oct-19	664	
CONSTRUCTION				06-Nov-17	27-Oct-19	584	217	11-Oct-17 A	27-Oct-19	664	
Cost Centre B - North Ventilation Building NOV				31-Jan-18	03-Jul-19	417	121	01-Dec-17 A	03-Jul-19	760	
HUH Land Area C&C Tunnel and NOV				31-Mar-19	03-Jul-19	95	95	31-Mar-19	03-Jul-19	11	
NOV Interface Works				31-Mar-19	03-Jul-19	95	95	31-Mar-19	03-Jul-19	11	
BL3 - Hoarding				31-Mar-19	03-Jul-19	95	95	31-Mar-19	03-Jul-19	11	
01121.24235	NOV - BL3 - Phase 2 trackwork (by others)			31-Mar-19	03-Jul-19	95	95	31-Mar-19	03-Jul-19	11	0%
NOV ABWF Works				31-Jan-18	23-Oct-18	214	22	01-Dec-17 A	28-Feb-19	-109	
ABWF at BL3				31-Jan-18	10-Oct-18	204	14	23-Dec-17 A	19-Feb-19	-101	
01121.13320	NOV - BL3 - ABWF Deg 2 (Completion Obligation 4E.2)	100%	91%	31-Jan-18	21-Apr-18	63	6	24-Dec-17 A	09-Feb-19	-93	91%
01121.13330	NOV - BL3 - ABWF Deg 3 (Completion Obligation 4E.3)	100%	93%	07-May-18	10-Oct-18	130	14	23-Dec-17 A	19-Feb-19	-114	93%
ABWF at BL2				31-Jan-18	03-Sep-18	174	14	01-Dec-17 A	19-Feb-19	-114	
01121.13380	NOV - BL2 - ABWF Deg 2 (Completion Obligation 4E.2)	100%	98%	31-Jan-18	21-Apr-18	63	14	01-Dec-17 A	19-Feb-19	-153	98%
01121.13390	NOV - BL2 - ABWF Deg 3 (Completion Obligation 4E.3)	100	70%	28-May-18	03-Sep-18	83	3	02-Apr-18 A	02-Feb-19	-103	70%
ABWF at BL1				02-May-18	25-Aug-18	97	22	18-Mar-18 A	28-Feb-19	-122	
01121.13400	NOV - BL1 - ABWF Deg 2 (Completion Obligation 4F.2) [3 Jun 18]	100%	45%	02-May-18	12-Jul-18	59	22	18-Mar-18 A	28-Feb-19	-221	45%
01121.13410	NOV - BL1 - ABWF Deg 3 (Completion Obligation 4F.3) [30 Sep 18]	100%	95%	04-Jun-18	25-Aug-18	70	20	02-Apr-18 A	26-Feb-19	-120	95%
ABWF at GL				03-Jul-18	11-Oct-18	85	14	25-May-18 A	19-Feb-19	-114	
01121.14120	NOV - GL - ABWF Deg 2 (Completion Obligation 4F.2) [3 Jun 18]	100%	94%	30-Jul-18	14-Aug-18	14	14	22-Jul-18 A	19-Feb-19	-213	94%
01121.14140	NOV - GL - ABWF Deg 3 (Completion Obligation 4F.3) [30 Sep 18]	100%	97%	03-Jul-18	11-Oct-18	85	10	25-May-18 A	14-Feb-19	-110	97%
ABWF at L1				31-May-18	23-Oct-18	120	14	23-May-18 A	19-Feb-19	-114	
01121.14250	NOV - L1 - ABWF Deg 2 (Completion Obligation 4G.2) [15 Jul 18]	100%	83%	31-May-18	30-Jul-18	50	14	31-May-18 A	19-Feb-19	-179	83%
01121.14360	NOV - L1 - ABWF Deg 3 (Completion Obligation 4G.3) [30 Sep 18]	100%	94%	31-Jul-18	23-Oct-18	70	10	23-May-18 A	14-Feb-19	-110	94%
NOV BS Installation Works				24-May-18	26-Feb-19	228	26	09-May-18 A	05-Mar-19	-8	
BS Installation at BL3				02-Jun-18	31-Oct-18	125	14	09-May-18	19-Feb-19	-40	
01121.13590	NOV - BL3 - BS 2nd Fix (Completion Obligation 4E.3) [30 Sep 18]	100%	95%	02-Jun-18	31-Oct-18	125	14	09-May-18 A	19-Feb-19	-40	95%
BS Installation at BL2				24-May-18	29-Jan-19	207	14	15-May-18 A	19-Feb-19	4	
01121.14410	NOV - BL2 - BS 2nd Fix (Completion Obligation 4E.3) [30 Sep 18]	100%	95%	24-May-18	11-Aug-18	67	10	24-May-18 A	14-Feb-19	-36	95%
01121.25510	NOV - BL2 Flood Gate Choke Rm, Machine Rm & Accumulator Room - BS 2nd fix [14 Feb 19]	100%	95%	09-Jul-18	29-Jan-19	170	14	15-May-18 A	19-Feb-19	4	95%



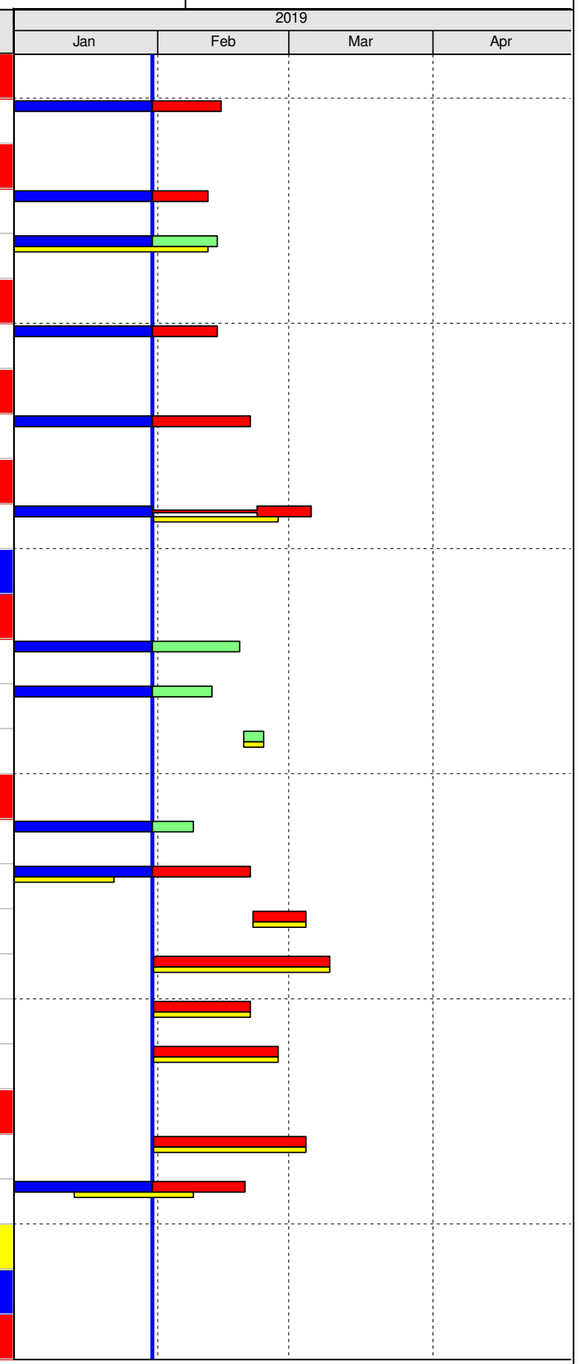
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Activity ID	Activity Name	Total Qty	Completed Qty	BL1 Start	BL1 Finish	BL Duration	Rem. Dur.	Start	Finish	Total Float	Physical % Complete
BS Installation at BL1				17-Jul-18	18-Aug-18	29	10	30-May-18 A	14-Feb-19	-110	
01121.14420	NOV - BL1 - BS 2nd Fix (Completion Obligation 4F.3) [30 Sep 18]	100%	88%	17-Jul-18	18-Aug-18	29	10	30-May-18 A	14-Feb-19	-110	88%
BS Installation at GL				04-Jul-18	11-Feb-19	182	9	19-Jun-18 A	13-Feb-19	9	
01121.14430	NOV - GL - BS 2nd Fix (Completion Obligation 4F.3) [30 Sep 18]	100%	87%	04-Jul-18	04-Sep-18	54	7	19-Jun-18 A	11-Feb-19	-107	87%
01121.25550	NOV - GL Flood Gate Choke Rm, Machine Rm & Accumulator Room - BS 2nd fix [14 Feb 19]	100%	96%	17-Sep-18	11-Feb-19	118	9	01-Aug-18 A	13-Feb-19	9	96%
BS Installation at L1				11-Jul-18	15-Sep-18	58	9	22-Jun-18 A	13-Feb-19	-109	
01121.14440	NOV - L1 - BS 2nd Fix (Completion Obligation 4G.3) [30 Sep 18]	100%	92%	11-Jul-18	15-Sep-18	58	9	22-Jun-18 A	13-Feb-19	-109	92%
BS Installation at Roof Level				13-Oct-18	31-Oct-18	15	15	13-Aug-18 A	20-Feb-19	-115	
01121.13630	NOV - RL - BS 2nd Fix (Completion Obligation 4G.3) [30 Sep 18]	100%	95%	13-Oct-18	31-Oct-18	15	15	13-Aug-18 A	20-Feb-19	-115	95%
BS Installation Testing and Commissioning				31-Jan-19	26-Feb-19	20	10	17-Nov-18 A	05-Mar-19	-8	
01121.13620	NOV - Final T&C of Building Services (Milestone B9)		75%	31-Jan-19	26-Feb-19	20	10	17-Nov-18 A	05-Mar-19	-8	75%
NOV External Works				11-Oct-18	09-Mar-19	122	30	16-Sep-18 A	09-Mar-19	851	
Ext Work - Underground Utilities				11-Oct-18	23-Feb-19	110	18	16-Sep-18 A	23-Feb-19	863	
01121.14460	NOV Ext Work - Construct Storm Water Drainge System (remaining portion)	100%	90%	11-Oct-18	15-Nov-18	30	13	16-Sep-18 A	18-Feb-19	863	90%
01121.14480	NOV Ext Work - Construct Watermain (remaining portion)	100%	90%	12-Dec-18	27-Dec-18	12	8	30-Nov-18 A	12-Feb-19	868	90%
01121.14630	NOV Ext Work - Construct Road Lighting Footing (remaining portion)			19-Feb-19	23-Feb-19	5	5	19-Feb-19	23-Feb-19	863	0%
Ext Work - Road Works				13-Dec-18	09-Mar-19	69	30	22-Oct-18 A	09-Mar-19	851	
01121.14560	NOV Ext Work - EVA - Lay and Compact Sub-Base (remaining portion)	100%	75%	13-Dec-18	24-Dec-18	10	5	22-Oct-18 A	08-Feb-19	876	75%
01121.14580	NOV Ext Work - EVA - Cast Concrete Paving	100%	60%	31-Dec-18	22-Jan-19	19	15	04-Nov-18 A	20-Feb-19	-103	60%
01121.14590	NOV Ext Work - EVA - Road Marking and Road Sign	100%	0%	21-Feb-19	04-Mar-19	10	10	21-Feb-19	04-Mar-19	-103	0%
01121.14600	NOV Ext Work - Construct Pavement	100%	0%	31-Jan-19	09-Mar-19	30	30	31-Jan-19	09-Mar-19	-93	0%
01121.14610	NOV Ext Work - Construct Fencing	100%	0%	31-Jan-19	20-Feb-19	15	15	31-Jan-19	20-Feb-19	-93	0%
01121.14650	NOV Ext Work - Landscaping Work	100%	0%	31-Jan-19	26-Feb-19	20	20	31-Jan-19	26-Feb-19	-98	0%
Ext Work - Testing and Commissioning				14-Jan-19	04-Mar-19	40	25	02-Dec-18 A	04-Mar-19	-92	
01121.14790	NOV External Work - Prepare and Submit As-Built Drawings	100%	0%	31-Jan-19	04-Mar-19	25	25	31-Jan-19	04-Mar-19	-92	0%
01121.14800	NOV External Work - Testing and Commissioning	100%	70%	14-Jan-19	08-Feb-19	20	14	02-Dec-18 A	19-Feb-19	-92	70%
Cost Centre C - Hung Hom Cut and Cover Tunnels				30-Jul-18	27-Oct-19	370	217	30-Jul-18 A	27-Oct-19	0	
HUH Submerged Tunnel (Area B)				11-Feb-19	24-Apr-19	59	59	11-Feb-19	24-Apr-19	-17	
HUH Area B - Dismantle Temporary Working Platform and Cofferdam				05-Mar-19	24-Apr-19	40	40	05-Mar-19	24-Apr-19	-408	



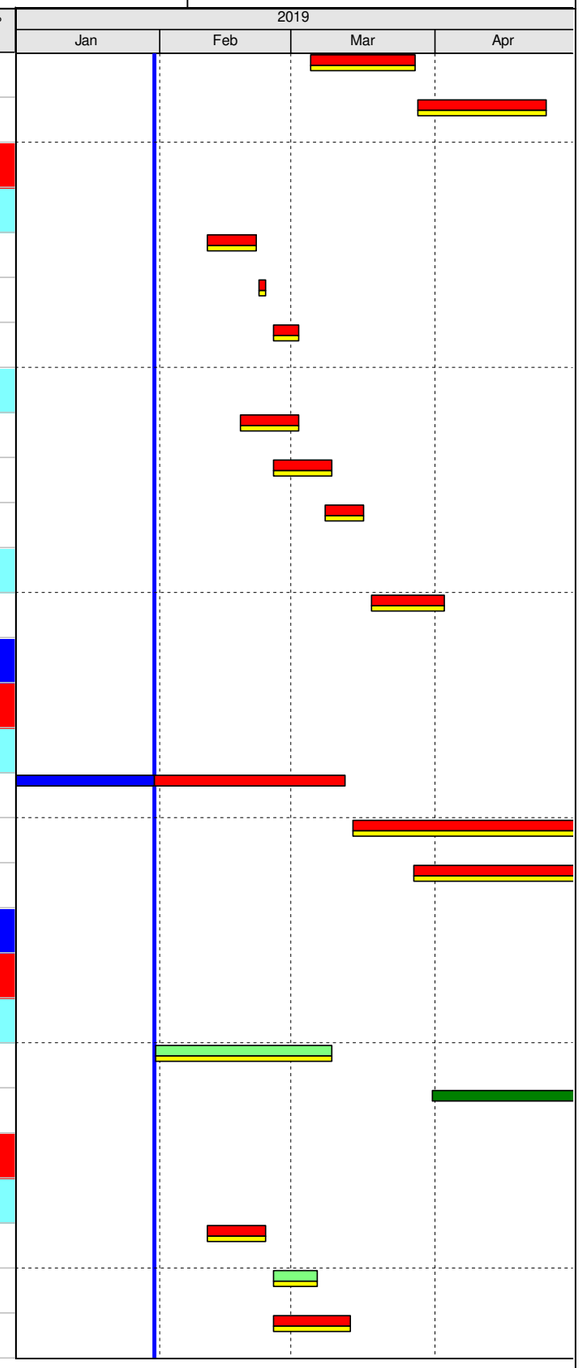
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01121.10640	HUH Area B - Remove Platform A1 and piles after IMT1 sinking	100%	0%	05-Mar-19	27-Mar-19	20	20	05-Mar-19	27-Mar-19	-408	0%
01121.10650	HUH Area B - Remove Platform A2 and piles after IMT1 sinking	100%	0%	28-Mar-19	24-Apr-19	20	20	28-Mar-19	24-Apr-19	-408	0%
HUH Area B - Civil Provision Works				11-Feb-19	02-Apr-19	44	44	11-Feb-19	02-Apr-19	-2	
HUH Area B - Invert Concrete				11-Feb-19	02-Mar-19	18	18	11-Feb-19	02-Mar-19	-2	
01121.13656	HUH Area B - Deg 1 - Formwork for Invert Concrete (1st portion)	100%	0%	11-Feb-19	21-Feb-19	10	10	11-Feb-19	21-Feb-19	-9	0%
01121.13660	HUH Area B - Deg 1 - Formwork for Invert Concrete (remaining portion)	100%	0%	22-Feb-19	23-Feb-19	2	2	22-Feb-19	23-Feb-19	-2	0%
01121.13670	HUH Area B - Deg 1 - Concrete Casting of Invert Concrete	100%	0%	25-Feb-19	02-Mar-19	6	6	25-Feb-19	02-Mar-19	-2	0%
HUH Area B - Walkways				18-Feb-19	16-Mar-19	24	24	18-Feb-19	16-Mar-19	-2	
01121.13700	HUH Area B - Deg 1 - Rebars for Walkways	100%	0%	18-Feb-19	02-Mar-19	12	12	18-Feb-19	02-Mar-19	0	0%
01121.13720	HUH Area B - Deg 1 - FormWork for Walkways	100%	0%	25-Feb-19	09-Mar-19	12	12	25-Feb-19	09-Mar-19	-2	0%
01121.13730	HUH Area B - Deg 1 - Concrete Casting of Walkways	100%	0%	08-Mar-19	16-Mar-19	8	8	08-Mar-19	16-Mar-19	-2	0%
HUH Area B - Civil Provision				18-Mar-19	02-Apr-19	14	14	18-Mar-19	02-Apr-19	-2	
01121.14210	HUH Area B - Deg 3 - Install Cross Wall Door and Ironmongery	100%	0%	18-Mar-19	02-Apr-19	14	14	18-Mar-19	02-Apr-19	-2	0%
Hung Hom Finger Pier				30-Jul-18	18-May-19	237	84	30-Jul-18 A	18-May-19	-208	
Reinstatement of Finger Pier				30-Jul-18	18-May-19	237	84	30-Jul-18 A	18-May-19	-208	
Bored Pile				30-Jul-18	18-May-19	237	84	30-Jul-18 A	18-May-19	-208	
01121.15627	HUH Finger Pier - Construct bored piles (Stage 2b)	10 nos.	8 nos.	30-Jul-18	22-Sep-18	48	32	30-Jul-18 A	12-Mar-19	-236	80%
01121.15630	HUH Finger Pier - interface core, BD inspection, through core test			14-Mar-19	03-May-19	39	39	14-Mar-19	03-May-19	-196	0%
01121.15644	HUH Finger Pier - remove steel platform and temp. pipe piles			27-Mar-19	18-May-19	40	40	27-Mar-19	18-May-19	-236	0%
HUH Land base Tunnel (Area C)				31-Jan-19	27-Oct-19	217	217	31-Jan-19	27-Oct-19	0	
HUH Area C - Construction of C&C Tunnel (On Land)				31-Jan-19	27-Oct-19	217	217	31-Jan-19	27-Oct-19	0	
HUH Area C - Temporary Access Shaft - Interface to DC				31-Jan-19	27-Oct-19	217	217	31-Jan-19	27-Oct-19	0	
01121.23180	HUH Area C - Dismantle Temporary Working Platform after Flood Gate Installation [4C Deg 1]			31-Jan-19	09-Mar-19	30	30	31-Jan-19	09-Mar-19	18	0%
01121.23190	HUH Area C - [LOA] 1120B (Phase 2) for Track & Works Train Delivery (PS P10.31) [from 4C to 27/10/19]			31-Mar-19	27-Oct-19	211	211	31-Mar-19	27-Oct-19	0	0%
HUH Area C - Civil Provision Works				11-Feb-19	11-Apr-19	51	51	11-Feb-19	11-Apr-19	-9	
Walkways				11-Feb-19	11-Apr-19	51	51	11-Feb-19	11-Apr-19	-9	
01121.11998	HUH Area C - Deg 1 - Rebars for Walkways (1st portion)	100%	0%	11-Feb-19	23-Feb-19	12	12	11-Feb-19	23-Feb-19	-9	0%
01121.12000	HUH Area C - Deg 1 - Rebars for Walkways (remaining portion)	100%	0%	25-Feb-19	06-Mar-19	9	9	25-Feb-19	06-Mar-19	6	0%
01121.12404	HUH Area C - Deg 1 - Formwork for Walkways (1st portion)	100%	0%	25-Feb-19	13-Mar-19	15	15	25-Feb-19	13-Mar-19	-9	0%



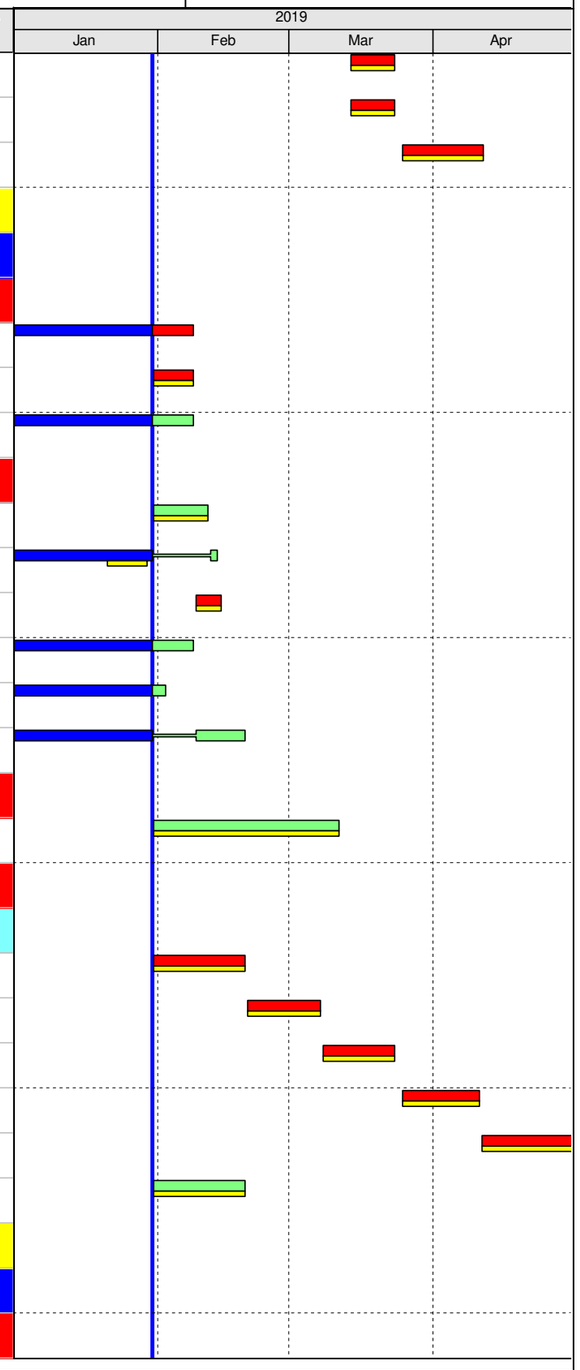
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01121.12410	HUH Area C - Deg 1 - Formwork for Walkways (remaining portion)	100%	0%	14-Mar-19	23-Mar-19	9	9	14-Mar-19	23-Mar-19	-9	0%
01121.12426	HUH Area C - Deg 1 - Concrete Casting of Walkways (1st portion)	100%	0%	14-Mar-19	23-Mar-19	9	9	14-Mar-19	23-Mar-19	-9	0%
01121.12430	HUH Area C - Deg 1 - Concrete Casting of Walkways (remaining portion)	100%	0%	25-Mar-19	11-Apr-19	15	15	25-Mar-19	11-Apr-19	-9	0%
Cost centre D - Immersed Tunnels				06-Nov-17	30-Apr-19	437	70	11-Oct-17 A	30-Apr-19	811	
IMT - Immersed Tunnel Installation				06-Nov-17	30-Apr-19	437	70	11-Oct-17 A	30-Apr-19	811	
IMT General Fill				30-May-18	08-Feb-19	208	5	11-Mar-18 A	08-Feb-19	28	
01121.29722-1010	E10 - general backfill	18,600 m3	48%	30-May-18	11-Jun-18	11	5	11-Mar-18 A	08-Feb-19	-100	48%
01121.29724	ME4 - general backfill			31-Jan-19	08-Feb-19	5	5	31-Jan-19	08-Feb-19	-110	0%
01121.29910	E9 - general backfill	14,779 m3	80%	09-Jun-18	23-Jun-18	12	5	10-May-18 A	08-Feb-19	28	80%
IMT Backfill of Filter Layer, Protective Layer & Site Won				06-Nov-17	14-Feb-19	377	14	11-Oct-17 A	19-Feb-19	867	
01121.33650-1000	E11 - backfill filter layer, protective layer & site won (remaining area)	14,500 m3		31-Jan-19	11-Feb-19	7	7	31-Jan-19	11-Feb-19	25	0%
01121.33650-1010	E10 - backfill filter layer, protective layer & site won (remaining area)	20,000 m3	75%	21-Jan-19	29-Jan-19	8	2	01-Dec-18 A	13-Feb-19	25	75%
01121.33652	ME4 - backfill filter layer, protective layer & site won			09-Feb-19	14-Feb-19	5	5	09-Feb-19	14-Feb-19	-110	0%
01121.33690	E3 - backfill filter layer, protective layer & site won [16,830 m3]	16,830 m3	69%	06-Nov-17	15-Nov-17	9	5	11-Oct-17 A	08-Feb-19	28	69%
01121.33700	E4 - backfill filter layer, protective layer & site won [13,931 m3]	13,931 m3	84%	15-Nov-17	22-Nov-17	7	3	23-Oct-17 A	02-Feb-19	30	84%
01121.33750	E9 - backfill filter layer, protective layer & site won	20,671 m3	75%	19-Jun-18	24-Jul-18	30	9	25-May-18 A	19-Feb-19	867	75%
Closure Joint E9/E10				31-Jan-19	11-Mar-19	31	31	31-Jan-19	11-Mar-19	17	
01121.30220	E9/E10 Connection Joint - complete remaining backfill			31-Jan-19	11-Mar-19	31	31	31-Jan-19	11-Mar-19	17	0%
IMT Internal Works				31-Jan-19	30-Apr-19	70	70	31-Jan-19	30-Apr-19	-22	
Cross Wall Doors and Access Panels				31-Jan-19	30-Apr-19	70	70	31-Jan-19	30-Apr-19	-22	
01121.23520	IMT1 - Install Door CWD008 (99+685.4) in IMT 1			31-Jan-19	19-Feb-19	14	14	31-Jan-19	19-Feb-19	-22	0%
01121.23540	IMT3 - Install Door CWD007 (99+440.7) in IMT3			20-Feb-19	07-Mar-19	14	14	20-Feb-19	07-Mar-19	-22	0%
01121.23560	IMT4 - Install Door CWD006 (99+221.7) in IMT4			08-Mar-19	23-Mar-19	14	14	08-Mar-19	23-Mar-19	-22	0%
01121.23580	IMT6 - Install Door CWD005 (98+977.7) in IMT6			25-Mar-19	10-Apr-19	14	14	25-Mar-19	10-Apr-19	-22	0%
01121.23600	IMT8 - Install Door CWD004 (98+733.7) in IMT8			11-Apr-19	30-Apr-19	14	14	11-Apr-19	30-Apr-19	-22	0%
01121.23605	IMT10 - Install Door CWD003 (98+489.7) in IMT10			31-Jan-19	19-Feb-19	14	14	31-Jan-19	19-Feb-19	10	0%
Cost Centre E - CBTS Tunnels				12-Apr-18	26-Apr-19	309	67	16-Mar-18 A	26-Apr-19	659	
South Section at VH3E (Inside Typhoon Shelter - Interface with 1128)				12-Apr-18	18-Feb-19	255	14	16-Mar-18 A	19-Feb-19	10	
MDN Application & Phase 4A Mooring				31-Jan-19	18-Feb-19	13	13	31-Jan-19	18-Feb-19	11	



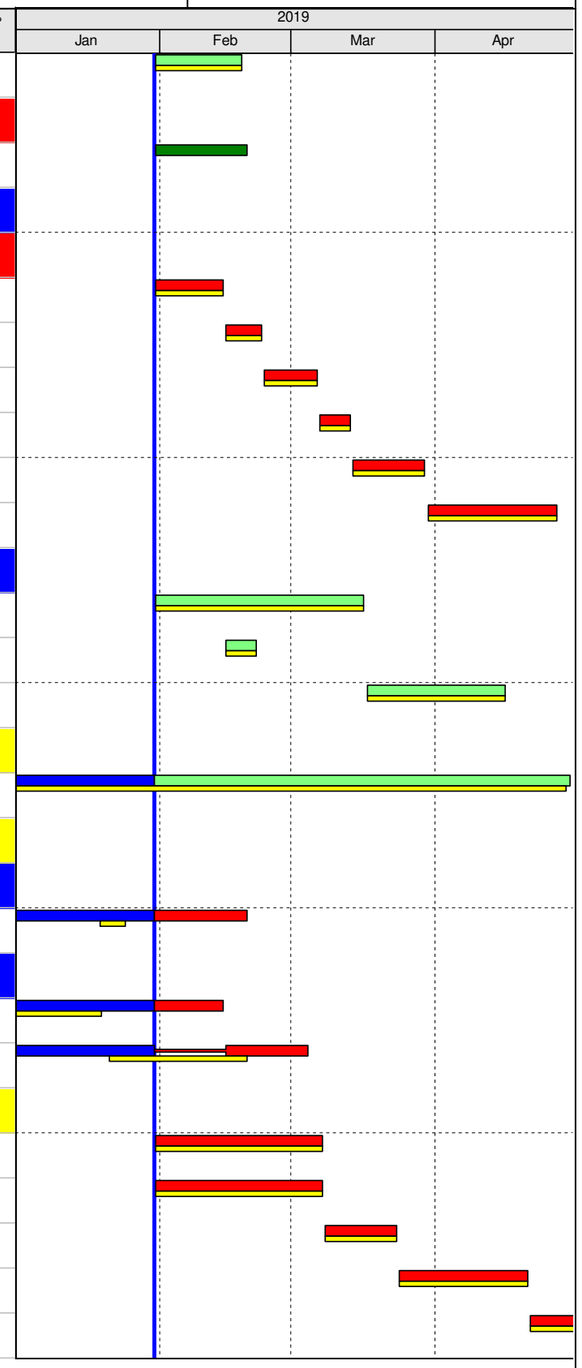
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01121.27983-280	CBTS - phase 4a final stage mooring			31-Jan-19	18-Feb-19	13	13	31-Jan-19	18-Feb-19	11	0%
Removal of ME4 D-wall				12-Apr-18	30-Jun-18	66	14	16-Mar-18 A	19-Feb-19	-114	
01121.13060	[LOE] CBTS complete reinstate breakwater			12-Apr-18	30-Jun-18	66	14	16-Mar-18 A	19-Feb-19	-114	0%
CBTS & ME4 Tunnel Civil Provision				31-Jan-19	26-Apr-19	67	67	31-Jan-19	26-Apr-19	-19	
ME4 - Internal Fitting Out Works				31-Jan-19	26-Apr-19	67	67	31-Jan-19	26-Apr-19	-19	
01121.12910	ME4 Tunnel - Deg 1 Work - Construct Maintenance and Evacuation Walkway Access			31-Jan-19	14-Feb-19	10	10	31-Jan-19	14-Feb-19	-19	0%
01121.12920	ME4 Tunnel - Deg 2 Work - Install Steel Cross Wall Door Frame			15-Feb-19	22-Feb-19	7	7	15-Feb-19	22-Feb-19	-19	0%
01121.12930	ME4 Tunnel - Deg 2 Work - Install Cat-Ladder, Steel Handrail			23-Feb-19	06-Mar-19	10	10	23-Feb-19	06-Mar-19	-19	0%
01121.12940	ME4 Tunnel - Deg 3 Work - Install Permanent Cross Wall Door and Related Fitting			07-Mar-19	13-Mar-19	6	6	07-Mar-19	13-Mar-19	-19	0%
01121.12950	ME4 Tunnel - Deg 3 Work - Seal Up Opening If Any			14-Mar-19	29-Mar-19	14	14	14-Mar-19	29-Mar-19	-19	0%
01121.12960	ME4 Tunnel - Deg 3 Work - Miscellaneous Works			30-Mar-19	26-Apr-19	20	20	30-Mar-19	26-Apr-19	-19	0%
Final Phase Mooring				31-Jan-19	15-Apr-19	60	60	31-Jan-19	15-Apr-19	666	
01121.33770	Relocation of RHKYC Pontoon - relocate and install new pontoon			31-Jan-19	16-Mar-19	45	45	31-Jan-19	16-Mar-19	811	0%
01121.33780	Relocation of Vessels - hydrographic after ME4/E11 joint backfill complete			15-Feb-19	21-Feb-19	6	6	15-Feb-19	21-Feb-19	685	0%
01121.33790	Relocation of Vessels - Stage 1 - RHKYC mooring area	63 nos.		17-Mar-19	15-Apr-19	30	30	17-Mar-19	15-Apr-19	811	0%
Cost Centre F - Associated Works				31-Oct-18	28-Apr-19	180	89	07-Oct-18 A	29-Apr-19	428	
01121.15570	F8 - Management, Maintenance and Operation of Barging Point Facility		49%	31-Oct-18	28-Apr-19	180	89	07-Oct-18 A	29-Apr-19	428	49%
Cost Centre G - RRIW				31-Dec-18	19-Feb-19	40	25	05-Nov-18 A	04-Mar-19	-125	
Reprovisioning of CBTS Breakwater				19-Jan-19	24-Jan-19	5	14	05-Nov-18 A	19-Feb-19	-114	
01121.12820	RRIW - CBTS - Reinstate breakwater [final stage after pipe pile across breakwater removed]	12,000 m3	85%	19-Jan-19	24-Jan-19	5	14	05-Nov-18 A	19-Feb-19	-114	85%
Reprovisioning of Fender Pile				31-Dec-18	19-Feb-19	40	25	03-Dec-18 A	04-Mar-19	-408	
01121.10610	RRIW - HUH Area B - Fender Pile - Construct Fender Pile (1st portion)	100%	43%	31-Dec-18	19-Jan-19	17	10	03-Dec-18 A	14-Feb-19	-408	43%
01121.14860	RRIW - HUH Area B - Fender Pile - Construct Fender Pile (remaining portion)	100%	33%	21-Jan-19	19-Feb-19	23	15	17-Dec-18 A	04-Mar-19	-408	33%
Statutory Inspection				31-Jan-19	04-May-19	73	73	31-Jan-19	04-May-19	-25	
01121.15664	NOV - WSD inspection and issue water cert			31-Jan-19	07-Mar-19	28	28	31-Jan-19	07-Mar-19	-30	0%
01121.15666	NOV - Application for FSD inspection			31-Jan-19	07-Mar-19	28	28	31-Jan-19	07-Mar-19	-30	0%
01121.15667	NOV - FSD inspection			08-Mar-19	23-Mar-19	14	14	08-Mar-19	23-Mar-19	-30	0%
01121.15670	NOV - Application for BD inspection			24-Mar-19	20-Apr-19	28	28	24-Mar-19	20-Apr-19	-34	0%
01121.15680	NOV - BD Inspection			21-Apr-19	04-May-19	14	14	21-Apr-19	04-May-19	-34	0%



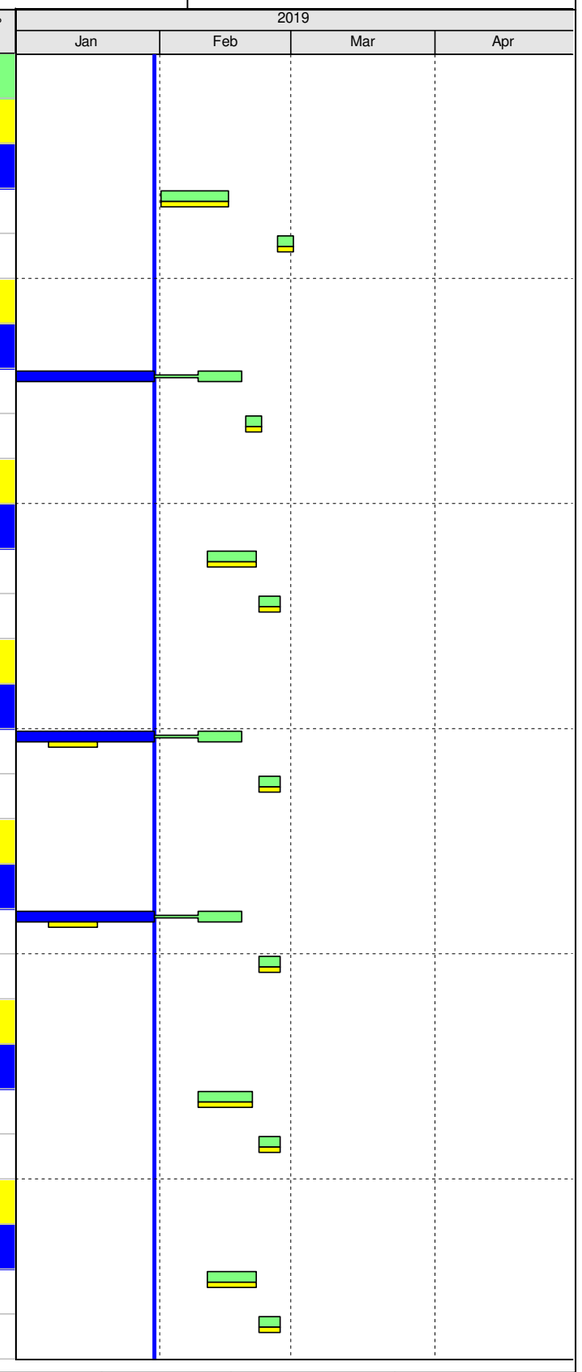
Data Date: 31-Jan-19
Proj ID: 1121-UP-51
Layout: 1121 - updated 3M Rolling Prog

Current Milestone
Baseline Milestone (PMP Rev. 1a)
Actual Work
Critical Remaining Work
Remaining Work
Baseline (PMP Rev.1a)
Remaining Level of Effort
3M Rolling Prog (last month)

Updated 3M Rolling Programme Feb - Apr 2019
(Updated as of 31 Jan 2019)

Date	Revision	Checked	Approved
04-Feb-19		Robby Yeung	John Mecleod

Activity ID	Activity Name	Total Qty	Completed Qty	BL1 Start	BL1 Finish	BL Duration	Rem. Dur.	Start	Finish	Total Float	Physical % Complete
IMT Internal Works Programme				07-Dec-18	01-Mar-19	67	23	22-Oct-18 A	01-Mar-19	858	
Element 1				01-Feb-19	01-Mar-19	22	22	01-Feb-19	01-Mar-19	25	
Immersion Joint				01-Feb-19	01-Mar-19	22	22	01-Feb-19	01-Mar-19	25	
01121.30560	CCT/E1 - Immersion Joint - install Dura-steel system			01-Feb-19	15-Feb-19	10	10	01-Feb-19	15-Feb-19	33	0%
01121.30570	CCT/E1 - Immersion Joint - Wall & slab joint cover			26-Feb-19	01-Mar-19	4	4	26-Feb-19	01-Mar-19	25	0%
Element 2				07-Dec-18	22-Feb-19	61	12	19-Nov-18 A	22-Feb-19	31	
Immersion Joint				07-Dec-18	22-Feb-19	61	12	19-Nov-18 A	22-Feb-19	31	
01121.30860	E1/E2 - Immersion Joint - install Dura-steel system	100%	70%	07-Dec-18	18-Dec-18	10	8	19-Nov-18 A	18-Feb-19	31	70%
01121.30870	E1/E2 - Immersion Joint - Wall & slab joint cover	100%		19-Feb-19	22-Feb-19	4	4	19-Feb-19	22-Feb-19	31	0%
Element 3				11-Feb-19	26-Feb-19	14	14	11-Feb-19	26-Feb-19	28	
Immersion Joint				11-Feb-19	26-Feb-19	14	14	11-Feb-19	26-Feb-19	28	
01121.31150	E2/E3 - Immersion Joint - install Dura-steel system	100%		11-Feb-19	21-Feb-19	10	10	11-Feb-19	21-Feb-19	28	0%
01121.31160	E2/E3 - Immersion Joint - Wall & slab joint cover	100%		22-Feb-19	26-Feb-19	4	4	22-Feb-19	26-Feb-19	28	0%
Element 4				08-Jan-19	26-Feb-19	40	15	17-Dec-18 A	26-Feb-19	28	
Immersion Joint				08-Jan-19	26-Feb-19	40	15	17-Dec-18 A	26-Feb-19	28	
01121.31440	E3/E4 - Immersion Joint - install Dura-steel system	100%	20%	08-Jan-19	18-Jan-19	10	8	17-Dec-18 A	18-Feb-19	31	20%
01121.31450	E3/E4 - Immersion Joint - Wall & slab joint cover	100%		22-Feb-19	26-Feb-19	4	4	22-Feb-19	26-Feb-19	28	0%
Element 5				08-Jan-19	26-Feb-19	40	15	24-Dec-18 A	26-Feb-19	28	
Immersion Joint				08-Jan-19	26-Feb-19	40	15	24-Dec-18 A	26-Feb-19	28	
01121.31730	E4/E5 - Immersion Joint - install Dura-steel system	100%	20%	08-Jan-19	18-Jan-19	10	8	24-Dec-18 A	18-Feb-19	31	20%
01121.31740	E4/E5 - Immersion Joint - Wall & slab joint cover	100%		22-Feb-19	26-Feb-19	4	4	22-Feb-19	26-Feb-19	28	0%
Element 6				09-Feb-19	26-Feb-19	15	15	09-Feb-19	26-Feb-19	28	
Immersion Joint				09-Feb-19	26-Feb-19	15	15	09-Feb-19	26-Feb-19	28	
01121.32020	E5/E6 - Immersion Joint - install Dura-steel system	100%		09-Feb-19	20-Feb-19	10	10	09-Feb-19	20-Feb-19	29	0%
01121.32030	E5/E6 - Immersion Joint - Wall & slab joint cover	100%		22-Feb-19	26-Feb-19	4	4	22-Feb-19	26-Feb-19	28	0%
Element 7				11-Feb-19	26-Feb-19	14	14	11-Feb-19	26-Feb-19	28	
Immersion Joint				11-Feb-19	26-Feb-19	14	14	11-Feb-19	26-Feb-19	28	
01121.32310	E6/E7 - Immersion Joint - install Dura-steel system	100%		11-Feb-19	21-Feb-19	10	10	11-Feb-19	21-Feb-19	28	0%
01121.32320	E6/E7 - Immersion Joint - Wall & slab joint cover	100%		22-Feb-19	26-Feb-19	4	4	22-Feb-19	26-Feb-19	28	0%



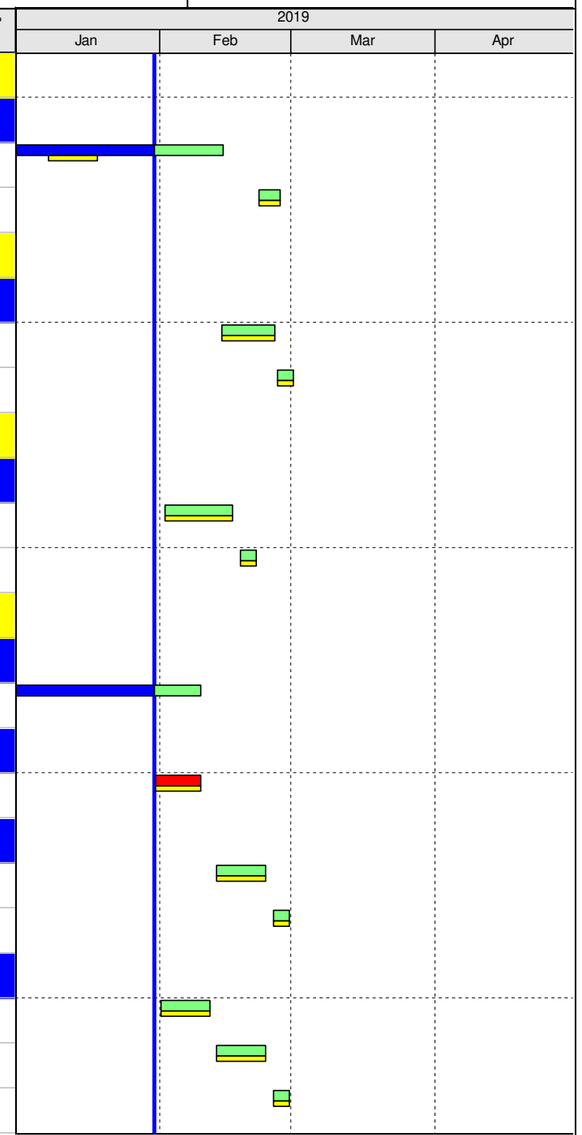
Data Date: 31-Jan-19
Proj ID: 1121-UP-51
Layout: 1121 - updated 3M Rolling Prog

Current Milestone
Baseline Milestone (PMP Rev. 1a)
Actual Work
Critical Remaining Work
Remaining Work
Baseline (PMP Rev.1a)
Remaining Level of Effort
3M Rolling Prog (last month)

Updated 3M Rolling Programme Feb - Apr 2019
(Updated as of 31 Jan 2019)

Date	Revision	Checked	Approved
04-Feb-19		Robby Yeung	John Mecleod

Activity ID	Activity Name	Total Qty	Completed Qty	BL1 Start	BL1 Finish	BL Duration	Rem. Dur.	Start	Finish	Total Float	Physical % Complete
Element 8				08-Jan-19	26-Feb-19	40	20	31-Dec-18 A	26-Feb-19	28	
Immersion Joint				08-Jan-19	26-Feb-19	40	20	31-Dec-18 A	26-Feb-19	28	
01121.32600	E7/E8 - Immersion Joint - install Dura-steel system	100%		08-Jan-19	18-Jan-19	10	10	31-Dec-18 A	14-Feb-19	34	5%
01121.32610	E7/E8 - Immersion Joint - Wall & slab joint cover	100%		22-Feb-19	26-Feb-19	4	4	22-Feb-19	26-Feb-19	28	0%
Element 9				14-Feb-19	01-Mar-19	14	14	14-Feb-19	01-Mar-19	25	
Immersion Joint				14-Feb-19	01-Mar-19	14	14	14-Feb-19	01-Mar-19	25	
01121.32890	E8/E9 - Immersion Joint - install Dura-steel system	100%		14-Feb-19	25-Feb-19	10	10	14-Feb-19	25-Feb-19	25	0%
01121.32900	E8/E9 - Immersion Joint - Wall & slab joint cover	100%		26-Feb-19	01-Mar-19	4	4	26-Feb-19	01-Mar-19	25	0%
Element 10				02-Feb-19	21-Feb-19	14	14	02-Feb-19	21-Feb-19	32	
Immersion Joint				02-Feb-19	21-Feb-19	14	14	02-Feb-19	21-Feb-19	32	
01121.33180	E9/E9-2 - Immersion Joint - install Dura-steel system	100%		02-Feb-19	16-Feb-19	10	10	02-Feb-19	16-Feb-19	32	0%
01121.33190	E9/E9-2 - Immersion Joint - Wall & slab joint cover	100%		18-Feb-19	21-Feb-19	4	4	18-Feb-19	21-Feb-19	32	0%
Element 11				18-Dec-18	28-Feb-19	57	22	22-Oct-18 A	28-Feb-19	859	
Up Track				18-Dec-18	24-Dec-18	6	6	22-Oct-18 A	09-Feb-19	875	
01121.33270	E11 - UT - Construct Walkway (2nd)	100%	90%	18-Dec-18	24-Dec-18	6	6	22-Oct-18 A	09-Feb-19	875	90%
Down Track				31-Jan-19	09-Feb-19	6	6	31-Jan-19	09-Feb-19	-9	
01121.33330	E11 - DT - Construct Walkway (2nd)	100%		31-Jan-19	09-Feb-19	6	6	31-Jan-19	09-Feb-19	-9	0%
Immersion Joint				13-Feb-19	28-Feb-19	14	14	13-Feb-19	28-Feb-19	2	
01121.33480	E10/E11 - Immersion Joint - install Dura-steel system	100%		13-Feb-19	23-Feb-19	10	10	13-Feb-19	23-Feb-19	2	0%
01121.33490	E10/E11 - Immersion Joint - Wall & slab joint cover	100%		25-Feb-19	28-Feb-19	4	4	25-Feb-19	28-Feb-19	2	0%
Immersion Joint-1				01-Feb-19	28-Feb-19	21	21	01-Feb-19	28-Feb-19	2	
01121.33580	E11/E11-2 - Immersion Joint - install shear key and wall formwork			01-Feb-19	11-Feb-19	6	6	01-Feb-19	11-Feb-19	2	0%
01121.33600	E11/E11-2 - Immersion Joint - install Dura-steel system			13-Feb-19	23-Feb-19	10	10	13-Feb-19	23-Feb-19	2	0%
01121.33610	E11/E11-2 - Immersion Joint - Wall & slab joint cover			25-Feb-19	28-Feb-19	4	4	25-Feb-19	28-Feb-19	2	0%



Data Date: 31-Jan-19
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Layout: 1121 - updated 3M Rolling Prog

Current Milestone
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Actual Work
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Remaining Work
Baseline (PMP Rev.1a)
Remaining Level of Effort
3M Rolling Prog (last month)

Updated 3M Rolling Programme Feb - Apr 2019
(Updated as of 31 Jan 2019)

Date	Revision	Checked	Approved
04-Feb-19		Robby Yeung	John Mecleod

APPENDIX B
ACTION AND LIMIT LEVELS

APPENDIX B – Action and Limit Levels

Derived Action and Limit Levels for Water Quality (Wet Season)

Parameters	Action Level	Limit Level
WSD Salt Water Intake (Station 14, A, WSD9, WSD17)		
DO in mg/L	<2.1	<2
SS in mg/L	6.0	6.0
Turbidity in NTU	4.7	6.5
Cooling Water Intake (Station 8, 9, 21 & 34)		
DO in mg/L	2.8	2.7
SS in mg/L	6.9	9.1
Turbidity in NTU	11.3	17.2
GB3		
DO in mg/L	5.5	5.3
SS in mg/L	4.5	4.5
Turbidity in NTU	2.1	2.4

Notes:
1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity and SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

Derived Action and Limit Levels for Water Quality (Dry Season)

Parameters	Action Level	Limit Level
WSD Salt Water Intake (Station 14, A, WSD9, WSD17)		
DO in mg/L	<2.1	<2
SS in mg/L	6.9	6.9
Turbidity in NTU	5.0	7.0
Cooling Water Intake (Station 8, 9, 21 & 34)		
DO in mg/L	3.3	3.2
SS in mg/L	8.0	10.4
Turbidity in NTU	12.2	18.5
GB3		
DO in mg/L	6.8	6.5
SS in mg/L	9.3	9.3
Turbidity in NTU	5.0	5.6

Notes:
1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity and SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

APPENDIX C
WATER QUALITY MONITORING SCHEDULE

Shatin to Central Link - Contract No. 1121
NSL Cross Harbour Tunnels
Impact Water Quality Monitoring Schedule (January 2019)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1-Jan	2-Jan	3-Jan	4-Jan	5-Jan
			Mid-Ebb 9:50 Mid-Flood 15:38			Mid-Ebb 11:35 Mid-Flood 16:48
6-Jan	7-Jan	8-Jan	9-Jan	10-Jan	11-Jan	12-Jan
		Mid-Flood 8:46 Mid-Ebb 14:00		Mid-Flood 9:54 Mid-Ebb 15:16		Mid-Flood 11:10 Mid-Ebb 16:50
13-Jan	14-Jan	15-Jan	16-Jan	17-Jan	18-Jan	19-Jan
	Mid-Flood 12:31 Mid-Ebb 18:58		Mid-Ebb 7:22 Mid-Flood 13:51		Mid-Ebb 9:44 Mid-Flood 15:19	
20-Jan	21-Jan	22-Jan	23-Jan	24-Jan	25-Jan	26-Jan
		Mid-Flood 7:53 Mid-Ebb 13:18		Mid-Flood 9:21 Mid-Ebb 14:55		Mid-Flood 10:49 Mid-Ebb 16:38
27-Jan	28-Jan	29-Jan	30-Jan	31-Jan		
	Mid-Flood 12:24 Mid-Ebb 19:03		Mid-Ebb 8:14 Mid-Flood 14:03			

Water Quality Monitoring Stations
C1, C2, 9, 21, 34, A, WSD9, WSD17

* indicates that the tidal range of individual flood or ebb tide is less than 0.5m
Remark: 1) Reference was made to the tidal information of Hong Kong Observatory (Quarry Bay Station)
2) The reasons for choosing the monitoring day (i.e 2, 5, 8, 10, 12, 14, 16, 18, 22, 30 January 2019) in which the tidal ranges are less than 0.5m include:
a) The tidal range of less than 0.5m occurs for 2 or more consecutive days
b) In compliance with the requirement of (i) three days per week at mid-ebb and mid-flood tide and (ii) the interval between two sets of monitoring not less than 36 hours

Shatin to Central Link - Contract No. 1121
NSL Cross Harbour Tunnels
Tentative Impact Water Quality Monitoring Schedule (February 2019)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1-Feb	2-Feb
					Mid-Ebb 10:36 Mid-Flood 15:41	
3-Feb	4-Feb	**5-Feb**	**6-Feb**	**7-Feb**	8-Feb	9-Feb
10-Feb	11-Feb	12-Feb	13-Feb	14-Feb	15-Feb	16-Feb
		Mid-Flood 11:16 Mid-Ebb 17:52		Mid-Ebb 6:40 Mid-Flood 12:41		Mid-Ebb 9:34 Mid-Flood 14:42
17-Feb	18-Feb	19-Feb	20-Feb	21-Feb	22-Feb	23-Feb
	Mid-Ebb 11:33 Mid-Flood 16:54		Mid-Ebb 13:03 Mid-Flood 18:43		Mid-Flood 8:39 Mid-Ebb 14:26	
24-Feb	25-Feb	26-Feb	27-Feb	28-Feb		
	Mid-Flood 10:31 Mid-Ebb 16:50		Mid-Ebb 6:24 Mid-Flood 12:02			

The schedule may be changed due to unforeseen circumstances (adverse weather, etc)

Water Quality Monitoring Stations
C1, C2, 9, 21, 34, A, WSD9, WSD17

* indicates that the tidal range of individual flood or ebb tide is less than 0.5m
Remark: 1) Reference was made to the tidal information of Hong Kong Observatory (Quarry Bay Station)

APPENDIX D
WATER QUALITY MONITORING RESULTS AND GRAPHICAL PRESENTATIONS

Water Quality Monitoring Results at 21 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Jan-19	Cloudy	Moderate	10:03	Surface	1	19.4 19.4	19.4	8.1 8.1	8.1	32.0 32.0	32.0	95.7 95.5	95.6	7.3 7.3	7.3	7.3	2.2 2.1	2.2	2.3	5 4	4.5	4.3
				Middle	4	19.4 19.4	19.4	8.1 8.1	8.1	32.0 32.0	32.0	95.7 95.2	95.5	7.3 7.3	7.3		2.0 2.0	2.0		4 4	4.0	
				Bottom	7	19.3 19.4	19.4	8.1 8.1	8.1	32.0 32.0	32.0	96.1 95.8	96.0	7.3 7.3	7.3		2.6 2.7	2.7		5 4	4.5	
5-Jan-19	Cloudy	Calm	11:50	Surface	1	19.2 19.2	19.2	8.2 8.2	8.2	31.9 31.9	31.9	94.0 93.3	93.7	7.2 7.1	7.2	7.2	1.7 1.7	1.7	2.0	4 4	4.0	4.7
				Middle	4	19.2 19.1	19.2	8.2 8.2	8.2	31.9 31.9	31.9	93.5 92.8	93.2	7.2 7.1	7.2		1.8 1.8	1.8		4 4	4.0	
				Bottom	7	19.1 19.1	19.1	8.2 8.2	8.2	31.9 31.9	31.9	92.5 92.3	92.4	7.1 7.1	7.1		2.3 2.5	2.4		6 6	6.0	
8-Jan-19	Cloudy	Calm	14:42	Surface	1	19.1 19.2	19.2	8.0 8.0	8.0	31.3 31.3	31.3	94.0 94.5	94.3	7.2 7.3	7.3	7.3	3.3 3.5	3.4	3.3	5 5	5.0	7.8
				Middle	4	19.0 18.9	19.0	8.0 8.0	8.0	31.3 31.3	31.3	94.9 94.8	94.9	7.3 7.3	7.3		3.2 3.1	3.2		13 13	13.0	
				Bottom	7	18.9 18.9	18.9	8.0 8.0	8.0	31.3 31.3	31.3	94.7 94.9	94.9	7.3 7.3	7.3		3.4 3.4	3.4		6 5	5.5	
10-Jan-19	Cloudy	Moderate	14:18	Surface	1	19.1 19.1	19.1	8.1 8.1	8.1	31.2 31.2	31.2	96.0 94.5	95.3	7.4 7.3	7.4	7.3	1.5 1.5	1.5	1.6	4 4	4.0	4.3
				Middle	4	18.8 18.9	18.9	8.1 8.1	8.1	31.3 31.2	31.3	94.6 94.0	94.3	7.3 7.3	7.3		1.6 1.5	1.6		4 4	4.0	
				Bottom	7	18.8 18.8	18.8	8.2 8.2	8.2	31.3 31.3	31.3	94.6 94.1	94.4	7.3 7.3	7.3		1.8 1.6	1.7		5 5	5.0	
12-Jan-19	Fine	Moderate	15:54	Surface	1	19.4 19.4	19.4	8.2 8.2	8.2	31.6 31.5	31.6	92.1 90.5	91.3	7.0 6.9	7.0	6.9	1.3 1.4	1.4	1.5	7 6	6.5	5.5
				Middle	4	19.2 19.2	19.2	8.2 8.2	8.2	31.6 31.6	31.6	90.5 90.0	90.3	6.9 6.9	6.9		1.3 1.5	1.4		5 5	5.0	
				Bottom	7	19.2 19.2	19.2	8.2 8.2	8.2	31.6 31.6	31.6	89.8 89.7	89.8	6.9 6.9	6.9		1.5 1.7	1.6		5 5	5.0	
14-Jan-19	Fine	Moderate	18:08	Surface	1	19.1 19.1	19.1	8.2 8.2	8.2	31.0 30.9	31.0	94.2 93.2	93.7	7.3 7.2	7.3	7.3	1.7 1.6	1.7	1.7	3 3	3.0	3.3
				Middle	4	19.0 19.0	19.0	8.2 8.2	8.2	31.0 31.0	31.0	94.1 93.1	93.6	7.3 7.2	7.3		1.7 1.5	1.6		3 <2.5	2.8	
				Bottom	7	19.0 19.0	19.0	8.2 8.2	8.2	31.0 31.0	31.0	94.0 93.6	93.8	7.3 7.2	7.3		1.7 1.8	1.8		4 4	4.0	
16-Jan-19	Fine	Moderate	08:11	Surface	1	19.0 19.0	19.0	8.1 8.1	8.1	31.2 31.2	31.2	92.7 92.2	92.5	7.1 7.1	7.1	7.2	1.0 1.0	1.0	1.1	4 3	3.5	3.7
				Middle	4	19.0 19.0	19.0	8.1 8.1	8.1	31.3 31.3	31.3	92.6 92.7	92.7	7.1 7.2	7.2		1.0 1.0	1.0		3 4	3.5	
				Bottom	7	19.0 19.0	19.0	8.1 8.1	8.1	31.3 31.3	31.3	92.7 92.4	92.6	7.2 7.1	7.2		1.2 1.2	1.2		4 4	4.0	
18-Jan-19	Cloudy	Calm	10:21	Surface	1	18.5 18.5	18.5	8.2 8.2	8.2	31.3 31.3	31.3	95.9 95.6	95.8	7.5 7.4	7.5	7.4	2.0 2.0	2.0	2.1	6 6	6.0	6.8
				Middle	4	18.5 18.5	18.5	8.2 8.2	8.2	31.3 31.3	31.3	95.6 95.5	95.6	7.4 7.4	7.4		2.0 2.2	2.1		6 5	5.5	
				Bottom	7	18.5 18.5	18.5	8.2 8.2	8.2	31.3 31.3	31.3	95.6 95.5	95.6	7.4 7.4	7.4		2.0 2.2	2.1		9 9	9.0	
22-Jan-19	Sunny	Calm	12:30	Surface	1	18.6 18.8	18.7	8.2 8.2	8.2	30.9 30.9	30.9	99.1 96.6	97.9	7.7 7.5	7.6	7.6	1.5 1.3	1.4	1.2	5 5	5.0	5.0
				Middle	4	18.6 18.7	18.7	8.2 8.2	8.2	30.9 30.9	30.9	97.8 96.2	97.0	7.6 7.5	7.6		1.1 1.1	1.1		7 7	7.0	
				Bottom	7	18.5 18.4	18.5	8.2 8.2	8.2	30.9 30.9	30.9	97.2 96.3	96.8	7.6 7.5	7.6		1.2 1.2	1.2		3 3	3.0	
24-Jan-19	Sunny	Moderate	13:55	Surface	1	18.5 18.5	18.5	8.2 8.2	8.2	30.9 30.8	30.9	97.9 93.4	95.7	7.6 7.3	7.5	7.4	1.6 1.7	1.7	1.8	5 6	5.5	6.2
				Middle	3.5	18.4 18.5	18.5	8.2 8.2	8.2	30.9 30.8	30.9	96.7 93.2	95.0	7.6 7.3	7.5		1.8 1.8	1.8		7 7	7.0	
				Bottom	6	18.4 18.4	18.4	8.2 8.2	8.2	30.8 30.8	30.8	93.0 93.1	93.1	7.3 7.3	7.3		2.0 1.9	2.0		6 6	6.0	
26-Jan-19	Sunny	Calm	15:41	Surface	1	18.6 18.7	18.7	8.1 8.1	8.1	30.9 30.8	30.9	96.4 96.7	96.6	7.5 7.5	7.5	7.5	1.1 1.2	1.2	1.2	5 5	5.0	6.7
				Middle	4	18.4 18.6	18.5	8.1 8.1	8.1	31.0 30.9	31.0	96.6 95.7	96.2	7.5 7.5	7.5		1.1 1.2	1.2		8 7	7.5	
				Bottom	7	18.3 18.4	18.4	8.1 8.1	8.1	31.0 31.0	31.0	96.3 95.6	96.0	7.5 7.5	7.5		1.1 1.0	1.1		8 7	7.5	
28-Jan-19	Sunny	Calm	18:01	Surface	1	18.5 18.5	18.5	8.2 8.2	8.2	30.6 30.6	30.6	103.2 103.3	103.3	8.1 8.1	8.1	8.1	1.5 1.4	1.5	1.3	4 4	4.0	4.0
				Middle	4	18.4 18.5	18.5	8.2 8.2	8.2	30.7 30.7	30.7	103.2 103.1	103.2	8.1 8.1	8.1		1.3 1.2	1.3		4 4	4.0	
				Bottom	7	18.4 18.4	18.4	8.2 8.2	8.2	30.7 30.7	30.7	102.8 102.7	102.8	8.0 8.0	8.0		1.3 1.1	1.2		4 4	4.0	
30-Jan-19	Sunny	Moderate	08:46	Surface	1	18.7 18.8	18.8	10.6 10.3	10.5	29.9 29.8	29.9	105.0 103.2	104.1	8.2 8.1	8.2	8.3	1.4 1.6	1.5	1.6	4 4	4.0	5.7
				Middle	4	18.5 18.5	18.5	10.6 10.4	10.5	30.1 30.1	30.1	108.0 107.1	107.6	8.5 8.4	8.5		1.3 1.3	1.3		5 5	5.0	
				Bottom	7	18.5 18.5	18.5	10.5 10.4	10.5	30.3 30.3	30.3	103.6 103.0	103.3	8.1 8.1	8.1		2.0 2.1	2.1		8 8	8.0	

Remarks: *DA: Depth-Averaged

**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

The reporting limit for laboratory analysis of suspended solids is 2.5 mg/L. For the results below the reporting limit, the SS level will be taken as 2.5 mg/L.

Water Quality Monitoring Results at 21 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Jan-19	Cloudy	Moderate	14:55	Surface	1	19.3 19.3	19.3	8.1 8.1	8.1	32.1 32.1	32.1	98.0 96.8	97.4	7.5 7.4	7.5	7.4	2.1 2.1	2.1	2.1	5 5	5.0	5.8
				Middle	4	19.3 19.3	19.3	8.1 8.1	8.1	32.1 32.1	32.1	97.2 96.5	96.9	7.4 7.4	7.4		2.2 2.2	2.2		6 7	6.5	
				Bottom	7	19.3 19.3	19.3	8.1 8.1	8.1	32.1 32.1	32.1	96.7 96.3	96.5	7.4 7.3	7.4		2.1 2.1	2.1		6 6	6.0	
5-Jan-19	Cloudy	Calm	15:59	Surface	1	19.6 19.4	19.5	8.2 8.2	8.2	31.8 31.9	31.9	94.0 91.9	93.0	7.1 7.0	7.1	7.0	2.2 1.9	2.1	2.3	5 5	5.0	6.8
				Middle	4	19.4 19.3	19.4	8.2 8.2	8.2	31.9 32.0	32.0	92.1 91.3	91.7	7.0 7.0	7.0		2.2 2.3	2.3		7 7	7.0	
				Bottom	7	19.3 19.3	19.3	8.2 8.2	8.2	32.0 32.0	32.0	91.2 91.1	91.2	7.0 7.0	7.0		2.3 2.6	2.5		8 9	8.5	
8-Jan-19	Cloudy	Calm	09:18	Surface	1	19.1 19.1	19.1	8.0 8.0	8.0	31.4 31.4	31.4	92.6 90.6	91.6	7.1 7.0	7.1	7.0	4.2 4.2	4.2	4.5	7 6	6.5	7.2
				Middle	4	19.1 19.1	19.1	8.0 8.0	8.0	31.4 31.4	31.4	91.1 90.3	90.7	7.0 6.9	7.0		4.4 4.4	4.4		7 7	7.0	
				Bottom	7	19.1 19.1	19.1	8.0 8.0	8.0	31.4 31.4	31.4	90.5 90.3	90.4	7.0 7.0	7.0		4.9 4.8	4.9		8 8	8.0	
10-Jan-19	Sunny	Moderate	10:00	Surface	1	18.9 18.9	18.9	8.1 8.1	8.1	31.2 31.2	31.2	93.3 92.0	92.7	7.2 7.1	7.2	7.1	2.1 2.1	2.1	2.3	5 5	5.0	5.7
				Middle	4	18.9 18.9	18.9	8.1 8.1	8.1	31.2 31.2	31.2	92.1 92.0	92.1	7.1 7.1	7.1		2.2 2.1	2.2		7 7	7.0	
				Bottom	7	18.9 18.8	18.9	8.1 8.1	8.1	31.2 31.2	31.2	92.0 91.7	91.9	7.1 7.1	7.1		2.5 2.5	2.5		5 5	5.0	
12-Jan-19	Fine	Moderate	11:49	Surface	1	19.3 19.2	19.3	8.2 8.2	8.2	31.5 31.5	31.5	93.4 91.0	92.2	7.2 7.0	7.1	7.0	1.5 1.6	1.6	1.6	7 7	7.0	5.0
				Middle	4	19.2 19.2	19.2	8.2 8.2	8.2	31.5 31.5	31.5	91.6 91.2	91.4	7.0 7.0	7.0		1.5 1.6	1.6		5 5	5.0	
				Bottom	7	19.2 19.2	19.2	8.2 8.2	8.2	31.5 31.5	31.5	91.1 91.0	91.1	7.0 7.0	7.0		1.5 1.6	1.6		3 3	3.0	
14-Jan-19	Fine	Moderate	12:44	Surface	1	19.1 19.1	19.1	8.2 8.2	8.2	30.9 30.9	30.9	92.7 90.9	91.8	7.1 7.0	7.1	7.0	1.6 1.6	1.6	1.7	6 7	6.5	5.8
				Middle	4	19.1 19.1	19.1	8.2 8.2	8.2	31.0 30.9	31.0	91.1 90.6	90.9	7.0 7.0	7.0		1.7 1.7	1.7		5 5	5.0	
				Bottom	7	19.1 19.1	19.1	8.2 8.2	8.2	31.0 31.0	31.0	90.5 90.1	90.3	7.0 6.9	7.0		1.7 1.8	1.8		6 6	6.0	
16-Jan-19	Fine	Moderate	12:52	Surface	1	19.0 19.0	19.0	8.1 8.1	8.1	31.2 31.2	31.2	94.7 94.0	94.4	7.3 7.3	7.3	7.3	1.2 1.2	1.2	1.3	4 5	4.5	3.8
				Middle	4	18.9 19.0	19.0	8.1 8.1	8.1	31.3 31.2	31.3	93.9 93.7	93.8	7.3 7.2	7.3		1.2 1.2	1.2		3 4	3.5	
				Bottom	7	18.9 18.9	18.9	8.1 8.1	8.1	31.3 31.3	31.3	93.7 93.4	93.6	7.2 7.2	7.2		1.4 1.3	1.4		3 4	3.5	
18-Jan-19	Cloudy	Calm	14:29	Surface	1	18.4 18.5	18.5	8.2 8.2	8.2	31.3 31.3	31.3	99.7 98.7	99.2	7.8 7.7	7.8	7.7	1.7 1.7	1.7	1.9	3 4	3.5	4.8
				Middle	4	18.5 18.4	18.5	8.2 8.2	8.2	31.3 31.3	31.3	98.7 98.4	98.6	7.7 7.7	7.7		1.8 1.9	1.9		4 4	4.0	
				Bottom	7	18.4 18.4	18.4	8.2 8.2	8.2	31.4 31.4	31.4	98.4 98.1	98.3	7.7 7.6	7.7		1.9 2.0	2.0		7 7	7.0	
22-Jan-19	Sunny	Calm	08:36	Surface	1	18.5 18.5	18.5	8.3 8.2	8.3	30.9 30.9	30.9	96.3 93.6	95.0	7.5 7.3	7.4	7.3	1.8 1.7	1.8	1.8	6 5	5.5	4.8
				Middle	4	18.5 18.5	18.5	8.2 8.2	8.2	30.9 30.9	30.9	93.7 93.4	93.6	7.3 7.3	7.3		1.8 1.7	1.8		4 3	3.5	
				Bottom	7	18.5 18.5	18.5	8.2 8.2	8.2	30.9 30.9	30.9	93.5 93.2	93.4	7.3 7.3	7.3		1.6 1.7	1.7		6 5	5.5	
24-Jan-19	Sunny	Moderate	10:24	Surface	1	18.3 18.5	18.4	8.2 8.2	8.2	30.9 30.8	30.9	96.1 93.4	94.8	7.5 7.3	7.4	7.3	1.8 1.7	1.8	1.9	5 4	4.5	6.2
				Middle	3.5	18.4 18.4	18.4	8.2 8.2	8.2	30.8 30.8	30.8	93.5 93.2	93.4	7.3 7.3	7.3		2.1 1.9	2.0		8 8	8.0	
				Bottom	6	18.4 18.4	18.4	8.2 8.2	8.2	30.8 30.8	30.8	93.0 93.1	93.1	7.3 7.3	7.3		2.0 1.9	2.0		6 6	6.0	
26-Jan-19	Sunny	Calm	11:36	Surface	1	18.4 18.4	18.4	8.1 8.1	8.1	30.8 30.8	30.8	93.1 91.6	92.4	7.3 7.2	7.3	7.2	2.8 3.0	2.9	3.0	7 7	7.0	7.0
				Middle	4	18.4 18.4	18.4	8.1 8.1	8.1	30.8 30.8	30.8	91.8 91.1	91.5	7.2 7.1	7.2		3.2 3.3	3.3		8 8	8.0	
				Bottom	7	18.4 18.4	18.4	8.1 8.1	8.1	30.8 30.8	30.8	90.9 90.8	90.9	7.1 7.1	7.1		3.0 2.7	2.9		6 6	6.0	
28-Jan-19	Sunny	Calm	13:17	Surface	1	18.6 18.6	18.6	8.2 8.2	8.2	30.6 30.6	30.6	103.8 104.1	104.0	8.1 8.1	8.1	8.1	1.2 1.2	1.2	1.2	7 7	7.0	7.2
				Middle	4	18.6 18.5	18.6	8.2 8.2	8.2	30.6 30.6	30.6	103.8 103.9	103.9	8.1 8.1	8.1		1.2 1.2	1.2		8 8	8.0	
				Bottom	7	18.5 18.4	18.5	8.2 8.2	8.2	30.6 30.6	30.6	103.4 102.9	103.2	8.1 8.0	8.1		1.2 1.3	1.3		7 6	6.5	
30-Jan-19	Sunny	Moderate	13:25	Surface	1	18.8 18.7	18.8	11.7 11.4	11.6	30.2 30.2	30.2	112.9 112.7	112.8	8.8 8.8	8.8	8.6	1.3 1.3	1.3	1.4	10 9	9.5	7.3
				Middle	4	18.7 18.7	18.7	11.7 11.2	11.5	30.2 30.2	30.2	111.5 112.6	112.1	8.7 8.8	8.8		1.4 1.4	1.4		7 8	7.5	
				Bottom	7	18.5 18.5	18.5	11.6 11.2	11.4	30.3 30.3	30.3	105.8 105.7	105.8	8.3 8.3	8.3		1.6 1.6	1.6		5 5	5.0	

Remarks: *DA: Depth-Averaged

**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Water Quality Monitoring Results at 34 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Jan-19	Cloudy	Moderate	09:50	Surface	1	17.4 17.5	17.5	8.1 8.1	8.1	32.0 31.9	32.0	96.4 96.3	96.4	7.6 7.6	7.6	7.5	2.7 2.7	2.7	3.1	4 5	4.5	5.8
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2	18.1 18.1	18.1	8.1 8.1	8.1	31.3 31.3	31.3	93.8 93.7	93.8	7.3 7.3	7.3		3.4 3.4	3.4		7 7	7.0	
5-Jan-19	Cloudy	Calm	11:43	Surface	1	19.3 19.3	19.3	8.2 8.2	8.2	31.9 31.9	31.9	93.2 92.2	92.7	7.1 7.0	7.1	7.1	2.3 2.3	2.3	2.3	9 10	9.5	7.8
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3	19.3 19.4	19.4	8.2 8.2	8.2	31.9 31.9	31.9	92.2 91.7	92.0	7.0 7.0	7.0		2.3 2.3	2.3		6 6	6.0	
8-Jan-19	Cloudy	Calm	14:28	Surface	1	19.4 19.4	19.4	8.0 8.0	8.0	31.5 31.5	31.5	94.4 94.3	94.4	7.2 7.2	7.2	7.2	5.1 5.1	5.1	5.0	8 9	8.5	7.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3	19.3 19.3	19.3	8.0 8.0	8.0	31.4 31.4	31.4	94.4 94.1	94.3	7.2 7.2	7.2		4.9 4.7	4.8		5 6	5.5	
10-Jan-19	Cloudy	Moderate	14:22	Surface	1	18.8 19.1	19.0	8.1 8.1	8.1	31.5 31.2	31.4	97.5 93.6	95.6	7.5 7.2	7.4	7.3	1.6 1.8	1.7	1.8	6 6	6.0	6.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4	19.0 19.1	19.1	8.1 8.1	8.1	31.2 31.2	31.2	93.8 93.3	93.6	7.2 7.2	7.2		1.7 1.8	1.8		6 6	6.0	
12-Jan-19	Fine	Moderate	16:00	Surface	1	19.8 19.6	19.7	8.1 8.2	8.2	31.4 31.5	31.5	93.0 92.2	92.6	7.1 7.0	7.1	7.1	1.5 1.6	1.6	1.6	4 4	4.0	5.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4	19.5 19.4	19.5	8.2 8.2	8.2	31.5 31.5	31.5	92.3 91.8	92.1	7.0 7.0	7.0		1.5 1.5	1.5		7 7	7.0	
14-Jan-19	Fine	Moderate	18:25	Surface	1	19.3 19.3	19.3	8.2 8.2	8.2	30.9 30.9	30.9	93.8 92.9	93.4	7.2 7.1	7.2	7.2	2.6 2.6	2.6	2.5	3 3	3.0	5.3
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3	19.1 19.2	19.2	8.2 8.2	8.2	30.9 30.9	30.9	93.0 92.4	92.7	7.2 7.1	7.2		2.5 2.3	2.4		7 8	7.5	
16-Jan-19	Fine	Moderate	08:00	Surface	1	19.0 19.0	19.0	8.1 8.1	8.1	31.2 31.2	31.2	92.2 91.4	91.8	7.1 7.1	7.1	7.1	1.8 1.7	1.8	1.9	5 5	5.0	5.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3	19.0 19.0	19.0	8.1 8.1	8.1	31.2 31.2	31.2	91.5 91.2	91.4	7.1 7.0	7.1		1.9 1.8	1.9		5 5	5.0	
18-Jan-19	Cloudy	Calm	10:02	Surface	1	17.9 17.9	17.9	8.2 8.2	8.2	30.3 30.3	30.3	97.9 97.8	97.9	7.7 7.7	7.7	7.6	3.6 3.7	3.7	3.9	6 6	6.0	6.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3	18.0 18.0	18.0	8.2 8.2	8.2	30.7 30.5	30.6	95.4 95.0	95.2	7.5 7.5	7.5		3.9 4.0	4.0		6 6	6.0	
22-Jan-19	Sunny	Calm	12:48	Surface	1	18.8 18.7	18.8	8.3 8.3	8.3	30.9 30.9	30.9	96.9 95.7	96.3	7.5 7.4	7.5	7.5	1.4 1.4	1.4	1.5	3 3	3.0	3.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3	18.7 18.6	18.7	8.3 8.3	8.3	30.9 30.9	30.9	95.6 95.4	95.5	7.4 7.4	7.4		1.5 1.4	1.5		3 3	3.0	
24-Jan-19	Sunny	Moderate	14:04	Surface	1	18.8 18.8	18.8	8.6 8.6	8.6	30.8 30.8	30.8	95.3 95.3	95.3	7.4 7.4	7.4	7.4	1.6 1.6	1.6	1.6	6 6	6.0	5.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.6	18.8 18.8	18.8	8.6 8.6	8.6	30.8 30.8	30.8	95.1 95.1	95.1	7.4 7.4	7.4		1.5 1.5	1.5		5 5	5.0	
26-Jan-19	Sunny	Calm	15:24	Surface	1	18.8 18.6	18.7	8.1 8.1	8.1	30.7 30.8	30.8	98.8 97.0	97.9	7.7 7.5	7.6	7.6	1.6 1.4	1.5	1.5	4 5	4.5	4.8
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.5	18.7 18.5	18.6	8.1 8.1	8.1	30.8 30.9	30.9	97.7 96.2	97.0	7.6 7.5	7.6		1.5 1.5	1.5		5 5	5.0	
28-Jan-19	Sunny	Calm	18:19	Surface	1	18.5 18.5	18.5	8.2 8.2	8.2	30.6 30.7	30.7	104.6 104.9	104.8	8.2 8.2	8.2	8.2	1.6 1.5	1.6	1.6	10 10	10.0	7.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.5	18.5 18.5	18.5	8.2 8.2	8.2	30.7 30.7	30.7	104.9 104.9	104.9	8.2 8.2	8.2		1.5 1.6	1.6		4 4	4.0	
30-Jan-19	Sunny	Moderate	08:27	Surface	1	18.5 18.6	18.6	10.8 11.0	10.9	30.2 30.2	30.2	101.2 102.5	101.9	7.9 8.0	8.0	7.9	1.6 1.6	1.6	1.6	7 8	7.5	6.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3	18.5 18.5	18.5	10.9 10.5	10.7	30.2 30.2	30.2	100.0 99.7	99.9	7.8 7.8	7.8		1.6 1.5	1.6		5 4	4.5	

Remarks: *DA: Depth-Averaged

**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Water Quality Monitoring Results at 34 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Jan-19	Cloudy	Moderate	15:08	Surface	1	18.7 18.7	18.7	8.1 8.1	8.1	32.0 32.0	32.0	96.0 95.8	95.9	7.4 7.4	7.4	7.4	4.7 4.7	4.7	4.3	4 5	4.5	6.8
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2	18.7 18.7	18.7	8.1 8.1	8.1	31.6 31.6	31.6	94.7 94.6	94.7	7.3 7.3	7.3		3.8 3.8	3.8		9 9	9.0	
5-Jan-19	Cloudy	Calm	16:09	Surface	1	19.5 19.5	19.5	8.2 8.2	8.2	31.9 31.9	31.9	92.2 92.1	92.2	7.0 7.0	7.0	7.0	2.2 2.4	2.3	2.4	5 4	4.5	6.3
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3	19.3 19.3	19.3	8.2 8.2	8.2	31.9 31.9	31.9	91.7 91.7	91.7	7.0 7.0	7.0		2.4 2.3	2.4		8 8	8.0	
8-Jan-19	Cloudy	Calm	09:03	Surface	1	19.0 19.0	19.0	8.0 8.0	8.0	31.3 31.3	31.3	96.5 96.4	96.5	7.4 7.4	7.4	7.4	6.5 6.5	6.5	6.5	4 4	4.0	6.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3	19.1 19.1	19.1	8.0 8.0	8.0	31.4 31.4	31.4	96.0 95.9	96.0	7.4 7.4	7.4		6.5 6.5	6.5		9 9	9.0	
10-Jan-19	Sunny	Moderate	09:54	Surface	1	18.9 18.9	18.9	8.1 8.1	8.1	31.3 31.3	31.3	93.3 91.4	92.4	7.2 7.1	7.2	7.2	2.1 2.0	2.1	2.1	6 7	6.5	7.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4	18.9 18.9	18.9	8.1 8.1	8.1	31.3 31.3	31.3	92.0 91.4	91.7	7.1 7.1	7.1		2.1 2.0	2.1		9 8	8.5	
12-Jan-19	Fine	Moderate	11:40	Surface	1	19.6 19.6	19.6	8.2 8.2	8.2	31.5 31.5	31.5	90.1 88.9	89.5	6.9 6.8	6.9	6.9	1.8 1.8	1.8	2.0	6 7	6.5	7.8
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4	19.4 19.5	19.5	8.2 8.2	8.2	31.6 31.6	31.6	88.7 88.3	88.5	6.8 6.7	6.8		2.0 2.1	2.1		9 9	9.0	
14-Jan-19	Fine	Moderate	12:25	Surface	1	19.1 19.1	19.1	8.2 8.2	8.2	30.8 30.7	30.8	93.9 93.8	93.9	7.2 7.2	7.2	7.3	3.1 3.1	3.1	2.9	7 7	7.0	7.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3	19.1 19.1	19.1	8.2 8.2	8.2	31.1 31.1	31.1	94.5 94.4	94.5	7.3 7.3	7.3		2.5 2.7	2.6		7 7	7.0	
16-Jan-19	Fine	Moderate	13:06	Surface	1	19.6 19.7	19.7	8.2 8.2	8.2	31.4 31.4	31.4	97.1 97.2	97.2	7.4 7.4	7.4	7.4	3.0 3.0	3.0	3.0	7 7	7.0	7.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3	19.3 19.5	19.4	8.2 8.2	8.2	31.2 31.2	31.2	97.2 97.2	97.2	7.4 7.4	7.4		2.9 2.9	2.9		8 8	8.0	
18-Jan-19	Cloudy	Calm	14:46	Surface	1	18.6 18.6	18.6	8.2 8.2	8.2	31.3 31.3	31.3	95.9 95.5	95.7	7.4 7.4	7.4	7.4	2.9 3.1	3.0	3.0	6 7	6.5	6.8
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3	18.6 18.6	18.6	8.2 8.2	8.2	31.3 31.3	31.3	95.7 95.5	95.6	7.4 7.4	7.4		3.0 2.8	2.9		7 7	7.0	
22-Jan-19	Sunny	Calm	08:19	Surface	1	18.6 18.6	18.6	8.2 8.2	8.2	30.9 30.9	30.9	93.5 92.5	93.0	7.3 7.2	7.3	7.3	2.3 2.2	2.3	2.3	7 6	6.5	6.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3	18.6 18.6	18.6	8.2 8.2	8.2	30.9 30.9	30.9	92.8 92.4	92.6	7.2 7.2	7.2		2.2 2.1	2.2		6 5	5.5	
24-Jan-19	Sunny	Moderate	10:16	Surface	1	18.5 18.5	18.5	8.3 8.3	8.3	30.8 30.8	30.8	95.5 91.6	93.6	7.4 7.1	7.3	7.2	1.3 1.4	1.4	1.6	7 7	7.0	7.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.6	18.5 18.5	18.5	8.2 8.2	8.2	30.8 30.8	30.8	90.9 90.8	90.9	7.1 7.1	7.1		1.7 1.8	1.8		8 8	8.0	
26-Jan-19	Sunny	Calm	11:48	Surface	1	19.3 19.4	19.4	8.1 8.1	8.1	31.1 31.2	31.2	97.0 97.0	97.0	7.4 7.4	7.4	7.4	3.9 4.1	4.0	4.3	5 5	5.0	6.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.5	19.3 19.4	19.4	8.1 8.1	8.1	30.8 30.8	30.8	96.6 96.6	96.6	7.4 7.4	7.4		4.3 4.6	4.5		7 7	7.0	
28-Jan-19	Sunny	Calm	13:01	Surface	1	18.6 18.6	18.6	8.3 8.2	8.3	30.6 30.6	30.6	102.0 102.8	102.4	8.0 8.0	8.0	8.0	1.2 1.2	1.2	1.2	8 8	8.0	6.8
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	2.6	18.6 18.6	18.6	8.3 8.2	8.3	30.6 30.6	30.6	102.8 102.5	102.7	8.0 8.0	8.0		1.2 1.1	1.2		6 5	5.5	
30-Jan-19	Sunny	Moderate	13:47	Surface	1	20.2 20.2	20.2	11.2 11.3	11.3	29.6 29.6	29.6	104.2 104.4	104.3	7.9 7.9	7.9	7.9	2.8 2.8	2.8	2.7	5 6	5.5	7.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.1	19.5 19.6	19.6	11.4 11.4	11.4	30.1 30.2	30.2	102.2 102.6	102.4	7.9 7.9	7.9		2.7 2.5	2.6		9 10	9.5	

Remarks: *DA: Depth-Averaged

**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Water Quality Monitoring Results at 9 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Jan-19	Cloudy	Moderate	10:49	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
				Middle	1.1	19.6	19.6	8.0	8.0	31.6	31.6	81.1	81.1	6.2	6.2	6.2	2.3	2.3	2.3	5	5.0	5.0
						19.6		8.0		31.6		81.1		6.2			2.3			5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
5-Jan-19	Cloudy	Calm	12:31	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
				Middle	1	19.6	19.6	8.1	8.1	31.1	31.2	78.3	78.4	6.0	6.0	6.0	2.2	2.2	2.2	5	5.5	5.5
						19.5		8.1		31.3		78.5		6.0			2.2			6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
8-Jan-19	Cloudy	Calm	13:32	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
				Middle	1.1	19.3	19.3	7.8	7.9	30.8	30.9	82.7	82.5	6.3	6.3	6.3	5.5	5.5	5.5	7	7.5	7.5
						19.3		7.9		30.9		82.2		6.3			5.5			8		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
10-Jan-19	Cloudy	Moderate	13:53	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
				Middle	1.1	19.2	19.2	7.9	7.9	31.1	31.1	85.6	85.5	6.6	6.6	6.6	3.0	3.0	3.0	4	4.0	4.0
						19.2		7.9		31.1		85.3		6.6			3.0			4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
12-Jan-19	Fine	Moderate	15:22	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
				Middle	1.1	19.6	19.6	8.3	8.3	31.2	31.2	78.6	78.7	6.0	6.0	6.0	3.5	3.6	3.6	6	6.0	6.0
						19.6		8.3		31.2		78.7		6.0			3.6			6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
14-Jan-19	Fine	Moderate	17:30	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
				Middle	1	19.4	19.4	8.1	8.1	30.9	30.9	81.7	81.3	6.3	6.3	6.3	2.9	2.9	2.9	4	4.0	4.0
						19.4		8.1		30.9		80.8		6.2			2.8			4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
16-Jan-19	Fine	Moderate	08:50	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
				Middle	1	19.2	19.2	8.0	8.0	31.0	31.0	80.8	80.7	6.2	6.2	6.2	0.9	0.9	0.9	4	4.0	4.0
						19.2		8.0		31.0		80.5		6.2			0.9			4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
18-Jan-19	Cloudy	Calm	11:10	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
				Middle	1.1	18.7	18.7	8.1	8.1	31.1	31.1	84.5	84.1	6.6	6.6	6.6	2.7	2.8	2.8	3	3.0	3.0
						18.7		8.1		31.1		83.6		6.5			2.8			3		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
22-Jan-19	Sunny	Calm	11:50	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
				Middle	1	18.6	18.6	8.1	8.1	30.6	30.6	83.7	83.4	6.5	6.5	6.5	1.6	1.6	1.6	6	5.5	5.5
						18.6		8.1		30.6		83.1		6.5			1.5			5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
24-Jan-19	Sunny	Moderate	13:25	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
				Middle	1.1	19.3	19.2	8.2	8.2	30.7	30.7	85.8	85.4	6.6	6.6	6.6	1.3	1.3	1.3	4	3.5	3.5
						19.1		8.2		30.6		84.9		6.6			1.3			3		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
26-Jan-19	Sunny	Calm	16:27	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
				Middle	1	18.8	18.8	8.0	8.0	30.7	30.7	84.9	83.3	6.6	6.5	6.5	2.8	2.8	2.8	6	5.5	5.5
						18.8		8.0		30.7		81.7		6.3			2.7			5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
28-Jan-19	Sunny	Calm	17:33	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
				Middle	1	18.8	18.8	8.2	8.2	30.4	30.4	99.8	99.1	7.8	7.8	7.8	1.3	1.3	1.3	4	3.5	3.5
						18.8		8.2		30.4		98.4		7.8			1.2			3		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
30-Jan-19	Sunny	Moderate	09:42	Surface	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
				Middle	0.9	19.1	19.1	10.9	10.9	29.8	29.8	94.4	94.5	7.3	7.3	7.3	1.0	1.1	1.1	7	7.5	7.5
						19.0		10.9		29.8		94.6		7.3			1.1			8		
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		

Remarks: *DA: Depth-Averaged

**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Water Quality Monitoring Results at 9 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Jan-19	Cloudy	Moderate	14:10	Surface	-	-	-	-	-	-	-	-	-	-	-	6.3	-	-	2.2	-	-	4.5
				Middle	1.1	19.6 19.6	19.6	8.0 8.0	8.0	31.6 31.6	31.6	82.3 82.0	82.2	6.3 6.2	6.3		2.2 2.1	2.2		4 5	4.5	
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
5-Jan-19	Cloudy	Calm	15:23	Surface	-	-	-	-	-	-	-	-	-	-	-	6.2	-	-	1.9	-	-	4.5
				Middle	1.1	19.6 19.5	19.6	8.1 8.1	8.1	31.2 31.4	31.3	80.0 80.9	80.5	6.1 6.2	6.2		1.9 1.9	1.9		4 5	4.5	
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
8-Jan-19	Cloudy	Calm	08:08	Surface	-	-	-	-	-	-	-	-	-	-	-	5.8	-	-	3.7	-	-	4.5
				Middle	1.1	19.3 19.2	19.3	7.8 7.8	7.8	30.9 31.0	31.0	74.4 74.8	74.6	5.7 5.8	5.8		3.5 3.8	3.7		4 5	4.5	
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
10-Jan-19	Sunny	Moderate	10:28	Surface	-	-	-	-	-	-	-	-	-	-	-	6.0	-	-	2.4	-	-	5.0
				Middle	1.1	19.1 19.1	19.1	8.0 8.0	8.0	31.0 31.0	31.0	77.5 77.1	77.3	6.0 5.9	6.0		2.2 2.5	2.4		5 5	5.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
12-Jan-19	Fine	Moderate	12:17	Surface	-	-	-	-	-	-	-	-	-	-	-	5.9	-	-	2.5	-	-	6.0
				Middle	1	19.4 19.4	19.4	8.1 8.1	8.1	31.3 31.3	31.3	77.6 77.4	77.5	5.9 5.9	5.9		2.4 2.6	2.5		6 6	6.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
14-Jan-19	Fine	Moderate	13:29	Surface	-	-	-	-	-	-	-	-	-	-	-	5.6	-	-	3.5	-	-	5.5
				Middle	1	19.4 19.4	19.4	8.0 8.1	8.1	30.8 30.8	30.8	72.5 72.1	72.3	5.6 5.6	5.6		3.3 3.6	3.5		5 6	5.5	
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
16-Jan-19	Fine	Moderate	12:21	Surface	-	-	-	-	-	-	-	-	-	-	-	5.2	-	-	1.1	-	-	4.0
				Middle	1.1	19.4 19.3	19.4	7.9 7.9	7.9	30.7 30.7	30.7	67.9 68.3	68.1	5.2 5.2	5.2		1.1 1.1	1.1		4 4	4.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
18-Jan-19	Cloudy	Calm	13:49	Surface	-	-	-	-	-	-	-	-	-	-	-	6.4	-	-	1.8	-	-	6.0
				Middle	1.1	18.8 18.8	18.8	8.1 8.1	8.1	31.0 31.0	31.0	82.2 81.7	82.0	6.4 6.3	6.4		1.7 1.8	1.8		6 6	6.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
22-Jan-19	Sunny	Calm	09:21	Surface	-	-	-	-	-	-	-	-	-	-	-	6.3	-	-	1.3	-	-	3.5
				Middle	1.1	18.7 18.7	18.7	8.1 8.1	8.1	30.5 30.5	30.5	80.5 80.0	80.3	6.3 6.2	6.3		1.3 1.2	1.3		4 3	3.5	
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
24-Jan-19	Sunny	Moderate	10:50	Surface	-	-	-	-	-	-	-	-	-	-	-	6.4	-	-	1.4	-	-	3.5
				Middle	1.1	18.6 18.6	18.6	8.1 8.1	8.1	30.5 30.5	30.5	83.4 80.5	82.0	6.5 6.3	6.4		1.3 1.4	1.4		4 3	3.5	
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
26-Jan-19	Sunny	Calm	10:57	Surface	-	-	-	-	-	-	-	-	-	-	-	6.3	-	-	2.2	-	-	6.0
				Middle	1.1	18.6 18.6	18.6	8.0 8.0	8.0	30.7 30.7	30.7	81.4 80.1	80.8	6.4 6.2	6.3		2.2 2.1	2.2		6 6	6.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
28-Jan-19	Sunny	Calm	11:51	Surface	-	-	-	-	-	-	-	-	-	-	-	6.7	-	-	1.2	-	-	7.0
				Middle	1	18.8 18.8	18.8	8.1 8.1	8.1	30.2 30.2	30.2	85.9 85.8	85.9	6.7 6.7	6.7		1.1 1.3	1.2		7 7	7.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
30-Jan-19	Sunny	Moderate	12:35	Surface	-	-	-	-	-	-	-	-	-	-	-	7.6	-	-	1.6	-	-	5.5
				Middle	0.9	19.0 19.0	19.0	13.1 12.9	13.0	30.0 30.0	30.0	98.3 98.2	98.3	7.6 7.6	7.6		1.6 1.5	1.6		6 5	5.5	
				Bottom	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	

Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Water Quality Monitoring Results at A - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Jan-19	Cloudy	Moderate	10:38	Surface	1	19.4 19.4	19.4	8.1 8.1	8.1	31.9 31.9	31.9	94.1 93.9	94.0	7.2 7.2	7.2	7.2	2.3 2.3	2.3	2.4	5 5	5.0	5.7
				Middle	3.5	19.4 19.4	19.4	8.1 8.1	8.1	31.9 32.0	32.0	93.6 93.6	93.6	7.1 7.1	7.1		2.4 2.3	2.4		6 6	6.0	
				Bottom	6	19.3 19.3	19.3	8.1 8.1	8.1	32.0 32.0	32.0	94.9 94.8	94.9	7.2 7.2	7.2		2.5 2.4	2.5		6 6	6.0	
5-Jan-19	Cloudy	Calm	12:18	Surface	1	19.5 19.5	19.5	8.2 8.2	8.2	31.9 31.9	31.9	90.2 89.6	89.9	6.9 6.8	6.9	6.9	1.9 1.9	1.9	2.1	6 6	6.0	6.0
				Middle	3.5	19.3 19.3	19.3	8.2 8.2	8.2	31.9 31.9	31.9	89.8 89.6	89.7	6.9 6.8	6.9		2.2 2.1	2.2		7 7	7.0	
				Bottom	6	19.2 19.2	19.2	8.2 8.2	8.2	31.9 31.9	31.9	90.3 90.2	90.3	6.9 6.9	6.9		2.2 2.2	2.2		5 5	5.0	
8-Jan-19	Cloudy	Calm	15:07	Surface	1	19.2 19.2	19.2	8.0 8.0	8.0	31.4 31.4	31.4	91.3 89.7	90.5	7.0 6.9	7.0	6.9	4.6 4.4	4.5	4.0	5 5	5.0	6.7
				Middle	3.5	19.2 19.2	19.2	8.0 8.0	8.0	31.4 31.4	31.4	88.3 89.1	88.7	6.8 6.8	6.8		3.6 3.7	3.7		9 9	9.0	
				Bottom	6	19.1 19.1	19.1	8.0 8.0	8.0	31.5 31.5	31.5	88.2 88.2	88.2	6.8 6.8	6.8		3.8 3.9	3.9		6 6	6.0	
10-Jan-19	Cloudy	Moderate	14:00	Surface	1	19.0 18.9	19.0	8.2 8.2	8.2	31.2 31.3	31.3	95.6 94.3	95.0	7.4 7.3	7.4	7.3	2.1 2.1	2.1	2.1	5 6	5.5	5.7
				Middle	3.5	18.9 18.9	18.9	8.2 8.2	8.2	31.3 31.3	31.3	94.3 94.3	94.3	7.3 7.3	7.3		2.0 2.1	2.1		6 6	6.0	
				Bottom	6	18.8 18.9	18.9	8.2 8.2	8.2	31.3 31.3	31.3	93.9 94.1	94.0	7.3 7.3	7.3		2.0 2.1	2.1		6 5	5.5	
12-Jan-19	Fine	Moderate	15:29	Surface	1	19.5 19.5	19.5	8.2 8.2	8.2	31.5 31.5	31.5	90.5 89.2	89.9	6.9 6.8	6.9	6.8	1.5 1.5	1.5	1.6	6 5	5.5	4.8
				Middle	3.5	19.4 19.4	19.4	8.2 8.2	8.2	31.5 31.5	31.5	89.3 88.7	89.0	6.8 6.8	6.8		1.6 1.5	1.6		4 5	4.5	
				Bottom	6	19.4 19.4	19.4	8.2 8.2	8.2	31.5 31.5	31.5	89.1 88.5	88.8	6.8 6.8	6.8		1.6 1.5	1.6		4 5	4.5	
14-Jan-19	Fine	Moderate	17:39	Surface	1	19.1 19.2	19.2	8.2 8.2	8.2	31.0 31.0	31.0	94.1 92.6	93.4	7.3 7.1	7.2	7.2	1.7 1.8	1.8	1.8	5 4	4.5	3.5
				Middle	3.5	19.0 19.1	19.1	8.2 8.2	8.2	31.0 31.0	31.0	93.0 92.5	92.8	7.2 7.1	7.2		2.0 1.7	1.9		3 3	3.0	
				Bottom	6	19.0 19.0	19.0	8.2 8.2	8.2	31.0 31.0	31.0	93.0 92.7	92.9	7.2 7.2	7.2		1.7 1.5	1.6		3 3	3.0	
16-Jan-19	Fine	Moderate	08:37	Surface	1	18.9 19.0	19.0	8.1 8.1	8.1	31.0 31.0	31.0	89.6 89.5	89.6	6.9 6.9	6.9	6.9	1.0 1.0	1.0	1.1	8 8	8.0	5.3
				Middle	3.5	19.0 19.0	19.0	8.1 8.1	8.1	31.2 31.2	31.2	90.2 89.9	90.1	7.0 6.9	7.0		1.0 0.9	1.0		5 5	5.0	
				Bottom	6	19.1 19.1	19.1	8.1 8.1	8.1	31.2 31.2	31.2	89.7 89.6	89.7	6.9 6.9	6.9		1.3 1.3	1.3		3 3	3.0	
18-Jan-19	Cloudy	Calm	10:55	Surface	1	18.5 18.5	18.5	8.1 8.2	8.2	31.3 31.3	31.3	95.2 94.6	94.9	7.4 7.4	7.4	7.4	1.6 1.6	1.6	1.5	3 4	3.5	6.2
				Middle	3.5	18.5 18.5	18.5	8.2 8.2	8.2	31.4 31.4	31.4	94.7 94.0	94.4	7.4 7.3	7.4		1.2 1.2	1.2		6 6	6.0	
				Bottom	6	18.5 18.5	18.5	8.2 8.2	8.2	31.4 31.4	31.4	94.5 94.5	94.5	7.4 7.4	7.4		1.7 1.8	1.8		9 9	9.0	
22-Jan-19	Sunny	Calm	11:58	Surface	1	18.6 18.6	18.6	8.2 8.2	8.2	30.9 30.9	30.9	94.4 94.9	94.7	7.3 7.4	7.4	7.4	2.1 2.0	2.1	1.8	8 7	7.5	5.5
				Middle	3.5	18.5 18.5	18.5	8.1 8.1	8.1	30.9 30.9	30.9	94.3 94.1	94.2	7.3 7.3	7.3		1.9 1.7	1.8		4 3	3.5	
				Bottom	6	18.4 18.4	18.4	8.2 8.2	8.2	30.9 30.9	30.9	97.5 95.6	96.6	7.6 7.5	7.6		1.4 1.4	1.4		6 5	5.5	
24-Jan-19	Sunny	Moderate	13:32	Surface	1	18.7 18.7	18.7	8.2 8.2	8.2	30.8 30.7	30.8	93.6 94.8	94.2	7.3 7.4	7.4	7.4	2.2 2.3	2.3	2.3	4 3	3.5	6.2
				Middle	3.5	18.5 18.6	18.6	8.2 8.2	8.2	30.8 30.8	30.8	93.5 93.0	93.3	7.3 7.2	7.3		2.3 2.2	2.3		10 10	10.0	
				Bottom	6	18.4 18.4	18.4	8.2 8.2	8.2	30.9 30.9	30.9	94.8 95.1	95.0	7.4 7.4	7.4		2.3 2.3	2.3		5 5	5.0	
26-Jan-19	Sunny	Calm	16:13	Surface	1	18.7 18.7	18.7	8.1 8.1	8.1	30.8 30.8	30.8	93.7 90.7	92.2	7.3 7.1	7.2	7.1	1.7 1.6	1.7	1.6	4 5	4.5	4.8
				Middle	3.5	18.5 18.6	18.6	8.1 8.1	8.1	30.9 30.9	30.9	90.7 90.3	90.5	7.1 7.0	7.1		1.3 1.5	1.4		5 5	5.0	
				Bottom	6	18.5 18.5	18.5	8.1 8.1	8.1	30.9 30.9	30.9	91.5 91.1	91.3	7.1 7.1	7.1		1.8 1.8	1.8		5 5	5.0	
28-Jan-19	Sunny	Calm	17:41	Surface	1	18.5 18.5	18.5	8.2 8.2	8.2	30.7 30.7	30.7	103.5 102.7	103.1	8.1 8.0	8.1	8.0	1.3 1.3	1.3	1.3	5 5	5.0	4.8
				Middle	3.5	18.4 18.4	18.4	8.2 8.2	8.2	30.7 30.7	30.7	102.3 102.3	102.3	8.0 8.0	8.0		1.2 1.3	1.3		6 6	6.0	
				Bottom	6	18.4 18.4	18.4	8.2 8.2	8.2	30.7 30.7	30.7	102.1 102.1	102.1	8.0 8.0	8.0		1.3 1.3	1.3		4 3	3.5	
30-Jan-19	Sunny	Moderate	09:29	Surface	1	18.8 18.8	18.8	11.8 11.3	11.6	29.8 29.9	29.9	103.8 104.7	104.3	8.1 8.2	8.2	8.2	1.4 1.5	1.5	1.4	6 6	6.0	5.0
				Middle	3.5	18.7 18.6	18.7	11.9 11.2	11.6	30.2 30.2	30.2	105.9 106.7	106.3	8.3 8.3	8.3		1.2 1.3	1.3		6 6	6.0	
				Bottom	6	18.5 18.5	18.5	11.7 11.0	11.4	30.2 30.2	30.2	104.2 104.2	104.2	8.2 8.2	8.2		1.4 1.4	1.4		3 3	3.0	

Remarks: *DA: Depth-Averaged

**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Water Quality Monitoring Results at A - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Jan-19	Cloudy	Moderate	14:17	Surface	1	19.4 19.4	19.4	8.1 8.1	8.1	31.9 31.9	31.9	93.7 94.1	93.9	7.1 7.2	7.2	7.2	2.7 2.6	2.7	2.7	7 8	7.5	6.8
				Middle	3.5	19.4 19.4	19.4	8.1 8.1	8.1	31.9 31.9	31.9	93.8 93.6	93.7	7.2 7.1	7.2		2.5 2.4	2.5		5 5	5.0	
				Bottom	6	19.4 19.4	19.4	8.1 8.1	8.1	32.0 32.0	32.0	94.5 94.4	94.5	7.2 7.2	7.2		3.0 3.0	3.0		8 8	8.0	
5-Jan-19	Cloudy	Calm	15:31	Surface	1	19.5 19.5	19.5	8.2 8.2	8.2	31.7 31.7	31.7	90.9 90.0	90.5	6.9 6.9	6.9	6.9	2.7 2.7	2.7	2.3	4 4	4.0	5.7
				Middle	3.5	19.5 19.5	19.5	8.2 8.2	8.2	31.8 31.8	31.8	90.2 89.8	90.0	6.9 6.8	6.9		2.1 2.0	2.1		7 7	7.0	
				Bottom	6	19.3 19.3	19.3	8.2 8.2	8.2	31.9 31.9	31.9	90.1 89.9	90.0	6.9 6.9	6.9		2.1 2.2	2.2		6 6	6.0	
8-Jan-19	Cloudy	Calm	09:42	Surface	1	19.1 19.1	19.1	8.0 8.0	8.0	31.5 31.5	31.5	90.9 88.8	89.9	7.0 6.8	6.9	6.9	4.3 4.2	4.3	4.7	6 6	6.0	5.0
				Middle	3.5	19.1 19.1	19.1	8.0 8.0	8.0	31.5 31.5	31.5	89.5 88.7	89.1	6.9 6.8	6.9		4.8 4.7	4.8		5 5	5.0	
				Bottom	6	19.1 19.1	19.1	8.0 8.0	8.0	31.5 31.5	31.5	89.1 88.9	89.0	6.8 6.8	6.8		5.0 5.1	5.1		4 4	4.0	
10-Jan-19	Sunny	Moderate	10:19	Surface	1	18.9 18.9	18.9	8.1 8.1	8.1	31.3 31.3	31.3	93.1 91.4	92.3	7.2 7.1	7.2	7.1	1.9 2.0	2.0	2.1	8 9	8.5	6.0
				Middle	3.5	18.9 18.9	18.9	8.1 8.1	8.1	31.3 31.3	31.3	91.4 91.2	91.3	7.1 7.0	7.1		2.1 2.0	2.1		4 5	4.5	
				Bottom	6	18.9 18.9	18.9	8.1 8.1	8.1	31.3 31.3	31.3	91.4 91.0	91.2	7.1 7.0	7.1		2.1 2.2	2.2		5 5	5.0	
12-Jan-19	Fine	Moderate	12:09	Surface	1	19.3 19.3	19.3	8.1 8.1	8.1	31.5 31.5	31.5	87.8 88.2	88.0	6.7 6.8	6.8	6.7	2.1 2.0	2.1	2.0	4 4	4.0	5.5
				Middle	3.5	19.3 19.3	19.3	8.1 8.1	8.1	31.5 31.5	31.5	87.7 87.7	87.7	6.7 6.7	6.7		1.9 2.0	2.0		5 5	5.0	
				Bottom	6	19.2 19.2	19.2	8.1 8.1	8.1	31.5 31.5	31.5	87.7 87.6	87.7	6.7 6.7	6.7		2.0 2.0	2.0		7 8	7.5	
14-Jan-19	Fine	Moderate	13:16	Surface	1	19.2 19.2	19.2	8.2 8.2	8.2	31.0 31.0	31.0	92.5 89.7	91.1	7.1 6.9	7.0	7.0	1.6 1.8	1.7	2.0	4 4	4.0	5.8
				Middle	3.5	19.1 19.1	19.1	8.2 8.2	8.2	31.0 31.0	31.0	89.8 89.5	89.7	6.9 6.9	6.9		2.0 2.0	2.0		5 4	4.5	
				Bottom	6	19.1 19.1	19.1	8.2 8.2	8.2	31.0 31.0	31.0	89.5 90.2	89.9	6.9 7.0	7.0		2.2 2.2	2.2		9 9	9.0	
16-Jan-19	Fine	Moderate	12:29	Surface	1	19.4 19.3	19.4	8.1 8.1	8.1	30.8 30.7	30.8	89.9 89.7	89.8	6.9 6.9	6.9	6.9	2.1 2.2	2.2	1.7	5 5	5.0	4.3
				Middle	3.5	19.1 19.1	19.1	8.1 8.1	8.1	31.2 31.2	31.2	88.8 89.2	89.0	6.8 6.9	6.9		1.4 1.4	1.4		5 4	4.5	
				Bottom	6	19.0 19.0	19.0	8.1 8.1	8.1	31.2 31.2	31.2	89.5 89.6	89.6	6.9 6.9	6.9		1.6 1.5	1.6		4 3	3.5	
18-Jan-19	Cloudy	Calm	13:56	Surface	1	18.6 18.6	18.6	8.1 8.1	8.1	31.2 31.2	31.2	95.7 94.5	95.1	7.4 7.3	7.4	7.4	1.9 1.7	1.8	2.3	5 6	5.5	4.8
				Middle	3.5	18.6 18.5	18.6	8.1 8.1	8.1	31.3 31.3	31.3	94.6 94.2	94.4	7.4 7.3	7.4		2.6 2.2	2.4		4 4	4.0	
				Bottom	6	18.5 18.5	18.5	8.1 8.1	8.1	31.3 31.3	31.3	95.2 94.6	94.9	7.4 7.4	7.4		2.6 2.5	2.6		5 5	5.0	
22-Jan-19	Sunny	Calm	09:09	Surface	1	18.6 18.6	18.6	8.1 8.1	8.1	30.9 30.9	30.9	91.6 88.8	90.2	7.1 6.9	7.0	7.0	1.9 1.7	1.8	1.8	4 3	3.5	4.5
				Middle	3.5	18.6 18.6	18.6	8.1 8.1	8.1	30.9 30.9	30.9	89.9 88.9	89.4	7.0 6.9	7.0		1.9 1.8	1.9		5 5	5.0	
				Bottom	6	18.6 18.6	18.6	8.1 8.1	8.1	30.9 30.9	30.9	90.1 89.8	90.0	7.0 7.0	7.0		1.8 1.8	1.8		5 5	5.0	
24-Jan-19	Sunny	Moderate	10:41	Surface	1	18.5 18.5	18.5	8.1 8.1	8.1	30.7 30.7	30.7	87.8 87.9	87.9	6.9 6.9	6.9	6.9	1.8 2.0	1.9	2.3	7 6	6.5	5.3
				Middle	3.5	18.5 18.5	18.5	8.1 8.1	8.1	30.8 30.8	30.8	88.7 88.7	88.7	6.9 6.9	6.9		2.0 2.1	2.1		5 5	5.0	
				Bottom	6	18.4 18.4	18.4	8.1 8.1	8.1	30.8 30.8	30.8	89.6 89.8	89.7	7.0 7.0	7.0		2.9 2.7	2.8		4 5	4.5	
26-Jan-19	Sunny	Calm	11:05	Surface	1	18.4 18.4	18.4	8.1 8.1	8.1	30.8 30.8	30.8	89.7 87.3	88.5	7.0 6.8	6.9	6.8	3.1 3.4	3.3	3.7	6 7	6.5	5.7
				Middle	3.5	18.4 18.4	18.4	8.1 8.1	8.1	30.8 30.8	30.8	87.4 87.1	87.3	6.8 6.8	6.8		3.4 3.6	3.5		5 6	5.5	
				Bottom	6	18.4 18.4	18.4	8.1 8.1	8.1	30.9 30.9	30.9	87.3 87.1	87.2	6.8 6.8	6.8		4.2 4.2	4.2		5 5	5.0	
28-Jan-19	Sunny	Calm	13:50	Surface	1	18.4 18.4	18.4	8.2 8.2	8.2	30.7 30.7	30.7	102.3 102.3	102.3	8.0 8.0	8.0	8.0	1.7 1.9	1.8	1.7	6 5	5.5	5.3
				Middle	3.5	18.5 18.4	18.5	8.2 8.2	8.2	30.7 30.7	30.7	102.0 102.1	102.1	8.0 8.0	8.0		1.8 1.7	1.8		6 5	5.5	
				Bottom	6	18.4 18.4	18.4	8.2 8.2	8.2	30.7 30.7	30.7	102.0 102.0	102.0	8.0 8.0	8.0		1.7 1.5	1.6		5 5	5.0	
30-Jan-19	Sunny	Moderate	12:44	Surface	1	18.9 18.8	18.9	12.0 11.8	11.9	29.8 29.9	29.9	109.5 111.2	110.4	8.5 8.7	8.6	8.5	1.4 1.4	1.4	1.5	5 6	5.5	5.0
				Middle	3.5	18.8 18.7	18.8	12.2 11.7	12.0	30.2 30.2	30.2	112.1 109.3	110.7	8.7 8.5	8.6		1.1 1.3	1.2		5 5	5.0	
				Bottom	6	18.6 18.5	18.6	12.1 11.4	11.8	30.2 30.2	30.2	104.2 103.8	104.0	8.2 8.1	8.2		1.7 1.9	1.8		4 5	4.5	

Remarks: *DA: Depth-Averaged

**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Water Quality Monitoring Results at C1 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Jan-19	Cloudy	Moderate	10:20	Surface	1	19.4 19.4	19.4	8.1 8.1	8.1	31.9 31.8	31.9	95.5 94.7	95.1	7.3 7.2	7.3	7.3	1.9 1.8	1.9	2.0	8 8	8.0	6.3
				Middle	6.5	19.4 19.4	19.4	8.1 8.1	8.1	32.0 32.0	32.0	95.4 95.3	95.4	7.3 7.3	7.3		2.0 2.0	2.0		5 5	5.0	
				Bottom	12	19.3 19.3	19.3	8.1 8.1	8.1	32.0 32.0	32.0	95.7 95.5	95.6	7.3 7.3	7.3		2.1 2.1	2.1		6 6	6.0	
5-Jan-19	Cloudy	Calm	12:05	Surface	1	19.2 19.2	19.2	8.2 8.2	8.2	32.0 32.0	32.0	92.7 91.2	92.0	7.1 7.0	7.1	7.0	2.1 1.9	2.0	2.2	4 4	4.0	4.8
				Middle	6.5	19.2 19.2	19.2	8.2 8.2	8.2	32.0 32.0	32.0	91.3 90.6	91.0	7.0 6.9	7.0		2.3 2.1	2.2		5 5	5.0	
				Bottom	12	19.2 19.2	19.2	8.2 8.2	8.2	32.0 32.0	32.0	90.5 90.3	90.4	6.9 6.9	6.9		2.1 2.4	2.3		5 6	5.5	
8-Jan-19	Cloudy	Calm	14:54	Surface	1	19.1 19.2	19.2	8.0 8.0	8.0	31.4 31.4	31.4	94.3 91.7	93.0	7.2 7.0	7.1	7.0	3.2 3.4	3.3	3.7	5 5	5.0	5.5
				Middle	6.5	19.2 19.2	19.2	8.0 8.0	8.0	31.4 31.4	31.4	91.4 90.3	90.9	7.0 6.9	7.0		3.4 3.7	3.6		6 6	6.0	
				Bottom	12	19.2 19.2	19.2	8.0 8.0	8.0	31.4 31.4	31.4	89.4 89.0	89.2	6.9 6.8	6.9		4.1 4.2	4.2		5 6	5.5	
10-Jan-19	Cloudy	Moderate	14:08	Surface	1	18.5 18.6	18.6	8.2 8.2	8.2	31.2 31.2	31.2	99.4 96.7	98.1	7.7 7.5	7.6	7.6	1.9 1.9	1.9	2.0	6 7	6.5	6.3
				Middle	6.5	18.6 18.6	18.6	8.2 8.2	8.2	31.2 31.2	31.2	97.9 97.4	97.7	7.6 7.6	7.6		1.9 1.9	1.9		6 6	6.0	
				Bottom	12	18.6 18.7	18.7	8.2 8.2	8.2	31.2 31.2	31.2	97.0 96.5	96.8	7.5 7.5	7.5		2.0 2.1	2.1		6 7	6.5	
12-Jan-19	Fine	Moderate	15:42	Surface	1	19.5 19.4	19.5	8.2 8.2	8.2	31.5 31.5	31.5	88.7 85.3	87.0	6.8 6.5	6.7	6.5	1.2 1.4	1.3	1.5	5 4	4.5	5.5
				Middle	6.5	19.3 19.3	19.3	8.2 8.2	8.2	31.6 31.6	31.6	84.5 84.2	84.4	6.5 6.4	6.5		1.5 1.4	1.5		4 4	4.0	
				Bottom	12	19.3 19.3	19.3	8.2 8.2	8.2	31.6 31.6	31.6	83.9 83.7	83.8	6.4 6.4	6.4		1.7 1.6	1.7		8 8	8.0	
14-Jan-19	Fine	Moderate	17:52	Surface	1	19.0 19.0	19.0	8.2 8.2	8.2	31.0 31.0	31.0	96.7 95.4	96.1	7.5 7.4	7.5	7.4	1.3 1.2	1.3	1.4	8 9	8.5	6.7
				Middle	6.5	19.0 19.0	19.0	8.2 8.2	8.2	31.0 31.0	31.0	95.2 95.0	95.1	7.4 7.3	7.4		1.2 1.3	1.3		9 8	8.5	
				Bottom	12	19.0 19.0	19.0	8.2 8.3	8.3	31.0 31.0	31.0	94.9 94.7	94.8	7.3 7.3	7.3		1.5 1.4	1.5		3 3	3.0	
16-Jan-19	Fine	Moderate	08:23	Surface	1	18.9 18.9	18.9	8.1 8.1	8.1	31.2 31.2	31.2	94.9 93.5	94.2	7.3 7.2	7.3	7.2	0.9 0.9	0.9	0.9	4 4	4.0	6.7
				Middle	6.5	18.9 18.9	18.9	8.1 8.1	8.1	31.2 31.2	31.2	93.5 93.1	93.3	7.2 7.2	7.2		0.9 0.9	0.9		9 9	9.0	
				Bottom	12	18.9 18.9	18.9	8.1 8.1	8.1	31.2 31.2	31.2	92.4 92.5	92.5	7.1 7.1	7.1		0.9 0.9	0.9		7 7	7.0	
18-Jan-19	Cloudy	Calm	10:37	Surface	1	18.6 18.6	18.6	8.1 8.2	8.2	31.4 31.4	31.4	93.8 92.8	93.3	7.3 7.2	7.3	7.2	1.8 1.9	1.9	1.9	4 4	4.0	5.0
				Middle	6.5	18.6 18.6	18.6	8.2 8.2	8.2	31.4 31.4	31.4	92.7 92.4	92.6	7.2 7.2	7.2		1.9 1.9	1.9		5 5	5.0	
				Bottom	12	18.6 18.6	18.6	8.2 8.2	8.2	31.4 31.4	31.4	92.2 92.0	92.1	7.2 7.1	7.2		2.0 2.0	2.0		6 6	6.0	
22-Jan-19	Sunny	Calm	12:13	Surface	1	18.5 18.5	18.5	8.3 8.2	8.3	30.9 30.9	30.9	100.3 99.2	99.8	7.8 7.7	7.8	7.8	1.2 1.2	1.2	1.3	6 6	6.0	5.7
				Middle	6.5	18.4 18.4	18.4	8.2 8.2	8.2	30.9 30.9	30.9	99.7 98.8	99.3	7.8 7.7	7.8		1.3 1.3	1.3		6 5	5.5	
				Bottom	12	18.4 18.4	18.4	8.2 8.2	8.2	30.9 30.9	30.9	98.8 98.4	98.6	7.7 7.7	7.7		1.4 1.5	1.5		6 5	5.5	
24-Jan-19	Sunny	Moderate	13:44	Surface	1	18.6 18.6	18.6	8.2 8.2	8.2	30.9 30.9	30.9	99.4 98.8	99.1	7.7 7.7	7.7	7.7	1.3 1.2	1.3	1.3	7 7	7.0	6.3
				Middle	6.5	18.5 18.5	18.5	8.2 8.2	8.2	30.9 30.9	30.9	98.3 98.4	98.4	7.7 7.7	7.7		1.4 1.3	1.4		6 6	6.0	
				Bottom	12	18.5 18.4	18.5	8.2 8.2	8.2	30.9 30.9	30.9	98.2 98.2	98.2	7.7 7.7	7.7		1.3 1.3	1.3		6 6	6.0	
26-Jan-19	Sunny	Calm	15:57	Surface	1	18.7 18.7	18.7	8.1 8.1	8.1	30.9 30.9	30.9	97.2 96.7	97.0	7.6 7.5	7.6	7.5	2.0 2.2	2.1	2.4	4 4	4.0	5.7
				Middle	6.5	18.5 18.5	18.5	8.2 8.2	8.2	30.9 30.9	30.9	96.8 96.2	96.5	7.5 7.5	7.5		2.5 2.7	2.6		7 7	7.0	
				Bottom	12	18.4 18.4	18.4	8.2 8.2	8.2	31.0 31.0	31.0	96.2 96.1	96.2	7.5 7.5	7.5		2.5 2.3	2.4		6 6	6.0	
28-Jan-19	Sunny	Calm	17:50	Surface	1	18.5 18.5	18.5	8.2 8.2	8.2	30.6 30.6	30.6	104.8 104.7	104.8	8.2 8.2	8.2	8.2	1.1 1.1	1.1	1.1	4 4	4.0	5.0
				Middle	6.5	18.5 18.5	18.5	8.2 8.2	8.2	30.7 30.7	30.7	104.4 103.4	103.9	8.2 8.1	8.2		1.1 1.2	1.2		5 5	5.0	
				Bottom	12	18.4 18.5	18.5	8.2 8.2	8.2	30.7 30.7	30.7	103.8 104.2	104.0	8.1 8.1	8.1		1.1 1.1	1.1		6 6	6.0	
30-Jan-19	Sunny	Moderate	09:06	Surface	1	18.7 18.7	18.7	11.0 10.7	10.9	30.2 30.2	30.2	100.9 101.0	101.0	7.9 7.9	7.9	7.8	1.8 1.7	1.8	1.8	6 7	6.5	6.5
				Middle	6.5	18.6 18.6	18.6	11.1 10.6	10.9	30.2 30.2	30.2	99.5 98.9	99.2	7.8 7.7	7.8		1.7 1.8	1.8		5 6	5.5	
				Bottom	12	18.5 18.5	18.5	10.9 10.5	10.7	30.2 30.2	30.2	98.8 99.0	98.9	7.7 7.7	7.7		1.6 1.8	1.7		8 7	7.5	

Remarks: *DA: Depth-Averaged

**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Water Quality Monitoring Results at C1 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Jan-19	Cloudy	Moderate	14:35	Surface	1	19.4 19.4	19.4	8.1 8.1	8.1	32.0 32.0	32.0	97.1 96.3	96.7	7.4 7.3	7.4		1.6 1.6	1.6		5 4	4.5	
				Middle	6.5	19.4 19.4	19.4	8.1 8.1	8.1	32.0 32.0	32.0	96.2 95.9	96.1	7.3 7.3	7.3	7.3	1.7 1.6	1.7	1.8	6 5	5.5	5.0
				Bottom	12	19.3 19.3	19.3	8.1 8.1	8.1	32.0 32.0	32.0	95.7 95.5	95.6	7.3 7.3	7.3		2.0 1.9	2.0		5 5	5.0	
5-Jan-19	Cloudy	Calm	15:45	Surface	1	19.4 19.4	19.4	8.2 8.2	8.2	32.0 32.0	32.0	94.1 92.1	93.1	7.2 7.0	7.1		2.0 2.1	2.1		6 6	6.0	
				Middle	6.5	19.4 19.4	19.4	8.2 8.2	8.2	32.0 32.0	32.0	91.4 91.6	91.5	7.0 7.0	7.0	7.0	2.2 2.1	2.2	2.3	5 5	5.0	5.3
				Bottom	12	19.4 19.4	19.4	8.2 8.2	8.2	32.0 32.0	32.0	90.3 90.7	90.5	6.9 6.9	6.9		2.5 2.5	2.5		5 5	5.0	
8-Jan-19	Cloudy	Calm	09:30	Surface	1	19.1 19.1	19.1	8.0 8.0	8.0	31.4 31.4	31.4	93.3 91.2	92.3	7.2 7.0	7.1		3.8 3.7	3.8		7 7	7.0	
				Middle	6.5	19.1 19.1	19.1	8.0 8.0	8.0	31.4 31.4	31.4	91.0 90.8	90.9	7.0 7.0	7.0	7.0	3.9 3.8	3.9	4.0	5 5	5.0	6.2
				Bottom	12	19.1 19.1	19.1	8.0 8.0	8.0	31.5 31.5	31.5	90.1 89.7	89.9	6.9 6.9	6.9		4.4 4.3	4.4		6 7	6.5	
10-Jan-19	Sunny	Moderate	10:09	Surface	1	19.0 18.8	18.9	8.1 8.1	8.1	31.3 31.3	31.3	94.9 92.6	93.8	7.3 7.2	7.3		1.9 2.0	2.0		3 3	3.0	
				Middle	6.5	18.8 18.8	18.8	8.1 8.1	8.1	31.3 31.3	31.3	93.1 92.3	92.7	7.2 7.1	7.2	7.2	2.3 2.3	2.3	2.3	6 6	6.0	5.0
				Bottom	12	18.8 18.8	18.8	8.1 8.1	8.1	31.3 31.3	31.3	92.1 92.0	92.1	7.1 7.1	7.1		2.6 2.5	2.6		6 6	6.0	
12-Jan-19	Fine	Moderate	12:02	Surface	1	19.3 19.3	19.3	8.2 8.1	8.2	31.5 31.5	31.5	92.0 90.2	91.1	7.0 6.9	7.0		1.1 1.2	1.2		6 6	6.0	
				Middle	6.5	19.2 19.2	19.2	8.2 8.1	8.2	31.5 31.6	31.6	90.7 89.8	90.3	7.0 6.9	7.0	7.0	1.2 1.3	1.3	1.3	4 4	4.0	5.8
				Bottom	12	19.2 19.2	19.2	8.1 8.1	8.1	31.6 31.6	31.6	89.3 89.2	89.3	6.9 6.8	6.9		1.4 1.4	1.4		7 8	7.5	
14-Jan-19	Fine	Moderate	12:59	Surface	1	19.0 19.0	19.0	8.1 8.2	8.2	31.0 31.0	31.0	93.7 92.6	93.2	7.2 7.1	7.2		1.4 1.4	1.4		6 6	6.0	
				Middle	6.5	19.0 19.0	19.0	8.1 8.2	8.2	31.0 31.0	31.0	92.0 92.4	92.2	7.1 7.1	7.1	7.1	1.4 1.4	1.4	1.4	6 6	6.0	5.3
				Bottom	12	19.0 19.0	19.0	8.2 8.2	8.2	31.0 31.0	31.0	91.3 91.2	91.3	7.0 7.0	7.0		1.5 1.5	1.5		4 4	4.0	
16-Jan-19	Fine	Moderate	12:40	Surface	1	18.9 18.9	18.9	8.1 8.1	8.1	31.2 31.2	31.2	95.7 94.4	95.1	7.4 7.3	7.4		1.0 1.0	1.0		5 5	5.0	
				Middle	6.5	18.9 18.9	18.9	8.1 8.1	8.1	31.2 31.2	31.2	94.2 93.9	94.1	7.3 7.3	7.3	7.3	1.2 1.0	1.1	1.1	7 6	6.5	5.2
				Bottom	12	18.9 18.9	18.9	8.1 8.1	8.1	31.2 31.2	31.2	93.6 93.4	93.5	7.2 7.2	7.2		1.2 1.2	1.2		4 4	4.0	
18-Jan-19	Cloudy	Calm	14:10	Surface	1	18.5 18.5	18.5	8.2 8.2	8.2	31.3 31.3	31.3	96.5 95.8	96.2	7.5 7.4	7.5		1.0 1.0	1.0		6 6	6.0	
				Middle	6.5	18.4 18.5	18.5	8.2 8.2	8.2	31.4 31.4	31.4	95.2 94.9	95.1	7.4 7.4	7.4	7.4	1.4 1.3	1.4	1.3	7 7	7.0	5.3
				Bottom	12	18.4 18.4	18.4	8.2 8.2	8.2	31.4 31.4	31.4	95.5 95.5	95.5	7.4 7.4	7.4		1.6 1.6	1.6		3 3	3.0	
22-Jan-19	Sunny	Calm	08:52	Surface	1	18.6 18.6	18.6	8.2 8.1	8.2	31.0 31.0	31.0	95.8 93.9	94.9	7.5 7.3	7.4		2.1 2.3	2.2		7 7	7.0	
				Middle	6.5	18.6 18.6	18.6	8.1 8.2	8.2	31.0 31.0	31.0	93.9 93.3	93.6	7.3 7.3	7.3	7.3	2.9 2.8	2.9	2.5	6 4	5.0	5.8
				Bottom	12	18.6 18.6	18.6	8.1 8.2	8.2	31.0 31.0	31.0	93.1 92.9	93.0	7.2 7.2	7.2		2.3 2.5	2.4		6 5	5.5	
24-Jan-19	Sunny	Moderate	10:34	Surface	1	18.5 18.5	18.5	8.1 8.1	8.1	30.9 30.9	30.9	95.9 94.8	95.4	7.5 7.4	7.5		2.2 2.2	2.2		10 10	10.0	
				Middle	6.5	18.5 18.5	18.5	8.1 8.1	8.1	30.9 30.9	30.9	93.5 93.3	93.4	7.3 7.3	7.3	7.3	2.5 2.6	2.6	2.7	5 4	4.5	6.5
				Bottom	12	18.5 18.5	18.5	8.1 8.1	8.1	30.9 30.9	30.9	92.8 92.8	92.8	7.2 7.2	7.2		3.1 3.3	3.2		5 5	5.0	
26-Jan-19	Sunny	Calm	11:19	Surface	1	18.4 18.4	18.4	8.1 8.1	8.1	31.0 31.0	31.0	95.2 91.9	93.6	7.4 7.2	7.3		3.3 3.2	3.3		6 6	6.0	
				Middle	6.5	18.4 18.4	18.4	8.1 8.1	8.1	31.0 31.0	31.0	92.4 91.2	91.8	7.2 7.1	7.2	7.2	3.5 3.4	3.5	3.5	5 5	5.0	5.7
				Bottom	12	18.4 18.4	18.4	8.1 8.1	8.1	31.0 31.0	31.0	91.0 90.6	90.8	7.1 7.1	7.1		3.6 3.5	3.6		6 6	6.0	
28-Jan-19	Sunny	Calm	13:33	Surface	1	18.4 18.4	18.4	8.3 8.2	8.3	30.7 30.7	30.7	105.5 106.0	105.8	8.3 8.3	8.3		1.5 1.4	1.5		6 5	5.5	
				Middle	6.5	18.4 18.4	18.4	8.2 8.2	8.2	30.7 30.7	30.7	104.4 104.9	104.7	8.2 8.2	8.2	8.2	1.6 1.4	1.5	1.5	5 5	5.0	5.5
				Bottom	12	18.4 18.4	18.4	8.2 8.2	8.2	30.7 30.7	30.7	103.8 104.0	103.9	8.1 8.1	8.1		1.5 1.3	1.4		6 6	6.0	
30-Jan-19	Sunny	Moderate	13:01	Surface	1	18.6 18.6	18.6	11.9 11.4	11.7	30.2 30.2	30.2	106.5 107.5	107.0	8.3 8.4	8.4		1.3 1.4	1.4		5 5	5.0	
				Middle	7	18.6 18.6	18.6	11.8 11.2	11.5	30.2 30.2	30.2	104.6 105.0	104.8	8.2 8.2	8.2	8.3	1.4 1.7	1.6	1.8	8 8	8.0	6.3
				Bottom	13	18.6 18.6	18.6	11.7 11.1	11.4	30.2 30.2	30.2	104.3 103.5	103.9	8.2 8.1	8.2		2.3 2.4	2.4		6 6	6.0	

Remarks: *DA: Depth-Averaged

**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Water Quality Monitoring Results at C2 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Jan-19	Cloudy	Moderate	09:04	Surface	1	19.2 19.2	19.2	8.0 8.1	8.1	32.1 32.1	32.1	99.5 98.3	98.9	7.6 7.5	7.6	7.5	2.0 2.1	2.1	2.3	5 5	5.0	5.8
				Middle	10	19.2 19.2	19.2	8.1 8.1	8.1	32.1 32.1	32.1	97.9 97.6	97.8	7.5 7.5	7.5		2.4 2.2	2.3		4 4	4.0	
				Bottom	19	19.2 19.2	19.2	8.1 8.1	8.1	32.1 32.1	32.1	97.2 97.1	97.2	7.4 7.4	7.4		2.6 2.5	2.6		8 9	8.5	
5-Jan-19	Cloudy	Calm	10:44	Surface	1	18.8 18.8	18.8	8.2 8.2	8.2	31.5 31.7	31.6	97.2 96.6	96.9	7.5 7.5	7.5	7.4	2.1 2.3	2.2	2.9	4 4	4.0	4.3
				Middle	10.5	18.8 18.8	18.8	8.2 8.2	8.2	31.8 31.8	31.8	95.5 95.4	95.5	7.4 7.4	7.4		3.2 3.1	3.2		5 5	5.0	
				Bottom	20	18.8 18.8	18.8	8.2 8.2	8.2	31.8 31.8	31.8	94.7 94.8	94.8	7.3 7.3	7.3		3.2 3.2	3.2		4 4	4.0	
8-Jan-19	Cloudy	Calm	13:58	Surface	1	18.8 18.8	18.8	8.0 8.0	8.0	31.3 31.3	31.3	99.2 98.0	98.6	7.7 7.6	7.7	7.6	3.1 3.5	3.3	3.6	6 6	6.0	6.2
				Middle	10.5	18.7 18.7	18.7	8.0 8.0	8.0	31.3 31.3	31.3	97.4 96.3	96.9	7.5 7.5	7.5		3.5 3.7	3.6		7 8	7.5	
				Bottom	20	18.7 18.7	18.7	8.0 8.0	8.0	31.3 31.3	31.3	96.4 96.3	96.4	7.5 7.5	7.5		3.6 3.9	3.8		5 5	5.0	
10-Jan-19	Cloudy	Moderate	14:48	Surface	1	18.5 18.6	18.6	8.2 8.2	8.2	31.2 31.2	31.2	99.6 98.2	98.9	7.8 7.6	7.7	7.6	1.5 1.5	1.5	1.6	7 7	7.0	5.5
				Middle	11	18.6 18.6	18.6	8.2 8.2	8.2	31.2 31.2	31.2	97.6 98.0	97.8	7.6 7.6	7.6		1.6 1.5	1.6		5 5	5.0	
				Bottom	21	18.6 18.6	18.6	8.2 8.2	8.2	31.2 31.2	31.2	97.4 97.6	97.5	7.6 7.6	7.6		1.6 1.5	1.6		4 5	4.5	
12-Jan-19	Fine	Moderate	16:32	Surface	1	19.1 19.1	19.1	8.2 8.2	8.2	31.5 31.5	31.5	98.6 98.9	98.8	7.6 7.6	7.6	7.6	1.0 1.0	1.0	1.0	<2.5 <2.5	<2.5	3.5
				Middle	11	18.9 18.9	18.9	8.2 8.2	8.2	31.5 31.5	31.5	98.1 98.1	98.1	7.6 7.6	7.6		1.0 1.0	1.0		4 4	4.0	
				Bottom	21	18.9 18.8	18.9	8.2 8.2	8.2	31.5 31.5	31.5	97.8 97.1	97.5	7.5 7.5	7.5		1.1 1.1	1.1		4 4	4.0	
14-Jan-19	Fine	Moderate	19:24	Surface	1	18.8 18.8	18.8	8.2 8.2	8.2	31.0 31.0	31.0	98.0 97.8	97.9	7.6 7.6	7.6	7.6	0.9 0.9	0.9	1.0	4 4	4.0	4.5
				Middle	10.5	18.7 18.7	18.7	8.2 8.2	8.2	31.0 31.0	31.0	97.3 97.2	97.3	7.6 7.5	7.6		0.9 0.9	0.9		6 7	6.5	
				Bottom	20	18.7 18.7	18.7	8.2 8.2	8.2	31.0 31.0	31.0	96.7 96.5	96.6	7.5 7.5	7.5		1.2 1.2	1.2		3 3	3.0	
16-Jan-19	Fine	Moderate	07:13	Surface	1	18.8 18.8	18.8	8.1 8.1	8.1	30.6 31.0	30.8	96.0 96.6	96.3	7.5 7.5	7.5	7.5	0.7 0.7	0.7	0.8	4 4	4.0	3.7
				Middle	10.5	18.7 18.7	18.7	8.1 8.1	8.1	31.3 31.3	31.3	97.0 96.6	96.8	7.5 7.5	7.5		0.8 0.8	0.8		3 3	3.0	
				Bottom	20	18.7 18.7	18.7	8.1 8.1	8.1	31.3 31.3	31.3	96.1 96.4	96.3	7.4 7.5	7.5		0.9 0.9	0.9		4 4	4.0	
18-Jan-19	Cloudy	Calm	09:10	Surface	1	18.2 18.2	18.2	8.2 8.2	8.2	31.4 31.4	31.4	101.4 100.7	101.1	7.9 7.9	7.9	7.8	1.2 1.3	1.3	1.4	3 3	3.0	5.2
				Middle	10.5	18.2 18.2	18.2	8.2 8.2	8.2	31.4 31.4	31.4	100.2 99.8	100.0	7.8 7.8	7.8		1.3 1.4	1.4		8 9	8.5	
				Bottom	20	18.2 18.2	18.2	8.2 8.2	8.2	31.4 31.4	31.4	99.3 99.3	99.3	7.8 7.8	7.8		1.7 1.5	1.6		4 4	4.0	
22-Jan-19	Sunny	Calm	13:41	Surface	1	18.5 18.4	18.5	8.3 8.3	8.3	30.9 30.9	30.9	103.4 100.4	101.9	8.1 7.8	8.0	7.8	1.1 1.1	1.1	1.2	5 4	4.5	4.2
				Middle	10.5	18.3 18.3	18.3	8.3 8.3	8.3	30.9 30.9	30.9	99.9 99.7	99.8	7.8 7.8	7.8		1.1 1.2	1.2		<2.5 <2.5	<2.5	
				Bottom	20	18.3 18.3	18.3	8.3 8.2	8.3	30.9 30.9	30.9	98.4 99.0	98.7	7.7 7.7	7.7		1.2 1.3	1.3		6 5	5.5	
24-Jan-19	Sunny	Moderate	14:41	Surface	1	18.5 18.5	18.5	8.6 8.5	8.6	30.9 30.9	30.9	102.4 101.5	102.0	8.0 7.9	8.0	7.9	1.1 1.0	1.1	1.1	6 6	6.0	6.2
				Middle	11	18.3 18.3	18.3	8.5 8.5	8.5	30.9 30.9	30.9	100.5 100.6	100.6	7.9 7.9	7.9		1.1 1.1	1.1		7 8	7.5	
				Bottom	21	18.3 18.3	18.3	8.5 8.5	8.5	30.9 30.9	30.9	98.9 98.8	98.9	7.7 7.7	7.7		1.2 1.2	1.2		5 5	5.0	
26-Jan-19	Sunny	Calm	16:59	Surface	1	18.4 18.4	18.4	8.2 8.2	8.2	31.0 31.0	31.0	103.0 102.6	102.8	8.1 8.0	8.1	8.0	1.4 1.4	1.4	1.6	5 6	5.5	4.8
				Middle	10.5	18.3 18.3	18.3	8.2 8.2	8.2	31.0 31.0	31.0	101.8 101.7	101.8	8.0 8.0	8.0		1.3 1.4	1.4		4 4	4.0	
				Bottom	20	18.3 18.3	18.3	8.2 8.2	8.2	31.0 31.0	31.0	100.7 100.7	100.7	7.9 7.9	7.9		2.0 2.0	2.0		5 5	5.0	
28-Jan-19	Sunny	Calm	19:09	Surface	1	18.3 18.3	18.3	8.2 8.2	8.2	30.8 30.8	30.8	109.4 108.3	108.9	8.6 8.5	8.6	8.4	1.0 1.2	1.1	1.5	4 4	4.0	5.0
				Middle	10.5	18.3 18.3	18.3	8.2 8.2	8.2	30.8 30.8	30.8	107.1 107.0	107.1	8.4 8.4	8.4		1.6 1.6	1.6		6 6	6.0	
				Bottom	20	18.3 18.3	18.3	8.2 8.2	8.2	30.8 30.8	30.8	106.2 106.4	106.3	8.3 8.3	8.3		1.8 1.7	1.8		5 5	5.0	
30-Jan-19	Sunny	Moderate	07:20	Surface	1	18.3 18.3	18.3	9.7 9.9	9.8	30.2 30.2	30.2	115.4 115.5	115.5	9.1 9.1	9.1	8.9	1.6 1.6	1.6	1.8	6 6	6.0	6.8
				Middle	11.5	18.3 18.3	18.3	9.8 10.0	9.9	30.4 30.4	30.4	111.8 111.9	111.9	8.8 8.8	8.8		1.1 1.0	1.1		5 5	5.0	
				Bottom	22	18.3 18.3	18.3	9.8 10.0	9.9	30.4 30.4	30.4	110.5 109.7	110.1	8.7 8.6	8.7		2.5 2.8	2.7		9 10	9.5	

Remarks: *DA: Depth-Averaged

**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

The reporting limit for laboratory analysis of suspended solids is 2.5 mg/L. For the results below the reporting limit, the SS level will be taken as 2.5 mg/L.

Water Quality Monitoring Results at C2 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Jan-19	Cloudy	Moderate	15:59	Surface	1	19.2 19.2	19.2	8.1 8.1	8.1	32.1 32.1	32.1	98.4 98.4	98.4	7.5 7.5	7.5		2.6 2.7	2.7		3 3	3.0	
				Middle	10	19.2 19.2	19.2	8.1 8.1	8.1	32.1 32.1	32.1	97.6 97.5	97.6	7.5 7.5	7.5	7.5	2.1 2.1	2.1	2.4	3 3	3.0	3.8
				Bottom	19	19.2 19.2	19.2	8.1 8.1	8.1	32.1 32.1	32.1	97.0 97.0	97.0	7.4 7.4	7.4		2.5 2.4	2.5		6 5	5.5	
5-Jan-19	Cloudy	Calm	17:01	Surface	1	18.9 19.0	19.0	8.3 8.3	8.3	31.7 31.7	31.7	99.6 99.2	99.4	7.7 7.6	7.7		1.6 1.6	1.6		6 6	6.0	
				Middle	10.5	18.8 18.8	18.8	8.3 8.3	8.3	31.8 31.8	31.8	96.5 96.3	96.4	7.4 7.4	7.4	7.5	2.3 2.3	2.3	2.6	0 0	0.0	5.8
				Bottom	20	18.8 18.8	18.8	8.3 8.3	8.3	31.8 31.8	31.8	95.3 95.4	95.4	7.4 7.4	7.4		3.7 3.8	3.8		5 6	5.5	
8-Jan-19	Cloudy	Calm	08:36	Surface	1	18.7 18.7	18.7	8.0 8.0	8.0	31.3 31.3	31.3	98.0 97.2	97.6	7.6 7.5	7.6		3.4 3.4	3.4		6 6	6.0	
				Middle	10.5	18.7 18.7	18.7	8.0 8.0	8.0	31.3 31.3	31.3	96.9 96.6	96.8	7.5 7.5	7.5	7.5	4.8 4.9	4.9	4.6	6 7	6.5	6.8
				Bottom	20	18.7 18.7	18.7	8.0 8.0	8.0	31.3 31.3	31.3	96.2 96.3	96.3	7.5 7.5	7.5		5.3 5.4	5.4		8 8	8.0	
10-Jan-19	Sunny	Moderate	09:22	Surface	1	18.5 18.5	18.5	7.9 8.1	8.0	31.2 31.2	31.2	98.1 97.6	97.9	7.6 7.6	7.6		1.8 1.9	1.9		8 9	8.5	
				Middle	11	18.5 18.5	18.5	8.0 8.1	8.1	31.2 31.2	31.2	97.3 97.3	97.3	7.6 7.6	7.6	7.6	2.2 2.2	2.2	2.2	5 5	5.0	6.0
				Bottom	21	18.5 18.5	18.5	8.0 8.1	8.1	31.2 31.2	31.2	96.9 96.9	96.9	7.5 7.5	7.5		2.4 2.3	2.4		5 4	4.5	
12-Jan-19	Fine	Moderate	11:07	Surface	1	18.8 18.8	18.8	8.2 8.3	8.3	31.5 31.5	31.5	97.0 97.6	97.3	7.5 7.5	7.5		1.5 1.6	1.6		5 5	5.0	
				Middle	11	18.8 18.8	18.8	8.3 8.2	8.3	31.5 31.5	31.5	97.0 97.3	97.2	7.5 7.5	7.5	7.5	1.6 1.6	1.6	1.7	5 5	5.0	5.7
				Bottom	21	18.8 18.8	18.8	8.3 8.2	8.3	31.5 31.5	31.5	96.8 96.9	96.9	7.5 7.5	7.5		1.8 1.9	1.9		7 7	7.0	
14-Jan-19	Fine	Moderate	11:32	Surface	1	18.8 18.8	18.8	8.2 8.2	8.2	31.0 31.0	31.0	97.5 96.2	96.9	7.6 7.5	7.6		1.2 1.2	1.2		8 8	8.0	
				Middle	10.5	18.8 18.8	18.8	8.2 8.2	8.2	31.0 31.0	31.0	95.6 95.5	95.6	7.4 7.4	7.4	7.5	1.3 1.3	1.3	1.4	<2.5 <2.5	<2.5	6.5
				Bottom	20	18.8 18.8	18.8	8.2 8.2	8.2	31.0 31.0	31.0	95.1 95.0	95.1	7.4 7.4	7.4		1.6 1.6	1.6		9 9	9.0	
16-Jan-19	Fine	Moderate	13:53	Surface	1	18.8 18.8	18.8	8.2 8.2	8.2	31.3 31.3	31.3	98.0 97.4	97.7	7.6 7.5	7.6		0.9 0.9	0.9		5 5	5.0	
				Middle	6	18.7 18.7	18.7	8.2 8.2	8.2	31.3 31.3	31.3	97.4 97.2	97.3	7.5 7.5	7.5	7.5	0.9 0.9	0.9	0.9	3 4	3.5	4.5
				Bottom	11	18.7 18.7	18.7	8.2 8.2	8.2	31.3 31.3	31.3	97.1 97.3	97.2	7.5 7.5	7.5		0.9 0.9	0.9		5 5	5.0	
18-Jan-19	Cloudy	Calm	15:43	Surface	1	18.3 18.3	18.3	8.2 8.2	8.2	31.4 31.4	31.4	102.2 101.6	101.9	8.0 7.9	8.0		0.7 0.8	0.8		4 4	4.0	
				Middle	10.5	18.3 18.3	18.3	8.2 8.2	8.2	31.4 31.4	31.4	100.8 100.6	100.7	7.9 7.9	7.9	7.9	1.3 1.2	1.3	1.2	<2.5 <2.5	<2.5	3.0
				Bottom	20	18.3 18.3	18.3	8.2 8.2	8.2	31.4 31.4	31.4	100.1 100.1	100.1	7.8 7.8	7.8		1.5 1.4	1.5		<2.5 <2.5	<2.5	
22-Jan-19	Sunny	Calm	07:22	Surface	1	18.3 18.3	18.3	8.1 8.1	8.1	30.9 30.9	30.9	100.2 99.3	99.8	7.8 7.8	7.8		2.1 2.2	2.2		4 5	4.5	
				Middle	10.5	18.3 18.3	18.3	8.2 8.2	8.2	30.9 30.9	30.9	98.9 98.6	98.8	7.7 7.7	7.7	7.7	2.6 2.5	2.6	2.9	4 4	4.0	5.7
				Bottom	20	18.3 18.3	18.3	8.2 8.2	8.2	30.9 30.9	30.9	98.5 98.3	98.4	7.7 7.7	7.7		3.8 3.8	3.8		9 8	8.5	
24-Jan-19	Sunny	Moderate	09:42	Surface	1	18.2 18.2	18.2	8.1 8.1	8.1	30.9 30.9	30.9	98.8 98.8	98.8	7.7 7.7	7.7		1.8 1.7	1.8		5 5	5.0	
				Middle	11	18.3 18.3	18.3	8.5 8.5	8.5	30.9 30.9	30.9	100.9 100.5	100.7	7.9 7.9	7.9	7.8	1.1 1.1	1.1	1.3	4 4	4.0	6.3
				Bottom	21	18.3 18.3	18.3	8.5 8.5	8.5	30.9 30.9	30.9	98.7 98.9	98.9	7.7 7.8	7.8		1.0 1.2	1.1		10 10	10.0	
26-Jan-19	Sunny	Calm	10:19	Surface	1	18.1 18.1	18.1	8.1 8.1	8.1	31.1 31.1	31.1	101.4 100.0	100.7	8.0 7.8	7.9		2.7 2.5	2.6		7 7	7.0	
				Middle	10.5	18.1 18.1	18.1	8.1 8.1	8.1	31.1 31.1	31.1	99.3 99.0	99.2	7.8 7.8	7.8	7.8	4.0 3.7	3.9	3.6	4 4	4.0	6.7
				Bottom	20	18.1 18.1	18.1	8.1 8.1	8.1	31.1 31.1	31.1	98.5 98.7	98.6	7.7 7.7	7.7		4.1 4.2	4.2		9 9	9.0	
28-Jan-19	Sunny	Calm	12:24	Surface	1	18.3 18.3	18.3	8.2 8.2	8.2	30.8 30.8	30.8	108.6 109.3	109.0	8.5 8.6	8.6		1.0 0.9	1.0		4 4	4.0	
				Middle	10.5	18.3 18.3	18.3	8.2 8.2	8.2	30.8 30.8	30.8	107.3 107.3	107.3	8.4 8.4	8.4	8.5	1.6 1.5	1.6	1.4	6 5	5.5	5.8
				Bottom	20	18.3 18.3	18.3	8.2 8.2	8.2	30.8 30.8	30.8	106.6 106.3	106.5	8.4 8.3	8.4		1.4 1.6	1.5		8 8	8.0	
30-Jan-19	Sunny	Moderate	14:36	Surface	1	18.3 18.3	18.3	10.6 10.7	10.7	30.4 30.4	30.4	126.4 126.1	126.3	9.9 9.9	9.9		1.1 1.2	1.2		4 4	4.0	
				Middle	11.5	18.2 18.2	18.2	10.6 10.6	10.6	30.5 30.5	30.5	115.1 116.5	115.8	9.0 9.2	9.1	9.3	1.3 1.5	1.4	1.5	8 7	7.5	5.5
				Bottom	22	18.2 18.2	18.2	10.6 10.6	10.6	30.5 30.5	30.5	113.6 114.2	113.9	8.9 9.0	9.0		1.9 1.7	1.8		5 5	5.0	

Remarks: *DA: Depth-Averaged

**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

The reporting limit for laboratory analysis of suspended solids is 2.5 mg/L. For the results below the reporting limit, the SS level will be taken as 2.5 mg/L.

Water Quality Monitoring Results at WSD17 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Jan-19	Cloudy	Moderate	09:19	Surface	1	19.2 19.2	19.2	8.1 8.1	8.1	31.9 31.9	31.9	97.0 96.8	96.9	7.4 7.4	7.4	7.4	2.2 2.2	2.2	2.4	6 6	6.0	5.5
				Middle	6	19.3 19.3	19.3	8.1 8.1	8.1	32.1 32.1	32.1	96.8 96.9	96.9	7.4 7.4	7.4		2.3 2.3	2.3		4 5	4.5	
				Bottom	11	19.3 19.3	19.3	8.1 8.1	8.1	32.1 32.1	32.1	96.5 96.5	96.5	7.4 7.4	7.4		2.8 2.8	2.8		6 6	6.0	
5-Jan-19	Cloudy	Calm	11:04	Surface	1	18.8 18.8	18.8	8.3 8.2	8.3	31.8 31.8	31.8	97.6 97.4	97.5	7.5 7.5	7.5	7.5	2.1 2.0	2.1	2.5	3 3	3.0	4.7
				Middle	5.5	18.8 18.8	18.8	8.2 8.2	8.2	31.8 31.8	31.8	96.9 96.4	96.7	7.5 7.4	7.5		2.6 2.8	2.7		5 5	5.0	
				Bottom	10	18.8 18.8	18.8	8.2 8.2	8.2	31.8 31.8	31.8	95.8 95.4	95.6	7.4 7.4	7.4		2.6 2.6	2.6		6 6	6.0	
8-Jan-19	Cloudy	Calm	13:51	Surface	1	19.0 19.0	19.0	8.0 8.0	8.0	31.1 31.2	31.2	95.1 93.8	94.5	7.3 7.2	7.3	7.3	3.9 3.8	3.9	4.1	6 6	6.0	6.7
				Middle	5.5	18.8 18.8	18.8	8.0 8.0	8.0	31.3 31.3	31.3	95.2 95.1	95.2	7.4 7.4	7.4		4.0 4.0	4.0		8 8	8.0	
				Bottom	10	18.8 18.8	18.8	8.0 8.0	8.0	31.3 31.3	31.3	94.9 95.0	95.0	7.3 7.3	7.3		4.6 4.4	4.5		6 6	6.0	
10-Jan-19	Cloudy	Moderate	14:31	Surface	1	18.7 18.7	18.7	8.2 8.2	8.2	31.2 31.2	31.2	98.0 98.1	98.1	7.6 7.6	7.6	7.6	1.5 1.4	1.5	1.6	4 4	4.0	5.2
				Middle	4.5	18.6 18.6	18.6	8.2 8.2	8.2	31.2 31.2	31.2	98.1 97.8	98.0	7.6 7.6	7.6		1.6 1.5	1.6		6 7	6.5	
				Bottom	8	18.6 18.6	18.6	8.2 8.2	8.2	31.2 31.2	31.2	97.7 97.7	97.7	7.6 7.6	7.6		1.5 1.6	1.6		5 5	5.0	
12-Jan-19	Fine	Moderate	16:11	Surface	1	19.2 19.1	19.2	8.3 8.3	8.3	31.5 31.5	31.5	94.3 94.1	94.2	7.2 7.2	7.2	7.3	1.0 1.0	1.0	1.1	5 6	5.5	5.8
				Middle	4.5	19.1 19.1	19.1	8.3 8.3	8.3	31.5 31.5	31.5	94.3 94.5	94.4	7.2 7.3	7.3		1.2 1.1	1.2		4 4	4.0	
				Bottom	8	19.0 19.1	19.1	8.3 8.3	8.3	31.5 31.5	31.5	95.3 95.0	95.2	7.3 7.3	7.3		1.2 1.2	1.2		8 8	8.0	
14-Jan-19	Fine	Moderate	18:48	Surface	1	18.9 19.0	19.0	8.2 8.2	8.2	31.0 31.0	31.0	95.3 94.1	94.7	7.4 7.3	7.4	7.4	1.1 1.1	1.1	1.1	3 4	3.5	4.3
				Middle	4.5	18.9 18.9	18.9	8.2 8.2	8.2	31.0 31.0	31.0	96.1 95.5	95.8	7.4 7.4	7.4		1.1 1.2	1.2		5 5	5.0	
				Bottom	8	18.9 18.9	18.9	8.2 8.3	8.3	31.0 31.0	31.0	95.9 95.7	95.8	7.4 7.4	7.4		1.2 1.0	1.1		5 4	4.5	
16-Jan-19	Fine	Moderate	07:27	Surface	1	18.6 18.8	18.7	8.1 8.1	8.1	30.1 30.7	30.4	95.6 94.0	94.8	7.5 7.3	7.4	7.4	0.7 0.7	0.7	1.0	4 4	4.0	4.8
				Middle	6	18.8 18.8	18.8	8.1 8.1	8.1	31.3 31.3	31.3	96.1 95.1	95.6	7.4 7.4	7.4		0.9 0.9	0.9		5 5	5.0	
				Bottom	11	18.8 18.8	18.8	8.1 8.2	8.2	31.3 31.3	31.3	96.1 95.9	96.0	7.4 7.4	7.4		1.2 1.3	1.3		6 5	5.5	
18-Jan-19	Cloudy	Calm	09:26	Surface	1	18.3 18.3	18.3	8.2 8.2	8.2	31.3 31.3	31.3	98.4 99.4	98.9	7.7 7.8	7.8	7.8	1.1 1.0	1.1	1.1	4 4	4.0	4.3
				Middle	6	18.2 18.2	18.2	8.2 8.2	8.2	31.4 31.4	31.4	99.2 98.9	99.1	7.8 7.7	7.8		1.0 1.0	1.0		5 5	5.0	
				Bottom	11	18.2 18.2	18.2	8.2 8.2	8.2	31.4 31.4	31.4	99.7 99.6	99.7	7.8 7.8	7.8		1.2 1.3	1.3		4 4	4.0	
22-Jan-19	Sunny	Calm	13:12	Surface	1	18.5 18.5	18.5	8.2 8.2	8.2	30.9 30.9	30.9	100.7 98.7	99.7	7.9 7.7	7.8	7.8	1.2 1.1	1.2	1.2	5 4	4.5	5.8
				Middle	4.5	18.4 18.5	18.5	8.2 8.2	8.2	30.9 30.9	30.9	99.8 98.8	99.3	7.8 7.7	7.8		1.1 1.1	1.1		5 5	5.0	
				Bottom	8	18.4 18.4	18.4	8.2 8.2	8.2	30.9 30.9	30.9	99.7 99.2	99.5	7.8 7.7	7.8		1.2 1.2	1.2		8 8	8.0	
24-Jan-19	Sunny	Moderate	14:15	Surface	1	18.7 18.7	18.7	8.6 8.6	8.6	30.9 30.9	30.9	100.2 99.8	100.0	7.8 7.8	7.8	7.7	1.0 1.1	1.1	1.1	4 4	4.0	4.2
				Middle	4.5	18.6 18.6	18.6	8.6 8.6	8.6	30.9 30.9	30.9	99.0 99.0	99.0	7.7 7.7	7.7		1.1 1.1	1.1		4 4	4.0	
				Bottom	8	18.3 18.3	18.3	8.6 8.6	8.6	30.9 30.9	30.9	98.4 98.5	98.5	7.7 7.7	7.7		1.2 1.2	1.2		5 4	4.5	
26-Jan-19	Sunny	Calm	16:46	Surface	1	18.4 18.4	18.4	8.1 8.2	8.2	30.6 30.8	30.7	96.2 96.1	96.2	7.5 7.5	7.5	7.5	2.5 2.4	2.5	2.0	6 5	5.5	5.0
				Middle	6	18.4 18.4	18.4	8.2 8.2	8.2	30.9 30.9	30.9	96.5 96.3	96.4	7.5 7.5	7.5		1.7 1.9	1.8		5 4	4.5	
				Bottom	11	18.3 18.3	18.3	8.2 8.2	8.2	31.0 31.0	31.0	96.9 97.6	97.3	7.6 7.6	7.6		1.7 1.8	1.8		5 5	5.0	
28-Jan-19	Sunny	Calm	18:57	Surface	1	18.3 18.3	18.3	8.2 8.2	8.2	30.8 30.8	30.8	106.7 107.0	106.9	8.4 8.4	8.4	8.3	1.7 1.5	1.6	1.8	6 6	6.0	5.5
				Middle	6	18.3 18.3	18.3	8.2 8.2	8.2	30.8 30.8	30.8	106.5 106.3	106.4	8.3 8.3	8.3		1.7 1.8	1.8		7 7	7.0	
				Bottom	11	18.3 18.3	18.3	8.2 8.2	8.2	30.8 30.8	30.8	105.9 105.7	105.8	8.3 8.3	8.3		2.0 1.9	2.0		4 3	3.5	
30-Jan-19	Sunny	Moderate	07:39	Surface	1	18.4 18.4	18.4	9.7 10.0	9.9	30.3 30.3	30.3	109.5 112.4	111.0	8.6 8.8	8.7	8.8	1.8 1.6	1.7	1.5	5 5	5.0	6.2
				Middle	5.5	18.3 18.3	18.3	9.9 10.1	10.0	30.4 30.4	30.4	112.4 112.5	112.5	8.8 8.8	8.8		1.4 1.6	1.5		6 7	6.5	
				Bottom	10	18.3 18.3	18.3	9.9 10.1	10.0	30.4 30.4	30.4	111.6 111.8	111.7	8.8 8.8	8.8		1.5 1.3	1.4		7 7	7.0	

Remarks: *DA: Depth-Averaged

**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Water Quality Monitoring Results at WSD17 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Jan-19	Cloudy	Moderate	15:20	Surface	1	19.3 19.3	19.3	8.1 8.1	8.1	32.1 32.0	32.1	97.6 97.1	97.4	7.5 7.4	7.5	7.4	1.8 1.9	1.9	2.0	7 7	7.0	6.5
				Middle	4	19.3 19.3	19.3	8.1 8.1	8.1	32.0 32.0	32.0	96.9 96.5	96.7	7.4 7.4	7.4		1.9 1.9	1.9		7 6	6.5	
				Bottom	7	19.3 19.3	19.3	8.1 8.1	8.1	32.1 32.0	32.1	97.0 96.7	96.9	7.4 7.4	7.4		2.1 2.0	2.1		6 6	6.0	
5-Jan-19	Cloudy	Calm	16:22	Surface	1	19.3 19.2	19.3	8.2 8.2	8.2	31.9 31.9	31.9	95.2 94.2	94.7	7.3 7.2	7.3	7.3	1.5 1.7	1.6	2.1	4 4	4.0	6.5
				Middle	4.5	19.0 19.0	19.0	8.2 8.2	8.2	31.9 31.9	31.9	94.4 94.1	94.3	7.3 7.2	7.3		2.2 2.1	2.2		9 9	9.0	
				Bottom	8	19.0 19.1	19.1	8.2 8.2	8.2	31.9 31.9	31.9	93.7 93.3	93.5	7.2 7.2	7.2		2.5 2.3	2.4		6 7	6.5	
8-Jan-19	Cloudy	Calm	08:29	Surface	1	18.7 18.7	18.7	8.0 8.0	8.0	31.2 31.2	31.2	99.7 98.4	99.1	7.7 7.6	7.7	7.6	4.3 4.1	4.2	4.8	4 4	4.0	6.2
				Middle	5.5	18.7 18.7	18.7	8.0 8.0	8.0	31.2 31.2	31.2	98.4 98.3	98.4	7.6 7.6	7.6		5.2 4.8	5.0		6 7	6.5	
				Bottom	10	18.7 18.7	18.7	8.0 8.0	8.0	31.2 31.2	31.2	97.5 98.0	97.8	7.6 7.6	7.6		5.5 4.9	5.2		8 8	8.0	
10-Jan-19	Sunny	Moderate	09:31	Surface	1	18.4 18.5	18.5	8.2 8.2	8.2	31.3 31.2	31.3	100.2 97.5	98.9	7.8 7.6	7.7	7.6	2.2 2.2	2.2	2.3	6 6	6.0	5.5
				Middle	6	18.5 18.5	18.5	8.2 8.2	8.2	31.2 31.2	31.2	97.9 97.8	97.9	7.6 7.6	7.6		2.1 2.1	2.1		5 6	5.5	
				Bottom	11	18.5 18.5	18.5	8.2 8.2	8.2	31.2 31.2	31.2	97.3 97.4	97.4	7.6 7.6	7.6		2.5 2.4	2.5		5 5	5.0	
12-Jan-19	Fine	Moderate	11:16	Surface	1	19.0 18.9	19.0	8.3 8.3	8.3	31.5 31.5	31.5	95.6 95.0	95.3	7.4 7.3	7.4	7.3	1.1 1.2	1.2	1.4	4 4	4.0	6.7
				Middle	6	18.9 18.9	18.9	8.3 8.2	8.3	31.5 31.5	31.5	94.6 94.9	94.8	7.3 7.3	7.3		1.4 1.4	1.4		8 8	8.0	
				Bottom	11	18.9 18.9	18.9	8.3 8.2	8.3	31.5 31.5	31.5	94.1 94.5	94.3	7.3 7.3	7.3		1.6 1.5	1.6		8 8	8.0	
14-Jan-19	Fine	Moderate	11:48	Surface	1	18.9 18.9	18.9	8.2 8.2	8.2	31.0 31.0	31.0	96.2 95.2	95.7	7.4 7.4	7.4	7.4	1.7 1.6	1.7	1.9	5 5	5.0	3.7
				Middle	6	18.9 18.9	18.9	8.2 8.2	8.2	31.0 31.0	31.0	95.2 94.9	95.1	7.4 7.4	7.4		1.9 1.8	1.9		3 3	3.0	
				Bottom	11	18.9 18.9	18.9	8.2 8.2	8.2	31.0 31.0	31.0	94.6 94.6	94.6	7.3 7.3	7.3		2.2 2.0	2.1		3 3	3.0	
16-Jan-19	Fine	Moderate	13:22	Surface	1	19.0 19.0	19.0	8.3 8.2	8.3	31.3 31.3	31.3	94.3 94.0	94.2	7.3 7.3	7.3	7.3	0.8 0.8	0.8	0.9	4 5	4.5	4.2
				Middle	4.5	18.9 18.9	18.9	8.3 8.2	8.3	31.3 31.3	31.3	94.4 94.1	94.3	7.3 7.3	7.3		0.8 0.8	0.8		4 4	4.0	
				Bottom	8	18.9 18.9	18.9	8.2 8.2	8.2	31.3 31.3	31.3	94.8 94.6	94.7	7.3 7.3	7.3		1.1 1.2	1.2		4 4	4.0	
18-Jan-19	Cloudy	Calm	15:08	Surface	1	18.3 18.4	18.4	8.2 8.2	8.2	31.4 31.4	31.4	106.0 104.3	105.2	8.3 8.1	8.2	8.1	1.6 1.7	1.7	1.6	<2.5 <2.5	<2.5	4.0
				Middle	4.5	18.4 18.4	18.4	8.2 8.2	8.2	31.4 31.4	31.4	104.5 102.9	103.7	8.1 8.0	8.1		1.5 1.7	1.6		<2.5 <2.5	<2.5	
				Bottom	8	18.4 18.4	18.4	8.2 8.2	8.2	31.4 31.4	31.4	103.7 102.6	103.2	8.1 8.0	8.1		1.5 1.6	1.6		7 7	7.0	
22-Jan-19	Sunny	Calm	07:36	Surface	1	18.3 18.3	18.3	8.2 8.2	8.2	30.9 30.9	30.9	101.0 99.0	100.0	7.9 7.7	7.8	7.8	1.8 1.7	1.8	2.0	6 5	5.5	6.0
				Middle	6	18.3 18.3	18.3	8.2 8.2	8.2	30.9 30.9	30.9	99.2 98.5	98.9	7.8 7.7	7.8		1.9 1.8	1.9		7 7	7.0	
				Bottom	11	18.3 18.3	18.3	8.2 8.2	8.2	30.9 30.9	30.9	98.3 98.1	98.2	7.7 7.7	7.7		2.3 2.5	2.4		6 5	5.5	
24-Jan-19	Sunny	Moderate	09:53	Surface	1	18.3 18.3	18.3	8.2 8.2	8.2	30.9 30.9	30.9	98.6 98.3	98.5	7.7 7.7	7.7	7.6	2.1 2.1	2.1	2.0	7 7	7.0	6.3
				Middle	6	18.3 18.3	18.3	8.2 8.2	8.2	30.9 30.9	30.9	97.7 97.6	97.7	7.6 7.6	7.6		2.1 2.0	2.1		6 6	6.0	
				Bottom	11	18.3 18.3	18.3	8.2 8.2	8.2	30.9 30.9	30.9	97.5 97.5	97.5	7.6 7.6	7.6		1.9 1.9	1.9		6 6	6.0	
26-Jan-19	Sunny	Calm	10:33	Surface	1	18.2 18.2	18.2	8.1 8.2	8.2	31.1 31.1	31.1	100.5 99.4	100.0	7.9 7.8	7.9	7.8	3.1 3.2	3.2	3.0	4 4	4.0	6.0
				Middle	6	18.2 18.2	18.2	8.1 8.2	8.2	31.1 31.1	31.1	99.5 99.2	99.4	7.8 7.8	7.8		2.7 2.5	2.6		8 8	8.0	
				Bottom	11	18.2 18.2	18.2	8.1 8.2	8.2	31.1 31.1	31.1	98.9 98.5	98.7	7.8 7.7	7.8		3.1 3.5	3.3		6 6	6.0	
28-Jan-19	Sunny	Calm	12:13	Surface	1	18.4 18.3	18.4	8.2 8.2	8.2	30.7 30.8	30.8	108.1 107.2	107.7	8.5 8.4	8.5	8.4	1.7 1.4	1.6	1.7	4 4	4.0	5.3
				Middle	6	18.3 18.3	18.3	8.3 8.2	8.3	30.8 30.8	30.8	106.3 106.7	106.5	8.3 8.4	8.4		1.6 1.6	1.6		7 6	6.5	
				Bottom	11	18.3 18.3	18.3	8.2 8.2	8.2	30.8 30.8	30.8	105.8 105.9	105.9	8.3 8.3	8.3		1.8 1.8	1.8		6 5	5.5	
30-Jan-19	Sunny	Moderate	13:59	Surface	1	18.7 18.7	18.7	11.0 10.9	11.0	30.2 30.2	30.2	123.2 123.2	123.2	9.6 9.6	9.6	9.1	1.2 1.1	1.2	1.9	6 7	6.5	6.2
				Middle	5	18.6 18.6	18.6	11.0 10.9	11.0	30.2 30.2	30.2	120.6 119.7	120.2	9.4 9.4	9.4		1.2 1.2	1.2		6 7	6.5	
				Bottom	9	18.5 18.5	18.5	11.0 10.8	10.9	30.3 30.3	30.3	106.8 105.7	106.3	8.4 8.3	8.4		3.2 3.5	3.4		5 6	5.5	

Remarks: *DA: Depth-Averaged

**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

The reporting limit for laboratory analysis of suspended solids is 2.5 mg/L. For the results below the reporting limit, the SS level will be taken as 2.5 mg/L.

Water Quality Monitoring Results at WSD9 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Jan-19	Cloudy	Moderate	09:35	Surface	1	19.3 19.3	19.3	8.1 8.1	8.1	32.0 32.0	32.0	96.1 95.1	95.6	7.3 7.3	7.3	7.3	2.0 1.9	2.0	2.0	5 4	4.5	6.0
				Middle	4	19.3 19.3	19.3	8.1 8.1	8.1	32.0 32.1	32.1	95.5 94.8	95.2	7.3 7.2	7.3		1.9 1.9	1.9		6 5	5.5	
				Bottom	7	19.3 19.3	19.3	8.1 8.1	8.1	32.0 32.1	32.1	95.7 95.0	95.4	7.3 7.2	7.3		2.3 2.1	2.2		8 8	8.0	
5-Jan-19	Cloudy	Calm	11:25	Surface	1	19.2 19.0	19.1	8.3 8.2	8.3	31.7 31.8	31.8	96.6 96.0	96.3	7.4 7.4	7.4	7.4	1.5 1.7	1.6	1.9	8 8	8.0	5.2
				Middle	4.5	18.9 18.9	18.9	8.3 8.2	8.3	31.8 31.8	31.8	96.0 96.1	96.1	7.4 7.4	7.4		1.9 2.1	2.0		3 4	3.5	
				Bottom	8	18.9 18.9	18.9	8.2 8.2	8.2	31.8 31.9	31.9	95.8 95.1	95.5	7.4 7.3	7.4		2.1 2.1	2.1		4 4	4.0	
8-Jan-19	Cloudy	Calm	14:17	Surface	1	18.9 18.9	18.9	8.0 8.0	8.0	31.3 31.3	31.3	95.6 95.3	95.5	7.4 7.4	7.4	7.4	3.7 3.9	3.8	3.9	4 4	4.0	5.0
				Middle	4.5	18.9 18.9	18.9	8.0 8.0	8.0	31.3 31.3	31.3	95.2 95.1	95.2	7.4 7.3	7.4		3.8 3.8	3.8		4 4	4.0	
				Bottom	8	18.9 18.9	18.9	8.0 8.0	8.0	31.3 31.3	31.3	94.9 94.8	94.9	7.3 7.3	7.3		3.9 4.0	4.0		7 7	7.0	
10-Jan-19	Cloudy	Moderate	14:41	Surface	1	18.7 18.6	18.7	8.2 8.2	8.2	31.0 31.1	31.1	95.5 97.5	96.5	7.4 7.6	7.5	7.5	1.1 1.1	1.1	1.6	5 5	5.0	5.3
				Middle	6	18.6 18.6	18.6	8.2 8.2	8.2	31.2 31.1	31.2	95.9 96.7	96.3	7.5 7.5	7.5		1.7 1.7	1.7		5 5	5.0	
				Bottom	11	18.5 18.5	18.5	8.2 8.2	8.2	31.2 31.2	31.2	97.0 96.8	96.9	7.5 7.5	7.5		2.1 1.8	2.0		6 6	6.0	
12-Jan-19	Fine	Moderate	16:25	Surface	1	19.2 19.1	19.2	8.2 8.2	8.2	31.4 31.5	31.5	94.1 95.4	94.8	7.2 7.3	7.3	7.4	1.3 1.1	1.2	1.4	5 5	5.0	4.3
				Middle	6	18.8 18.9	18.9	8.3 8.2	8.3	31.5 31.5	31.5	95.2 94.7	95.0	7.4 7.3	7.4		1.4 1.5	1.5		4 4	4.0	
				Bottom	11	18.8 18.8	18.8	8.3 8.2	8.3	31.5 31.5	31.5	96.6 95.8	96.2	7.5 7.4	7.5		1.5 1.6	1.6		4 4	4.0	
14-Jan-19	Fine	Moderate	19:09	Surface	1	19.0 18.9	19.0	8.2 8.2	8.2	30.9 30.9	30.9	93.1 94.6	93.9	7.2 7.3	7.3	7.4	1.4 1.5	1.5	1.3	<2.5 <2.5	<2.5	5.3
				Middle	6	18.8 18.9	18.9	8.2 8.2	8.2	31.0 31.0	31.0	95.8 95.3	95.6	7.4 7.4	7.4		1.2 1.1	1.2		7 7	7.0	
				Bottom	11	18.8 18.8	18.8	8.2 8.2	8.2	31.0 31.0	31.0	95.3 95.2	95.3	7.4 7.4	7.4		1.3 1.3	1.3		7 6	6.5	
16-Jan-19	Fine	Moderate	07:45	Surface	1	18.9 18.9	18.9	8.1 8.1	8.1	31.2 31.2	31.2	93.7 92.7	93.2	7.2 7.2	7.2	7.3	0.9 0.9	0.9	1.0	7 8	7.5	4.7
				Middle	4.5	18.9 18.9	18.9	8.1 8.1	8.1	31.3 31.3	31.3	94.9 94.2	94.6	7.3 7.3	7.3		1.0 1.1	1.1		3 3	3.0	
				Bottom	8	18.9 18.9	18.9	8.1 8.1	8.1	31.3 31.3	31.3	94.6 94.4	94.5	7.3 7.3	7.3		1.1 1.0	1.1		4 3	3.5	
18-Jan-19	Cloudy	Calm	09:44	Surface	1	18.4 18.4	18.4	8.2 8.2	8.2	31.3 31.4	31.4	99.1 97.9	98.5	7.7 7.6	7.7	7.7	1.6 1.4	1.5	1.3	11 10	10.5	6.8
				Middle	4.5	18.3 18.3	18.3	8.2 8.2	8.2	31.4 31.4	31.4	98.4 98.1	98.3	7.7 7.7	7.7		1.3 1.2	1.3		3 3	3.0	
				Bottom	8	18.2 18.2	18.2	8.2 8.2	8.2	31.4 31.4	31.4	99.3 99.0	99.2	7.8 7.7	7.8		1.1 1.1	1.1		7 7	7.0	
22-Jan-19	Sunny	Calm	13:30	Surface	1	18.4 18.4	18.4	8.4 8.3	8.4	30.9 30.9	30.9	102.1 99.6	100.9	8.0 7.8	7.9	7.8	1.4 1.4	1.4	1.6	6 5	5.5	4.8
				Middle	6	18.4 18.3	18.4	8.4 8.3	8.4	30.9 30.9	30.9	100.5 98.9	99.7	7.9 7.7	7.8		1.4 1.2	1.3		7 6	6.5	
				Bottom	11	18.3 18.3	18.3	8.4 8.3	8.4	30.9 30.9	30.9	99.2 98.5	98.9	7.8 7.7	7.8		2.0 1.9	2.0		<2.5 <2.5	<2.5	
24-Jan-19	Sunny	Moderate	14:30	Surface	1	18.5 18.5	18.5	8.6 8.6	8.6	30.6 30.9	30.8	98.3 99.8	99.1	7.7 7.8	7.8	7.7	1.4 1.3	1.4	1.5	7 7	7.0	5.3
				Middle	6	18.4 18.4	18.4	8.6 8.6	8.6	30.9 30.9	30.9	98.4 98.3	98.4	7.7 7.7	7.7		1.4 1.3	1.4		3 4	3.5	
				Bottom	11	18.3 18.3	18.3	8.6 8.6	8.6	30.9 30.9	30.9	98.2 98.3	98.3	7.7 7.7	7.7		1.6 1.6	1.6		5 6	5.5	
26-Jan-19	Sunny	Calm	15:08	Surface	1	18.4 18.4	18.4	8.1 8.1	8.1	30.9 30.9	30.9	94.6 94.8	94.7	7.4 7.4	7.4	7.4	2.2 2.2	2.2	2.2	5 5	5.0	5.5
				Middle	4.5	18.4 18.4	18.4	8.1 8.1	8.1	30.9 30.9	30.9	94.6 94.6	94.6	7.4 7.4	7.4		2.3 2.2	2.3		5 5	5.0	
				Bottom	8	18.4 18.4	18.4	8.1 8.1	8.1	30.9 30.9	30.9	94.0 93.9	94.0	7.3 7.3	7.3		2.0 1.9	2.0		7 6	6.5	
28-Jan-19	Sunny	Calm	18:37	Surface	1	18.4 18.4	18.4	8.2 8.2	8.2	30.7 30.7	30.7	105.3 105.0	105.2	8.2 8.2	8.2	8.2	1.3 1.3	1.3	1.3	8 8	8.0	6.7
				Middle	4.5	18.4 18.4	18.4	8.2 8.2	8.2	30.7 30.7	30.7	104.4 104.7	104.6	8.2 8.2	8.2		1.3 1.4	1.4		4 4	4.0	
				Bottom	8	18.4 18.4	18.4	8.2 8.2	8.2	30.8 30.8	30.8	104.5 104.8	104.7	8.2 8.2	8.2		1.2 1.2	1.2		8 8	8.0	
30-Jan-19	Sunny	Moderate	07:57	Surface	1	18.5 18.5	18.5	9.6 9.9	9.8	30.2 30.0	30.1	108.7 109.0	108.9	8.5 8.5	8.5	8.4	1.4 1.2	1.3	1.6	5 6	5.5	5.8
				Middle	4.5	18.4 18.4	18.4	9.8 9.9	9.9	30.3 30.3	30.3	107.5 107.6	107.6	8.4 8.4	8.4		1.6 1.8	1.7		4 4	4.0	
				Bottom	8	18.4 18.4	18.4	9.9 10.0	10.0	30.3 30.4	30.4	107.5 107.5	107.5	8.4 8.4	8.4		1.9 1.8	1.9		8 8	8.0	

Remarks: *DA: Depth-Averaged

**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

The reporting limit for laboratory analysis of suspended solids is 2.5 mg/L. For the results below the reporting limit, the SS level will be taken as 2.5 mg/L.

Water Quality Monitoring Results at WSD9 - Mid-Flood Tide

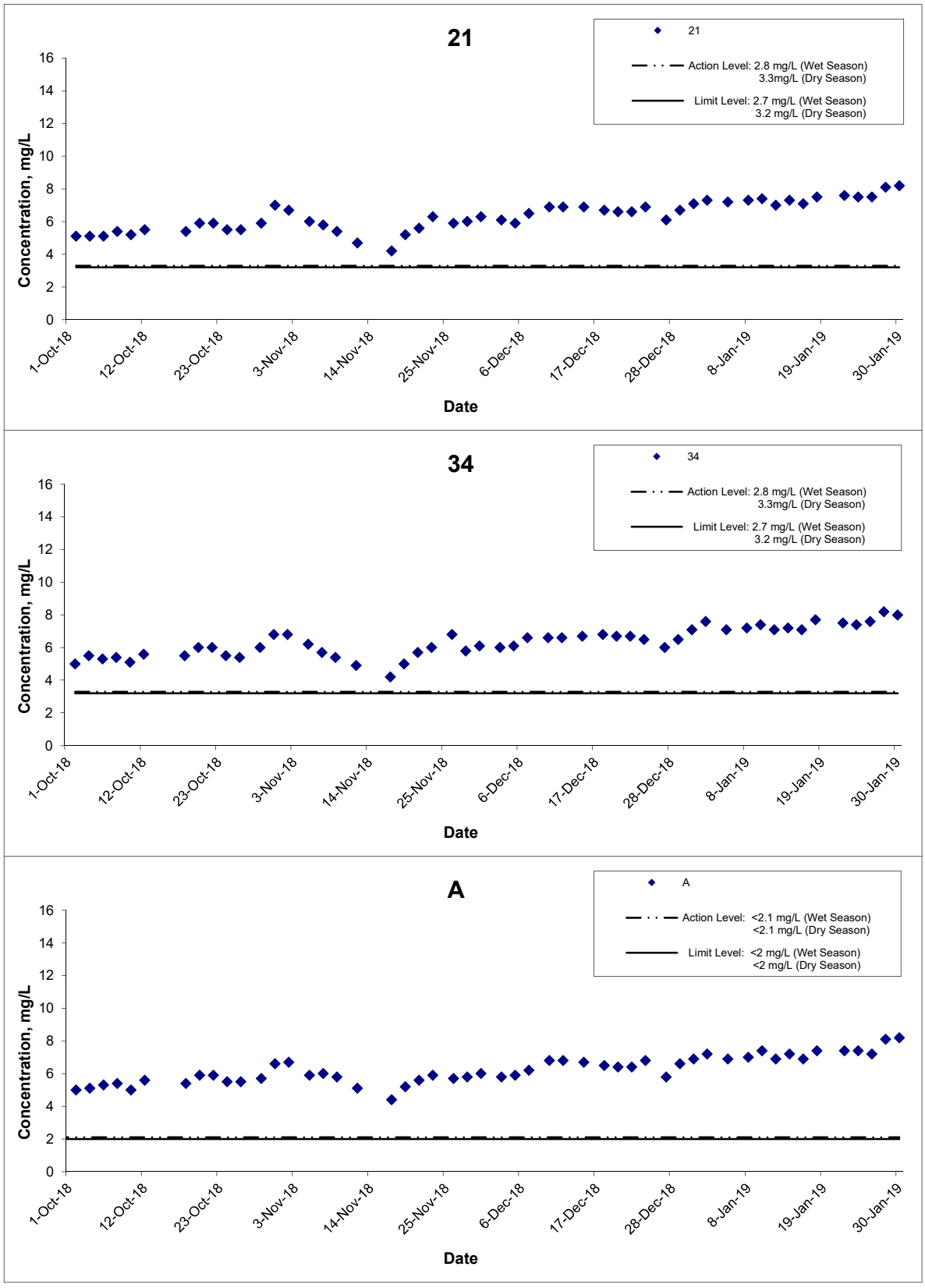
Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
2-Jan-19	Cloudy	Moderate	15:41	Surface	1	19.2 19.2	19.2	8.1 8.1	8.1	31.9 31.9	31.9	95.8 95.7	95.8	7.3 7.3	7.3	7.4	2.2 2.2	2.2	2.3	8 8	8.0	6.7
				Middle	6	19.3 19.3	19.3	8.1 8.1	8.1	32.1 32.1	32.1	96.5 96.5	96.5	7.4 7.4	7.4		2.1 2.1	2.1		4 4	4.0	
				Bottom	11	19.3 19.3	19.3	8.1 8.1	8.1	32.1 32.1	32.1	96.5 96.5	96.5	7.4 7.4	7.4		2.7 2.7	2.7		8 8	8.0	
5-Jan-19	Cloudy	Calm	16:46	Surface	1	19.0 19.0	19.0	8.3 8.2	8.3	31.7 31.7	31.7	95.6 94.9	95.3	7.4 7.3	7.4	7.3	1.8 2.0	1.9	2.3	3 4	3.5	4.5
				Middle	5.5	19.1 19.0	19.1	8.3 8.2	8.3	31.8 31.8	31.8	95.2 94.7	95.0	7.3 7.3	7.3		2.4 2.4	2.4		5 5	5.0	
				Bottom	10	19.1 19.1	19.1	8.2 8.2	8.2	31.9 31.9	31.9	94.4 94.2	94.3	7.2 7.2	7.2		2.7 2.7	2.7		5 5	5.0	
8-Jan-19	Cloudy	Calm	08:52	Surface	1	19.0 19.0	19.0	8.0 8.0	8.0	31.4 31.3	31.4	94.3 92.5	93.4	7.3 7.1	7.2	7.2	3.7 3.5	3.6	3.6	7 7	7.0	6.8
				Middle	4.5	19.0 19.0	19.0	8.0 8.0	8.0	31.4 31.3	31.4	92.9 92.3	92.6	7.2 7.1	7.2		3.5 3.5	3.5		6 7	6.5	
				Bottom	8	19.0 19.0	19.0	8.0 8.0	8.0	31.3 31.3	31.3	92.5 92.0	92.3	7.1 7.1	7.1		3.5 3.6	3.6		7 7	7.0	
10-Jan-19	Sunny	Moderate	09:44	Surface	1	18.8 18.8	18.8	8.1 8.1	8.1	31.2 31.2	31.2	95.5 93.8	94.7	7.4 7.3	7.4	7.3	1.7 1.8	1.8	1.8	5 6	5.5	6.0
				Middle	4.5	18.8 18.8	18.8	8.1 8.1	8.1	31.2 31.2	31.2	94.3 93.9	94.1	7.3 7.3	7.3		1.7 1.8	1.8		8 8	8.0	
				Bottom	8	18.8 18.8	18.8	8.1 8.1	8.1	31.2 31.2	31.2	93.7 93.6	93.7	7.3 7.2	7.3		1.9 1.8	1.9		4 5	4.5	
12-Jan-19	Fine	Moderate	11:30	Surface	1	19.2 19.2	19.2	8.4 8.4	8.4	31.5 31.4	31.5	93.1 92.6	92.9	7.1 7.1	7.1	7.1	1.2 1.2	1.2	1.3	7 8	7.5	5.7
				Middle	4.5	19.2 19.2	19.2	8.5 8.3	8.4	31.4 31.4	31.4	92.7 92.6	92.7	7.1 7.1	7.1		1.2 1.3	1.3		6 5	5.5	
				Bottom	8	19.2 19.2	19.2	8.4 8.3	8.4	31.4 31.4	31.4	92.1 92.4	92.3	7.1 7.1	7.1		1.3 1.4	1.4		4 4	4.0	
14-Jan-19	Fine	Moderate	12:04	Surface	1	19.0 19.0	19.0	8.2 8.2	8.2	31.0 31.0	31.0	94.9 93.4	94.2	7.3 7.2	7.3	7.2	1.1 1.3	1.2	1.2	3 4	3.5	5.2
				Middle	4.5	19.0 19.0	19.0	8.2 8.2	8.2	31.0 31.0	31.0	93.5 93.2	93.4	7.2 7.2	7.2		1.2 1.2	1.2		6 6	6.0	
				Bottom	8	19.0 19.0	19.0	8.2 8.2	8.2	31.0 31.0	31.0	92.6 92.3	92.5	7.2 7.1	7.2		1.2 1.2	1.2		6 6	6.0	
16-Jan-19	Fine	Moderate	13:40	Surface	1	19.0 18.9	19.0	8.2 8.2	8.2	31.0 31.0	31.0	97.6 97.2	97.4	7.5 7.5	7.5	7.5	0.8 0.8	0.8	0.9	4 4	4.0	4.0
				Middle	10.5	18.7 18.7	18.7	8.2 8.2	8.2	31.3 31.3	31.3	96.4 96.1	96.3	7.5 7.4	7.5		1.0 1.0	1.0		3 3	3.0	
				Bottom	20	18.7 18.7	18.7	8.2 8.2	8.2	31.3 31.3	31.3	96.2 96.1	96.2	7.4 7.4	7.4		1.0 1.0	1.0		5 5	5.0	
18-Jan-19	Cloudy	Calm	15:29	Surface	1	18.3 18.3	18.3	8.2 8.2	8.2	31.3 31.3	31.3	101.8 101.5	101.7	7.9 7.9	7.9	7.9	1.9 1.9	1.9	1.8	4 4	4.0	3.3
				Middle	6	18.3 18.3	18.3	8.2 8.2	8.2	31.3 31.3	31.3	101.3 101.0	101.2	7.9 7.9	7.9		1.4 1.4	1.4		3 4	3.5	
				Bottom	11	18.3 18.3	18.3	8.2 8.2	8.2	31.3 31.3	31.3	100.4 100.4	100.4	7.8 7.8	7.8		2.0 2.0	2.0		<2.5 <2.5	<2.5	
22-Jan-19	Sunny	Calm	07:55	Surface	1	18.6 18.6	18.6	8.1 8.1	8.1	30.9 30.9	30.9	96.8 93.9	95.4	7.5 7.3	7.4	7.4	1.7 1.6	1.7	1.8	10 9	9.5	6.3
				Middle	4.5	18.5 18.6	18.6	8.1 8.1	8.1	30.9 30.9	30.9	94.8 93.4	94.1	7.4 7.3	7.4		1.7 1.7	1.7		4 4	4.0	
				Bottom	8	18.5 18.5	18.5	8.1 8.1	8.1	30.9 30.9	30.9	94.0 93.2	93.6	7.3 7.3	7.3		2.0 1.9	2.0		6 5	5.5	
24-Jan-19	Sunny	Moderate	10:06	Surface	1	18.4 18.4	18.4	8.2 8.2	8.2	30.8 30.8	30.8	94.6 94.5	94.6	7.4 7.4	7.4	7.4	1.7 1.7	1.7	1.8	5 5	5.0	5.2
				Middle	4.5	18.4 18.4	18.4	8.2 8.2	8.2	30.8 30.8	30.8	94.3 94.3	94.3	7.4 7.4	7.4		1.9 1.9	1.9		5 5	5.0	
				Bottom	8	18.4 18.4	18.4	8.2 8.2	8.2	30.8 30.8	30.8	94.1 94.1	94.1	7.4 7.4	7.4		1.8 1.8	1.8		5 6	5.5	
26-Jan-19	Sunny	Calm	12:11	Surface	1	18.4 18.4	18.4	8.1 8.1	8.1	30.9 30.9	30.9	95.1 94.6	94.9	7.4 7.4	7.4	7.4	1.7 1.8	1.8	1.9	<2.5 <2.5	<2.5	3.7
				Middle	4.5	18.4 18.4	18.4	8.1 8.1	8.1	30.9 30.9	30.9	94.5 94.4	94.5	7.4 7.4	7.4		1.9 2.0	2.0		4 4	4.0	
				Bottom	8	18.4 18.4	18.4	8.1 8.1	8.1	30.9 30.9	30.9	94.2 94.2	94.2	7.4 7.4	7.4		1.9 2.0	2.0		5 4	4.5	
28-Jan-19	Sunny	Calm	12:40	Surface	1	18.4 18.4	18.4	8.3 8.3	8.3	30.7 30.7	30.7	106.1 107.2	106.7	8.3 8.4	8.4	8.3	1.4 1.2	1.3	1.3	6 6	6.0	6.5
				Middle	4.5	18.4 18.4	18.4	8.3 8.2	8.3	30.7 30.7	30.7	106.4 106.8	106.6	8.3 8.3	8.3		1.3 1.3	1.3		5 4	4.5	
				Bottom	8	18.4 18.4	18.4	8.3 8.2	8.3	30.7 30.7	30.7	106.1 106.6	106.4	8.3 8.3	8.3		1.3 1.2	1.3		9 9	9.0	
30-Jan-19	Sunny	Moderate	14:21	Surface	1	18.3 18.4	18.4	10.8 10.8	10.8	30.4 30.4	30.4	116.6 118.5	117.6	9.1 9.3	9.2	9.1	1.6 1.6	1.6	1.8	5 5	5.0	5.3
				Middle	6.5	18.3 18.3	18.3	10.9 10.8	10.9	30.4 30.4	30.4	116.4 116.3	116.4	9.1 9.1	9.1		1.7 1.7	1.7		5 5	5.0	
				Bottom	12	18.3 18.3	18.3	10.9 10.7	10.8	30.4 30.4	30.4	115.0 114.7	114.9	9.0 9.0	9.0		1.9 2.0	2.0		6 6	6.0	

Remarks: *DA: Depth-Averaged

**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

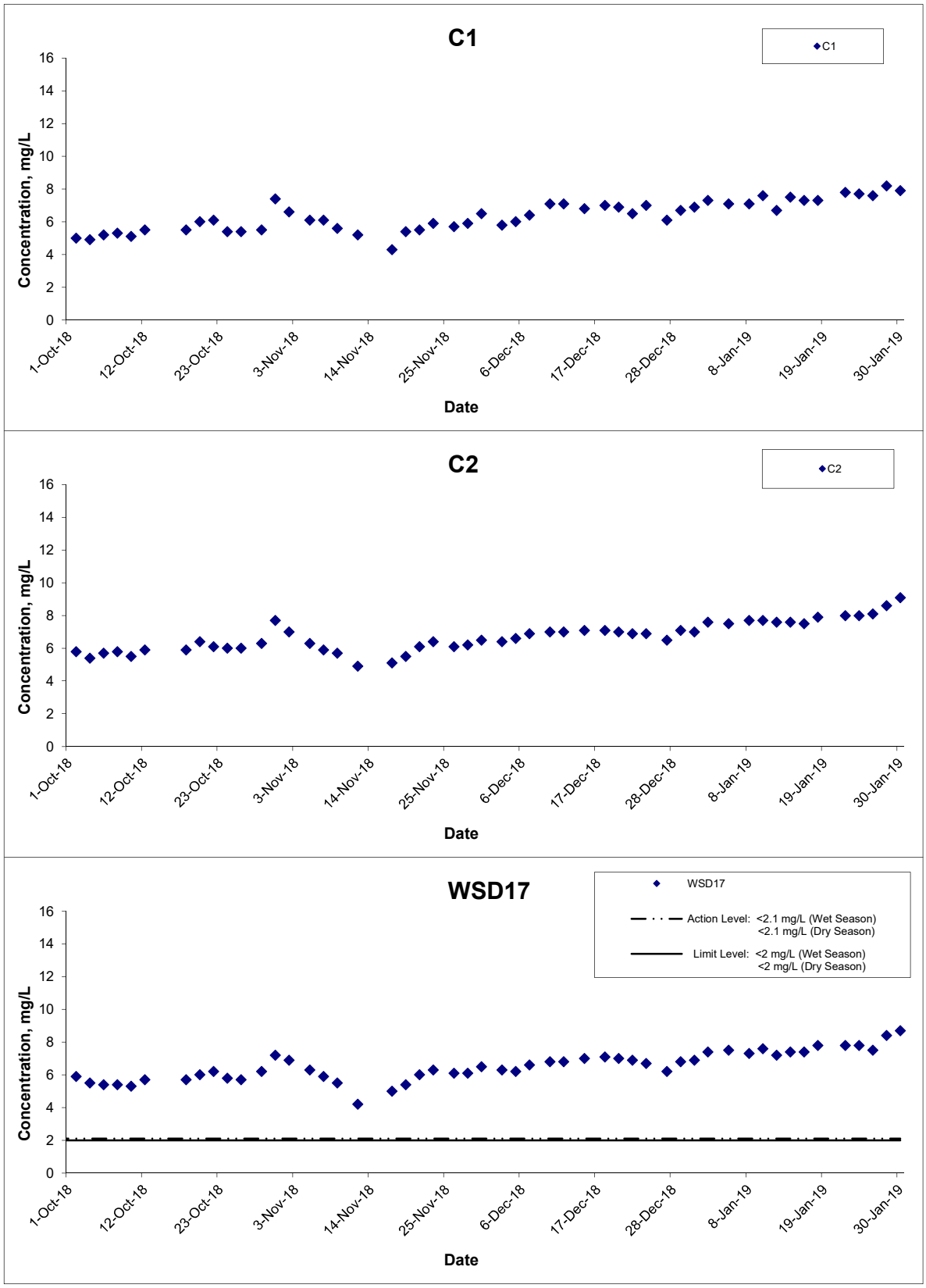
The reporting limit for laboratory analysis of suspended solids is 2.5 mg/L. For the results below the reporting limit, the SS level will be taken as 2.5 mg/L.

Dissolved Oxygen (Surface) at Mid-Ebb Tide



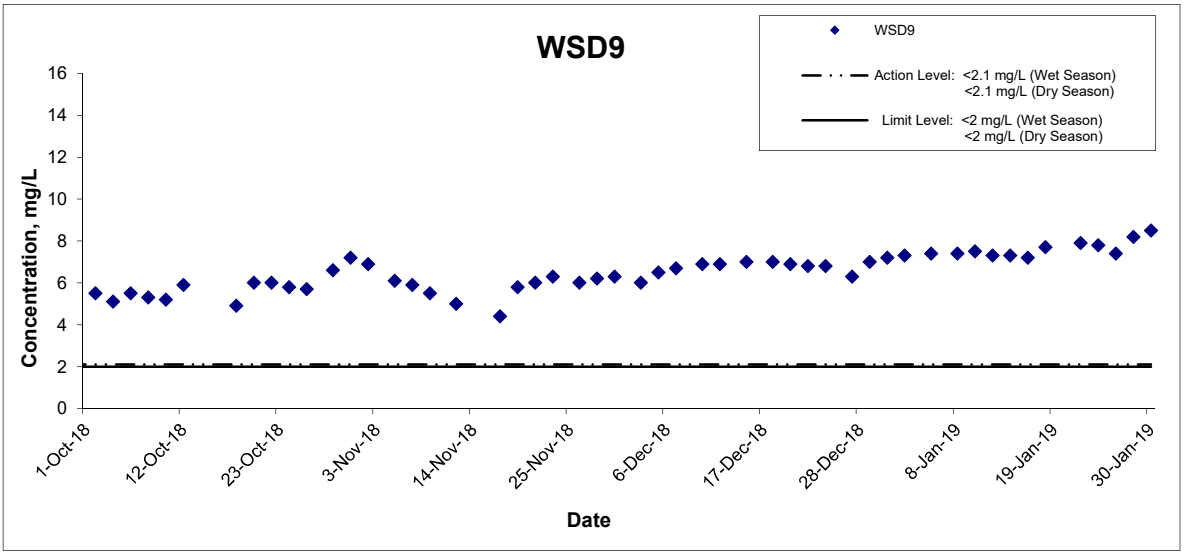
Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	WELLAB 匯力 consulting . testing . research
	Date: Jan 19	Appendix: D	

Dissolved Oxygen (Surface) at Mid-Ebb Tide



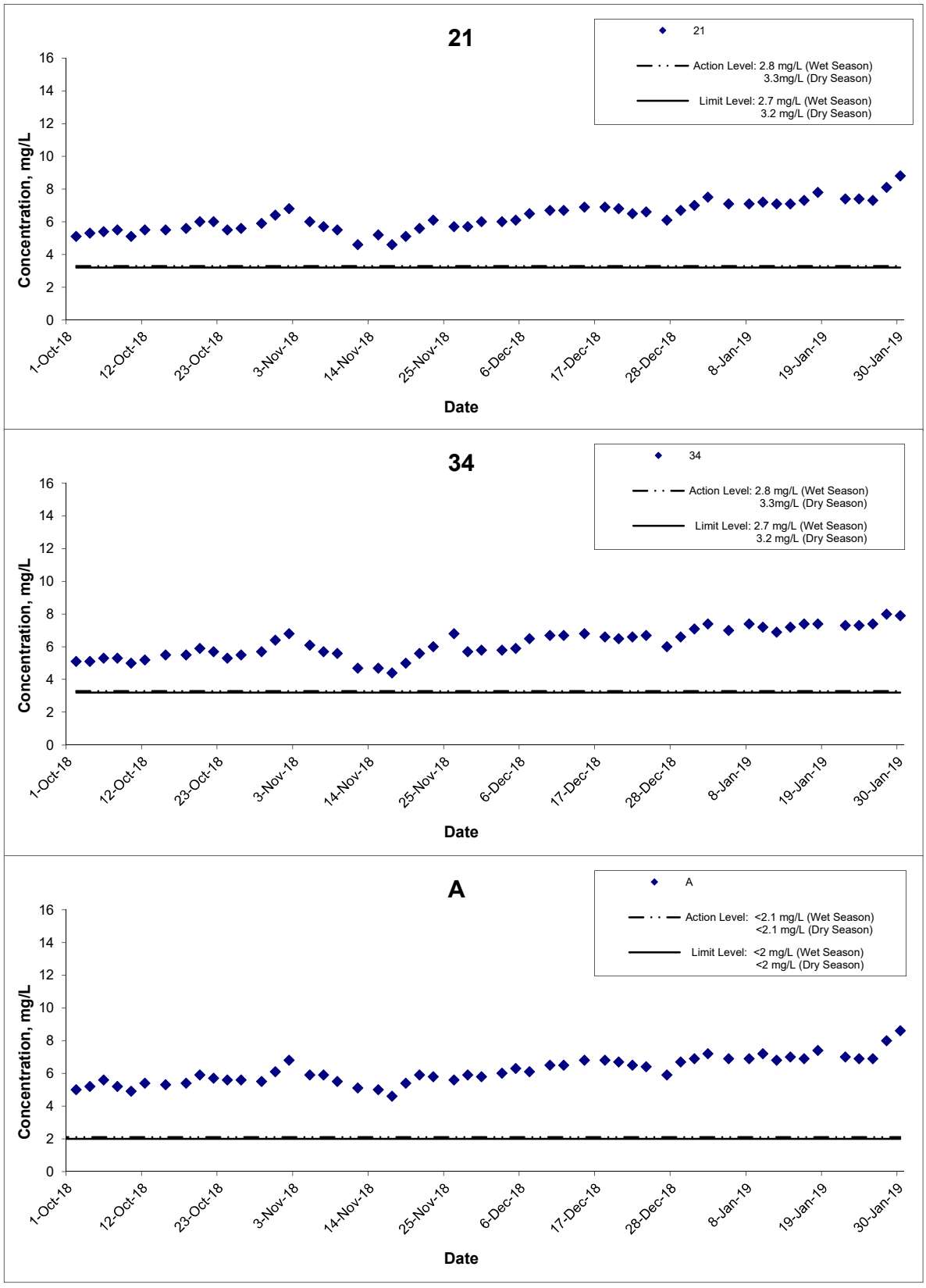
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	WELLAB 匯力 consulting . testing . research
		Date: Jan 19	Appendix: D	

Dissolved Oxygen (Surface) at Mid-Ebb Tide



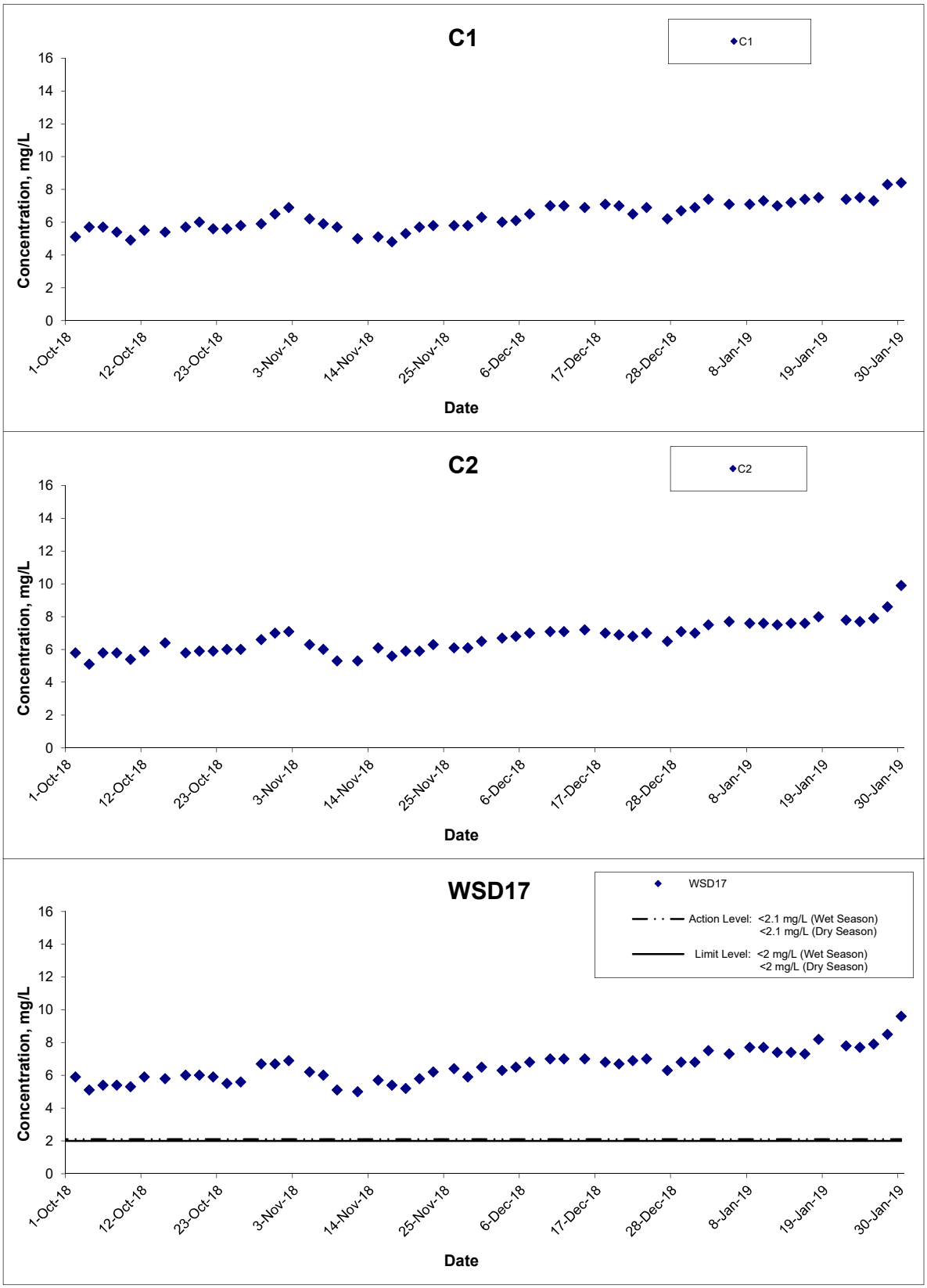
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		Date Jan 19	Appendix D	

Dissolved Oxygen (Surface) at Mid-Flood Tide



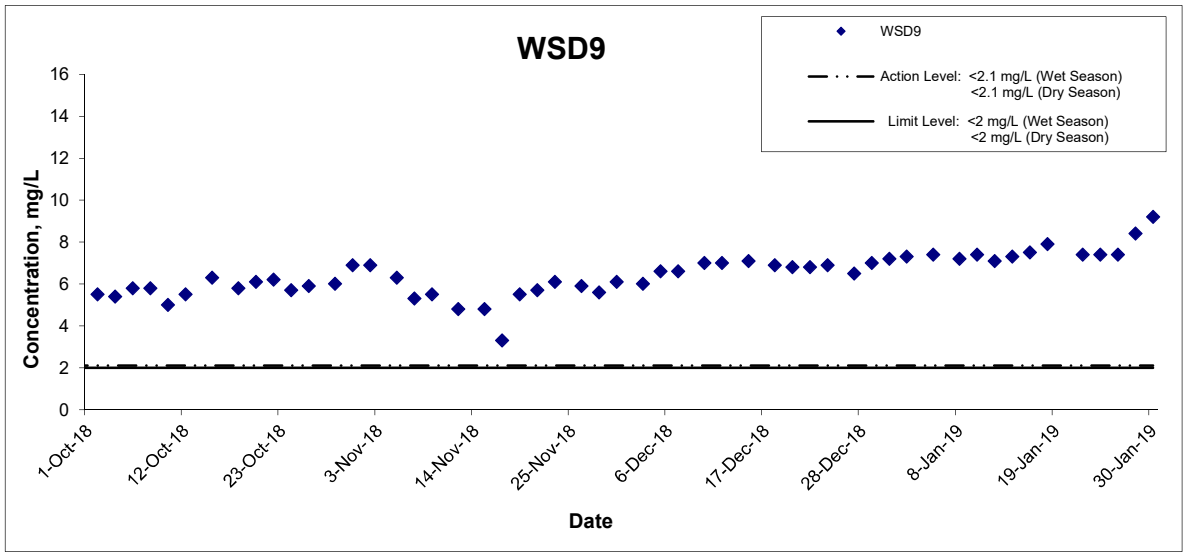
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		Date Jan 19	Appendix D	

Dissolved Oxygen (Surface) at Mid-Flood Tide



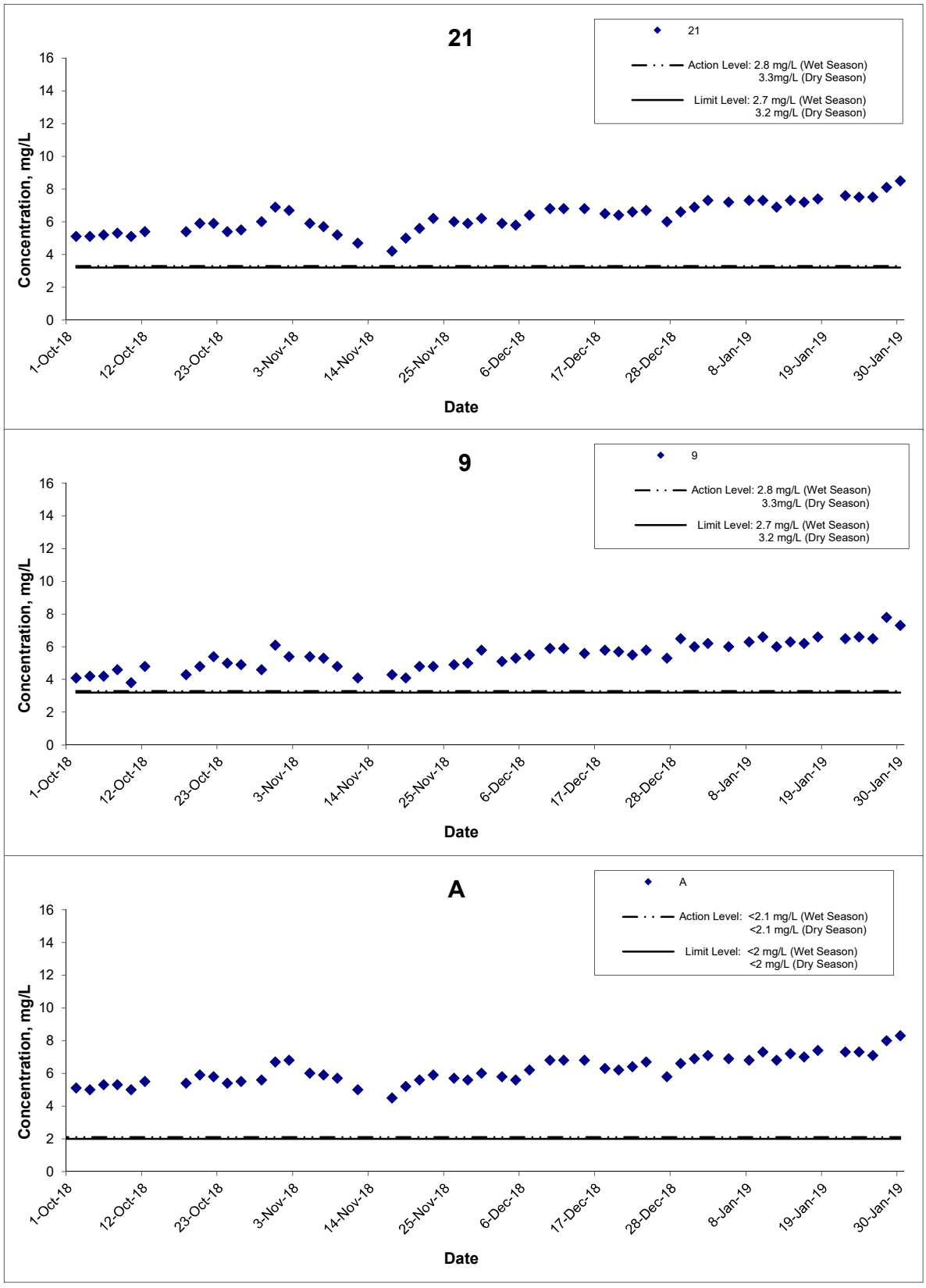
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		Date: Jan 19	Appendix: D	

Dissolved Oxygen (Surface) at Mid-Flood Tide



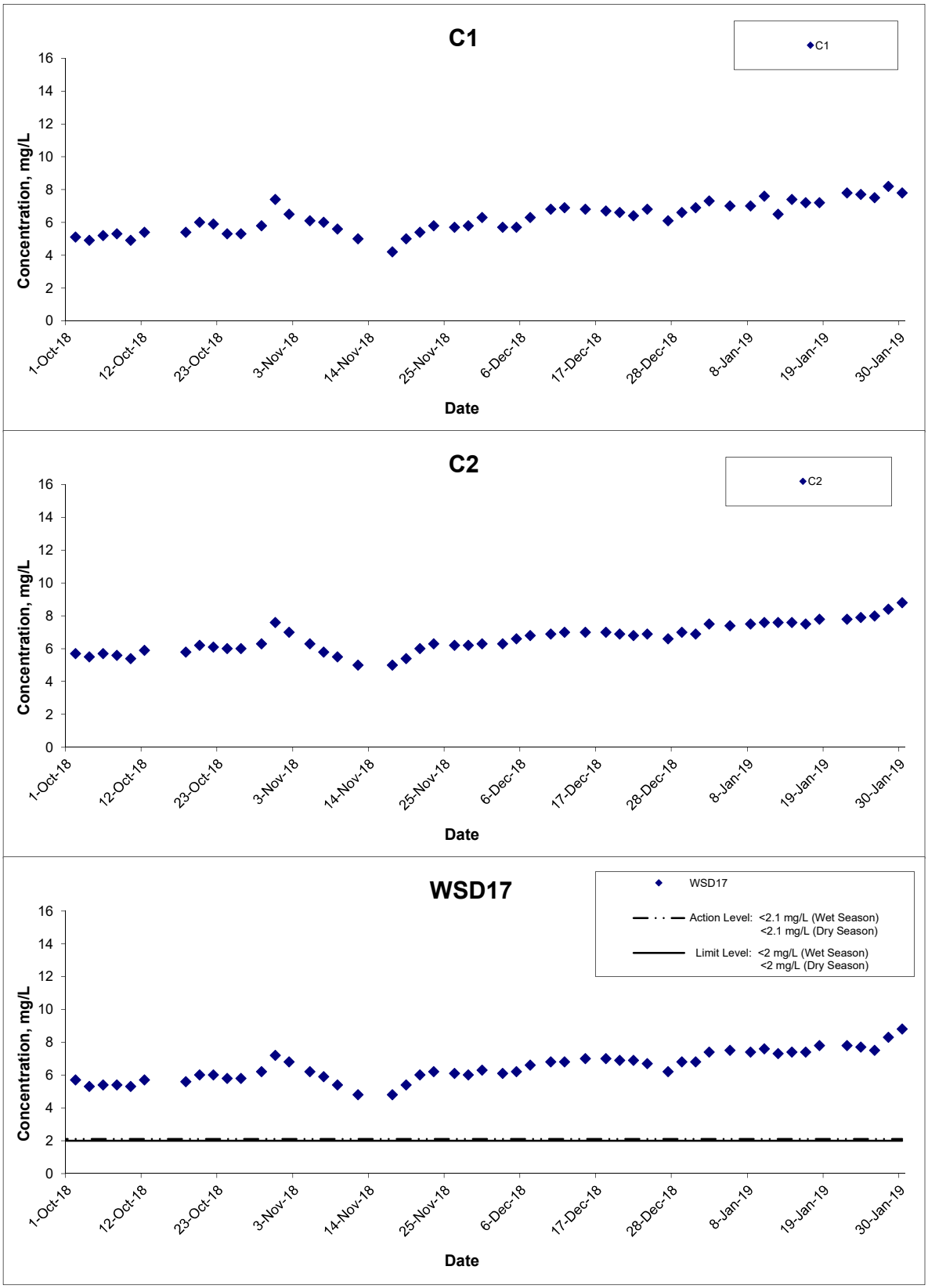
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		Date: Jan 19	Appendix: D	

Dissolved Oxygen (Middle) at Mid-Ebb Tide



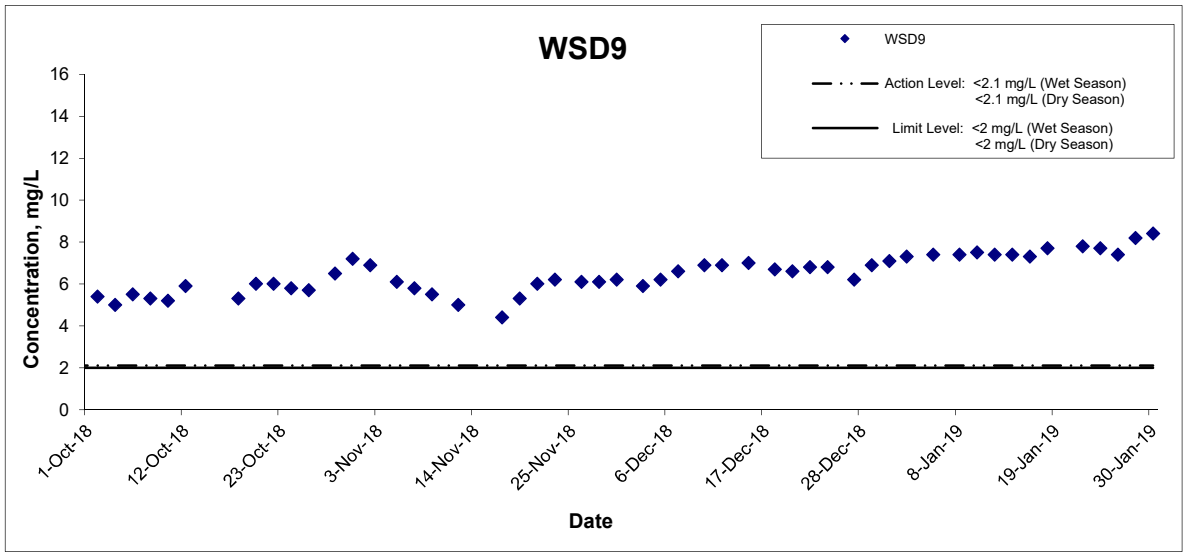
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	Date: Jan 19	Appendix: D	

Dissolved Oxygen (Middle) at Mid-Ebb Tide



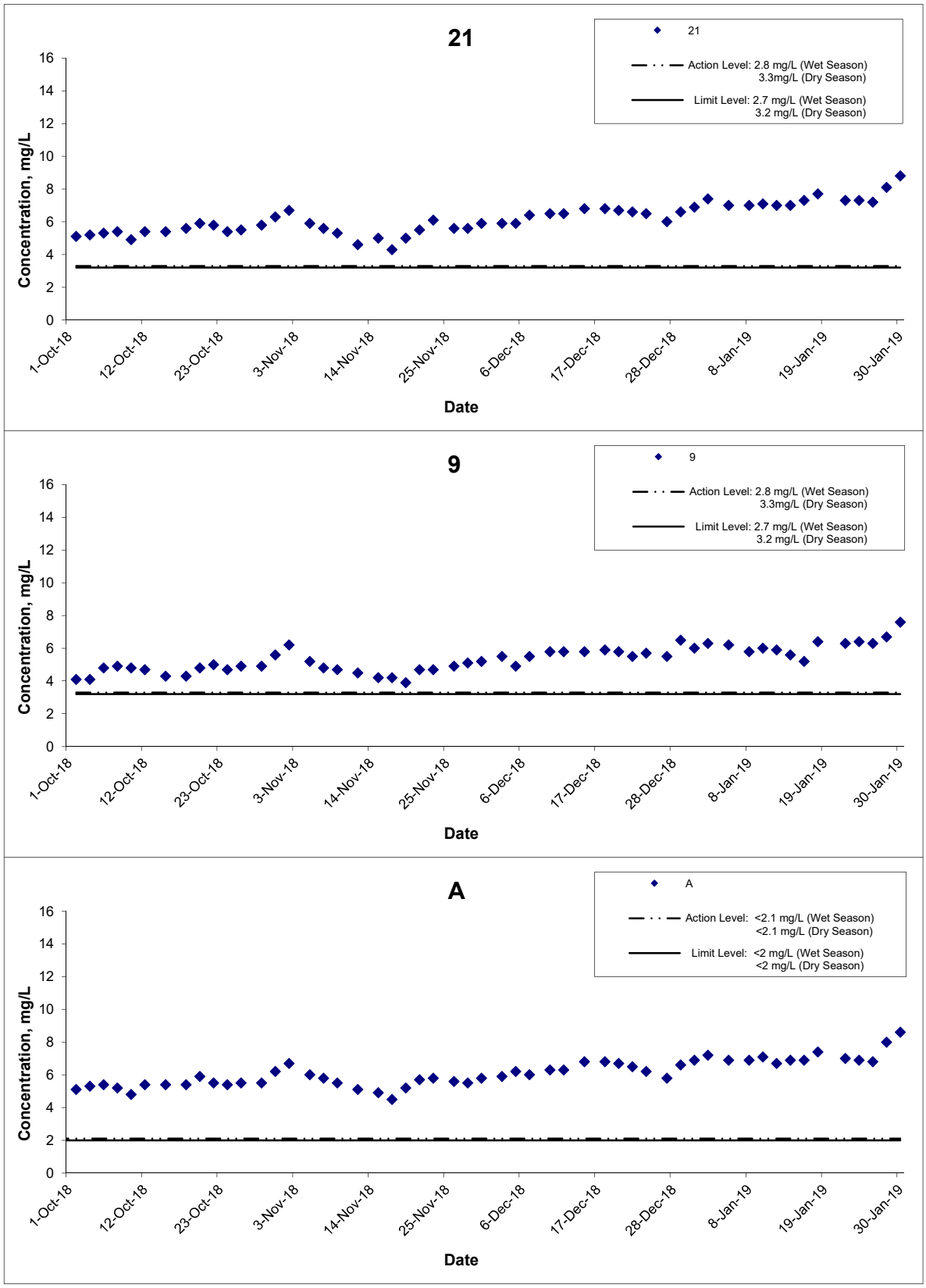
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		Date: Jan 19	Appendix: D	

Dissolved Oxygen (Middle) at Mid-Ebb Tide



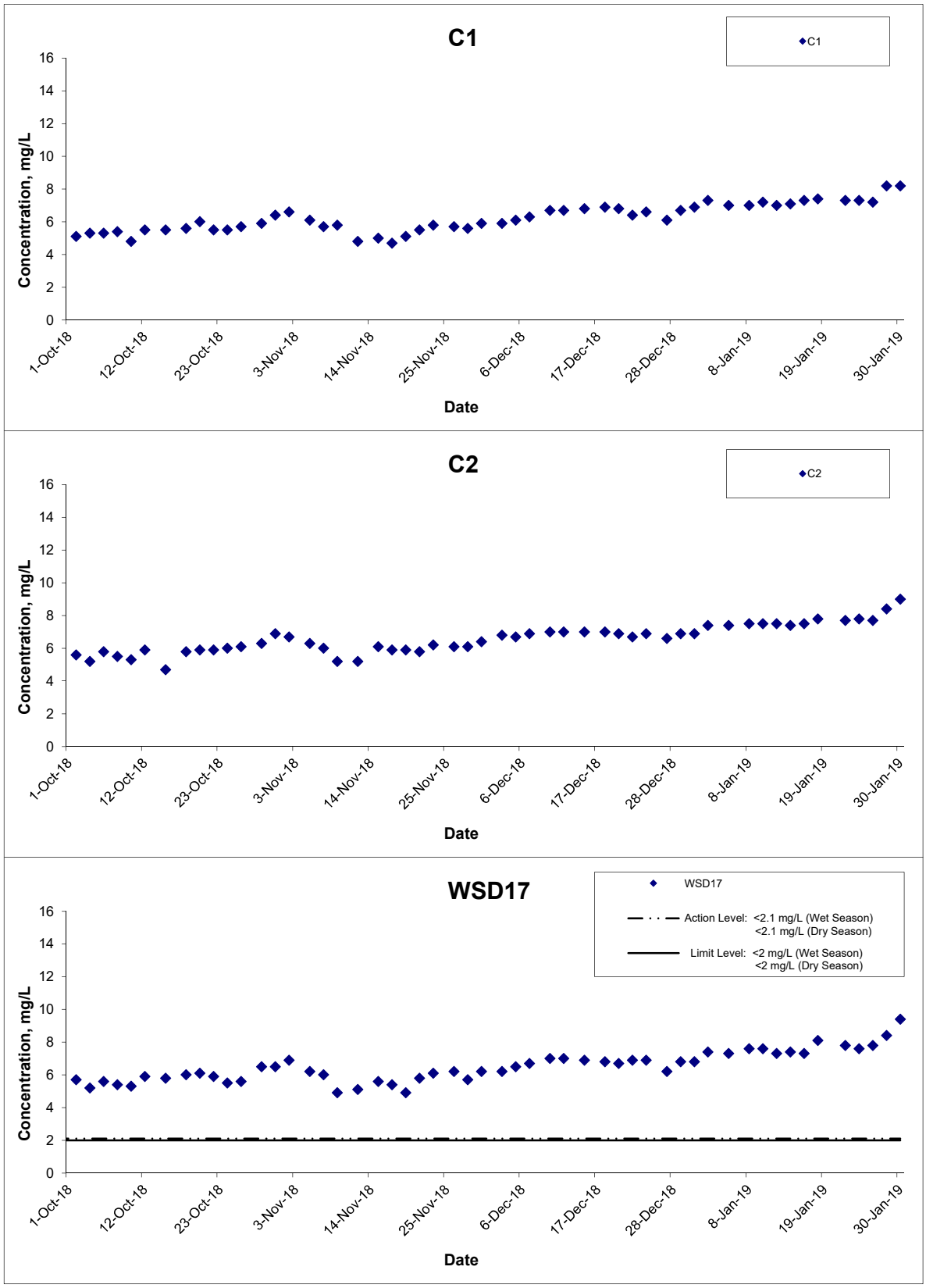
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		Date Jan 19	Appendix D	

Dissolved Oxygen (Middle) at Mid-Flood Tide



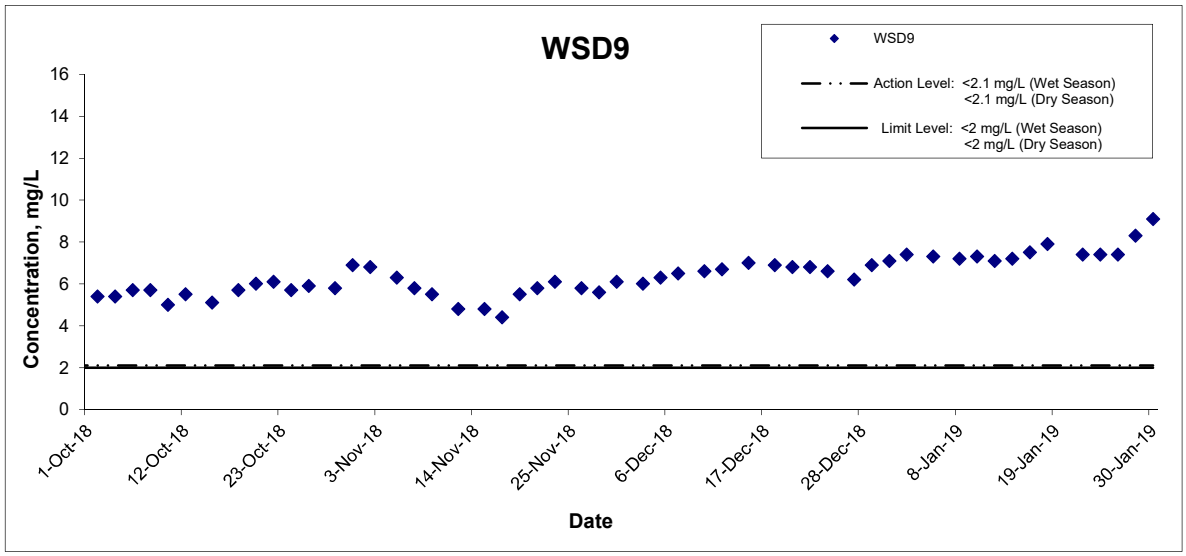
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	Date: Jan 19	Appendix: D	

Dissolved Oxygen (Middle) at Mid-Flood Tide



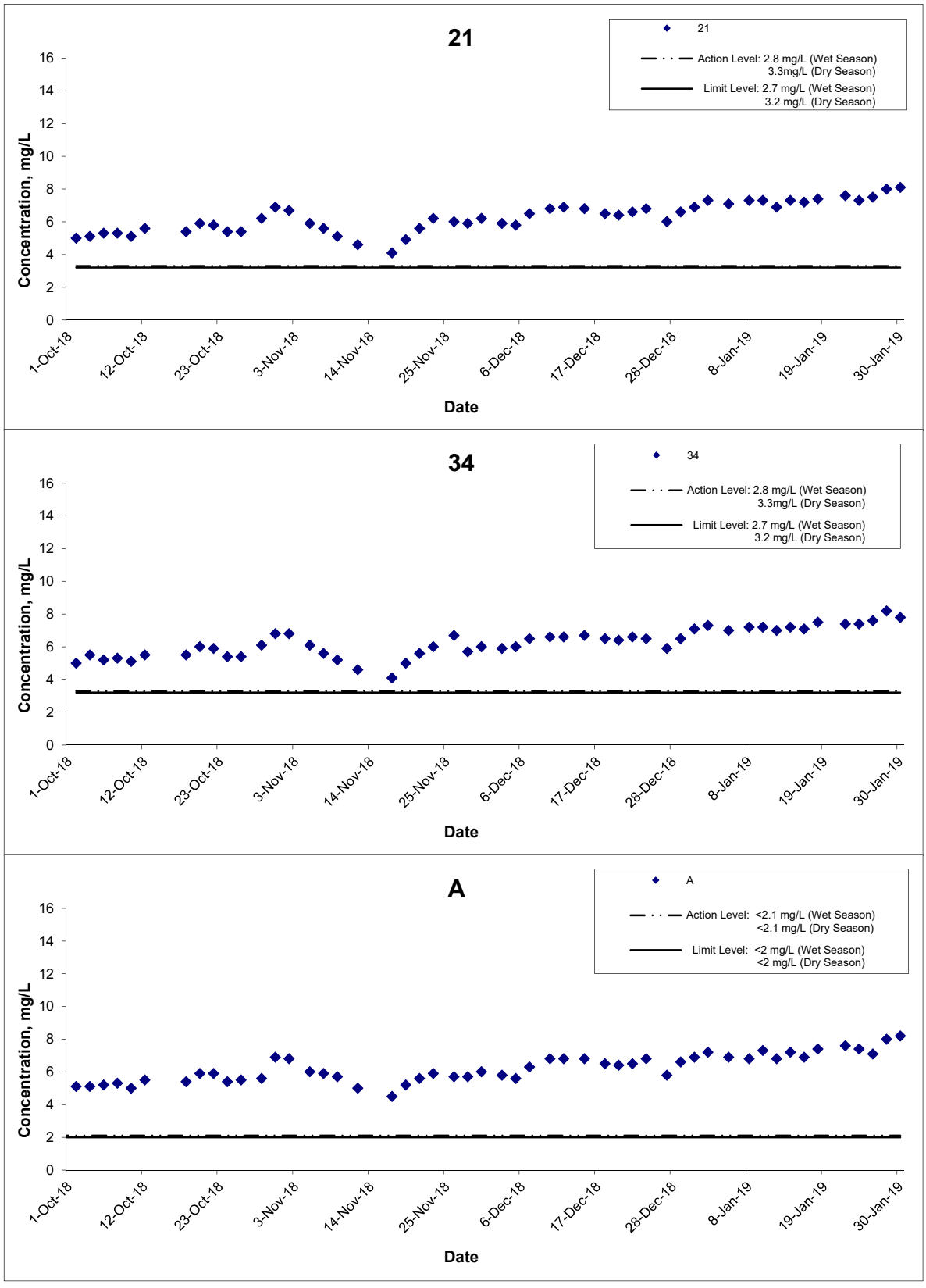
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		Date: Jan 19	Appendix: D	

Dissolved Oxygen (Middle) at Mid-Flood Tide



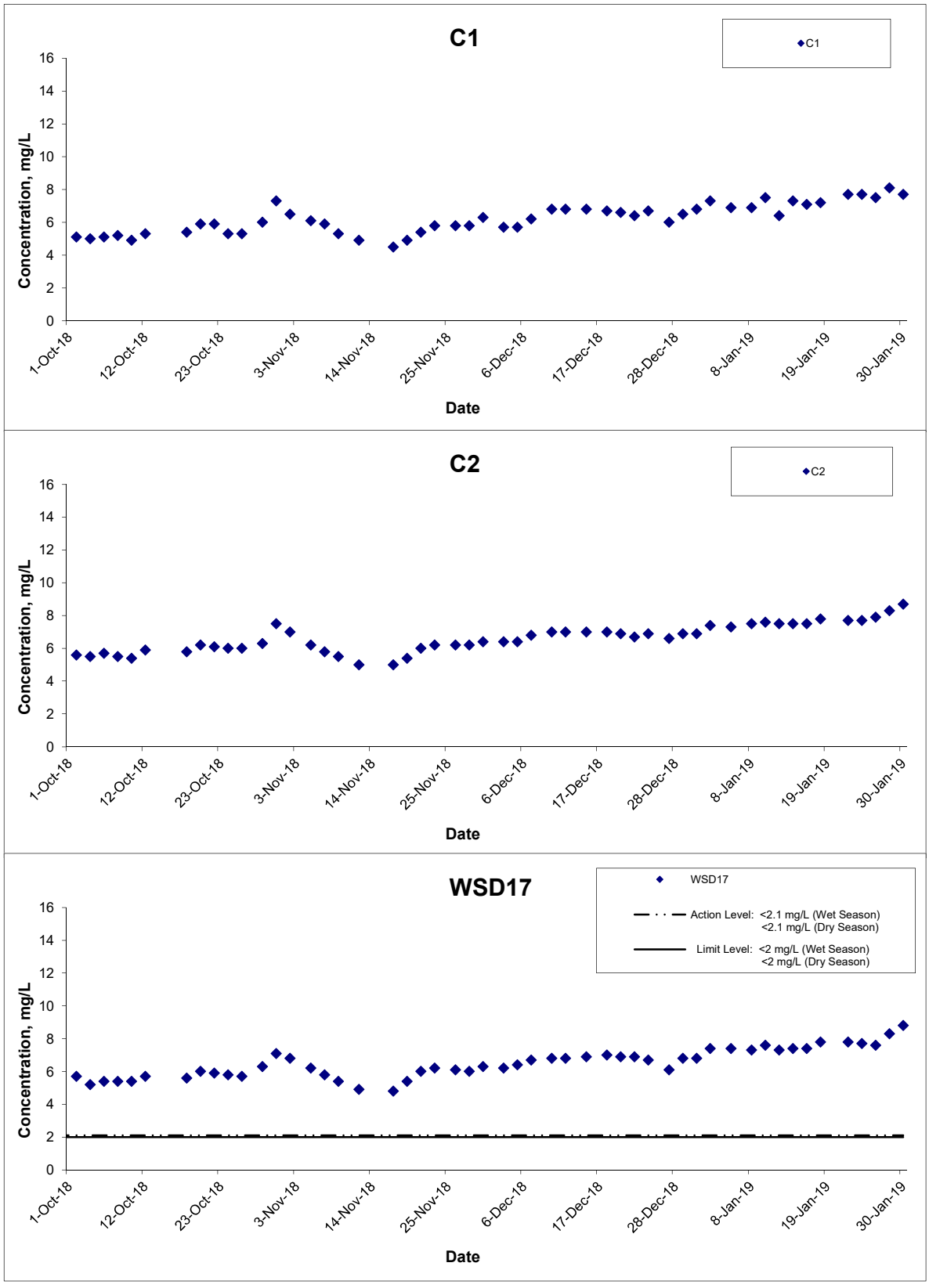
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA14047	WELLAB 匯力 consulting . testing . research
		Date Jan 19	Appendix D	

Dissolved Oxygen (Bottom) at Mid-Ebb Tide



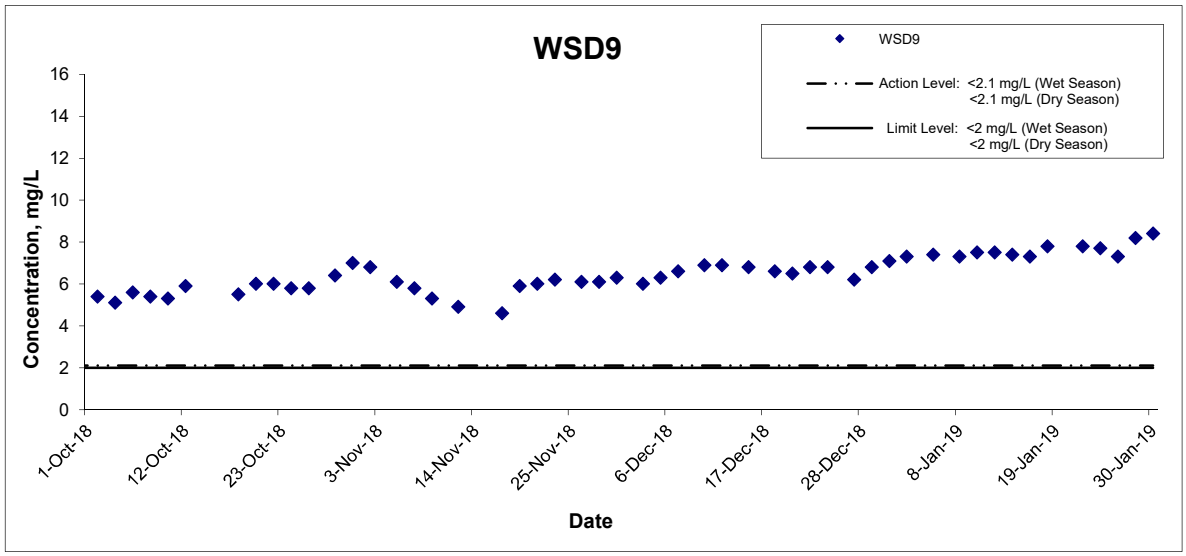
Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA14047	WELLAB 匯力 consulting . testing . research
		Date Jan 19	Appendix D	

Dissolved Oxygen (Bottom) at Mid-Ebb Tide



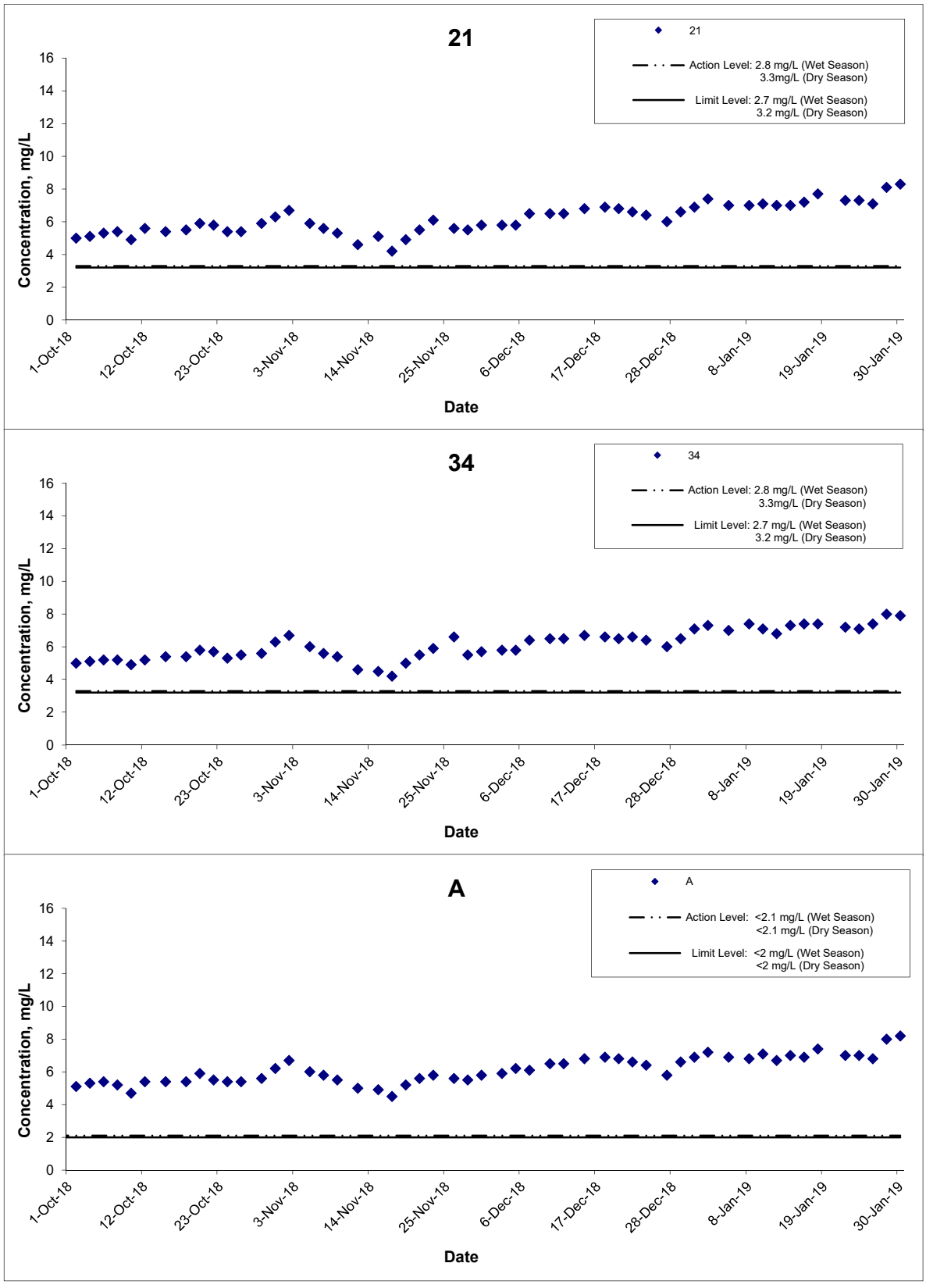
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		Date: Jan 19	Appendix: D	

Dissolved Oxygen (Bottom) at Mid-Ebb Tide



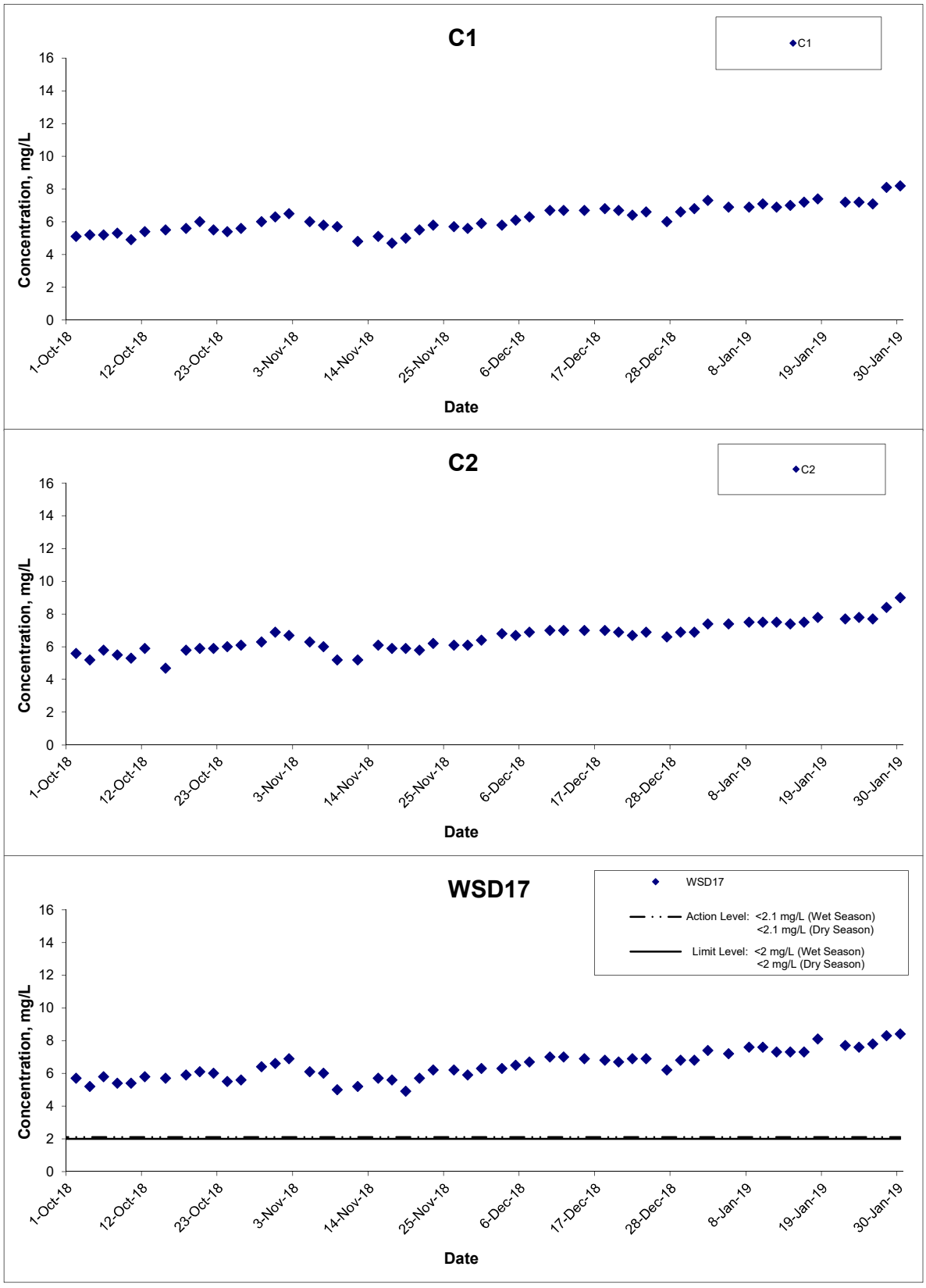
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		Date Jan 19	Appendix D	

Dissolved Oxygen (Bottom) at Mid-Flood Tide



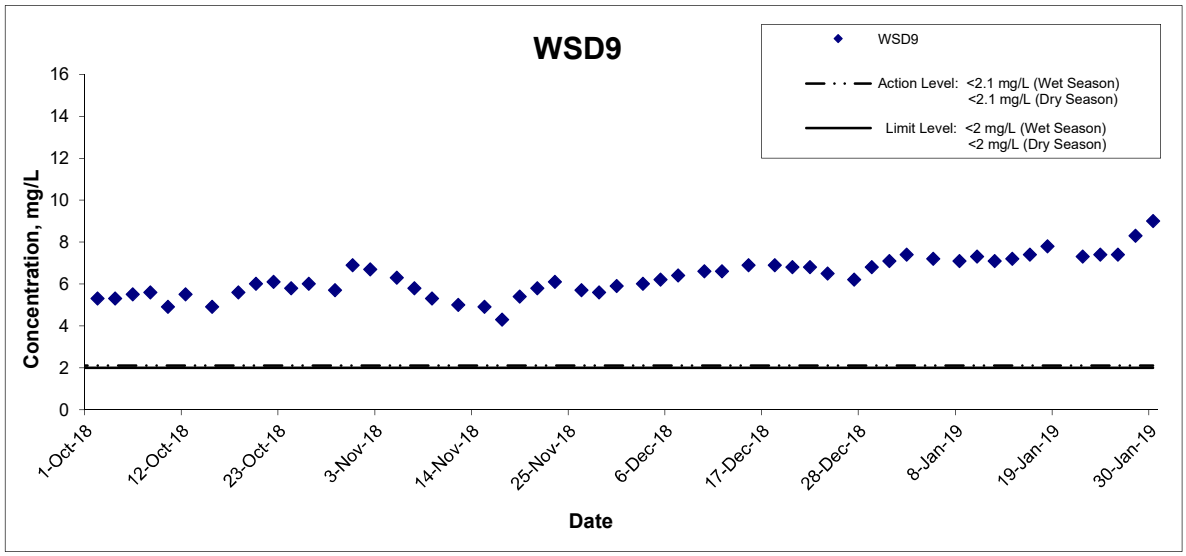
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	Date: Jan 19	Appendix: D	

Dissolved Oxygen (Bottom) at Mid-Flood Tide



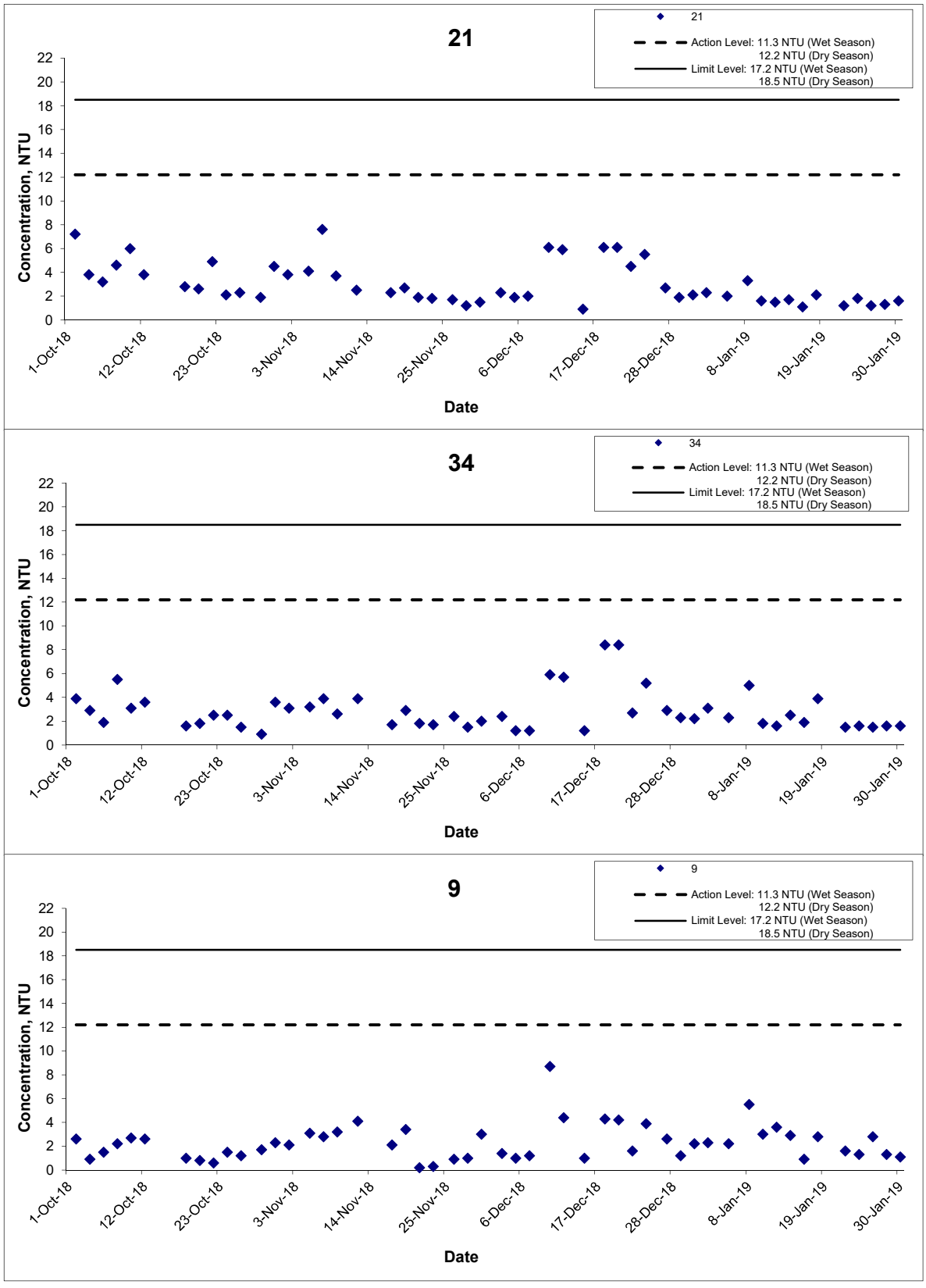
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		Date: Jan 19	Appendix: D	

Dissolved Oxygen (Bottom) at Mid-Flood Tide



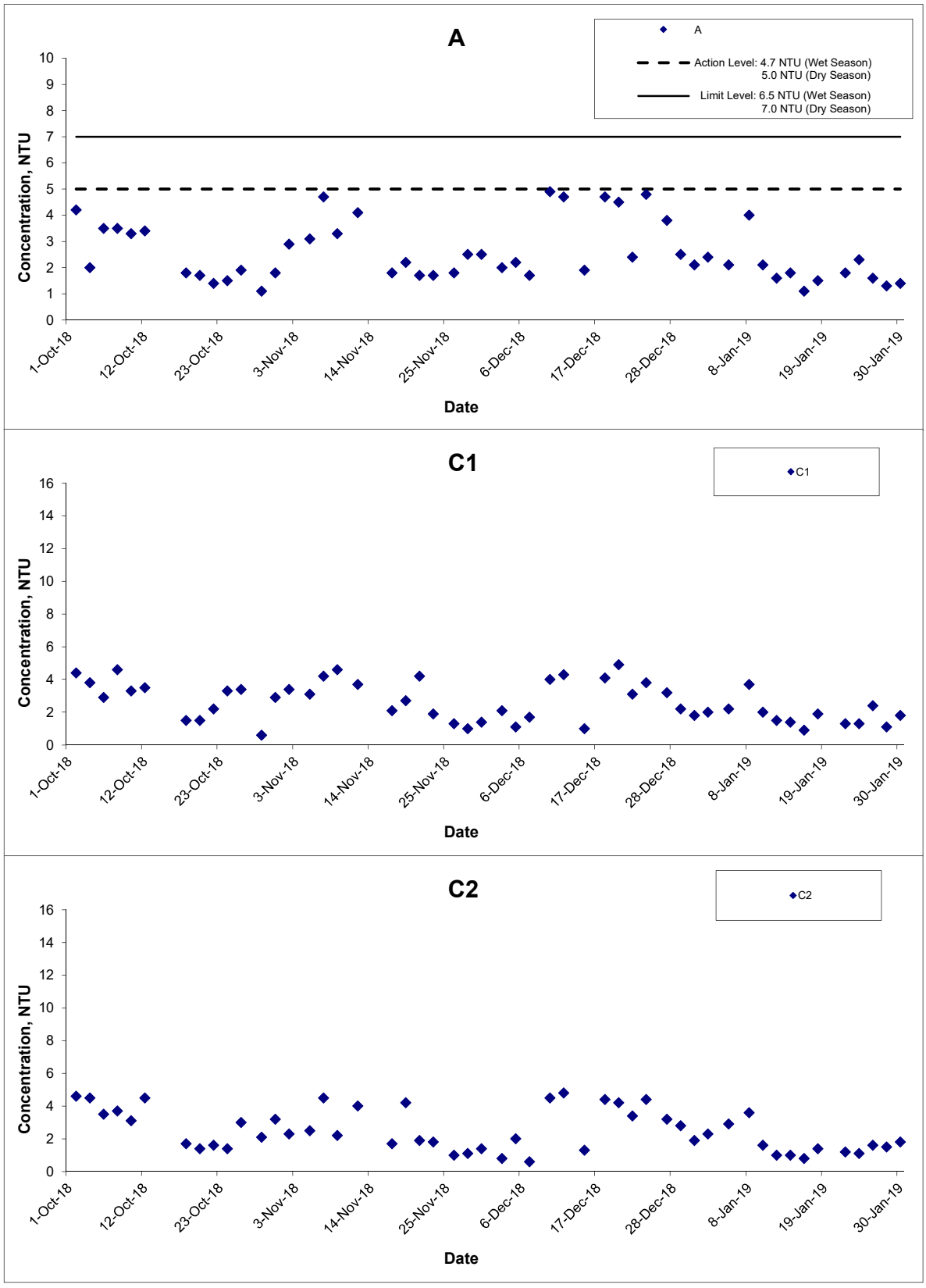
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		Date Jan 19	Appendix D	

Turbidity (Depth-averaged) at Mid-Ebb Tide



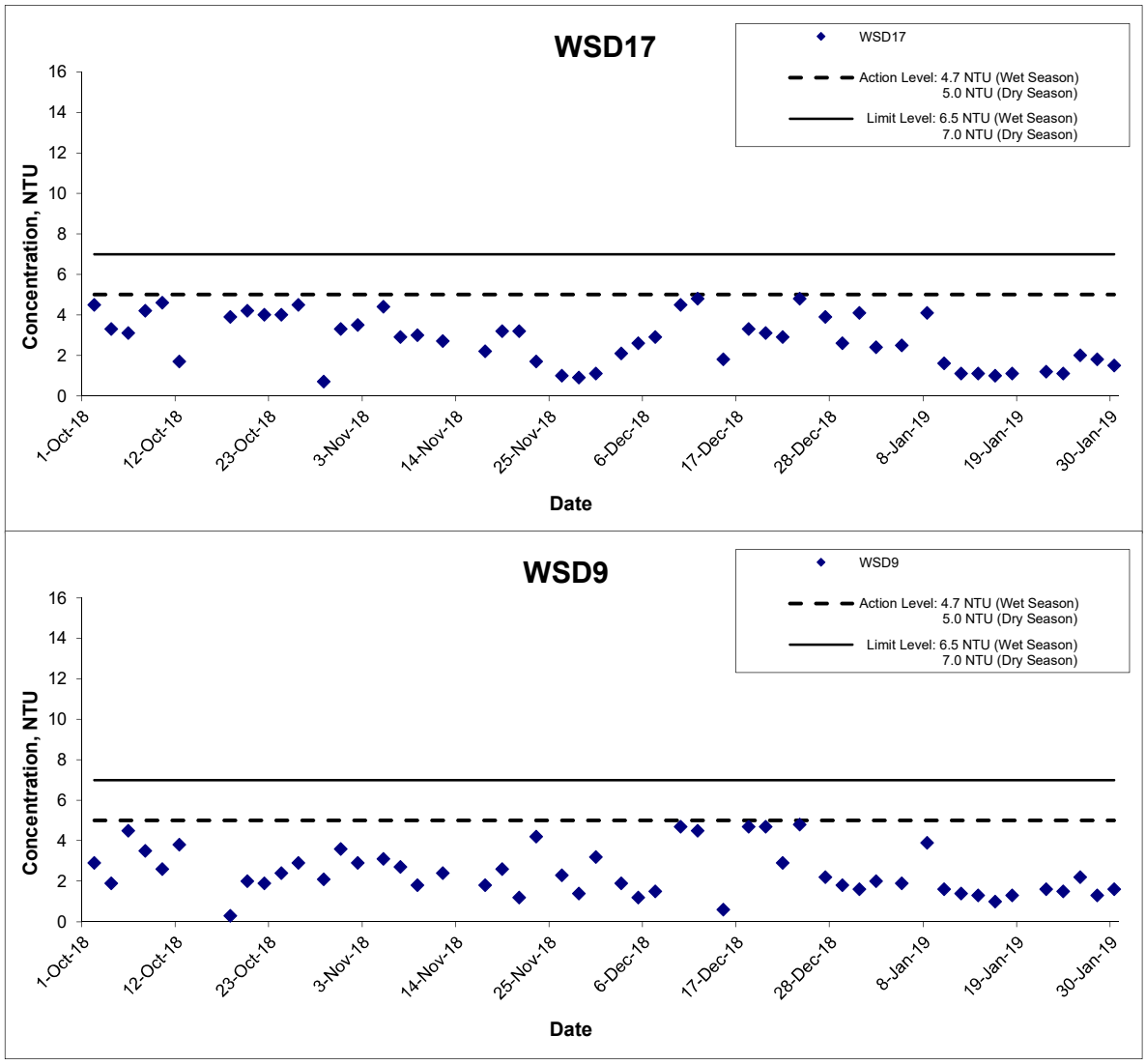
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		Date: Jan 19	Appendix: D	

Turbidity (Depth-averaged) at Mid-Ebb Tide



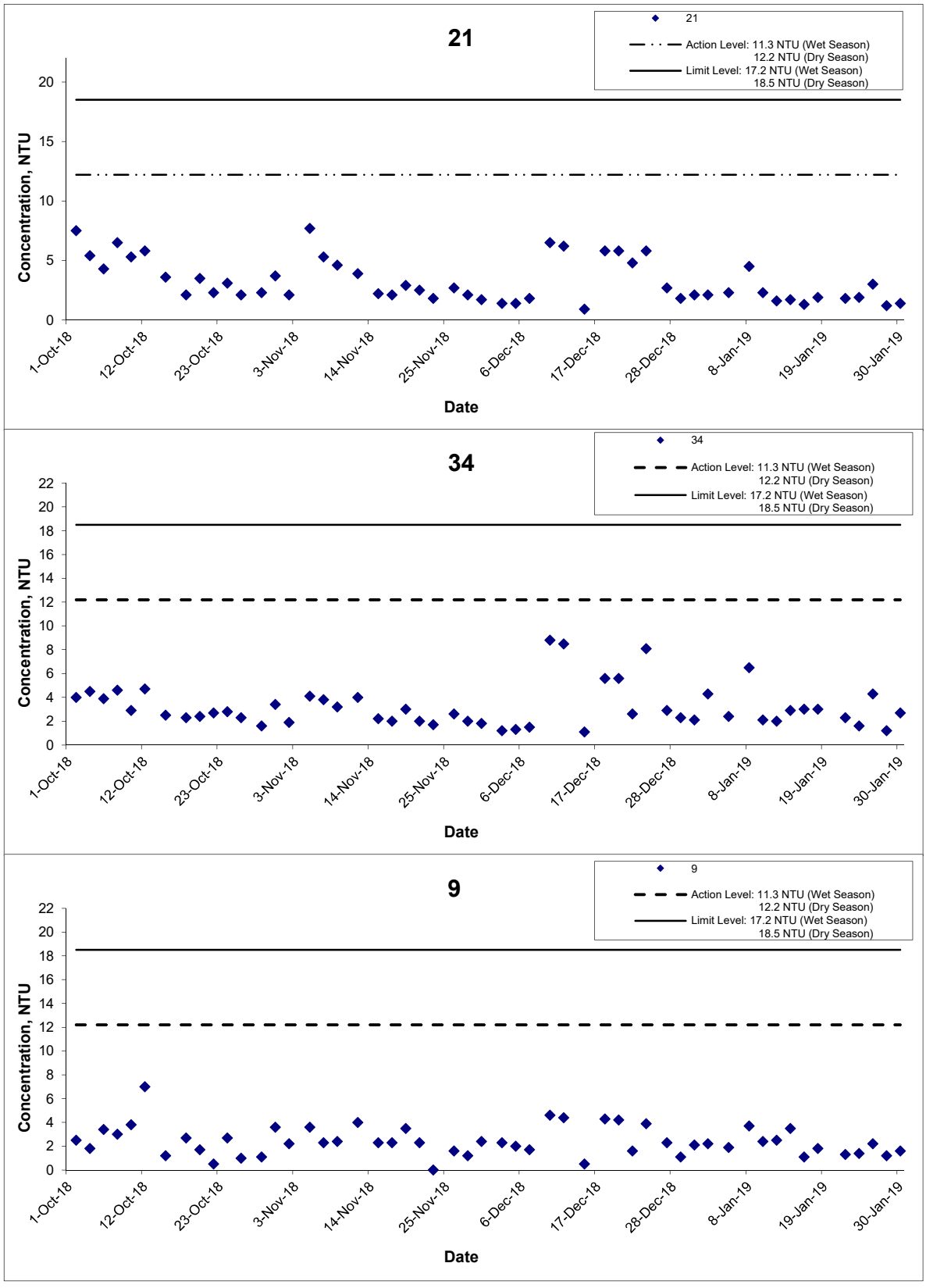
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	Date: Jan 19	Appendix: D	

Turbidity (Depth-averaged) at Mid-Ebb Tide



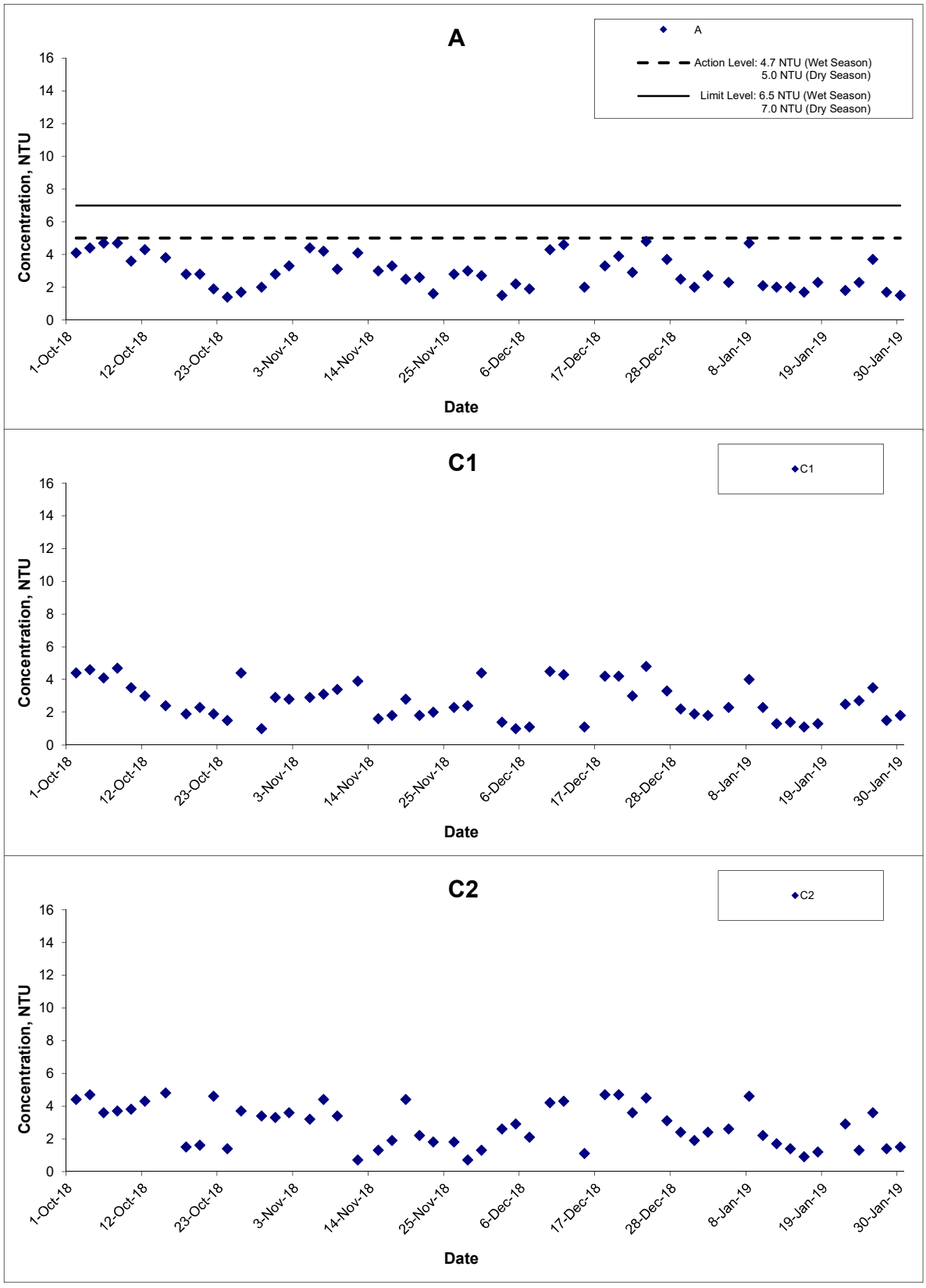
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		Date Jan 19	Appendix D	

Turbidity (Depth-averaged) at Mid-Flood Tide



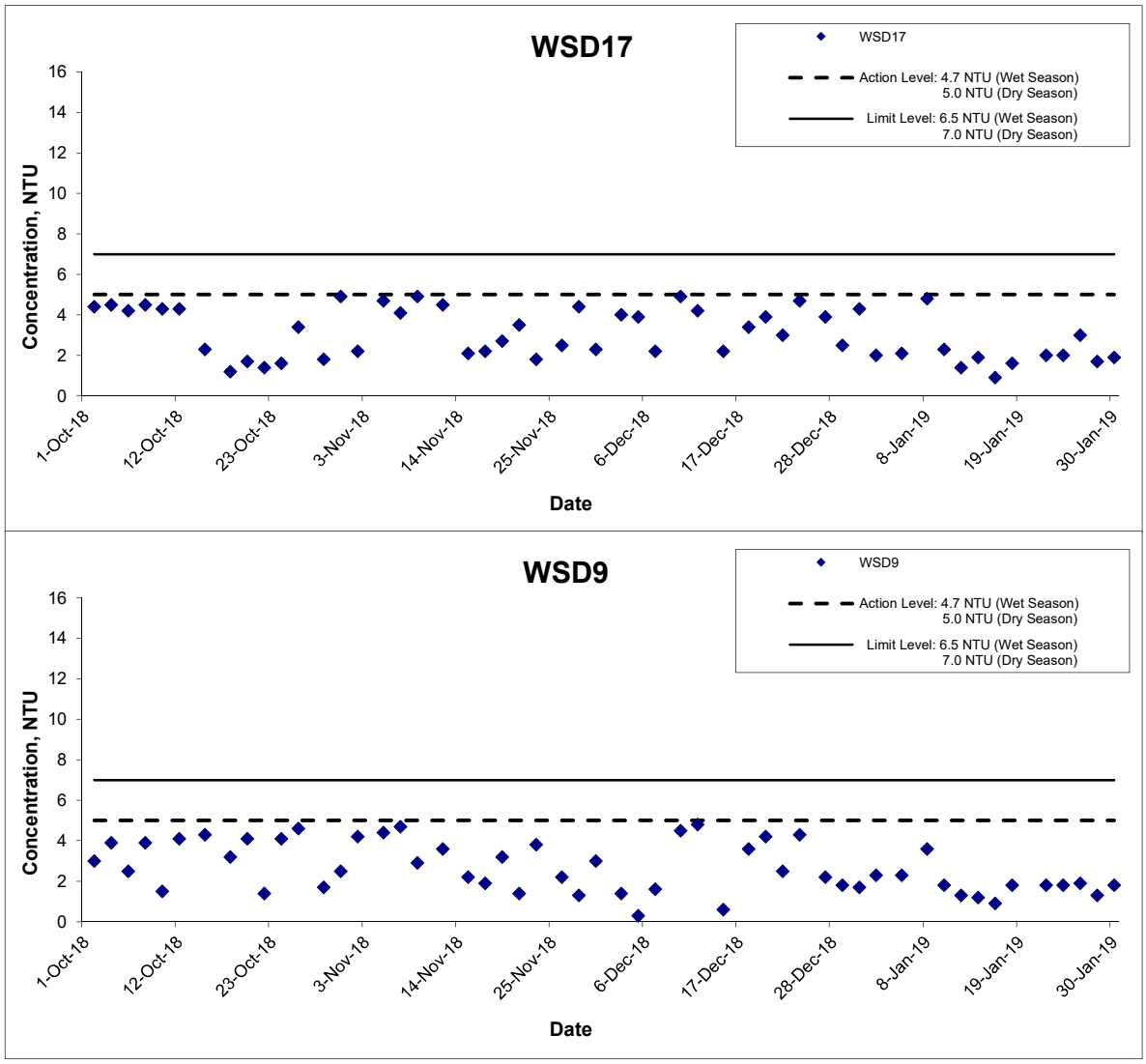
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Turbidity (Depth-averaged) at Mid-Flood Tide



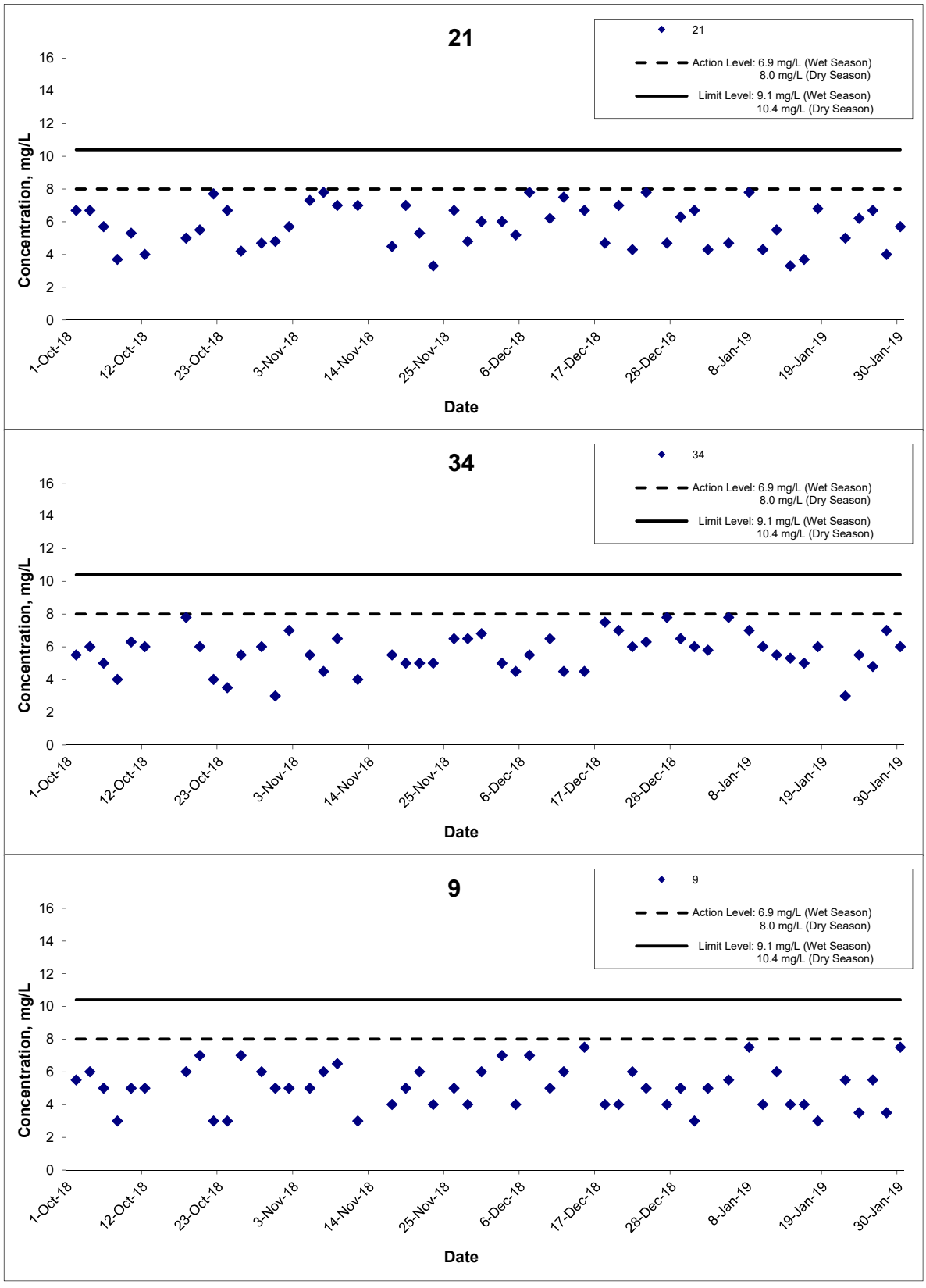
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		Date Jan 19	Appendix D	

Turbidity (Depth-averaged) at Mid-Flood Tide



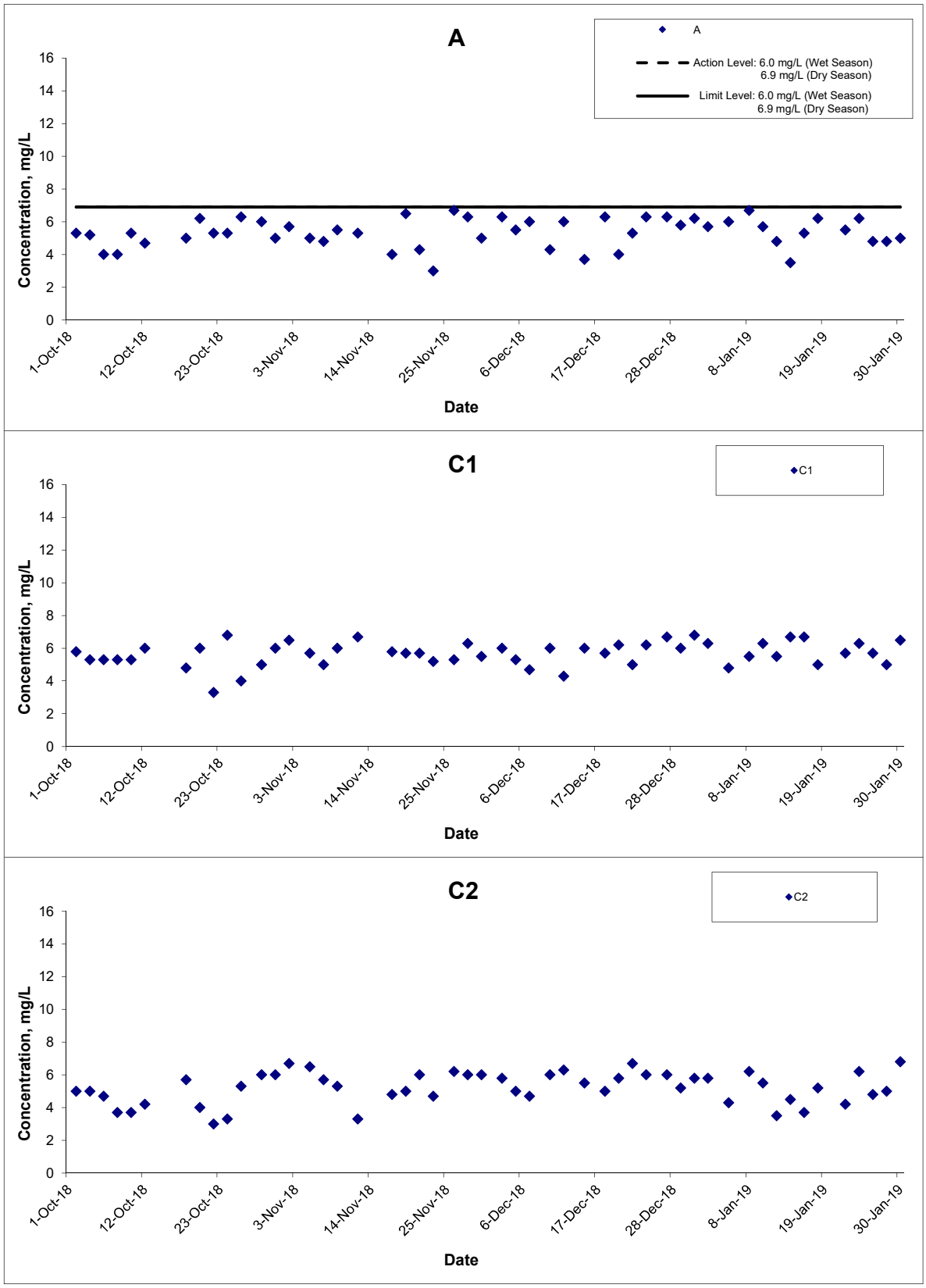
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		Date Jan 19	Appendix D	

Suspended Solids (Depth-averaged) at Mid-Ebb Tide



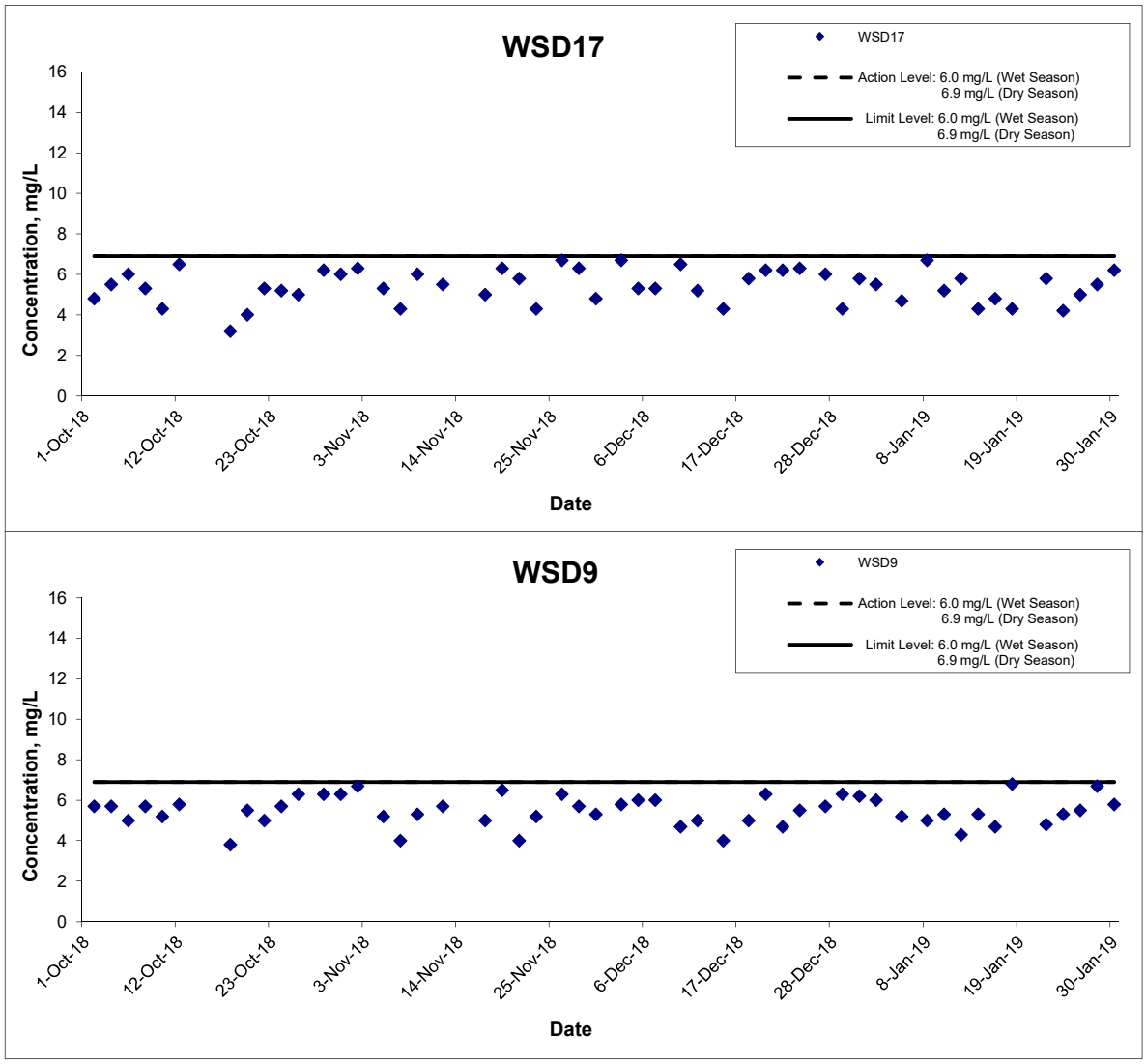
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	Date: Jan 19	Appendix: D	

Suspended Solids (Depth-averaged) at Mid-Ebb Tide



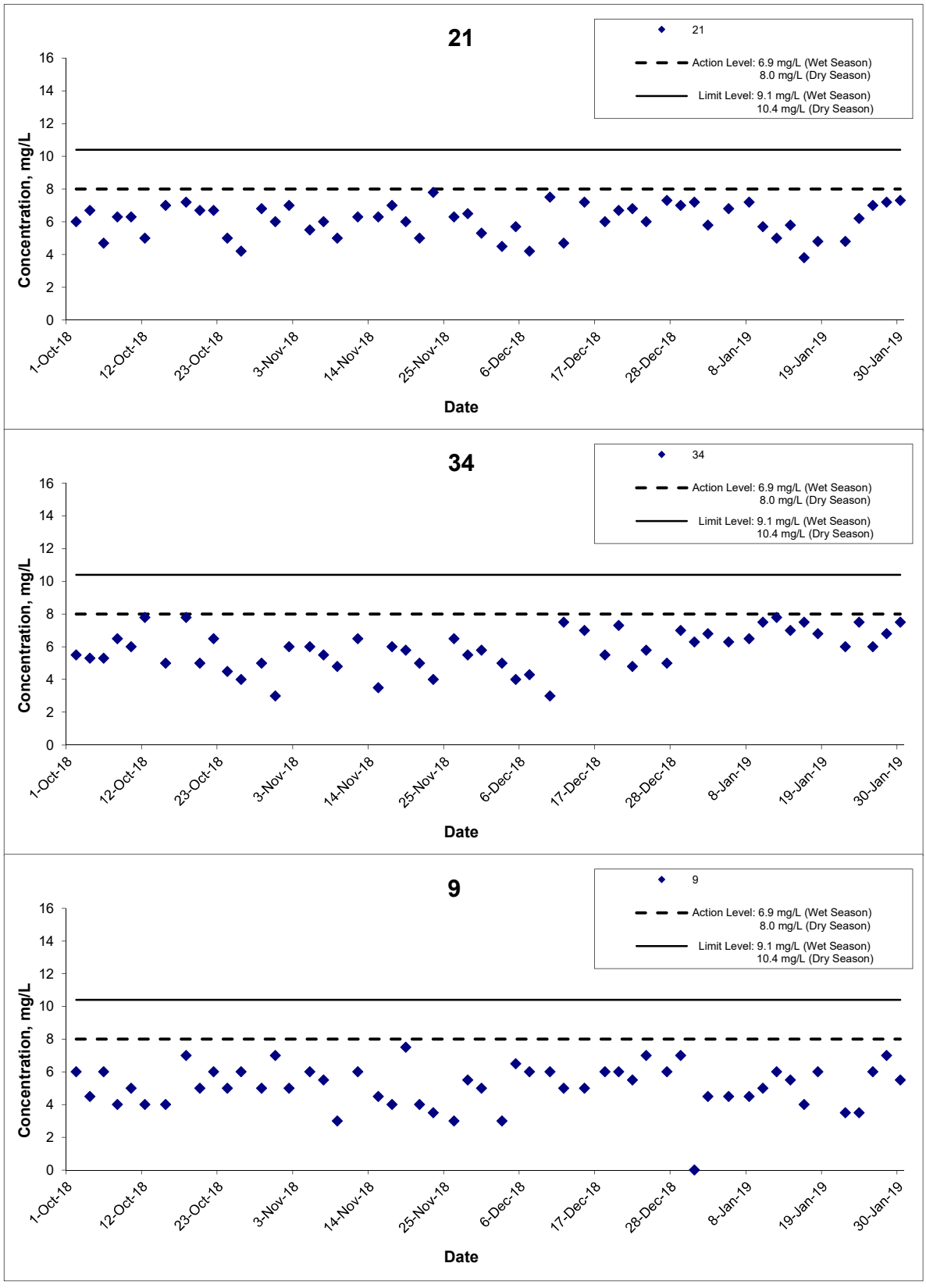
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		Date: Jan 19	Appendix: D	

Suspended Solids (Depth-averaged) at Mid-Ebb Tide



Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	WELLAB 匯力 consulting . testing . research
		Date: Jan 19	Appendix: D	

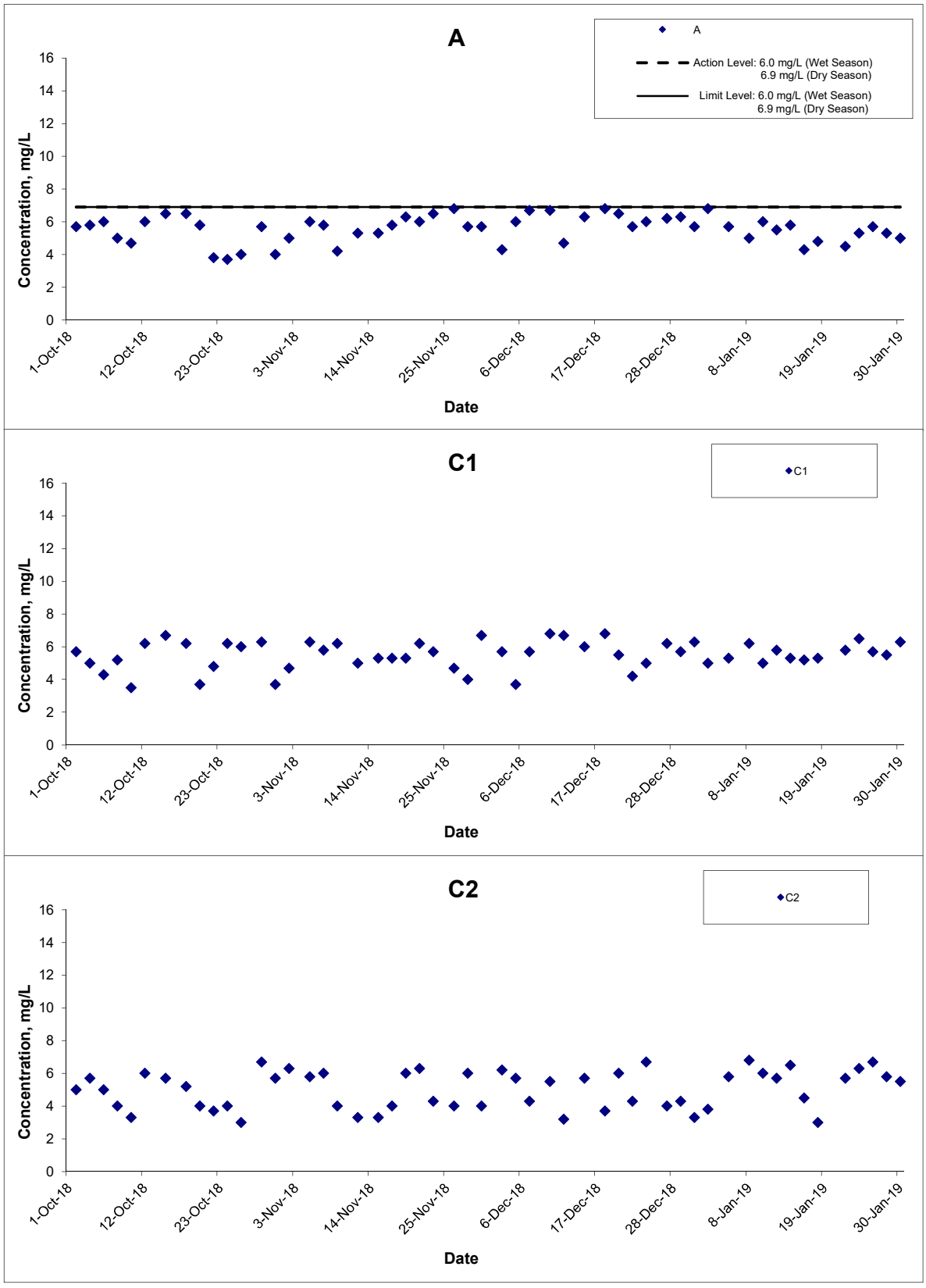
Suspended Solids (Depth-averaged) at Mid-Flood Tide



Remarks: The graphical point at zero concentration is presented as <2.5 mg/L

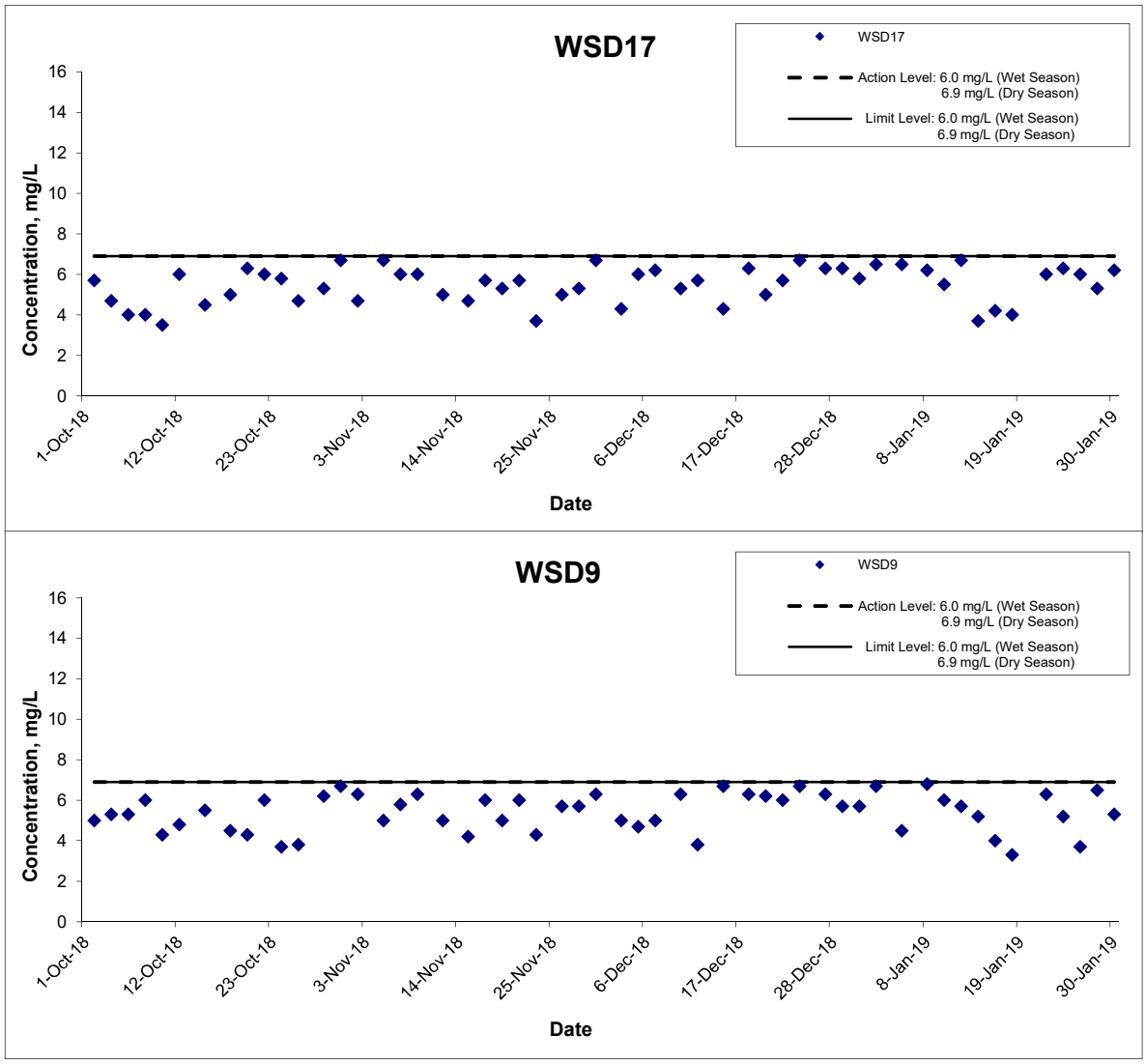
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	Date: Jan 19	Appendix: D	

Suspended Solids (Depth-averaged) at Mid-Flood Tide



Title	Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	WELLAB 匯力 consulting . testing . research
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Suspended Solids (Depth-averaged) at Mid-Flood Tide



Title: Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA14047	WELLAB 匯力 consulting . testing . research
	Date: Jan 19	Appendix: D	

APPENDIX E
COPIES OF CALIBRATION CERTIFICATES

WELLAB LIMITED
Rms 1214, 1502, 1516, 1701 & 1716,
Technology Park, 18 On Lai Street,
Shatin, N.T., Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
RM 1710, Technology Park,
18 On Lai Street,
Shatin, N.T., Hong Kong

Test Report No.:	29957A
Date of Issue:	2018-11-03
Date Received:	2018-11-03
Date Tested:	2018-11-03
Date Completed:	2018-11-03
Next Due Date:	2019-02-02

ATTN: **Miss Mei Ling Tang**

Certificate of Calibration

Item for calibration:

YSI EXO1 Multiparameter Sondes	Equipment No.:	SW-08-09
Manufacturer:	YSI Incorporated, a Xylem brand	
Description:	Model No.	Serial No.
- EXO Optical DO Sensor, Ti	599100-01	18C102842
- EXO conductivity/Temperature Sensor, Ti	599870	16G102310
- EXO Turbuduty Sensor, Ti	599101-01	16H102467
- EXO pH Sensor Assembly, Guarded, Ti	599701	16J100419

Test conditions:

Room Temperature : 17-22 degree Celsius
Relative Humidity : 40-70%

Test Specifications:

Performance checking for Conductivity, Temperature, pH, Dissolved oxygen (D.O.) and Turbidity

Methodology:

According to manufacturer instruction manual, APHA 20e 4500-O C

****

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

PATRICK TSE
Laboratory Manager

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Technology Park, 18 On Lai Street,
Shatin, N.T., Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

Test Report No.:	29957A
Date of Issue:	2018-11-03
Date Received:	2018-11-03
Date Tested:	2018-11-03
Date Completed:	2018-11-03
Next Due Date:	2019-02-02
Page:	2 of 2

Certificate of Calibration

Results:

Conductivity performance checking

	Instrument Readings (μS/cm)	Accetance Criteria	Comment
KCl stock solution (12890 μS/cm)	13000	12246-13534	Pass

Temperature performance checking

Reference thermometer-E431 Readings (°C)	Instrument Readings (°C)	Correction (°C)	Comment
20.0	20.002	-0.002	N/A

pH performance checking

	Instrument Readings (pH unit)	Accetance Criteria	Comment
pH QC buffer 4.00	4.02	4.00 ± 0.10	Pass
pH QC buffer 6.86	6.87	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.19	9.18 ± 0.10	Pass

D.O. performance checking

	Instrument Readings (mg/L)	Accetance Criteria	Comment
Zero DO soultion	0.08	<0.1mg/L	Pass

Winkler Titration value (mg/L)	Instrument Readings (mg/L)	Accetance Criteria	Comment
8.02	8.08	Difference between Titration value and instrument reading <0.2mg/L	Pass

Turbidity performance checking

Turbidity stock solution	Instrument Readings (NTU)	Accetance Criteria	Comment
10 NTU	10.05	9.0-11.0	Pass
50 NTU	50.04	45.0-55.0	Pass
100 NTU	100.4	90.0-110.0	Pass

Depth performance checking

Water Depth	Instrument Readings (NTU)	Accetance Criteria	Comment
0.5 meter	0.50	0.45-0.55	Pass

**********END OF REPORT**********

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Technology Park, 18 On Lai Street,
Shatin, N.T., Hong Kong.
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Website: www.wellab.com.hk

TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
RM 1710, Technology Park,
18 On Lai Street,
Shatin, N.T., Hong Kong

ATTN: **Miss Mei Ling Tang**

Test Report No.:	30298
Date of Issue:	2018-11-24
Date Received:	2018-11-24
Date Tested:	2018-11-24
Date Completed:	2018-11-24
Next Due Date:	2019-02-23
Page:	1 of 2

Certificate of Calibration

Item for calibration:

YSI EXO1 Multiparameter Sondes	Equipment No.: SW-08-15	
Manufacturer:	YSI Incorporated, a Xylem brand	
Description:	Model No.	Serial No.
- EXO Optical DO Sensor, Ti	599100-01	17B101545
- EXO conductivity/Temperature Sensor, Ti	599870	17B100792
- EXO Turbuduty Sensor, Ti	599101-01	17B102247
- EXO pH Sensor Assembly, Guarded, Ti	599701	17B103623

Test conditions:

Room Temperature : 17-22 degree Celsius
Relative Humidity : 40-70%

Test Specifications:

Performance checking for Conductivity, Temperature, pH, Dissolved oxygen (D.O.) and Turbidity

Methodology:

According to manufacturer instruction manual, APHA 20e 4500-O C

****

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PATRICK TSE
Laboratory Manager

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Website: www.wellab.com.hk

TEST REPORT

Test Report No.:	30298
Date of Issue:	2018-11-24
Date Received:	2018-11-24
Date Tested:	2018-11-24
Date Completed:	2018-11-24
Next Due Date:	2019-02-23

Certificate of Calibration

Results:

Conductivity performance checking

	Instrument Readings (μS/cm)	Accetance Criteria	Comment
KCl stock solution (12890 μS/cm)	13000	12246-13534	Pass

Temperature performance checking

Reference thermometer-E431 Readings (°C)	Instrument Readings (°C)	Correction (°C)	Comment
20.0	20.001	-0.001	N/A

pH performance checking

	Instrument Readings (pH unit)	Accetance Criteria	Comment
pH QC buffer 4.00	4.01	4.00 ± 0.10	Pass
pH QC buffer 6.86	6.86	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.14	9.18 ± 0.10	Pass

D.O. performance checking

	Instrument Readings (mg/L)	Accetance Criteria	Comment
Zero DO soultion	0.08	<0.1mg/L	Pass

Winkler Titration value (mg/L)	Instrument Readings (mg/L)	Accetance Criteria	Comment
8.00	8.10	Difference between Titration value and instrument reading <0.2mg/L	Pass

Turbidity performance checking

Turbidity stock solution	Instrument Readings (NTU)	Accetance Criteria	Comment
10 NTU	10.00	9.0-11.0	Pass
50 NTU	50.02	45.0-55.0	Pass
100 NTU	100.2	90.0-110.0	Pass

Depth performance checking

Water Depth	Instrument Readings (NTU)	Accetance Criteria	Comment
0.5 meter	0.50	0.45-0.55	Pass

**********END OF REPORT**********

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TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
RM 1710, Technology Park,
18 On Lai Street,
Shatin, N.T., Hong Kong

Test Report No.:	30301
Date of Issue:	2018-11-24
Date Received:	2018-11-24
Date Tested:	2018-11-24
Date Completed:	2018-11-24
Next Due Date:	2019-02-23

ATTN: **Miss Mei Ling Tang**

Certificate of Calibration

Item for calibration:

YSI EXO1 Multiparameter Sondes	Equipment No.: SW-08-132	
Manufacturer:	YSI Incorporated, a Xylem brand	
Description:	Model No.	Serial No.
- EXO Optical DO Sensor, Ti	599100-01	17B102219
- EXO conductivity/Temperature Sensor, Ti	599870	17B100807
- EXO Turbuduty Sensor, Ti	599101-01	17B102262
- EXO pH Sensor Assembly, Guarded, Ti	599795-01	16J101314

Test conditions:

Room Temperature : 17-22 degree Celsius
Relative Humidity : 40-70%

Test Specifications:

Performance checking for Conductivity, Temperature, pH, Dissolved oxygen (D.O.) and Turbidity

Methodology:

According to manufacturer instruction manual, APHA 20e 4500-O C

****

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PATRICK TSE
Laboratory Manager

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TEST REPORT

Test Report No.:	30301
Date of Issue:	2018-11-24
Date Received:	2018-11-24
Date Tested:	2018-11-24
Date Completed:	2018-11-24
Next Due Date:	2019-02-23
Page:	2 of 2

Certificate of Calibration

Results:

Conductivity performance checking

	Instrument Readings (μS/cm)	Accetance Criteria	Comment
KCl stock solution (12890 μS/cm)	13000	12246-13534	Pass

Temperature performance checking

Reference thermometer-E431 Readings (°C)	Instrument Readings (°C)	Correction (°C)	Comment
20.0	20.001	-0.001	N/A

pH performance checking

	Instrument Readings (pH unit)	Accetance Criteria	Comment
pH QC buffer 4.00	4.02	4.00 ± 0.10	Pass
pH QC buffer 6.86	6.89	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.20	9.18 ± 0.10	Pass

D.O. performance checking

	Instrument Readings (mg/L)	Accetance Criteria	Comment
Zero DO soultion	0.07	<0.1mg/L	Pass

Winkler Titration value (mg/L)	Instrument Readings (mg/L)	Accetance Criteria	Comment
8.00	8.04	Difference between Titration value and instrument reading <0.2mg/L	Pass

Turbidity performance checking

Turbidity stock solution	Instrument Readings (NTU)	Accetance Criteria	Comment
10 NTU	10.01	9.0-11.0	Pass
50 NTU	50.00	45.0-55.0	Pass
100 NTU	100.2	90.0-110.0	Pass

Depth performance checking

Water Depth	Instrument Readings (NTU)	Accetance Criteria	Comment
0.5 meter	0.50	0.45-0.55	Pass

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TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
RM 1710, Technology Park,
18 On Lai Street,
Shatin, N.T., Hong Kong

Test Report No.:	30303
Date of Issue:	2018-11-24
Date Received:	2018-11-24
Date Tested:	2018-11-24
Date Completed:	2018-11-24
Next Due Date:	2019-02-23

ATTN: **Miss Mei Ling Tang**

Certificate of Calibration

Item for calibration:

YSI EXO1 Multiparameter Sondes	Equipment No.:	SW-08-159
Manufacturer:	YSI Incorporated, a Xylem brand	
Description:	Model No.	Serial No.
- EXO Optical DO Sensor, Ti	599100-01	17K100317
- EXO conductivity/Temperature Sensor, Ti	599870	17H103441
- EXO Turbuduty Sensor, Ti	599101-01	17K100325
- EXO pH Sensor Assembly, Guarded, Ti	599795-01	17K103094

Test conditions:

Room Temperature : 17-22 degree Celsius
Relative Humidity : 40-70%

Test Specifications:

Performance checking for Conductivity, Temperature, pH, Dissolved oxygen (D.O.) and Turbidity

Methodology:

According to manufacturer instruction manual, APHA 20e 4500-O C

****

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Laboratory Manager

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TEST REPORT

Test Report No.:	30303
Date of Issue:	2018-11-24
Date Received:	2018-11-24
Date Tested:	2018-11-24
Date Completed:	2018-11-24
Next Due Date:	2019-02-23

Certificate of Calibration

Results:

Conductivity performance checking

	Instrument Readings (μS/cm)	Accetance Criteria	Comment
KCl stock solution (12890 μS/cm)	13000	12246-13534	Pass

Temperature performance checking

Reference thermometer-E431 Readings (°C)	Instrument Readings (°C)	Correction (°C)	Comment
20.0	20.001	-0.001	N/A

pH performance checking

	Instrument Readings (pH unit)	Accetance Criteria	Comment
pH QC buffer 4.00	4.02	4.00 ± 0.10	Pass
pH QC buffer 6.86	6.87	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.16	9.18 ± 0.10	Pass

D.O. performance checking

	Instrument Readings (mg/L)	Accetance Criteria	Comment
Zero DO soultion	0.06	<0.1mg/L	Pass

Winkler Titration value (mg/L)	Instrument Readings (mg/L)	Accetance Criteria	Comment
8.00	8.02	Difference between Titration value and instrument reading <0.2mg/L	Pass

Turbidity performance checking

Turbidity stock solution	Instrument Readings (NTU)	Accetance Criteria	Comment
10 NTU	10.02	9.0-11.0	Pass
50 NTU	50.04	45.0-55.0	Pass
100 NTU	100.2	90.0-110.0	Pass

Depth performance checking

Water Depth	Instrument Readings (NTU)	Accetance Criteria	Comment
0.5 meter	0.50	0.45-0.55	Pass

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APPENDIX F
QUALITY CONTROL REPORTS FOR SS LABORATORY ANALYSIS

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TEST REPORT

QC REPORT

APPLICANT: Penta-Ocean-China State Joint Venture
2/F, SCL Hung Hom Site Office (HUHSO),
Cheong Tung Road South, Hung Hom,
Kowloon, Hong Kong

Report No.:	30559
Date of Issue:	2019/1/3
Date Received:	2019/1/2
Date Tested:	2019/1/2
Date Completed:	2019/1/3
Page:	1 of 1

ATTN: Mr. Hints Pang

Project Name: Shatin to Central Link - Contract No.1121
- NSL Cross Harbour Tunnels

Sampling Date: 2019/1/2

Number of Sample: 84

Custody No.: MA14047/190102

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	5	4	22	96

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TEST REPORT

QC REPORT

APPLICANT: Penta-Ocean-China State Joint Venture
2/F, SCL Hung Hom Site Office (HUHSO),
Cheong Tung Road South, Hung Hom,
Kowloon, Hong Kong

Report No.:	30579
Date of Issue:	2019/1/7
Date Received:	2019/1/5
Date Tested:	2019/1/5
Date Completed:	2019/1/7
Page:	1 of 1

ATTN: Mr. Hints Pang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2019/1/5
Number of Sample: 84
Custody No.: MA14047/190105

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	8	8	2	97

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Laboratory Manager

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TEST REPORT

QC REPORT

APPLICANT: Penta-Ocean-China State Joint Venture
2/F, SCL Hung Hom Site Office (HUHSO),
Cheong Tung Road South, Hung Hom,
Kowloon, Hong Kong

Report No.:	30588
Date of Issue:	2019/1/9
Date Received:	2019/1/8
Date Tested:	2019/1/8
Date Completed:	2019/1/9
Page:	1 of 1

ATTN: Mr. Hints Pang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2019/1/8
Number of Sample: 84
Custody No.: MA14047/190108

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	4	5	4	101

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TEST REPORT

QC REPORT

APPLICANT: Penta-Ocean-China State Joint Venture
2/F, SCL Hung Hom Site Office (HUHSO),
Cheong Tung Road South, Hung Hom,
Kowloon, Hong Kong

Report No.:	30606
Date of Issue:	2019/1/11
Date Received:	2019/1/10
Date Tested:	2019/1/10
Date Completed:	2019/1/11
Page:	1 of 1

ATTN: Mr. Hints Pang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2019/1/10
Number of Sample: 84
Custody No.: MA14047/190110

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	5	5	1	105

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TEST REPORT

QC REPORT

APPLICANT: Penta-Ocean-China State Joint Venture
2/F, SCL Hung Hom Site Office (HUHSO),
Cheong Tung Road South, Hung Hom,
Kowloon, Hong Kong

Report No.:	30619
Date of Issue:	2019/1/14
Date Received:	2019/1/12
Date Tested:	2019/1/12
Date Completed:	2019/1/14
Page:	1 of 1

ATTN: Mr. Hints Pang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2019/1/12
Number of Sample: 84
Custody No.: MA14047/190112

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
c2bf	7	7	3	104

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Laboratory Manager

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TEST REPORT

QC REPORT

APPLICANT: Penta-Ocean-China State Joint Venture
2/F, SCL Hung Hom Site Office (HUHSO),
Cheong Tung Road South, Hung Hom,
Kowloon, Hong Kong

Report No.:	30625
Date of Issue:	2019/1/15
Date Received:	2019/1/14
Date Tested:	2019/1/14
Date Completed:	2019/1/15
Page:	1 of 1

ATTN: Mr. Hints Pang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2019/1/14
Number of Sample: 84
Custody No.: MA14047/190114

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C2me	6	6	4	103

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TEST REPORT

QC REPORT

APPLICANT: Penta-Ocean-China State Joint Venture
2/F, SCL Hung Hom Site Office (HUHSO),
Cheong Tung Road South, Hung Hom,
Kowloon, Hong Kong

Report No.:	30641
Date of Issue:	2019/1/17
Date Received:	2019/1/16
Date Tested:	2019/1/16
Date Completed:	2019/1/17
Page:	1 of 1

ATTN: Mr. Hints Pang

Project Name: Shatin to Central Link - Contract No.1121
- NSL Cross Harbour Tunnels

Sampling Date: 2019/1/16

Number of Sample: 84

Custody No.: MA14047/190116

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	7	7	4	92

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TEST REPORT

QC REPORT

APPLICANT: Penta-Ocean-China State Joint Venture
2/F, SCL Hung Hom Site Office (HUHSO),
Cheong Tung Road South, Hung Hom,
Kowloon, Hong Kong

Report No.:	30657
Date of Issue:	2019/1/21
Date Received:	2019/1/18
Date Tested:	2019/1/18
Date Completed:	2019/1/21
Page:	1 of 1

ATTN: Mr. Hints Pang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2019/1/18
Number of Sample: 84
Custody No.: MA14047/190118

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	11	11	1	99

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TEST REPORT

QC REPORT

APPLICANT: Penta-Ocean-China State Joint Venture
2/F, SCL Hung Hom Site Office (HUHSO),
Cheong Tung Road South, Hung Hom,
Kowloon, Hong Kong

Report No.:	30671
Date of Issue:	2019/1/23
Date Received:	2019/1/22
Date Tested:	2019/1/22
Date Completed:	2019/1/23
Page:	1 of 1

ATTN: Mr. Hints Pang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2019/1/22
Number of Sample: 84
Custody No.: MA14047/190122

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	6	6	3	102

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TEST REPORT

QC REPORT

APPLICANT: Penta-Ocean-China State Joint Venture
2/F, SCL Hung Hom Site Office (HUHSO),
Cheong Tung Road South, Hung Hom,
Kowloon, Hong Kong

Report No.:	30685
Date of Issue:	2019/1/25
Date Received:	2019/1/24
Date Tested:	2019/1/24
Date Completed:	2019/1/25
Page:	1 of 1

ATTN: Mr. Hints Pang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2019/1/24
Number of Sample: 84
Custody No.: MA14047/190124

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	7	7	3	98

**********END OF REPORT**********

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Laboratory Manager

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TEST REPORT

QC REPORT

APPLICANT: Penta-Ocean-China State Joint Venture
2/F, SCL Hung Hom Site Office (HUHSO),
Cheong Tung Road South, Hung Hom,
Kowloon, Hong Kong

Report No.:	30706
Date of Issue:	2019/1/28
Date Received:	2019/1/26
Date Tested:	2019/1/26
Date Completed:	2019/1/28
Page:	1 of 1

ATTN: Mr. Hints Pang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2019/1/26
Number of Sample: 84
Custody No.: MA14047/190126

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	5	5	5	98

**********END OF REPORT**********

PREPARED AND CHECKED BY:
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Laboratory Manager

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TEST REPORT

QC REPORT

APPLICANT: Penta-Ocean-China State Joint Venture
2/F, SCL Hung Hom Site Office (HUHSO),
Cheong Tung Road South, Hung Hom,
Kowloon, Hong Kong

Report No.:	30712
Date of Issue:	2019/1/29
Date Received:	2019/1/28
Date Tested:	2019/1/28
Date Completed:	2019/1/29
Page:	1 of 1

ATTN: Mr. Hints Pang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2019/1/28
Number of Sample: 84
Custody No.: MA14047/190128

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	8	8	1	97

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TEST REPORT

QC REPORT

APPLICANT: Penta-Ocean-China State Joint Venture
2/F, SCL Hung Hom Site Office (HUHSO),
Cheong Tung Road South, Hung Hom,
Kowloon, Hong Kong

Report No.:	30738
Date of Issue:	2019/1/31
Date Received:	2019/1/30
Date Tested:	2019/1/30
Date Completed:	2019/1/31
Page:	1 of 1

ATTN: Mr. Hints Pang

Project Name: Shatin to Central Link - Contract No.1121 - NSL Cross Harbour Tunnels
Sampling Date: 2019/1/30
Number of Sample: 84
Custody No.: MA14047/190130

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	5	5	2	104

**********END OF REPORT**********

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

PATRICK TSE
Laboratory Manager

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APPENDIX G
SUMMARY OF EXCEEDANCE

APPENIDX G – SUMMARY OF EXCEEDANCE

Reporting Month: January 2019

a) Exceedance Report for Dust Monitoring (NIL)

b) Exceedance Report for Water Quality Monitoring (NIL)

APPENDIX H
SITE AUDIT SUMMARY

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	190102
Date	02 January 2019 (Wednesday)
Time	13:30 – 17:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
190102-R01	***Part B – Water Quality*** • The Contractor was reminded to repair the pH meter of the AquaSed near discharge point at Hung Hom site. ***Part C – Ecology / Others*** • No environmental deficiency was identified during the site inspection. ***Part D – Landscape & Visual*** • No environmental deficiency was identified during the site inspection. ***Part E – Air Quality*** • No environmental deficiency was identified during the site inspection. ***Part F – Construction Noise Impact*** • No environmental deficiency was identified during the site inspection. ***Part G – Waste/Chemical Management*** • No environmental deficiency was identified during the site inspection. ***Part H – Permits/Licenses*** • No environmental deficiency was identified during the site inspection. ***Part I - Others*** • Follow-up on previous audit section (Ref. No.:181224), all environmental deficiency was rectified or improved by the Contractor.	B7

	Name	Signature	Date
Recorded by	Andy Chan	Andy	02 January 2019
Checked by	Dr. Priscilla Choy		04 January 2019

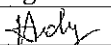
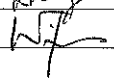
Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	190107
Date	07 January 2019 (Monday)
Time	13:30 – 17:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
190107-R01	***Part B – Water Quality*** • The Contractor was reminded to check the pH of treated water and make sure that the AquaSed is functioning properly at Hung Hom site. ***Part C – Ecology / Others*** • No environmental deficiency was identified during the site inspection. ***Part D – Landscape & Visual*** • No environmental deficiency was identified during the site inspection. ***Part E – Air Quality***	B7
190107-R02	• A three-side dust curtain should be provided to the tipping hall during the operation at Hung Hom site.	E21
190107-R03	• Stockpile of dusty material at mud pit should be covered by the impervious sheet for dust suppression at Hung Hom site. ***Part F – Construction Noise Impact*** • No environmental deficiency was identified during the site inspection. ***Part G – Waste/Chemical Management*** • No environmental deficiency was identified during the site inspection. ***Part H – Permits/Licenses*** • No environmental deficiency was identified during the site inspection. ***Part I - Others*** • Follow-up on previous audit section (Ref. No.:190102), item 190102-R01 was remarked as 190107-R01 and the follow-up action is needed to be reviewed.	E6

	Name	Signature	Date
Recorded by	Andy Chan		07 January 2019
Checked by	Dr. Priscilla Choy		09 January 2019

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	190114
Date	14 January 2019 (Monday)
Time	13:30 – 17:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
190114-O01	***Part B – Water Quality*** • The Contractor was reminded to closely monitor the pH of treated water and make sure that the AquaSed is functioning properly at Hung Hom site. And the sediment in sedimentation tank inside the IMT should be cleaned regularly. ***Part C – Ecology / Others*** • No environmental deficiency was identified during the site inspection. ***Part D – Landscape & Visual*** • No environmental deficiency was identified during the site inspection. ***Part E – Air Quality*** • No environmental deficiency was identified during the site inspection. ***Part F – Construction Noise Impact*** • No environmental deficiency was identified during the site inspection. ***Part G – Waste/Chemical Management*** • No environmental deficiency was identified during the site inspection. ***Part H – Permits/Licenses*** • No environmental deficiency was identified during the site inspection. ***Part I - Others*** • Follow-up on previous audit section (Ref. No.:190107), item 190107-R01 was remarked as 190114-O01 and the follow-up action is needed to be reviewed.	B7

	Name	Signature	Date
Recorded by	Andy Chan	Andy	14 January 2019
Checked by	Dr. Priscilla Choy		15 January 2019

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	190121
Date	21 January 2019 (Monday)
Time	13:30 – 17:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
190121-R01	***Part B – Water Quality*** • No environmental deficiency was identified during the site inspection. ***Part C – Ecology / Others*** • No environmental deficiency was identified during the site inspection. ***Part D – Landscape & Visual*** • No environmental deficiency was identified during the site inspection. ***Part E – Air Quality*** • No environmental deficiency was identified during the site inspection. ***Part F – Construction Noise Impact*** • No environmental deficiency was identified during the site inspection. ***Part G – Waste/Chemical Management*** • Drip tray should be provided to chemical container to prevent oil leakage at Hung Hom site. ***Part H – Permits/Licenses*** • No environmental deficiency was identified during the site inspection. ***Part I - Others*** • Follow-up on previous audit section (Ref. No.:190114), all environmental deficiency was rectified or improved by the Contractor.	G9

	Name	Signature	Date
Recorded by	Andy Chan	Andy	21 January 2019
Checked by	Dr. Priscilla Choy		22 January 2019

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	190128
Date	28 January 2019 (Monday)
Time	13:30 – 17:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
190128-R01	***Part B – Water Quality*** • No environmental deficiency was identified during the site inspection. ***Part C – Ecology / Others*** • No environmental deficiency was identified during the site inspection. ***Part D – Landscape & Visual*** • No environmental deficiency was identified during the site inspection. ***Part E – Air Quality*** • A fading NRMM label on the excavator should be replaced near the NOV building at Hung Hom site. ***Part F – Construction Noise Impact*** • No environmental deficiency was identified during the site inspection. ***Part G – Waste/Chemical Management*** • No environmental deficiency was identified during the site inspection. ***Part H – Permits/Licenses*** • No environmental deficiency was identified during the site inspection. ***Part I - Others*** • Follow-up on previous audit section (Ref. No.:190121), all environmental deficiency was rectified or improved by the Contractor.	E22

	Name	Signature	Date
Recorded by	Andy Chan		28 January 2019
Checked by	Dr. Priscilla Choy		29 January 2019

APPENDIX I
EVENT AND ACTION PLANS

Event and Action Plan for Marine Water Quality Monitoring

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
ACTION LEVEL				
Action level being exceeded by one sampling day	1. Inform the Contractor, IEC and ER; 2. Check monitoring data, all plant, equipment and the Contractor's working methods; and 3. Discuss remedial measures with the IEC and Contractor.	1. Discuss with the ET, ER and Contractor on the implemented mitigation measures; 2. Review proposals on remedial measures submitted by the Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER the effectiveness of the implemented mitigation measures.	1. Discuss with the ET, IEC and Contractor on the implemented mitigation measures; 2. Make agreement on the remedial measures to be implemented; and 3. Supervise the implementation of agreed remedial measures.	1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4. Check all plant and equipment; 5. Consider changes of working methods; 6. Discuss with the ET, IEC and ER and propose remedial measures to IEC and ER; and 7. Implement the agreed remedial measures.
Action level being exceeded by more than one consecutive sampling days	1. Repeat in-situ measurement to confirm findings; 2. Inform the Contractor, IEC and ER; 3. Check monitoring data, all plant, equipment and the Contractor's working methods; 4. Discuss remedial measures with the IEC and Contractor; and 5. Ensure remedial measures are implemented.	1. Discuss with the ET, ER and Contractor on the implemented mitigation measures; 2. Review proposals on remedial measures submitted by the Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER the effectiveness of the implemented remedial measures.	1. Discuss with the ET, IEC and Contractor on the implemented mitigation measures; 2. Make agreement on the remedial measures to be implemented; and 3. Discuss with the ET and IEC on the effectiveness of the implemented remedial measures.	1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4. Check all plant and equipment; 5. Consider changes of working methods; 6. Discuss with the ET, IEC and ER and propose remedial measures to IEC and ER within 3 working days of notification; and 7. Implement the agreed remedial measures.

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
LIMIT LEVEL				
1. Limit level being exceeded by one sampling day	1. Repeat in-situ measurement to confirm findings; 2. Inform the Contractor, IEC, EPD and ER; 3. Rectify unacceptable practice; 4. Check monitoring data, all plant, equipment and the Contractor's working methods; 5. Discuss with the ET and IEC and propose remedial measures to the IEC, EPD and ER; and 6. Ensure the agreed remedial measures are implemented.	1. Discuss with the ET, ER and Contractor on the implemented mitigation measures; 2. Review proposals on remedial measures submitted by Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER the effectiveness of the implemented remedial measures.	1. Discuss with the ET, IEC and Contractor on the implemented mitigation measures; 2. Request the Contractor to critically review the working methods; 3. Make agreement on the remedial measures to be implemented; and 4. Assess the effectiveness of the implemented remedial measures.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET , IEC and ER and propose remedial measures to IEC and ER within 3 working days of notification; and 6. Implement the agreed remedial measures.
2. Limit level being exceeded by more than one consecutive sampling days	1. Inform the Contractor, IEC, EPD and ER; 2. Check monitoring data, all plant, equipment and the Contractor's working methods; 3. Discuss remedial measures with the IEC, EPD, ER and Contractor; 4. Ensure remedial measures are implemented; and 5. Increase the monitoring frequency to daily until no exceedance of Limit level	1. Discuss with the ET, ER and Contractor on the implemented measures; 2. Review proposals on remedial measures submitted by the Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER the effectiveness of the implemented remedial measures.	1. Discuss with the ET, IEC and Contractor on the implemented mitigation measures; 2. Request the Contractor to critically review the working methods; 3. Make agreement on the remedial measures to be implemented; 4. Discuss with the the ET, IEC and Contractor on the effectiveness of the implemented remedial measures; and 5. Consider and instruct, if necessary,	1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4. Check all plant and equipment; 5. Consider changes of working methods; 6. Discuss with the ET, IEC and ER and propose remedial measures to IEC and ER within 3 working days of notification; 7. Implement the agreed remedial measures; and

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
	for two consecutive days.		the Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit level.	8. As directed by the ER, to slow down or to stop all or part of the marine works or construction activities.

APPENDIX J
UPDATED ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

SCL Works Contract 1121 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Cultural Heritage Impact (Construction Phase)							
S4.93 & Table 4.2	Erection of decorative and sensibly designed hoarding along the boundary of the works area	To mitigate the temporary visual impact due to surface works.	Contractor	Works Areas in Causeway Bay and Wan Chai	Construction phase	EIAO	N/A
Ecology (Construction Phase)							
S 5.133	The following mitigation measures in controlling water quality change shall be implemented: - Installation of silt curtains around the dredgers, where appropriate, during dredging activities; - Use of closed grab dredger during dredging; and - Reduction of dredging rate	To minimize changes in water quality impact on marine flora and fauna	Contractor	All reclamation and dredging works areas	Construction phase	• EIAO-TM	^ ^ ^
S5.134	Accidental chemical spillage and construction site run-off to the receiving water bodies, mitigation measures such as removing the pollutants before discharge into storm drain and paving the section of construction road between the wheel washing bay and the public road as suggested in Sections 11.216 and 11.219 to 11.256 of the EIA Report shall be adopted	Minimise the contamination of wastewater discharge	Contractor	All land based works areas	Construction phase	• EIAO-TM	^
ERR S3.6.3	Installation of floating type silt curtains around the area of construction and removal of earth	Minimize indirect impact to the nearby subtidal and intertidal flora and fauna	Contractor	Shek O Casting Basin	Construction phase	• EIAO-TM	^

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Fisheries Impact							
S5.132	The size of the dredging and underwater blasting areas shall be minimized as much as possible	To minimize loss of fishing ground and fisheries resources	Contractor/ MTR	All dredging and underwater blasting works areas	Construction phase	• EIAO-TM	^
S5.133	Mitigation measures recommended in Sections 11.200 to 11.207, 11.209 to 11.211 and 11.213 to 11.256 of the EIA Report to control water quality, i.e. use of effective site drainage in land-based construction site and installation of silt curtain surrounding the dredging point, use of closed grab dredger and reduction of dredging rate shall be implemented.	To minimize change in water quality impact on fisheries resources and operation	Contractor	Works Areas	Construction phase	• EIAO-TM	^
S6.59	After completion of armour rock filling, the final surfaces of the protective armour tock layer shall be checked by ultrasonic sounding survey. Measures such as removing the rock or breaking the rock into pieces shall be implemented in case of non-compliance	To minimize the IMT protrusion above the seabed	Contractor	Along IMT laying works areas	Construction phase	• EIAO-TM	N/A
Landscape & Visual (Construction Phase)							
Table 7.9	CM3 - Control of night-time lighting glare	Minimize the night time glare due to the Project during construction phase	MTR	All works sites	Construction phase	• EIAO-TM	^

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Table 7.9	CM4 - Erection of decorative screen hoarding compatible with the surrounding setting.	Minimize the visual impact of the Project during construction phase	MTR	All works sites	Construction phase	• EIAO-TM	N/A
Table 7.9	CM5 - Management of facilities on work sites which give control on the height and disposition/arrangement of all facilities on the works site to minimize visual impact to adjacent VSRs.	Control of height and deposition/arrangement of temporary facilities in works areas	MTR	All works sites	Construction phase	• EIAO-TM	N/A
Table 7.9	CM6 - All hard and soft landscape areas disturbed temporarily during construction shall be reinstated on like-to-like basis to the satisfaction of the relevant Government Departments.	Reinstatement of temporary works areas.	MTR	All works sites	Construction phase	• EIAO-TM	N/A
Construction Dust Impact							
EP 2.25	All diesel fuelled construction plant used by the contractors within the works areas of the Project shall be powered by ultra-low sulphur diesel fuel.	Mitigating Aerial Emissions from Construction Plant	Contractor	All works areas	Construction phase	• EIAO-TM	^
Table 8.5	Barging facilities: (i) Pave all road surfaces within the barging facilities and provide watering once along with the haul road for every	To minimize dust impacts	Contractor	Barging facility at Shek O Casting Basin	Construction phase	APCO	^

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	working hours to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.0 L/m^2 once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.0L/m^2 to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual (ii) Unloading of spoil materials – Undertake the unloading process within a 3-sided screen with top tipping hall. Provide water spraying and flexible dust curtains at the discharge point for dust suppression. (iii) Vehicles leaving the barging facilities – Pass vehicles						* ^

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	through the wheel washing facilities provided at site exits.						
S8.63	For concrete batching plant, the requirements and mitigation measures stipulated in the Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93) shall be followed and implemented.	To minimize dust impact	Contractor	Concrete Batching Plant	Construction phase	APCO	N/A
Table 8.6	During operation of concrete batching plant: (i) Unloading of aggregates from the tipper trucks to receiving hopper – unload the aggregates from the tipper trucks to the receiving hopper equipped with enclosures on 3 sides and top cover, and water spraying system. (ii) Unloading of cement and PFA from tankers into the silo – Directly load the cement and PFA into the silo via a flexible duct. Install dust collectors at cement/PFA silos. (iii) Storage of aggregates in overhead storage bins – Store the aggregates in fully enclosed overhead storage bins. Cover the top of overhead storage bins with cladding. Install water spraying system at the top of storage bins for watering the aggregates, and fully enclose aggregates storage bins. (iv) Weighing and batching of cementitious materials – Perform the whole process of weighing and mixing in a fully	To minimize dust impact	Contractor	Concrete Batching Plant	Construction phase	APCO	N/A N/A N/A N/A

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	enclosed environment. Equip all the mixers with dust collectors. (v) Loading of concrete from mixer into transit mixer of a truck – Directly load the concrete from the mixer into the transit mixer of a truck in "wet form". (vi) Tipper trucks and cement tankers leaving the Concrete Batching Plant – Haul road within the site is unpaved. Install wheel washing pit at the gate of the concrete batching plant. (vii) Transportation of materials within the plant – Provide watering twice a day would be provided.						N/A N/A N/A
S8.89	Watering once every working hour on active works areas, exposed areas and paved haul roads to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.7 L/m2 for Kowloon side and 1.0 L/m^2 for Hong Kong side once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While	To minimize dust impact	Contractor	Works areas at: • Hung Hom • Cross Harbour section up to Breakwater of CBTS Breakwater of CBTS to SOV • Shek O Casting Basin	Construction phase	APCO	^

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.7 L/m^2 for Kowloon side and 1.0 L/m^2 for Hong Kong side to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual.						
S8.90	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: - Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. - Use of frequent watering for particularly dusty construction areas and areas close to ASRs. - Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. - Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles	To minimize dust impact	Contractor	Works areas at: • Hung Hom • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV	Construction phase	APCO and Air Pollution Control (Construction Dust) Regulation	^ ^ ^ *

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	near ASRs. - Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. - Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. - Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. - Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit. - Imposition of speed controls for vehicles on site haul roads. - Where possible, routing of vehicles and positioning of construction plant shall be at the maximum possible distance from ASRs. - Every stock of more than 20 bags of cement or dry						^ N/A ^ N/A ^ ^ ^

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. - Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.						N/A
Air Quality (Construction Phase)							
/	Emission from Vehicles and Plants • All vehicles shall be shut down in intermittent use. • Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke. • All diesel fuelled construction plant within the works areas shall be powered by ultra low sulphur diesel fuel (ULSD)	Reduce air pollution emission from construction vehicles and plants	Contractor	All construction sites	Construction stage	• APCO	^ ^ ^
/	Valid Non-road Mobile Machinery (NRMM) labels should be provided to regulated machines	Reduce air pollution emission from construction vehicles and plants	Contractor	All construction sites	Construction stage	• APCO	*
Construction Noise (Airborne)							
S9.55	Implement the following good site practices:	Control construction	Contractor	Works areas	Construction	• EIAO-TM	

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	• only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; • silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; • mobile plant should be sited as far away from NSRs as possible and practicable; • material stockpiles, mobile container site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.	airborne noise			phase		^ ^ ^ ^ ^ ^
S9.56 & Table 9.16	The following quiet PME shall be used: • Crane lorry, mobile	To minimize construction noise impact	Contractor	Works areas at: • Hung Hom	Construction stage	• EIAO-TM	N/A

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	• Crane, mobile • Asphalt paver • Backhoe with hydraulic breaker • Breaker, excavator mounted (hydraulic) • Hydraulic breaker • Concrete lorry mixer • Poker, vibrator, hand-held • Concrete pump • Crawler crane, mobile • Mobile crane • Dump truck • Excavator • Truck • Rock drill • Lorry • Wheel loader • Roller vibratory			• Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV			
S9.58 – S9.59 & Table 9.17	Movable noise barrier shall be used for the following PME: • Air compressor • Asphalt paver • Backhoe with hydraulic breaker	To minimize construction noise impact	Contractor	Works areas at: • Cross Harbour section up to Breakwater of	Construction stage	• EIAO-TM	N/A

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	• Bar bender • Bar bender and cutter (electric) • Breaker, excavator mounted • Concrete pump • Concrete pump, stationary/lorry mounted • Excavator • Generator • Grout pump • Hand held breaker • Hydraulic breaker • Saw, concrete			CBTS • Breakwater of CBTS to SOV			
S9.60 & Table 9.17	Noise insulating fabric shall be used for • Drill rig, rotary type • Piling, diaphragm wall, bentonite filtering plant • Piling, diaphragm wall, grab and chisel • Piling, diaphragm wall, hydraulic extractor • Piling, large diameter bored, grab and chisel • Piling, hydraulic extractor • Piling, earth auger, auger • Rock drill, crawler mounted (pneumatic)	To minimize construction noise impact	Contractor	Works areas at: • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV	Construction stage	• EIAO-TM	N/A
Water Quality (Construction Phase)							

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
S11.200 & 201	All excavation and tunnel construction works will be undertaken within the cofferdam and there will be no open dredging. Removal of fender piles of Hung Hom Bypass and minor marine piling works will be carried out prior to the construction of the elevated platform adjacent to the cofferdam at Hung Hom Landfall. Reinstatement of the fender piles will be carried out upon completion of tunnel section. Potential release of sediment due to abovementioned works could be minimized by installation of silt curtains surrounding the works area as appropriate. All excavation and tunnel construction works will be undertaken within the cofferdam. No open dredging shall be allowed.	To minimize release of sediment and contaminants during temporary reclamation.	Contractor	Marine works at Hung Hom Landfall	Construction phase	• EIAO-TM • WPCO	N/A ^ ^
S11.202	All temporary reclamation works will adopt an approach where temporary seawalls will first be formed to enclose each phase of the temporary reclamation. Installation of diaphragm wall on temporary reclamation as well as any bulk filling will proceed behind the completed seawall. Any gaps that may need to be provided for marine access will be shielded by silt curtains to control sediment plume dispersion away from the	To minimize loss of fines and contaminants during temporary reclamations	Contractor	All temporary reclamation works areas	Construction phase	• EIAO-TM • WPCO	N/A

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	site. Demolition of temporary reclamation including the demolition of the diaphragm wall and dredging to the existing seabed levels will also be carried out behind the temporary seawall. Temporary seawall will be removed after completion of all excavation and dredging works for demolition of the temporary reclamation.						N/A N/A
S11. 202	During construction of the temporary reclamation, temporary seawall will be partially constructed to protect the nearby seawater intakes from further dredging activities. For example, the seawalls along the southeast and northeast boundaries of PW1.1 shall be constructed first (above high water mark) so that the seawater intake at the inner water would be protected from the impacts from the remaining dredging activities along the northwest boundary.	To minimize water quality impact upon the cooling water intakes in CBTS from temporary reclamation works	Contractor	Temporary reclamation works areas in CBTS	Construction phase	• EIAO-TM • WPCO	N/A
S11. 202	Dredging will be carried out by closed grab dredger to minimize release of sediment and other contaminants during dredging.	To minimize loss of fines and contaminants during dredging in CBTS	Contractor	All temporary reclamation and dredging works areas within CBTS	Construction phase	• EIAO-TM • WPCO	^
S11. 202 & Table	Silt curtains will be deployed to fully enclose the closed grab	To minimize loss of fines	Contractor	All temporary	Construction	• EIAO-TM	^

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11.25	dredger and shall be extended from water surface to the seabed, as far as practicable, during any dredging operation.	and contaminants during dredging in CBTS		reclamation and dredging works areas within CBTS	phase	• WPCO	
S11. 202 & Table 11.23	Silt screens will be installed at the cooling water intakes within the CBTS during the temporary reclamation period.	To minimize water quality impact upon the cooling water intakes in CBTS from marine construction activities	Contractor	Cooling water intakes inside CBTS	Construction phase	• EIAO-TM • WPCO	^
S11. 203 & Table 11.24	No more than two dredgers (of about 8 m^3 capacity each) shall be operated for dredging within the typhoon shelter at any time for the tunnel construction works. Moreover, the combined dredging rate for all concurrent dredging works (include dredging works for concurrent projects such as WDII and CWB) to be undertaken within the CBTS shall not exceed 4,500 m^3 per day (and 281 m^3 per hour with a maximum working period of 16 hours per day) throughout the entire construction period.	To minimize loss of fines and contaminants during dredging in CBTS	Contractor	All dredging works areas within CBTS	Construction phase	• EIAO-TM • WPCO	^
ERR 6.7.1	Closed grab dredger shall be used for any dredging operations, except at for removal of fill material at the gap at the IMT/ME4 interface, which will be carried out by air lift or	To minimize water quality impact in CBTS from marine construction	Contractor	All marine works areas within CBTS	Construction phase	• EIAO-TM • WPCO	N/A

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	sand pump method	activities					
ERR 6.7.1	Fill materials removed by air lift or sand pumping method shall be stored inside impermeable compartment of the barge	To minimize water quality impact in CBTS from marine construction activities	Contractor	All marine works areas within CBTS	Construction phase	• EIAO-TM • WPCO	N/A
ERR 6.7.1	Bulk filling operation within CBTS shall be carried out by closed grab dredger and/or by feeding the fill material into a down pipe for placing of fill materials	To minimize water quality impact in CBTS from marine construction activities	Contractor	All marine works areas within CBTS	Construction phase	• EIAO-TM • WPCO	N/A
EP 2.18.1a	Pipe piles shall be used to form temporary seawalls for IMT construction within CBTS.	To minimize water quality impact in CBTS from IMT construction	Contractor	IMT construction works within CBTS	Construction phase	• EIAO-TM • WPCO	^
EP 2.18.1b	The temporary seawalls shall not be removed before completion of all dredging or filling works for IMT construction, except for a small section of pipe piles adjoining IMT11 to facilitate the necessary dredging works for placing the IMT11.	To minimize water quality impact in CBTS from IMT construction	Contractor	IMT construction works within CBTS	Construction phase	• EIAO-TM • WPCO	^
EP 2.18.1j	Water quality monitoring shall be conducted at cooling water intake 9 for Windsor House during IMT construction within CBTS. The monitoring frequency, parameters, equipment and methodology shall follow those for dredging and filling as	To minimize water quality impact in CBTS from IMT construction	Contractor	IMT construction works within CBTS	Construction phase	• EIAO-TM • WPCO	^

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	stipulated in the EM&A Manual.						
S11. 204	Bulk filling along the IMT tunnel alignment for SCL shall be carried out after the bulk dredging works along the IMT alignment are completed. Hence, bulk dredging and bulk filling along the IMT alignment shall not be undertaken at the same time.	To minimize loss of fines and contaminants during IMT construction	Contractor	Marine works areas in Victoria Harbour	Construction phase	• EIAO-TM • WPCO	N/A
S11. 204	Dredging for IMT and SCL2 construction shall be carried out by closed grab dredger to minimize release of sediment and other contaminants during dredging.	To minimize loss of fines and contaminants during dredging in the Victoria Harbour	Contractor	Marine works areas in Victoria Harbour	Construction phase	• EIAO-TM • WPCO	^
S11.204	No more than one closed grab dredger shall be operated outside the CBTS in the open harbor for SCL construction.	To minimize loss of fines and contaminants from dredging in the Victoria Harbour	Contractor	Marine works areas in Victoria Harbour	Construction phase	• EIAO-TM • WPCO	^
S11. 204	Dredging for temporary reclamation outside the CBTS (at SCL2) shall not be carried out concurrently with the dredging / filling works for IMT construction.	To minimize loss of fines and contaminants from dredging / filling in the Victoria Harbour	Contractor	Marine works areas in Victoria Harbour	Construction phase	• EIAO-TM • WPCO	N/A
S11. 205	Floating type or frame type silt curtains shall be deployed around the dredging operations within 200m from the Hung Hom landfall.	To minimize loss of fines and contaminants from dredging in the Victoria	Contractor	Construction of northern IMT segment in the	Construction phase	• EIAO-TM • WPCO	^

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
		Harbour		near shore region within 200 m from the Hung Hom landfall			
EP 2.19e	Frame type silt curtains shall be deployed around the dredging operations for the remaining IMT segments outside 200 m from the Hung Hom landfall.	To minimize water quality impacts in Victoria Harbour from IMT construction	Contractor	Construction of northern IMT segment in Victoria Harbour outside 200m from the Hung Hom landfall	Construction phase	• EIAO-TM • WPCO	^
S11. 205 & Table 11.23	Silt screens shall be installed at the cooling water intakes for East Rail Extension, Metropolis and Hong Kong Coliseum (namely 21, 34 and 35 respectively) which are in close vicinity of the northern IMT segment.	To protect the beneficial use of water intakes along the Kowloon waterfront from dredging / filling activities	Contractor	Construction of northern IMT segment in the near shore region within 200 m from the Hung Hom landfall	Construction phase	• EIAO-TM • WPCO	
S11.207	If underwater blasting is required for SCL construction, the following precautionary / mitigation measures shall be adopted:	To protect the water quality in Victoria Harbour from any possible underwater	Contractor	Marine works areas in Victoria Harbour	Construction phase	• EIAO-TM • WPCO	N/A

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	• Charge shall be placed in cores within the rock in order that there will be no blast directly into the water. • In terms of the construction sequence, sediment dredging (within the planned IMT works area) shall be conducted prior to any underwater blasting.	blasting					
Table 11.23	Silt screens shall be installed at the WSD Flushing Water Intakes at Kowloon Station, Tai Wan, Quarry Bay and Wan Chai (namely Intakes 14, WSD9, WSD17 and A respectively) during any dredging / filling works outside the CBTS for temporary reclamation at SCL2 or for IMT construction	To protect the beneficial use of flushing water intakes in Victoria Harbour from dredging / filling activities	Contractor	Flushing water intake points in Victoria Harbour	Construction phase	• EIAO-TM • WPCO	N/A
S11.210 - S11.211 & Table 11.24 ERR S6.7.1	If the marine works for SCL are to be carried out concurrently with other dredging / filling activities in the Victoria Harbour, the production rates of any dredging / filling work to be undertaken outside the CBTS for SCL construction in the open harbour (including temporary reclamation at SCL2 and IMT construction, except for the area within 60m from the southern boundary of the temporary reclamation at Hung Hom Landfall) shall not exceed 2,500 m^3 per day at any time throughout the entire construction period. The hourly production rate for dredging or bulk filling within the open Victoria Harbour (outside the breakwater of CBTS, except for	To minimize loss of fines and contaminants from dredging / filling in the Victoria Harbour	Contractor	Marine works areas in Victoria Harbour	Construction phase	• EIAO-TM • WPCO	^

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	the area within 60m from the southern boundary of the temporary reclamation at Hung Hom Landfall) shall not exceed 156 m^3 per hour (if there are other concurrent marine works in Victoria Harbour) and the maximum working hour for the dredging / bulk filling works shall be 16 hours per day. Silt screen shall be deployed at the Kowloon Station Intake to minimize the water quality impact. If the marine works for SCL are to be carried out with no other concurrent dredging / filling activities in the Victoria Harbour, the production rates of any dredging / filling work to be undertaken outside the CBTS for SCL construction in the open harbour (including temporary reclamation at SCL2 and IMT construction except for the area within 60m from the southern boundary of the temporary reclamation at Hung Hom Landfall) shall not exceed 4,500 m^3 per day at any time throughout the entire construction period. The hourly production rate for dredging or bulk filling within the open Victoria Harbour (outside the breakwater of CBTS except for the area within 60m from the southern boundary of the temporary reclamation at Hung Hom Landfall) shall not exceed 281 m^3 per hour (if there is no other concurrent marine works in Victoria Harbour) and the						

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	maximum working hour for the dredging / bulk filling works shall be 16 hours per day. Silt screen shall be deployed at the Kowloon Station Intake to minimize the water quality impact. Only one chiseling machine or hydraulic breaker shall be adopted for rock breaking. For any dredging / filling work for IMT construction within 60m from the southern boundary of the temporary reclamation at Hung Hom Landfall: • The daily production rate shall not exceed 1,500m^3 per day • the hourly production rate shall not exceed 93m^3						^ ^
S11.215	The following good site practices shall be undertaken during filling and dredging: • mechanical grabs, if used, shall be designed and maintained to avoid spillage and sealed tightly while being lifted; • all vessels shall be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash;	To minimize loss of fines and contaminants from dredging / filling	Contractor	Marine works areas	Construction phase	• EIAO-TM • WPCO	^ ^

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	• all hopper barges and dredgers shall be fitted with tight fitting seals to their bottom openings to prevent leakage of material; • construction activities shall not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site or dumping grounds; • loading of barges and hoppers shall be controlled to prevent splashing of dredged material into the surrounding water. Barges or hoppers shall not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation; • before commencement of the temporary reclamation works, the holder of the Environmental Permit shall submit plans showing the phased construction of the reclamation, design and operation of the silt curtain.						^ ^ ^ ^
S11.216	The following mitigation measures are proposed to minimize the potential water quality impacts from the construction works at or close to the seafront: ・Temporary storage of construction materials (e.g. equipment, filling materials, chemicals and fuel) and	minimize release of construction wastes from construction works at or close to the seafront	Contractor	Construction works at or close to the seafront	Construction phase	・ EIAO-TM ・ WPCO	*

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	temporary stockpile of construction and demolition materials shall be located well away from the seawater front and storm drainage during carrying out of the works. ・Stockpiling of construction and demolition materials and dusty materials shall be covered and located away from the seawater front and storm drainage. ・Construction debris and spoil shall be covered up and/or disposed of as soon as possible to avoid being washed into the nearby receiving waters.						^ ^
S11.217	The following mitigation measures are proposed to minimize the potential water quality impacts from any marine piling works: • The potential release of sediment or excavated materials could be controlled through the installation of silt curtains surrounding the working area as necessary. • Spoil shall be collected by sealed hopper barges for proper disposal.	To minimize release of sediment and pollutants from marine piling activities	Contractor	Marine piling works areas	Construction phase	・EIAO-TM ・WPCO	^ ^
S11.218	Silt screens are recommended to be deployed at the seawater intakes during the construction works period. Regular maintenance of the silt screens and refuse collection shall be performed at the silt screens at regular intervals on a	To avoid the pollutant and refuse entrapment problems at the silt screens to be installed at the water	Contractor	Proposed silt screens at water intakes	Construction phase	・EIAO-TM ・WPCO	^

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	daily basis. The Contractor shall be responsible for keeping the water behind the silt screen free from floating rubbish and debris during the impact monitoring period.	intakes.					
S11.219	It is recommended that collection and removal of floating refuse shall be performed within the marine construction areas at regular intervals on a daily basis. The Contractor shall be responsible for keeping the water within the site boundary and the neighbouring water free from rubbish during the dredging works.	To minimize water quality impacts from illegal dumping and littering from marine vessels and runoff from the coastal area	Contractor	Marine works area	Construction phase	• EIAO-TM • WPCO • WDO	^
S11.220 & 221	Any wastewater including washdown waters and any concrete curing waters generated from the casting basin shall be drained to the wastewater treatment unit. Appropriate treatment process such as sedimentation and oil removal shall be employed for the wastewater treatment units so that any discharge from the casting basin will comply with standards stipulated in the TM-DSS. Recovered oil from any oil interceptor shall be properly contained, labeled and stored on site prior to collection by licensed collectors for disposal. During the flooding of the basin with seawater (accomplished by pumps) no escape of water could occur as the cofferdam will still be in place. Prior to opening a channel through the	To minimize water quality impacts from the washdown, flooding and draining operation at Shek O Casting Basin	Contractor	Shek O Casting Basin	Construction phase	• EIAO-TM • WPCO	^

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	cofferdam, water inside the basin will be skimmed of floating debris. A period of settling of 24 hours before opening the basin to the sea would allow much of the suspended material to settle out. The channel through the cofferdam will only be opened with the approval of the Site Engineer to the effect that all reasonable steps had been taken to remove contaminants.						
S11.222 to 11.245	The site practices outlined in ProPECC PN 1/94 “Construction Site Drainage” shall be followed where practicable.	To minimize water quality impacts from construction site runoff and general construction activities	Contractor	Works areas	Construction phase	• EIAO-TM • WPCO • TMDSS, • WDO, • ProPECC PN 1/94	^
S11.246 & 11.247	Construction work force sewage discharges on site are expected to be discharged to the nearby existing trunk sewer or sewage treatment facilities. If disposal of sewage to public sewerage system is not feasible, appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. The Contractor shall also be responsible for waste disposal	minimize water quality impacts due to sewage generated from construction workforce	Contractor	All works areas	Construction phase	• EIAO-TM • WPCO • TM-DSS • WDO	^

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	and maintenance practices. Notices shall be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.						^
S11.248	In case seepage of uncontaminated groundwater occurs, groundwater shall be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process shall also be discharged into the storm system via silt traps.	To minimize impact from discharge of uncontaminated groundwater	Contractor	Works areas	Construction phase	• EIAO-TM • WPCO • TM-DSS • WDO	^
S11.252	The following good site practices shall be adopted for the proposed barging points: - all vessels shall be sized so that adequate clearance is between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash - all hopper barges shall be fitted with tight fitting seals to their bottom openings to prevent leakage of material - construction activities shall not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site - loading of barges and hoppers shall be controlled to	To minimize water quality impacts generated from the barging points.	Contractor	Barging Points	Construction phase	• EIAO-TM • WPCO	^ ^ * ^

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	prevent splashing of material into the surrounding water. Barges or hoppers shall not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation						
S11.253	There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas shall be treated so that it satisfies all the standards listed in the TM-DSS. Minimum distances of 100 m shall be maintained between the discharge points of construction site effluent and the existing seawater intakes. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., can minimize water consumption and reduce the effluent discharge volume. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring shall be carried out in accordance with the WPCO license which is under the ambit of Regional Office (RO) of EPD.	To minimize water quality impact from effluent discharges from construction sites	Contractor	All construction works areas	Construction phase	• EIAO-TM • WPCO • TM-DSS	*

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S11.254	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation shall be observed and complied with for control of chemical wastes.	minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction phase	• EIAO-TM • WPCO • TM-DSS • WDO	^
S11.255	Any service shop and maintenance facilities shall be located on hard standings within a bunded area, and sumps and oil interceptors shall be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage shall only be undertaken within the areas appropriately equipped to control these discharges.	minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction phase	• EIAO-TM • WPCO • TM-DSS • WDO	^
S11.256	Disposal of chemical wastes shall be carried out in compliance with the Waste Disposal Ordinance. The “Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes” published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: • Suitable containers shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport.	minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction phase	• EIAO-TM • WPCO • TM-DSS • WDO	*

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	・Chemical waste containers shall be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents. ・Storage area shall be selected at a safe location on site and adequate space shall be allocated to the storage area.						^ ^
ERR S 8.5.1	Floating type silt curtains would be installed around the area of construction and removal of earth bund during the respective works.	minimize water quality impact at Shek O Casting Basin	Contractor	Shek O Casting Basin	Construction phase	・WPCO	^
Waste Management (Construction Waste)							
S12.75	***Good Site Practices and Waste Reduction Measures*** - Prepare a Waste Management Plan (WMP) approved by the Engineer/Supervising Officer of the Project based on current practices on construction sites; - Training of site personnel in, site cleanliness, proper waste management and chemical handling procedures; - Provision of sufficient waste disposal points and regular collection of waste; - Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; - Regular cleaning and maintenance programme for	reduce waste management impacts	Contractor	All works sites	Construction phase	・Waste Disposal Ordinance (Cap. 354) ・ Land (Miscellaneous Provisions) Ordinance (Cap. 28) ・DEVB TCW No. 6/2010	^ ^ ^ ^

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	drainage systems, sumps and oil interceptors; and - Separation of chemical wastes for special handling and appropriate treatment.						^
S12.76	***Good Site Practices and Waste Reduction Measures (Con't)*** - Sorting of demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions (i.e. soil, broken concrete, metal etc.); - Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; - Encourage collection of aluminum cans by providing separate labeled bins to enable this waste to be segregated from other general refuse generated by the workforce; - Proper storage and site practices to minimize the potential for damage or contamination of construction materials; - Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; and - Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management	achieve waste reduction	Contractor	All works sites	Construction phase	• Waste Disposal Ordinance (Cap. 354) • Land (Miscellaneous Provisions) Ordinance (Cap. 28)	^ ^ ^ ^ ^ ^

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	procedures, including waste reduction, reuse and recycle.						
S12.77	***Good Site Practices and Waste Reduction Measures (Con't)*** - The Contractor shall prepare and implement a WMP as part of the EMP in accordance with ETWBTCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. Such a management plan shall incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials. The EMP shall be submitted to the Engineer for approval. The Contractor shall implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP shall be reviewed regularly and updated by the Contractor, preferably in a monthly basis.	achieve waste reduction	Contractor	All works sites	Construction phase	• ETWB TCW No. 19/2005	^
S12.78	C&D materials would be reused in other local concurrent projects as far as possible. If all reuse outlets are exhausted during the construction phase, the C&D materials would be disposed of at Taishan, China as a last resort.	achieve waste reduction	Contractor	All works sites	Construction phase	• ETWB TCW No. 19/2005	^

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S12.79	***Storage, Collection and Transportation of Waste*** Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include: - Waste, such as soil, shall be handled and stored well to ensure secure containment, thus minimizing the potential of pollution; - Maintain and clean storage areas routinely; - Stockpiling area shall be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and - Different locations shall be designated to stockpile each material to enhance reuse	minimize potential adverse environmental impacts arising from waste storage	Contractor	All works sites	Construction phase	-	^ ^ ^ ^
S12.80	***Storage, Collection and Transportation of Waste (Con't)*** Waste haulier with appropriate permits shall be employed by the Contractor for the collection and transportation of waste from works areas to respective disposal outlets. The following suggestions shall be enforced to minimize the potential adverse impacts: - Remove waste in timely manner - Waste collectors shall only collect wastes prescribed by	minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	All works sites	Construction phase	-	N/A ^ ^

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	their permits - Impacts during transportation, such as dust and odour, shall be mitigated by the use of covered trucks or in enclosed containers - Obtain relevant waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28) - Waste shall be disposed of at licensed waste disposal facilities - Maintain records of quantities of waste generated, recycled and disposed						N/A ^ ^ ^
S12.81	***Storage, Collection and Transportation of Waste (Con't)*** - Implementation of trip ticket system with reference to DevB TC(W) No.6/2010 to monitor disposal of waste and to control fly-tipping at PFRFs or landfills. A recording system for the amount of waste generated, recycled and disposed (including disposal sites) shall be proposed	minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	All works sites	Construction phase	• DEVB TCW No. 6/2010	^
S12.83 – 12.86	***Sorting of C&D Materials*** - Sorting to be performed to recover the inert materials,	minimize potential adverse environmental impacts	Contractor	All works sites	Construction phase	• DEVB TCW No. 6/2010	^

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	reusable and recyclable materials before disposal off-site. - Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. - The C&D materials shall at least be segregated into inert and non-inert materials, in which the inert portion could be reused and recycled as far as practicable before delivery to PFRFs as mentioned for beneficial use in other projects. While opportunities for reusing the non-inert portion shall be investigated before disposal of at designated landfills. - Possibility of reusing the spoil in the Project will be continuously investigated in the detailed design and construction stages, it includes backfilling to cut and cover construction works for the Hung Hom south and north approach	during the handling, transportation and disposal of C&D materials				• ETWB TCW No. 33/2002 • ETWB TCW No. 19/2005	^ ^ ^
S12.88	***Sediments*** The basic requirements and procedures for excavated / dredged sediment disposal specified under ETWB TC(W) No. 34/2002 shall be followed. MFC is managing the disposal facilities in Hong Kong for the dredged and excavated sediment, while EPD is the authorityof issuing marine	To ensure the sediment to be disposed of in an authorized and least impacted way	Contractor	All works areas with sediments concern	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	^

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	dumping permit under the Dumping at Sea Ordinance						
S12.89	***Sediments*** The contractor for the excavation / dredging works shall apply for the site allocations of marine sediment disposal based on the prior agreement with MFC/CEDD. A request for reservation of sediment disposal space have been submitted to MFC for onward discussions of disposal approach and feasible disposal sites and the letter is attached in Appendix 12.6. The Project proponent shall also be responsible for the application of all necessary permits from relevant authorities, including the dumping permit as required under DASO from EPD, for the disposal of dredged and excavated sediment prior to the commencement of the excavation works.	To determine the best handling and disposal option of the sediments	Contractor	All works areas with sediments concern	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	^
S12.91-12.94	***Sediments*** - Stockpiling of contaminated sediments shall be avoided as far as possible. If temporary stockpiling of contaminated sediments is necessary, the excavated sediment shall be covered by tarpaulin and the area shall be placed within earth bunds or sand bags to prevent leachate from entering the ground, nearby drains and/or surrounding water bodies. The stockpiling areas shall be	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	^

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas shall be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, shall be collected and discharged according to the Water Pollution Control Ordinance (WPCO). - In order to minimise the potential odour / dust emissions during excavation and transportation of the sediment, the excavated sediments shall be wetted during excavation / material handling and shall be properly covered when placed on trucks or barges. Loading of the excavated sediment to the barge shall be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water. - The barge transporting the sediments to the designated disposal sites shall be equipped with tight fitting seals to prevent leakage and shall not be filled to a level that would cause overflow of materials or laden water during loading or transportation. In addition, monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation.						^ ^

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	Transport barges or vessels shall be equipped with automatic selfmonitoring devices as specified by the DEP. - In order to minimise the exposure to contaminated materials, workers shall, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities shall also be provided on site.						^
S12.95	***Sediments*** A possible arrangement for Type 3 disposal is by geosynthetic containment. A geosynthetic containment method is a method whereby the sediments are sealed in geosynthetic containers and, at the disposal site, the containers would be dropped into the designated contaminated mud pit where they would be covered by further mud disposal and later by the mud pit capping, thereby meeting the requirements for fully confined mud disposal. The technology is readily available for the manufacture of the geosynthetic containers to the project-specific requirements. Similar disposal methods have been used for projects in Europe, the USA and Japan and the issues of fill retention by the geosynthetic fabrics, possible	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	N/A

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	rupture of the containers and sediment loss due to impact of thecontainer on the seabed have been addressed.						
S12.97	***Containers for Storage of Chemical Waste*** The Contractor shall register with EPD as a chemical waste producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Containers used for storage of chemical waste shall: - Be compatible with the chemical wastes being stored, maintained in good condition and securely sealed; - Have a capacity of less than 450 litters unless the specifications have been approved by EPD; and - Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation	register with EPD as a Chemical waste producer and store chemical waste in appropriate containers	Contractor	All works sites	Construction phase	• Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes	^ ^ ^
S12.98	***Chemical Waste Storage Area*** - Be clearly labeled to indicate corresponding chemical characteristics of the chemical waste and used for storage of chemical waste only; - Be enclosed on at least 3 sides; - Have an impermeable floor and bunding, of capacity to	prepare appropriate storage areas for chemical waste at works areas	Contractor	All works sites	Construction phase	• Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes	^ ^ ^

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest; - Have adequate ventilation; - Be covered to prevent rainfall from entering; and - Be properly arranged so that incompatible materials are adequately separated.						^ ^ ^
S12.99	***Chemical Waste*** - Lubricants, waste oils and other chemical wastes would be generated during the maintenance of vehicles and mechanical equipments. Used lubricants shall be collected and stored in individual containers which are fully labelled in English and Chinese and stored in a designated secure place.	clearly label the chemical waste at works areas	Contractor	All works sites	Construction phase	• Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes	^
S12.100	***Collection and Disposal of Chemical Waste*** A trip-ticket system shall be operated in accordance with the Waste Disposal (Chemical Waste) (General) Regulation to monitor all movements of chemical waste. The Contractor shall employ a licensed collector to transport and dispose of the chemical wastes, to either the approved CWTC at Tsing Yi, or another licensed facility, in accordance with the Waste	To monitor the generation, reuse and disposal of chemical waste	Contractor	All works sites	Construction phase	• Waste Disposal (Chemical Waste) (General) Regulation	^

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	Disposal (Chemical Waste) (General) Regulation						
S12.101	***General Refuse*** General refuse shall be stored in enclosed bins or compaction units separate from C&D materials and chemical waste. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D materials and chemical wastes. Preferably, an enclosed and covered area shall be provided to reduce the occurrence of wind-blown light material.	properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	All works sites	Construction phase	-	^
S12.102	***General Refuse (Con't)*** The recyclable component of general refuse, such as aluminum cans, paper and cleansed plastic containers shall be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste shall be set up by the Contractor. The Contractor shall also be responsible for arranging recycling companies to collect these materials.	facilitate recycling of recyclable portions of refuse	Contractor	All works sites	Construction phase	-	^
S12.103	***General Refuse (Con't)*** The Contractor shall carry out an education programme for workers in avoiding, reducing, reusing and recycling of materials generation. Posters and leaflets advising on the	raise workers' awareness on recycling issue	Contractor	All works sites	Construction phase	-	^

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	use of the bins shall also be provided in the sites as reminders						

Remarks: ^ Compliance of mitigation measure X Non-compliance of mitigation measure

• Non-compliance but rectified by the contractor

* Observation/reminder was made during site audit but improved/rectified by the contractor.

Observation/reminder was made during site audit but not yet improved/rectified by the contractor.

N/A Not Applicable

APPENDIX K
WASTE GENERATION IN THE REPORTING MONTH

Monthly Summary Waste Flow Table for _2019_ (year)

Contract No: SCL1121
Date Reported: January 2019

Month		Actual Quantities of Inert C&D Materials Generated Monthly									Actual Quantities of Non-inert C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rocks and Large Broken Concrete (See Note 3)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill from 1111	Imported Fill from 1112	Imported Fill from 1114	Imported Fill from 1123	Imported Fill from 1128	Metals	Paper/ cardboard packaging	Plastics (see Note 2)	Chemical Waste	Others, e.g. general refuse
	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000kg)	(in '000kg)	(in '000kg)	(in'000kg)	(in '000tonne)
Jan	**0**	**0**	**1.324**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.113**
Feb															
Mar															
Apr															
May															
June															
July															
Aug															
Sept															
Oct															
Nov															
Dec															
Total	**0**	**0**	**1.324**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.113**

Notes:

(1) The performance targets are given below:

- All excavated materials to be sorted for recovering the inert portion of C&D materials, e.g. hard rocks, soil and broken concrete, for reuse on the Site or disposal to designated outlets;
- All metallic waste to be recovered for collection by recycling contractors;
- All cardboard and paper packaging (for plant, equipment and materials) to be recovered, properly stockpiled in dry and covered condition to prevent cross contamination;
- All chemical wastes to be collected and properly disposed of by specialist contractors; and
- All demolition debris to be stored to recover broken concrete, reinforcement bars, mechanical and electrical fittings, hardware as well as other fitting / materials that have established recycling outlets.

(2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

(3) Broken concrete for recycling into aggregates.

(4) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.

(5) All the C&D material come from SCL1111, 1112, 1114, 1121, 1123, 1128 will be reussed in other project

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Penta-Ocean – China State Joint Venture

Monthly Summary of Marine Sediment Flow for 2019 (year)

Contract No: SCL1121
Date Reported: January 2019

Month	Volume of Sediments Generated Monthly Bulk Volume)																
	Type 1 – Open Sea Disposal					Type 1 – Open Sea Disposal (Dedicated Site)					Type 2 – Confined Marine Disposal					Type 3 – Special Treatment Disposal	
	Generated from 1111	Generated from 1112	Generated from 1121	Generated from 1128	Disposed	Generated from 1111	Generated from 1112	Generated from 1121	Generated from 1128	Disposed	Generated from 1111	Generated from 1112	Generated from 1121	Generated from 1128	Disposed	Generated from 1121	Disposed
Unit	(in '000m^3)					(in '000m^3)					(in '000m^3)					(in '000m^3)	
Jan	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Feb																	
Mar																	
Apr																	
May																	
June																	
Sub-Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
July																	
Aug																	
Sept																	
Oct																	
Nov																	
Dec																	
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

APPENDIX L
CUMULATIVE LOG FOR COMPLAINT LOGS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

Appendix L - Cumulative Log for Complaints, Notifications of Summons and Successful Prosecutions

Cumulative Complaint Log

Log Ref.	Date/Location	Complainant/ Date of Contact	Details of Complaint	Investigation/ Mitigation Action	File Closed
--	--	--	--	--	--

Cumulative Log for Notifications of Summons

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

Cumulative Log for Successful Prosecutions

Log Ref.	Date/Location	Subject	Status	Total no. Received in this reporting month	Total no. Received since the commencement of the project
ESS41852/2016	4 May 2016/ CMP Vd at East Sha Chau	Contrary to: Sections 8 (1) (a) and 25 (1) (b) Dumping at Sea Ordinance	One (1) successful prosecution was recorded in August.	0	1

Appendix L - Cumulative Log for Complaints, Notifications of Summons and Successful Prosecution

Reporting Month	Number of Complaints in Reporting Month	Number of Summons in Reporting Month	Number of Successful Prosecutions in Reporting Month
March 2015	0	0	0
April 2015	0	0	0
May 2015	0	0	0
June 2015	0	0	0
July 2015	0	0	0
August 2015	1	0	0
September 2015	1	0	0
October 2015	1	0	0
November 2015	1	0	0
December 2015	0	0	0
January 2016	0	0	0
February 2016	0	0	0
March 2016	1	0	0
April 2016	0	0	0
May 2016	1	0	0
June 2016	1	0	0
July 2016	1	0	0
August 2016	2	0	0
September 2016	0	0	0
October 2016	0	0	0
November 2016	1	1	0
December 2016	0	0	0
January 2017	0	0	0
February 2017	0	0	0
March 2017	0	0	0
April 2017	1	0	0
May 2017	0	0	0
June 2017	0	0	0
July 2017	0	0	0
August 2017	0	0	1
September 2017	0	0	0
October 2017	1	0	0
November 2017	0	0	0
December 2017	0	0	0
January 2018	0	0	0
February 2018	0	0	0
March 2018	1	0	0
April 2018	0	0	0
May 2018	0	0	0
June 2018	0	0	0
July 2018	0	0	0
August 2018	0	0	0
September 2018	0	0	0
October 2018	0	0	0
November 2018	0	0	0
December 2018	0	0	0
January 2019	0	0	0
Total	**14**	**1**	**1**

Appendix C

Monthly EM&A Report for January 2019 – SCL Works Contract 1123 Exhibition Station and Western Approach Tunnel

AECOM

Leighton – China State J.V.

Shatin to Central Link -
Hung Hom to Admiralty Section

Works Contract 1123 -
Exhibition Station and Western Approach Tunnel

Monthly EM&A Report for
January 2019

[February 2019]

	Name	Signature
Prepared & Checked:	Ray Cheng	
Reviewed, Approved & Certified:	Y W Fung (Contractor's Environmental Team Leader)	

Version: 0	Date: 11 February 2019

Disclaimer

This Environmental Monitoring and Audit Report is prepared for Leighton – China State J.V. and is given for its sole benefit in relation to and pursuant to SCL1123 and may not be disclosed to, quoted to or relied upon by any person other than Leighton – China State J.V. without our prior written consent. No person (other than Leighton – China State J.V. into whose possession a copy of this report comes may rely on this plan without our express written consent and Leighton – China State J.V. may not rely on it for any purpose other than as described above.

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EXECUTIVE SUMMARY

Shatin to Central Link Contract 1123 – Exhibition Station and Western Approach Tunnel (hereafter called "the Project") covers part of the construction of the Shatin to Central Link (SCL).

The Project comprises the construction of an underground station (Exhibition Station) and 300 m of cut and cover tunnel (Western Approach Tunnel) along Convention Avenue.

The EM&A programme commenced on 1 June 2015.The impact EM&A for the Project includes air quality and noise monitoring.

This report documents the findings of EM&A works conducted in the period between 1 and 31 January 2019. As informed by the Contractor, major activities in the reporting period were:

Location	Site Activities
Exhibition Station (Zone 1 - PTI Area)	• Excavation and Lateral Support • Structure Station/Tunnel
Harbour Road Sport Cenrtre (Zone 2)	• Excvation and Lateral Support
Exhibition Station (Zone 4 - Tunnel at Tonnochy Road)	• Excavation and Lateral Support
Exhibition Station (Zone 3 – Swimming Pool Area) (including W7a, W7b, W4, W5 and partial W6)	• Excavation and Lateral Support
Fleming Road Junction Area E	• Fleming Road Culvert Diverson • Excavation and Lateral Support • Temporary Traffic Management • Utilities Diversion & Protection
Western Vent Shaft and Western Approach Tunnel (WAT) Area C	• Structure Vent Shaft/Tunnel
WAT Area B	• Structure tunnel
WAT Area A	• Structure tunnel
Kai Tak Barging Point[#]	• Storage and barging of fill materials

[#] The Kai Tak Barging Point will be for storage and barging of fill materials over the whole contract period.

Breaches of Action and Limit Levels for Air Quality

No exceedance of Action and Limit Level of air quality was recorded in the reporting month.

Breaches of Action and Limit Levels for Noise

Regular Noise Monitoring

No Action Level exceedance was recorded since no noise related complaint was received in the reporting month.

No exceedance of Limit Level of noise was recorded in the reporting month.

Complaint, Notification of Summons and Successful Prosecution

No environmental related complaint, notification of summons and successful prosecution were received in the reporting month.

Reporting Changes

There was no reporting change in the reporting month.

Future Key Issues

Key issues to be considered in the next three month included:

Location	Site Activities
Exhibition Station (Zone 1 - PTI Area)	• Temporary Traffic Management • Structure Station/ Tunnel
Harbour Road Sport Cenrtre (Zone 2)	• Excavation and Lateral Support • Structure Station/Tunnel
Exhibition Station (Zone 3 - Swimming Pool Area) (including W7a, W7b, W4, W5 and partial W6)	• Excavation and Lateral Support • Structure Station/Tunnel
Exhibition Station (Zone 4 - Tunnel at Tonnochy Road)	• Excavation and Lateral Support • Structure Station/Tunnel
Fleming Road Junction Area E	• Temporary Traffic Management • Excavation and Lateral Support
Western Vent Shaft and WAT Area C	• Structure Ventilation Shaft / Tunnel
WAT Area B	• Structure Tunnel • 1128/1123 Interface
WAT Area A	• Structure Tunnel • Reprovisioning, Remedial and Improvement Works
Kai Tak Barging Point[#]	• Storage and barging of fill materials

[#] The Kai Tak Barging Point will be for storage and barging of fill materials over the whole contract period.

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

1 INTRODUCTION

Leighton – China State Joint Venture (JV) was commissioned by MTR as the Civil Contractor for Works Contract 1123. AECOM Asia Company Limited (AECOM) was appointed by JV as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) programme during construction phase of the Project.

1.1 Purpose of the Report

1.1.1 This is the forty-fourth monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting period between 1 and 31 January 2019.

1.2 Report Structure

1.2.1 This monthly EM&A Report is organised as follows:

- Section 1: Introduction
- Section 2: Project Information
- Section 3: Environmental Monitoring Requirement
- Section 4: Implementation Status of Environmental Mitigation Measures
- Section 5: Monitoring Results
- Section 6: Environmental Site Inspection and Audit
- Section 7: Environmental Non-conformance
- Section 8: Future Key Issues
- Section 9: Conclusions and Recommendations

2 PROJECT INFORMATION

2.1 Background

2.1.1 The Shatin to Central Link (SCL) is a 17km extension of the existing Ma On Shan Line (MOL) and East Rail Line (EAL) comprising (i) The East-West Corridor which extends the MOL from Tai Wai via East Kowloon to connect with the West Rail Line (WRL) at Hung Hom Station (HUH); and (ii) The North-South Corridor which is an extension of the East Rail Line (EAL) at Hung Hom across the harbour to Admiralty Station (ADM).

2.1.2 The Environmental Impact Assessment (EIA) Reports for SCL – Hung Hom to Admiralty Section [SCL (HUH-ADM)] (Register No.: AEIAR-166/2012) was approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, an Environmental Permit (EP) was granted on 22 March 2012, which covers SCL (HUH-ADM) EP No.: EP-436/2012), for the construction and operation. Variation of EP (VEP) was subsequently applied and the latest EP (EP No. EP-436/2012/F) was issued by the Director of Environmental Protection (DEP) on 23 January 2019.

2.1.3 The construction of the SCL is divided into different civil construction works contracts and Works Contract 1123 – Exhibition Station and Western Approach involves the construction of an underground station (Exhibition Station) and 300m of cut and cover tunnel (Western Approach Tunnel) along Convention Avenue.

2.1.4 The site layout plan of the Project is shown in **Figure 1.1** and **Figure 1.2**.

2.2 Site Description

2.2.1 The major construction activities under Works Contract 1123 include:

(a) Site preparation;
(b) Demolition works;
(c) Utilities works;
(d) Box Culvert works;
(e) Diaphragm wall construction and piling works;
(f) Pile Removal works;
(g) Excavation & Lateral Support (ELS) works; and
(h) Reprovisioning/ Reinstatement works.

2.3 Construction Programme and Activities

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

Location	Site Activities
Exhibition Station (Zone 1 - PTI Area)	• Excavation and Lateral Support Structure Station/Tunnel
Harbour Road Sport Cenrtre (Zone 2)	• Excvation and Lateral Support
Exhibition Station (Zone 4 - Tunnel at Tonnochy Road)	• Excavation and Lateral Support
Exhibition Station (Zone 3 – Swimming Pool Area) (including W7a, W7b, W4, W5 and partial W6)	• Excavation and Lateral Support
Fleming Road Junction Area E	• Fleming Road Culvert Diverson • Excavation and Lateral Support • Temporary Traffic Management • Utilities Diversion & Protection
Western Vent Shaft and Western Approach Tunnel (WAT) Area C	• Structure Vent Shaft/Tunnel
WAT Area B	• Structure tunnel
WAT Area A	• Structure tunnel
Kai Tak Barging Point[#]	• Storage and barging of fill materials

[#] The Kai Tak Barging Point will be for storage and barging of fill materials over the whole contract period.

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

2.4 Project Organisation

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

Table 2.1 Contact Information of Key Personnel

Party	Role	Position	Name	Telephone	Fax
MTR	Residential Engineer (ER)	Construction Manager	Mr. Walter Lam	3959 2128	3959 2200
		SCL Project Environmental Team Leader	Ms. Lisa Poon	3127 6295	3127 6422
Meinhardt	Independent Environmental Checker	Independent Environmental Checker	Mr. Fredrick Leong	2859 1739	2540 1580
JV	Contractor	Project Director	Mr. Brian Shepstone	3973 0838	31051126
		Environmental Engineer	Ms. Doris Law	9198 8399	
AECOM	Contractor's Environmental Team (ET)	ET Leader	Mr. Y W Fung	3922 9366	2317 7609

2.5 Status of Environmental Licences, Notification and Permits

2.5.1 Relevant environmental licenses, permits and/or notifications on environmental protection for this Project and valid in the reporting month are summarized in **Table 2.2**.

Table 2.2 Status of Environmental Licenses, Notifications and Permits

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
Environmental Permit				
EP-436/2012/E	23 Nov 2016	-	Valid until 22 Jan 2019	-
EP-436/2012/F	23 Jan 2019	-	Valid on 23 Jan 2019	
Construction Noise Permit				
GW-RS0716-18	20 Aug 2018	19 Feb 2019	Valid	WAT Area E Box culvert wire cutting, ELS & Tunnel Acceleration Works, formwork & rebar-fixing, ELS at W18, grouting, water barrier replacement, All PCW
GW-RS0896-18	30 Sep 2018	24 Mar 2019	Valid	EXH ELS, Z2 grouting, drilling, W6 lift tower, TTM, rock splitting, water barrier replacement, footbridge erection
GW-RS1064-18	23 Nov 2018	30 Jan 2019	Valid until 30 Jan 2019	WCFP Footbridge E&M Works
GW-RS1115-18	06 Dec 2018	05 Jun 2019	Valid	EXH, W6 Plant mobilization and demobilization
GW-RS1122-18	08 Dec 2018	14 Jan 2019	Valid until 14 Jan 2019	Road P2 Salt watermain connection (Area A&B)
GW-RS1154-18	27 Dec 2018	26 Jun 2019	Valid	WAT Plant mobilization and demobilization
GW-RS1164-18	23 Dec 2018	27 Jan 2019	Valid until 27 Jan 2019	TTM6-2 Advance Civil Works
GW-RS1192-18	19 Dec 2018	14 Jan 2019	Valid until 14 Jan 2019	Road P2 Salt watermain connection (Area C)
GW-RE0612-18	12 Sep 2018	11 Mar 2019	Valid	Kai Tak Barging Point: routine operations and maintenance for haul road
GW-RE0722-18	11 Nov 2018	10 May 2019	Valid	Kai Tak Barging point routine operations and maintenance
GW-RS0025-19	18 Jan 2019	28 Feb 2019	Valid on 18 Jan 2019	RoadP2 Salt watermain connection (Area A&B)
GW-RS0028-19	18 Jan 2019	28 Feb 2019	Valid on 18 Jan 2019	RoadP2 Salt watermain connection (Area C)
GW-RS0085-19	31 Jan 2019	28 Jul 2019	Valid on 31 Jan 2019	ELS, welding, grouting at Zone 1-4 + Zone1 drilling + Zone2 grout station + Rock Splitting + footbridge erection, impact wrench (general night works) + Tower Crane
Wastewater Discharge License				
WT00022480-2015	04 Sep 2015	30 Sep 2020	Valid	For site portion W1a, W1b
WT00022482-2015	04 Sep 2015	30 Sep 2020	Valid	For site portion W9a, W9b

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
WT00025181-2016	03 Aug 2016	30 Apr 2020	Valid	For site portion W12T
WT00025182-2016	03 Aug 2016	30 Jun 2020	Valid	For site portions W15a, W16, W17 & W18a
WT00026195-2016	30 Nov 2016	30 Nov 2021	Valid	For Kai Tak Barging Point
WT00031573-2018	23 Jul 2018	31 Jul 2023	Valid	For W15d, W13 & W6
WT00031235-2018	23 Jul 2018	31 Jul 2023	Valid	For W25
Chemical Waste Producer Registration				
5213-135-L2881-01	02 Apr 2015	End of Contract	Valid	For whole site at Wan Chi Area
5213-247-L2532-02	23 Aug 2016	End of Contract	Valid	Kai Tak Barging Point Area
Marine Dumping Permit				
EP/MD/19-084	24 Jan 2019	23 Jul 2019	Valid on 24 Jan 2019	For Type I – Open Sea Disposal
EP/MD/19-082	23 Jan 2019	22 Feb 2019	Valid on 23 Jan 2019	For Type 1 - Open Sea Disposal (Dedicated Space) & Type 2 - Confined Marine Disposal
Billing Account for Construction Waste Disposal				
7021736	16 Feb 2015	End of Contract	Valid	For Disposal of C&D Waste
Notification Under Air Pollution Control (Construction Dust) Regulation				
385128	1 Mar 2015	End of Contract	Valid	For whole site at Wan Chi Area
405660	29 Jul 2016	End of Contract	Valid	Kai Tak Barging Point Area

3 ENVIRONMENTAL MONITORING REQUIREMENTS

3.1 Construction Dust Monitoring

Monitoring Requirements

3.1.1 In accordance with the approved EM&A Manuals, 24-hour Total Suspended Particulates (TSP) level at the designated air quality monitoring station is required. Impact 24-hour TSP monitoring should be carried out for at least once every 6 days. The Action and Limit level of the air quality monitoring is provided in **Appendix D**.

Monitoring Equipment

3.1.2 24-hour TSP air quality monitoring was performed using High Volume Sampler (HVS) located at the designated monitoring stations. The HVS meets all the requirements of the EM&A Manual. Brand and model of the equipment is given in **Table 3.1**.

Table 3.1 Air Quality Monitoring Equipment

Equipment	Brand and Model
High Volume Sampler (24-hour TSP)	Andersen Total Suspended Particulate Mass Flow Controlled High Volume Air Sampler (Model No. GS 2310 (S/N:809))
Calibration Kit	TISCH Environmental Orifice (Model TE-5025A (Orifice I.D.: 0843 & 0988))

Monitoring Locations

3.1.3 The monitoring station for construction dust monitoring pertinent to the Project has been identified based on the approved EM&A Manual for SCL (HUH-ADM) of the Project. The location of the construction dust monitoring stations are summarised in **Table 3.2** and shown in **Figure 3.1**.

Table 3.2 Locations of Construction Dust Monitoring Station

ID	Air Sensitive Receiver (ASR) ID in EIA Report	Dust Monitoring Station
AM2[1]	EXA6	Wanchai Sports Ground
AM3[2] , [3]	EXA5	Existing Harbour Road Sports Centre

Note:
[1] The impact monitoring at AM2 was handed over from Contract SCL1128 on 28 October 2015.
[2] The impact monitoring at AM3 was handed over from Contract SCL1126 in June 2015.
[3] The impact monitoring at AM3 terminated on 6 May 2017 as demolition of Existing Harbour Road Sports Centre commenced on 8 May 2017.

Monitoring Methodology

3.1.4 24-hour TSP Monitoring

(a) The HVS was installed in the vicinity of the air sensitive receivers. The following criteria were considered in the installation of the HVS as far as practicable:-

(i) A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
(ii) Two samplers should not be placed less than 2m apart from each others;
(iii) The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
(iv) A minimum of 2 meters separation from walls, parapets and penthouse for rooftop sampler.
(v) A minimum of 2 meters separation from any supporting structure, measured horizontally is required.
(vi) No furnace or incinerator flues nearby.
(vii) Airflow around the sampler was unrestricted.

(viii) The sampler was located more than 20 meters from any dripline.
(ix) Any wire fence and gate, required to protect the sampler, did not obstruct the monitoring process.
(x) Permission was obtained to set up the samplers and access to the monitoring station.
(xi) A secured supply of electricity was obtained to operate the sampler.

(b) Preparation of Filter Papers

(i) Glass fibre filters, G810 were labelled and sufficient filters that were clean and without pinholes were selected.
(ii) All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ±3 °C; the relative humidity (RH) was < 50% and not variable by more than ±5%. A convenient working RH was 40%.
(iii) All filter papers were prepared and analysed by ALS Technichem (HK) Pty Ltd., which is a HOKLAS accredited laboratory and has comprehensive quality assurance and quality control programmes.

(c) Field Monitoring

(i) The power supply was checked to ensure the HVS works properly.
(ii) The filter holder and the area surrounding the filter were cleaned.
(iii) The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
(iv) The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
(v) The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied was sufficient to avoid air leakage at the edges.
(vi) Then the shelter lid was closed and was secured with the aluminium strip.
(vii) The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
(viii) A new flow rate record sheet was set into the flow recorder.
(ix) On site temperature and atmospheric pressure readings were taken and the flow rate of the HVS was checked and adjusted at around 1.3 m^3/min, and complied with the range specified in the EM&A Manual (i.e. 0.6-1.7 m^3/min).
(x) The programmable digital timer was set for a sampling period of 24 hrs, and the starting time, weather condition and the filter number were recorded.
(xi) The initial elapsed time was recorded.
(xii) At the end of sampling, on site temperature and atmospheric pressure readings were taken and the final flow rate of the HVS was checked and recorded.
(xiii) The final elapsed time was recorded.
(xiv) The sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
(xv) It was then placed in a clean envelope and sealed.
(xvi) All monitoring information was recorded on a standard data sheet.
(xvii) Filters were then sent to ALS Technichem (HK) Pty Ltd. for analysis.

(d) Maintenance and Calibration

(i) The HVS and its accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
(ii) HVSs were calibrated using TE-5025A Calibration Kit upon installation and thereafter at bi-monthly intervals.
(iii) Calibration certificate of the TE-5025A Calibration Kit and the HVSs are provided in **Appendix E**.

Monitoring Schedule for the Reporting Month

3.1.5 The schedule for environmental monitoring in January 2019 is provided in **Appendix F**.

3.2 Construction Noise Monitoring

Monitoring Requirements

3.2.1 In accordance with the EM&A Manual, impact noise monitoring should be conducted for at least once a week during the construction phase of the Project. **Table 3.3** summarises the monitoring parameters, frequency and duration of impact noise monitoring. The Action and Limit level of the noise monitoring is provided in **Appendix D**.

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

Parameter and Duration	Frequency
30-mins measurement at each monitoring station between 0700 and 1900 on normal weekdays. Leq, L_{10} and L_{90} would be recorded.	At least once per week

Monitoring Equipment

3.2.2 Noise monitoring was performed using sound level meter at each designated monitoring station. The sound level meters deployed comply with the International Electrotechnical Commission Publications (IEC) 651:1979 (Type 1) and 804:1985 (Type 1) specifications. Acoustic calibrator was deployed to check the sound level meters at a known sound pressure level. Brand and model of the equipment is given in **Table 3.4**.

Table 3.4 Noise Monitoring Equipment for Regular Noise Monitoring

Equipment	Brand and Model
Integrated Sound Level Meter	Model No. B&K2238 (S/N: 2800927), Model No. B&K2250 (S/N: 3001291)
Acoustic Calibrator	Model No. B&K4231 (S/N: 3006428)

Monitoring Locations

3.2.3 The monitoring station for construction noise monitoring pertinent to the Project has been identified based on the approved EM&A Manual for SCL (HUH-ADM) of the Project. Location of the noise monitoring station is summarised in **Table 3.5** and shown in **Figure 3.1**.

Table 3.5 Noise Monitoring Station during Construction Phase

Identification No.	Noise Sensitive Receiver (NSR) ID in EIA Report	Noise Monitoring Station	Alternative Noise Monitoring Location
NM2[1]	EX1	Causeway Centre, Block A	Harbour Centre[2]

Note:
[1] The impact monitoring at NM2 was handed over from Works Contract SCL1126 in June 2015.
[2] The Access to the designated monitoring location NM2 (i.e. Block A, Causeway Centre) was denied before the commencement of impact monitoring under Works Contract 1126. An alternative monitoring location at Harbour Centre was approved by the ER, agreed by IEC. The alternative monitoring location was approved by EPD on 18 December 2017.

Monitoring Methodology

3.2.4 Monitoring Procedure

(a) Façade measurements were made at NM2.

(b) The battery condition was checked to ensure the correct functioning of the meter.

(c) Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:

(i) frequency weighting: A
(ii) time weighting: Fast
(iii) time measurement: $L_{eq(30\text{-}minutes)}$ during non-restricted hours i.e. 0700 – 1900 on normal weekdays.

(d) Prior to and after each noise measurement, the meter was calibrated using the acoustic calibrator for 94 dB(A) at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1 dB(A), the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.

(e) During the monitoring period, the L_{eq}, L_{10} and L_{90} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.

(f) Noise measurement was paused during periods of high intrusive noise (e.g. dog barking, helicopter noise) if possible. Observations were recorded when intrusive noise was unavoidable.

(g) Noise monitoring was cancelled in the presence of fog, rain, wind with a steady speed exceeding 5m/s, or wind with gusts exceeding 10m/s.

3.2.5 Maintenance and Calibration

(a) The microphone head of the sound level meter was cleaned with soft cloth at regular intervals.

(b) The meter and calibrator were sent to the supplier or HOKLAS laboratory to check and calibrate at yearly intervals.

(c) Calibration certificates of the sound level meters and acoustic calibrators are provided in **Appendix E**.

Monitoring Schedule for the Reporting Month

3.2.6 The schedule for environmental monitoring in January 2019 is provided in **Appendix F**.

3.3 Continuous noise monitoring

3.3.1 According to EP conditions under EP-436/2012/F (Condition 2.7 and 2.8), the latest Construction Noise Mitigation Measures Plan (CNMMP) and Continuous Noise Monitoring Plan (CNMP) were submitted to EPD in June 2016, it is predicted that no residual air-borne construction noise impact excceding the relevant noise criteria is anticipated. No continuous noise monitoring is required under this Contract.

3.4 Landscape and Visual

3.4.1 As per the EM&A Manuals, the landscape and visual mitigation measures shall be implemented and site inspections should be undertaken once every two weeks during the construction period. A summary of the implementation status is presented in **Section 6.**

4 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

4.1.1 The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Reports, the EP and EM&A Manuals. The implementation status of the environmental mitigation measures during the reporting period is summarized in **Appendix C.** Status of required submissions under the EP during the reporting period is summarised in **Table 4.1**.

Table 4.1 Status of Required Submission under Environmental Permit

EP Condition	Submission	Submission Date
Condition 3.4 (EP-436/2012/E)	Monthly EM&A Report for December 2018	14 January 2019

5 MONITORING RESULTS

5.1 Construction Dust Monitoring

5.1.1 The monitoring station at AM2 was handed over from Contract SCL1128 on 28 October 2015.

5.1.2 The monitoring results for 24-hour TSP are summarised in **Table 5.1**. Detailed air quality monitoring results and wind monitoring data extracted from the nearest Automatic Weather Station are presented in **Appendix G**.

Table 5.1 Summary of 24-hour TSP Monitoring Result in the Reporting Period

ID	Average (μg/m^3)	Range (μg/m^3)	Action Level (μg/m^3)	Limit Level (μg/m^3)
AM2[1]	68.3	49.1 – 80.9	160	260

Note:
[1] The impact monitoring at AM2 was handed over from Contract SCL1128 on 28 October 2015.

5.1.3 No Action and Limit Level exceedance were recorded for 24-hour TSP monitoring at the monitoring locations in the reporting month.

5.1.4 The event and action plan is annexed in **Appendix I**.

5.1.5 Major dust sources during the monitoring included construction dust, nearby traffic emission and other nearby construction sites.

5.2 Regular Construction Noise Monitoring

5.2.1 The monitoring results for noise are summarized in **Table 5.2** and the monitoring data is provided in **Appendix H**.

Table 5.2 Summary of Construction Noise Monitoring Results in the Reporting Period

ID	Range, dB(A), $L_{eq\ (30\ mins)}$	Limit Level, dB(A), $L_{eq\ (30\ mins)}$
NM2 (*)	<Baseline	75

(*) Baseline correction will be made to the measured L_{eq} when the measured noise level exceeded the corresponding baseline noise level and presented in the table.

5.2.2 No Action Level exceedance was recorded since no noise related complaint was received in the reporting month.

5.2.3 No Limit Level exceedance of noise was recorded at the monitoring station in the reporting month.

5.2.4 The event and action plan is annexed in **Appendix I**.

5.2.5 Major noise sources during the monitoring included construction noise from the Project site, nearby traffic noise and the community.

5.3 Waste Management

5.3.1 C&D materials and wastes sorting were carried out on site. Receptacles were available for C&D wastes and general refuse collection.

5.3.2 As advised by the Contractor, 6,687 m^3 of inert C&D material was generated, 6,255 m^3 was disposed of as public fill in the reporting month. 357 m^3 of inert C&D materials were reused in other projects. 76 m^3 of inert C&D materials were reused in the Contract. 134 m^3 fill material was imported. 205 m^3 general refuse was generated in the reporting month. 131,388 kg of metals was collected by recycling contractor in the reporting month. 280 kg paper/cardboard packaging material, 57 kg plastic and no chemical waste were collected by licensed contractor in the reporting period. No Type 1 and no Type 2 of Marine sediment was disposed were disposed of at Confined Marine Disposal Facility to the East of Sha Chau. The waste flow table is annexed in **Appendix K**.

5.3.3 The Contractor is advised to properly maintain on site C&D materials and wastes collection, sorting and recording system and maximize reuse / recycle of C&D materials and wastes. The Contractor is reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly.

5.3.4 The Contractor is reminded that chemical waste containers should be properly treated and stored 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.

5.4 Landscape and Visual

5.4.1 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 03, 17 and 31 January 2019. A summary of the site inspection is provided in **Appendix C**. The observations and recommendations made during the site inspections are presented in **Table 6.1**.

6 ENVIRONMENTAL SITE INSPECTION AND AUDIT

6.1.1 Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. A summary of the mitigation measures implementation schedule is provided in **Appendix C**.

6.1.2 In the reporting month, 7 site inspections were carried out on 3, 8, 10, 18, 22, 24 and 31 January 2019. Joint inspections with the IEC, ER, the Contractor and the ET were conducted on 18 January 2019. No non-compliance was recorded during the site inspection. Details of observations recorded during the site inspections are presented in **Table 6.1**.

Table 6.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Air Quality	03 January 2019	Reminder: • The Contractor was reminded to provide sufficient cover for cement bags storage at WAT.	The item was rectified by the Contractor on 10 January 2019.
	08 January 2019	Reminder: • The Contractor was reminded to provide proper cover for the stockpiles at Kai Tak Barging Point.	The item was rectified by the Contractor on 10 January 2019.
	18 January 2019	• NRMM label was not observed on the roller at W6. The Contractor was advised to display the NRMM label on the roller.	The item was rectified by the Contractor on 24 January 2019.
		Reminder: • The Contractor was reminded to cover the stockpiles at WAT and Zone 4.	The item was rectified by the Contractor on 24 January 2019.
	22 January 2019	Reminder: • The Contractor was reminded to provide sufficient water spraying on the haul road at Kai Tak Barging Point.	The item was rectified by the Contractor on 25 January 2019.
	24 January 2019	Reminder: • The Contractor was reminded to properly cover the cement bags at Zone 4.	The item was rectified by the Contractor on 25 January 2019.
	31 January 2019	Reminder: • The Contractor was reminded to provide sufficient cover for the cement bags at WAT.	The item will follow up in next reporting period.
		Reminder: • The Contractor was reminded to display the NRMM label on the roller at WAT.	The item will follow up in next reporting period.
Noise	Nil	Nil	Nil
Water Quality	27 December 2018	• Wastewater treatment facility at WAT was observed without proper maintenance. The Contractor was advised to provide sufficient maintenance for wastewater treatment facility.	The item was rectified by the Contractor on 07 January 2019.
	10 January 2019	Reminder: • The Contractor was reminded to maintain the wastewater treatment facility at Zone 4.	The item was rectified by the Contractor on 17 January 2019.
	18 January 2019	Reminder: • The Contractor was reminded to check the function of pH meter at the Aquased at Zone 3 and 4 to ensure the water discharge under the license requirement.	The item was rectified by the Contractor on 23 January 2019.
	24 January 2019	• Wastewater treatment facility at Zone 1 was observed without sufficient maintenance and pH value was lower than the license requirement. The Contractor was advised to improve the maintenance of wastewater treatment facility.	The item was rectified by the Contractor on 31 January 2019.
Waste/ Chemical Management	Nil	Nil	Nil
Landscape & Visual	Nil	Nil	Nil
Permits/ Licenses	24 January 2019	• Valid construction noise permit was not observed at the site entrance of W6. The Contractor was advised to display the valid construction noise permit at site entrance.	The item was rectified by the Contractor on 30 January 2019

6.1.1 Most of the follow-up actions requested by Contractor's ET and IEC during the site inspection were undertaken as reported by the Contractor and confirmed in the following weekly site inspection conducted during the reporting period. Some outstanding follow-up actions will be reported in the next reporting period.

7 ENVIRONMENTAL NON-CONFORMANCE

7.1 Summary of Monitoring Exceedances

7.1.1 All 24-hour TSP result was below the Action and Limit level at all monitoring locations in the reporting month.

7.1.2 No noise complaint was received in the reporting month; hence, no Action Level exceedance was recorded.

7.1.3 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.

7.2 Summary of Environmental Non-Compliance

7.2.1 No environmental non-compliance was recorded in the reporting month.

7.3 Summary of Environmental Complaints

7.3.1 No environmental related complaint was received in the reporting month. Cumulative statistics on environmental complaints is provided in **Appendix J**.

7.4 Summary of Environmental Summon and Successful Prosecutions

7.4.1 No environmental related prosecution or notification of summons was received in the reporting month. Cumulative statistics on notification of summons and successful prosecutions is provided in **Appendix J**.

8 FUTURE KEY ISSUES

8.1 Construction Programme for the Next Three Month

8.1.1 The major construction works between February and April 2019 will be:

Location	Site Activities
Exhibition Station (Zone 1 - PTI Area)	• Temporary Traffic Management • Structure Station/ Tunnel
Harbour Road Sport Cenrtre (Zone 2)	• Excavation and Lateral Support • Structure Station/Tunnel
Exhibition Station (Zone 3 - Swimming Pool Area) (including W7a, W7b, W4, W5 and partial W6)	• Excavation and Lateral Support • Structure Station/Tunnel
Exhibition Station (Zone 4 - Tunnel at Tonnochy Road)	• Excavation and Lateral Support • Structure Station/Tunnel
Fleming Road Junction Area E	• Temporary Traffic Management • Excavation and Lateral Support
Western Vent Shaft and WAT Area C	• Structure Ventilation Shaft / Tunnel
WAT Area B	• Structure Tunnel • 1128/1123 Interface
WAT Area A	• Structure Tunnel • Reprovisioning, Remedial and Improvement Works
Kai Tak Barging Point[#]	• Storage and barging of fill materials

[#] The Kai Tak Barging Point will be for storage and barging of fill materials over the whole contract period.

8.2 Key Issues for the Coming Month

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

8.3 Monitoring Schedule for the Next Three Month

8.3.1 The tentative schedules for environmental monitoring in between February and April 2019 are provided in **Appendix F**.

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

9.1.1 24-hour TSP and noise monitoring were carried out in the reporting month.

9.1.2 No Action and Limit Level exceedance was recorded for 24-hour TSP monitoring at the monitoring locations in the reporting month.

9.1.3 No noise complaint was received in the reporting month; hence, no Action Level exceedance was recorded.

9.1.4 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.

9.1.5 7 nos. of environmental site inspections were carried out in January 2019. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.

9.1.6 Referring to the Contractor's information, no environmental related complaint, notification of summons and successful prosecution was received in the reporting month.

9.2 Recommendations

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

Air Quality Impact

- Cover every stock of more than 20 bags of cement at site.
- Cover or spray water on every stockpiles and haul road at site.
- Ensure NRMM label was displayed on the machinery

Construction Noise Impact

- No specific observation was identified in the reporting month.

Water Quality Impact

- Maintain waste water treatment facilities properly.

Chemical and Waste Management

- No specific observation was identified in the reporting month.

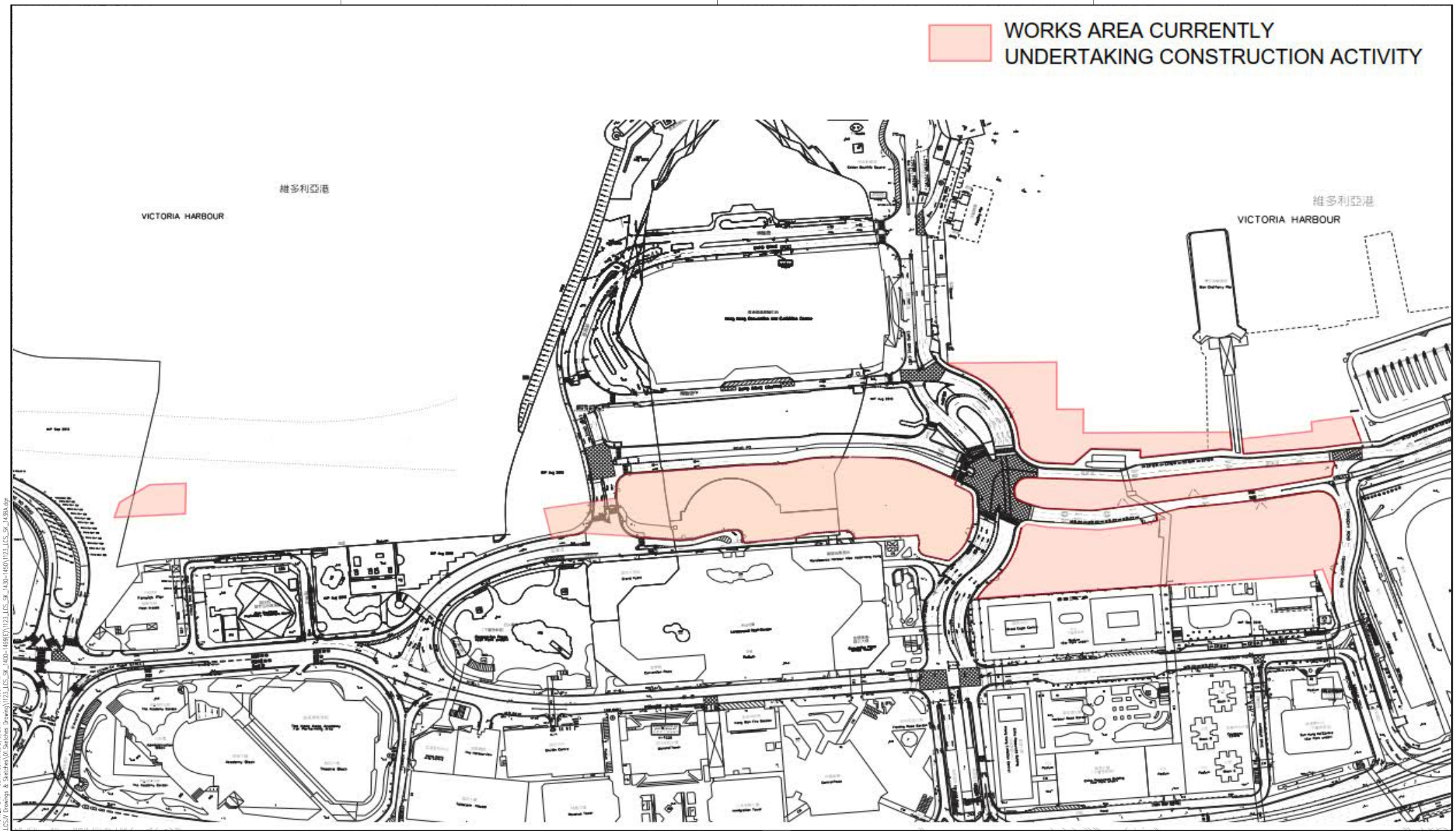
Landscape & Visual Impact

- No specific observation was identified in the reporting month.

Permits/licenses

- Valid construction noise permit were reminded to display at site entrance.

FIGURES



REV	DESCRIPTION	BY	DATE	APPROVED

REV	DESCRIPTION	BY	DATE	APPROVED

DRAWN	C.F.WOO
DESIGNED	---
CHECKED	---
APPROVED	---
DATE	20Jun/2018

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ORIGINATOR

AECOM

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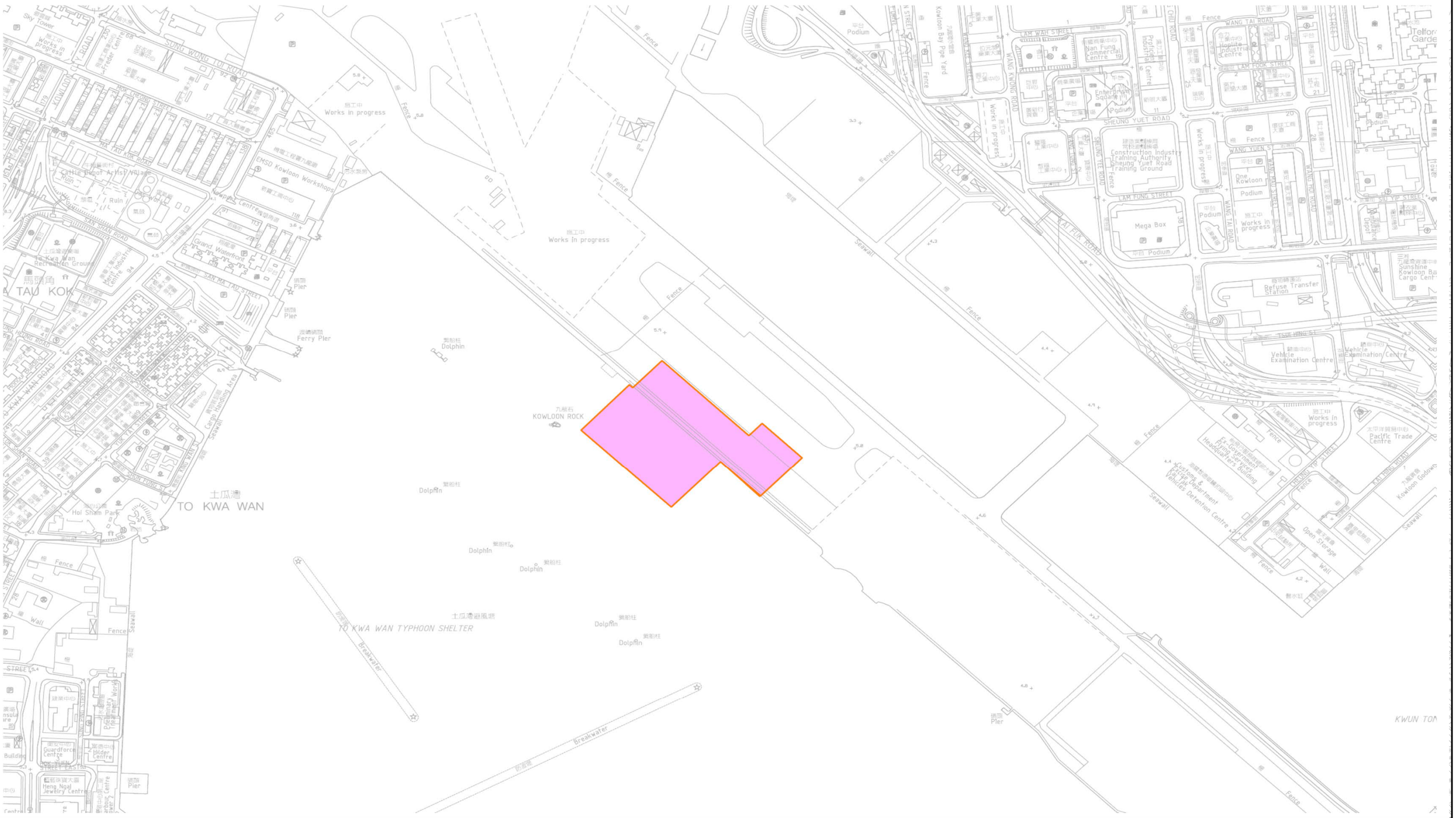
CONTRACT 1123

EXHIBITION STATION AND WESTERN APPROACH TUNNEL

SITE LAYOUT PLAN

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REV	DESCRIPTION	BY	DATE	APPROVED
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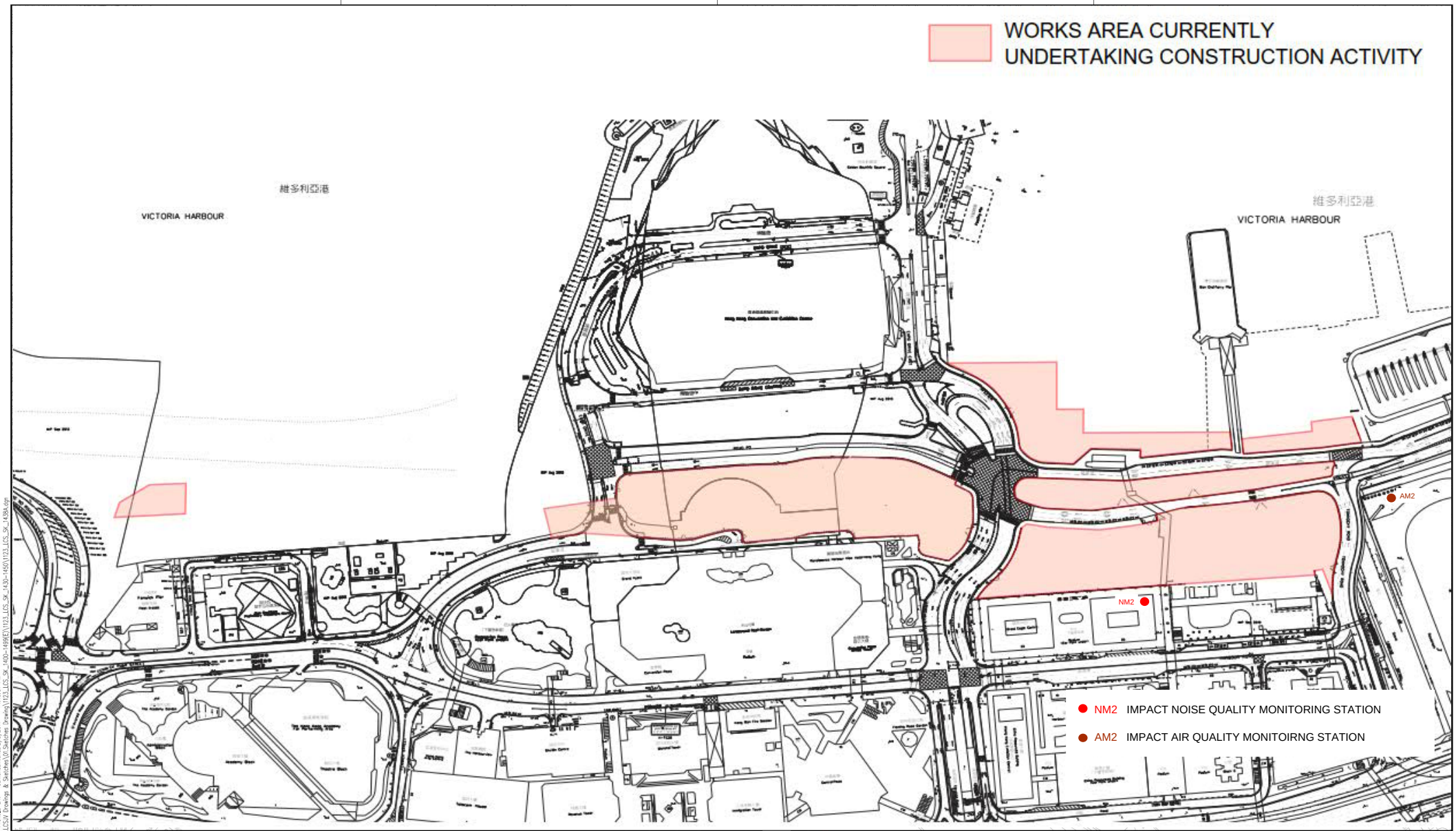
CONTRACT 1123

EXHIBITION STATION AND WESTERN APPROACH TUNNEL

SITE LAYOUT PLAN FOR KAI TAK BARGING POINT

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SHATIN TO CENTRAL LINK – CONTRACT 1123

ORIGINATOR

AECOM

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TITLE

CONTRACT 1123

EXHIBITION STATION AND WESTERN APPROACH TUNNEL

LOCATION OF NOISE AND AIR QUALITY MONITORING STATIONS

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APPENDIX A

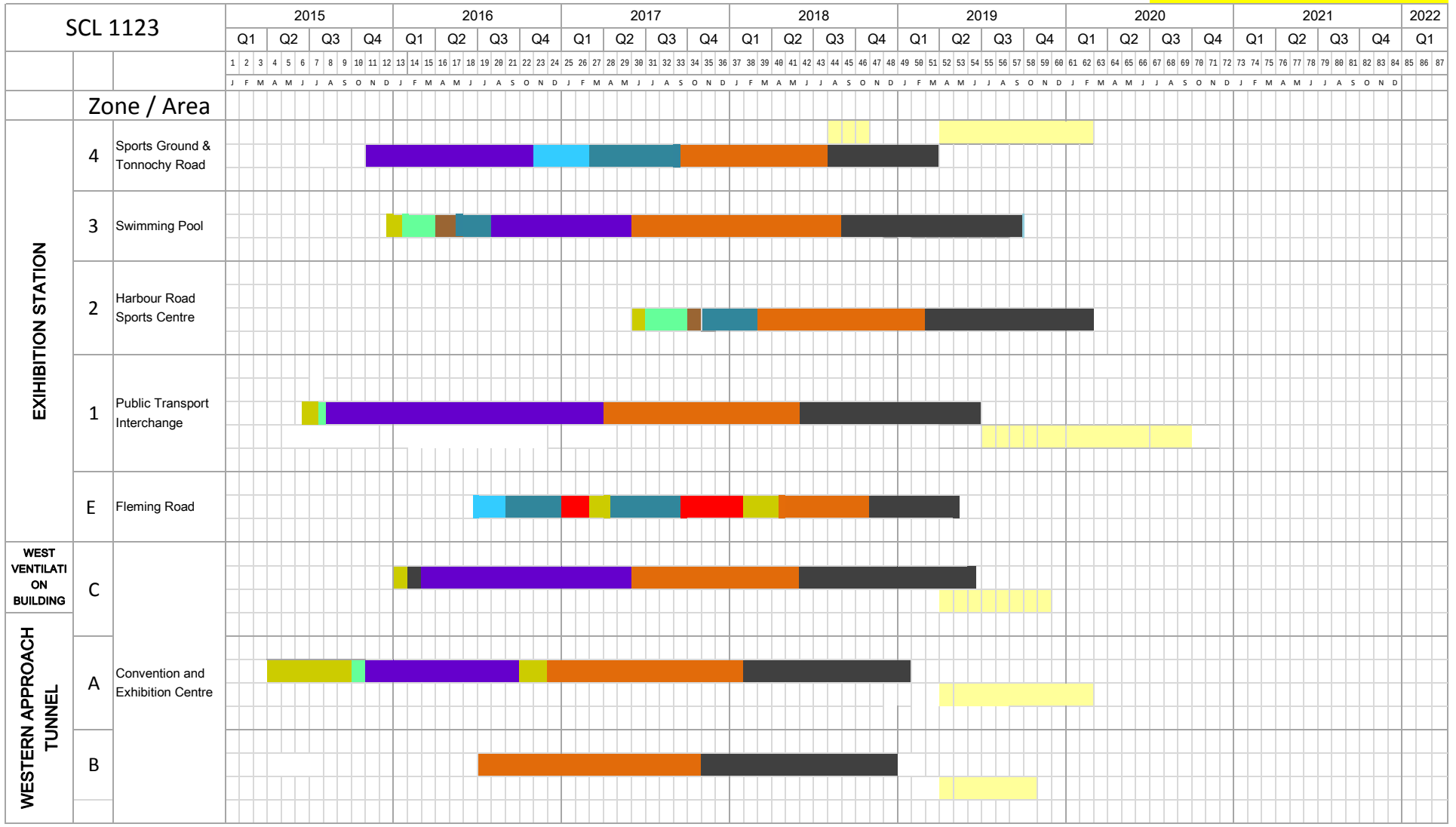
Construction Programme

MTR SCL 1123 - Exhibition Station and Western Approach Tunnel

High Level Programme

Leighton - China State Joint Venture

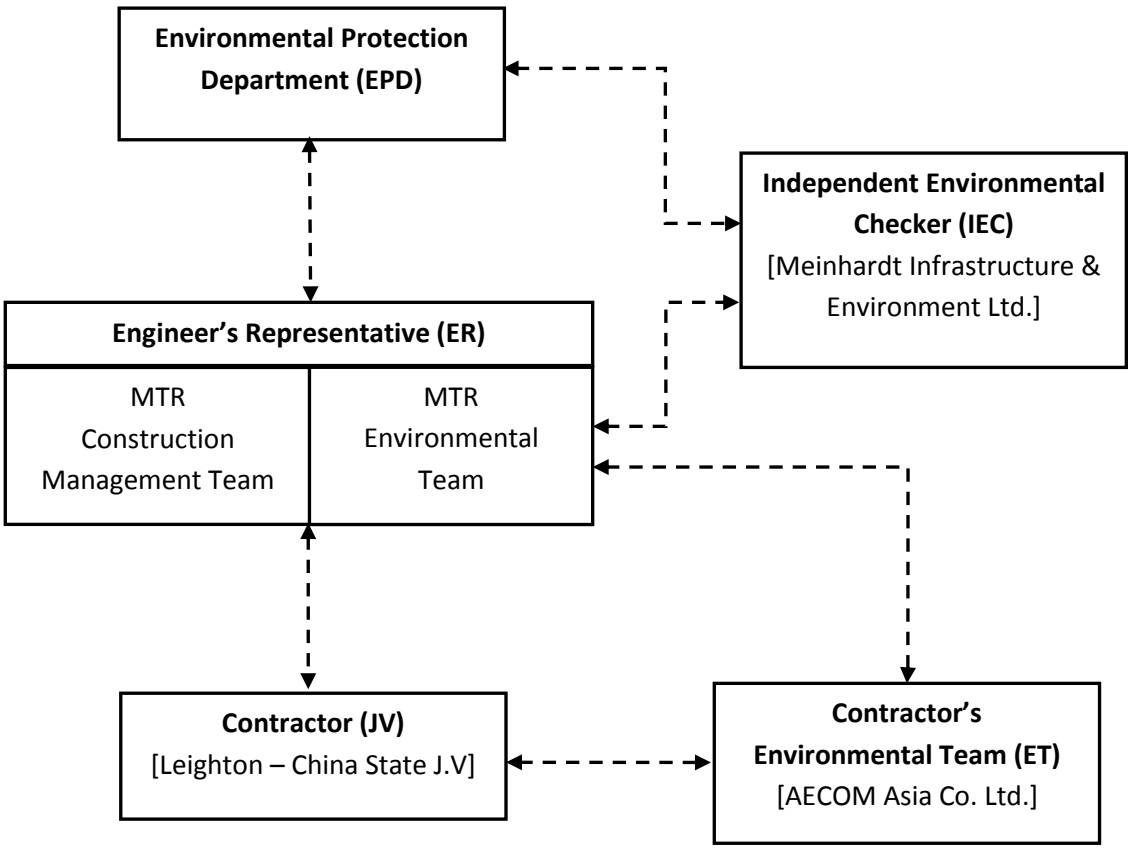
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APPENDIX B

Project Organization Structure

Appendix B Project Organisation Structure



APPENDIX C

Implementation Schedule of Environmental Mitigation Measures

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Cultural Heritage Impact						
S4.93 & Table 4.2	Erection of decorative and sensibly designed hoarding along the boundary of the works area	To mitigate the temporary visual impact due to surface works.	Contractor	Works Areas in Causeway Bay and Wan Chai, and Works Shaft in Admiralty	Construction Phase	V
Ecological Impact						
S5.134	Accidental chemical spillage and construction site run-off to the receiving water bodies, mitigation measures such as removing the pollutants before discharge into storm drain and paving the section of construction road between the wheel washing bay and the public road as suggested in Sections 11.216 and 11.219 to 11.256 of the EIA Report shall be adopted.	To minimize the contamination of wastewater discharge	Contractor	All land based works areas	Construction Phase	N/A
Landscape and Visual Impact						
Construction Phase						
Table 7.9	CM1 - Trees unavoidably affected by the works shall be transplanted as far as possible in accordance with ETWB TC(W) 3/2006 – Tree Preservation.	Transplanting and reuse of affected trees.	MTR	Works Sites	Construction Phase	V
Table 7.9	CM2a - Compensatory tree planting shall be provided in accordance with ETWB TC(W) 3/2006 – Tree Preservation to compensate for felled trees and maintained until end of the establishment period.	Compensation for the removal of existing trees due to the Project.	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM2b - Compensatory shrub planting shall be provided to compensate for the loss of shrub planting in amenity areas.	Compensation for the removal of existing shrub planting due to the Project.	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM3 - Control of night-time lighting glare	Minimize the night time glare due to the Project during construction phase	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM4 - Erection of decorative screen hoarding compatible with the surrounding setting.	Minimize the visual impact of the Project during construction phase	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM5 - Management of facilities on work sites which give control on the height and disposition/arrangement of all facilities on the works site to minimize visual impact to adjacent VSRs	Control of height and deposition/ arrangement of temporary facilities in works areas	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM6 - All hard and soft landscape areas disturbed temporarily during construction shall be reinstated on like-to-like basis to the satisfaction of the relevant Government Departments.	Reinstatement of temporary works areas.	MTR	Works Sites	Construction Phase	N/A
Construction Dust Impact						
Table 8.5	Barging facilities: (i) Transportation of spoils to the barging point – Pave all road surfaces within the barging facilities and provide watering once along with the haul road for every working hours to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.0 L/m^2 once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.0L/m^2 to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual. (ii) Unloading of spoil materials – Undertake the unloading process within a 3-sided screen with top	To minimize dust impacts	Contractor	All barging points	Construction phase	@ V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	tipping hall. Provide water spraying and flexible dust curtains at the discharge point for dust suppression. (iii) Vehicles leaving the barging facilities – Pass vehicles through the wheel washing facilities provided at site exits.					V
S8.63	For concrete batching plant, the requirements and mitigation measures stipulated in the *Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93)* shall be followed and implemented.	To minimize dust impact	Contractor	Concrete Batching Plant	Construction phase	N/A
Table 8.6	During operation of concrete batching plant: (i) Unloading of aggregates from the tipper trucks to receiving hopper – unload the aggregates from the tipper trucks to the receiving hopper equipped with enclosures on 3 sides and top cover, and water spraying system. (ii) Unloading of cement and PFA from tankers into the silo – Directly load the cement and PFA into the silo via a flexible duct. Install dust collectors at cement/PFA silos. (iii) Storage of aggregates in overhead storage bins – Store the aggregates in fully enclosed overhead storage bins. Cover the top of overhead storage bins with cladding. Install water spraying system at the top of storage bins for watering the aggregates, and fully enclose aggregates storage bins. (iv) Weighing and batching of cementitious materials – Perform the whole process of weighing and mixing in a fully enclosed environment. Equip all the mixers with dust collectors. (v) Loading of concrete from mixer into transit mixer of a truck – Directly load the concrete from the mixer into the transit mixer of a truck in "wet form". (vi) Tipper trucks and cement tankers leaving the Concrete Batching Plant – Haul road within the site is unpaved. Install wheel washing pit at the gate of the concrete batching plant. (vii) Transportation of materials within the plant – Provide watering twice a day would be provided.	To minimize dust impacts	Contractor	Concrete Batching Plant	Construction phase	N/A
S8.89	Watering once every working hour on active works areas, exposed areas and paved haul roads to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.7 L/m2 for Kowloon side and 1.0 L/m2 for Hong Kong side once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.7 L/m2 for Kowloon side and 1.0 L/m2 for Hong Kong side to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual.	To minimize dust impact	Contractor	Works areas	Construction Phase	V
S8.89	Enclosing the unloading process at barging point by a 3-sided screen with top tipping hall, provision of water spraying and flexible dust curtains to reduce dust emission	To minimize dust impact	Contractor	All barging points	Construction phase	V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S8.90	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: • Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. • Use of frequent watering for particularly dusty construction areas and areas close to ASRs. • Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. • Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. • Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. • Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. • Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. • Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit. • Imposition of speed controls for vehicles on site haul roads. • Where possible, routing of vehicles and positioning of construction plant shall be at the maximum possible distance from ASRs. • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. • Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise	To minimize dust impacts	Contractor	Works areas	Construction phase	V V V @ V V V V N/A V @ V
/	***Dust suppression measures (con't)*** • De-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement • The portion of any road where along the site boundary should be kept clear of dusty materials. • Use of frequent watering for any dusty construction process (e.g. breaking works) to reduce dust emissions.	To minimize dust impacts	Contractor	Works areas	Construction phase	V V V
/	***Emission from Vehicles and Plants*** • All vehicles shall be shut down in intermittent use. • Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke. • All diesel fuelled construction plant within the works areas shall be powered by ultra low sulphur diesel fuel (ULSD)	Reduce air pollution emission from construction vehicles and plants	Contractor	Works areas	Construction phase	V V V
Airborne Noise Impact						
Construction Phase						
S9.55	The following good site practices shall be implemented: • Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program • Silencers or mufflers on construction equipment shall be utilized and shall be properly maintained during the construction program • Mobile plant, if any, shall be sited as far from NSRs as possible • Machines and plant (such as trucks) that may be in intermittent use shall be shut down between work periods or shall be throttled down to a minimum • Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs	To minimize construction noise impact	Contractor	Works areas	Construction phase	V V V V N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	• Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities					N/A
/	• Install movable noise barriers, acoustic mat or full enclosure, screen the noisy plants during operation • Air compressors shall be fitted with valid noise emission labels during operation	To minimize construction noise impact	Contractor	Works areas	Construction phase	V V
S9.56 & Table 9.16	The following quiet PME shall be used: • Crane lorry, mobile • Crane, mobile • Asphalt paver • Backhoe with hydraulic breaker • Breaker, excavator mounted (hydraulic) • Hydraulic breaker • Concrete lorry mixer • Poker, vibrator, hand-held • Concrete pump • Crawler crane, mobile • Mobile crane • Dump truck • Excavator • Truck • Rock drill • Lorry • Wheel loader • Roller vibratory	To minimize construction noise impact	Contractor	Works areas at: • Hung Hom • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunnel	Construction phase	V V N/A V N/A N/A N/A N/A N/A V V V V V N/A N/A N/A N/A
S9.58 – S9.59 & Table 9.17	Movable noise barrier shall be used for the following PME: • Air compressor • Asphalt paver • Backhoe with hydraulic breaker • Bar bender • Bar bender and cutter (electric) • Breaker, excavator mounted • Concrete pump • Concrete pump, stationary/lorry mounted • Excavator • Generator • Grout pump • Hand held breaker • Hydraulic breaker • Saw, concrete	To minimize construction noise impact	Contractor	Works areas at: • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunnel	Construction phase	N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
S9.60 & Table 9.17	Noise insulating fabric shall be used for • Drill rig, rotary type • Piling, diaphragm wall, bentonite filtering plant • Piling, diaphragm wall, grab and chisel • Piling, diaphragm wall, hydraulic extractor • Piling, large diameter bored, grab and chisel • Piling, hydraulic extractor • Piling, earth auger, auger • Rock drill, crawler mounted (pneumatic)	To minimize construction noise impact	Contractor	Works areas at: • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunnel	Construction phase	N/A N/A N/A N/A N/A N/A N/A N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Water Quality Impact						
Construction Phase						
S11.216	The following mitigation measures are proposed to minimize the potential water quality impacts from the construction works at or close to the seafront: • Temporary storage of construction materials (e.g. equipment, filling materials, chemicals and fuel) and temporary stockpile of construction and demolition materials shall be located well away from the seawater front and storm drainage during carrying out of the works. • Stockpiling of construction and demolition materials and dusty materials shall be covered and located away from the seawater front and storm drainage. • Construction debris and spoil shall be covered up and/or disposed of as soon as possible to avoid being washed into the nearby receiving waters.	To minimize release of construction wastes from construction works at or close to the seafront	Contractor	Construction works at or close to the seafront	Construction Phase	V V N/A
S11.222 to 11.245	The site practices outlined in ProPECC PN 1/94 “Construction Site Drainage” shall be followed where practicable. <u>Surface Run-off</u> • Surface run-off from construction sites shall be discharged into storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sedimentation basins. Channels or earth bunds or sand bag barriers shall be provided on site to properly direct stormwater to such silt removal facilities. Perimeter channels at site boundaries shall be provided where necessary to intercept storm run-off from outside the site so that it will not wash across the site. Catchpits and perimeter channels shall be constructed in advance of site formation works and earthworks. • Silt removal facilities, channels and manholes shall be maintained and the deposited silt and grit shall be removed regularly, at the onset of and after each rainstorm to prevent local flooding. Any practical options for the diversion and re-alignment of drainage shall comply with both engineering and environmental requirements in order to provide adequate hydraulic capacity of all drains. Minimum distances of 100 m shall be maintained between the discharge points of construction site runoff and the existing saltwater intakes. • Construction works shall be programmed to minimize soil excavation works in rainy seasons (April to September). If excavation in soil cannot be avoided in these months or at any time of year when rainstorms are likely, for the purpose of preventing soil erosion, temporary exposed slope surfaces shall be covered e.g. by tarpaulin, and temporary access roads shall be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels shall be provided (e.g. along the crest / edge of excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements shall always be in place in such a way that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm. • Earthworks final surfaces shall be well compacted and the subsequent permanent work or surface protection shall be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels shall be provided where necessary. • Measures shall be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they shall be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations shall be discharged into storm drains via silt removal facilities. • Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites shall be covered with tarpaulin or similar fabric during rainstorms. • Manholes (including newly constructed ones) shall 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. Discharge of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system. • Good site practices shall be adopted to remove rubbish and litter from construction sites so as to prevent the rubbish and litter from spreading from the site area. It is recommended to clean the construction sites on a regular basis. <u>Boring and Drilling Water</u> • Water used in ground boring and drilling for site investigation or rock / soil anchoring shall as far as	To minimize water quality impacts from construction site runoff and general construction activities	Contractor	Works areas	Construction Phase	V @ V N/A N/A V V V V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	practicable be re-circulated after sedimentation. When there is a need for final disposal, the wastewater shall be discharged into storm drains via silt removal facilities. Wheel Washing Water • All vehicles and plant shall be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay shall be provided at every site exit if practicable and wash-water shall have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road shall be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains. Bentonite Slurries • Bentonite slurries used in diaphragm wall and bore-pile construction shall be reconditioned and used again wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the bentonite slurries shall either be dewatered or mixed with inert fill material for disposal to a public filling area. • If the used bentonite slurry is intended to be disposed of through the public drainage system, it shall be treated to the respective effluent standards applicable to foul sewer, storm drains or the receiving waters as set out in the TM-DSS. Water for Testing & Sterilization of Water Retaining Structures and Water Pipes • Water used in water testing to check leakage of structures and pipes shall be used for other purposes as far as practicable. Surplus unpolluted water will be discharged into storm drains. • Sterilization is commonly accomplished by chlorination. Specific advice from EPD shall be sought during the design stage of the works with regard to the disposal of the sterilizing water. The sterilizing water shall be used again wherever practicable. Acid Cleaning, Etching and Pickling Wastewater • Acidic wastewater generated from acid cleaning, etching, pickling and similar activities shall be neutralized to within the pH range of 6 to 10 before discharging into foul sewers. If there is no public foul sewer in the vicinity, the neutralized wastewater shall be tankered off site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters. Wastewater from Site Facilities • Wastewater collected from any temporary canteen kitchens, including that from basins, sinks and floor drains, shall be discharged into foul sewer via grease traps. In case connection to the public foul sewer is not feasible, wastewater generated from kitchens or canteen, if any, shall be collected in a temporary storage tank. A licensed waste collector shall be deployed to clean the temporary storage tank on a regular basis. • Drainage serving an open oil filling point shall be connected to storm drains via petrol interceptors with peak storm bypass. • Vehicle and plant servicing areas, vehicle wash bays and lubrication bays shall as far as possible be located within roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor. Oil leakage or spillage shall be contained and cleaned up immediately. Waste oil shall be collected and stored for recycling or disposal in accordance with the Waste Disposal Ordinance.					V V V N/A N/A N/A N/A N/A N/A V
S11.246 & 11.247	Construction work force sewage discharges on site are expected to be discharged to the nearby existing trunk sewer or sewage treatment facilities. If disposal of sewage to public sewerage system is not feasible, appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. The Contractor shall also be responsible for waste disposal and maintenance practices. Notices shall be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.	To minimize water quality impacts due to sewage generated from construction workforce	Contractor	Works areas	Construction Phase	N/A
S11.248	In case seepage of uncontaminated groundwater occurs, groundwater shall be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process shall also be discharged into the storm system via silt traps.	To minimize impact from discharge of uncontaminated groundwater	Contractor	Works areas	Construction Phase	V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S11.249	If land contaminated site is identified from the Stage 2 SI work (refer to Sections 11.188 to 11.191 of the EIA Report), the following mitigation measures shall be implemented for the identified contaminated area. Any transient pile of contaminated soil / material shall be minimized and shall be bottom-lined, bunded and covered with impervious membrane during rain event to avoid generation of contaminated runoff. Appropriate intercepting channels and partial shelters shall be provided where necessary to prevent rainwater from collecting within trenches or footing excavations. Any contaminated water and wastewater generated from the decontamination process shall not be directly discharged to public sewers or site drainage. They shall be treated or tanked away as necessary for proper disposal in compliance with the TM-DSS.	To control site run-off generated from any potential contaminated works areas.	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
S11.250 & S11.251	No direct discharge of groundwater from contaminated areas shall be adopted. If land contamination impact and generation of contaminated groundwater is identified from the Stage 2 SI works (refer to Sections 11.189 to 11.192 of the EIA Report), the following mitigation measures shall be adopted. Any contaminated groundwater shall be either properly treated in compliance with the requirements of the TM-DSS or properly recharged into the ground. If wastewater treatment is deployed for treating the contaminated groundwater, the wastewater treatment unit shall deploy suitable treatment processes (e.g. oil interceptor / activated carbon) to reduce the pollution level to an acceptable standard and remove any prohibited substances (such as TPH) to an undetectable range. All treated effluent from the wastewater treatment plant shall meet the requirements as stated in TM-DSS and shall be discharged into the foul sewers. If groundwater recharging wells are deployed, the recharging wells shall be installed as appropriate for recharging the contaminated groundwater back into the ground. The recharging wells shall be selected at places where the groundwater quality will not be affected by the recharge operation as indicated in Section 2.3 of the TM-DSS. The baseline groundwater quality shall be determined prior to the selection of the recharge wells, and submit a working plan (including the laboratory analytical results showing the quality of groundwater at the proposed recharge location(s) as well as the pollutant levels of groundwater to be recharged) to EPD for agreement. Pollution levels of groundwater to be recharged shall not be higher than pollutant levels of ambient groundwater at the recharge well. Prior to recharge, any prohibited substance such as TPH products shall be removed as necessary by installing the petrol interceptor. The Contractor shall apply for a discharge licence under the WPCO through the Regional Office of EPD for groundwater recharge operation or discharge of treated groundwater.	To minimize potential water quality impact from discharge of contaminated groundwater	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
S11.252	The following good site practices shall be adopted for the proposed barging points: • all vessels shall be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash • all hopper barges shall be fitted with tight fitting seals to their bottom openings to prevent leakage of material • construction activities shall not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site • loading of barges and hoppers shall be controlled to prevent splashing of material into the surrounding water. Barges or hoppers shall not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation	To minimize water quality impacts generated from the barging points.	Contractor	Barging points	Construction Phase	N/A
S11.253	There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas shall be treated so that it satisfies all the standards listed in the TM-DSS. Minimum distances of 100 m shall be maintained between the discharge points of construction site effluent and the existing seawater intakes. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., can minimize water consumption and reduce the effluent discharge volume. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring shall be carried out in accordance with the WPCO license which is under the ambit of Regional Office (RO) of EPD.	To minimize water quality impact from effluent discharges from construction sites	Contractor	All construction works areas	Construction Phase	V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S11.254	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation shall be observed and complied with for control of chemical wastes.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	V
S11.255	Any service shop and maintenance facilities shall be located on hard standings within a bunded area, and sumps and oil interceptors shall be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage shall only be undertaken within the areas appropriately equipped to control these discharges.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	N/A
S11.256	Disposal of chemical wastes shall be carried out in compliance with the Waste Disposal Ordinance. The "Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes" published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: • Suitable containers shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport. • Chemical waste containers shall be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents. • Storage area shall be selected at a safe location on site and adequate space shall be allocated to the storage area.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	V V V
Waste Management Implications						
Construction Phase						
S12.75	***Good Site Practices and Waste Reduction Measures*** • Prepare a Waste Management Plan (WMP) approved by the Engineer/Supervising Officer of the Project based on current practices on construction sites; • Training of site personnel in, site cleanliness, proper waste management and chemical handling procedures; • Provision of sufficient waste disposal points and regular collection of waste; • Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and • Separation of chemical wastes for special handling and appropriate treatment.	To reduce waste management impacts	Contractor	All Work Sites	Construction Phase	V V V V N/A V
S12.76	***Good Site Practices and Waste Reduction Measures (con't)*** • Sorting of demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions (i.e. soil, broken concrete, metal etc.); • Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; • Encourage collection of aluminum cans by providing separate labeled bins to enable this waste to be segregated from other general refuse generated by the workforce; • Proper storage and site practices to minimize the potential for damage or contamination of construction materials; • Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; and • Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	N/A V V V V V
S12.77	***Good Site Practices and Waste Reduction Measures (con't)*** The Contractor shall prepare and implement a WMP as part of the EMP in accordance with ETWB TCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. Such a management plan shall incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	The EMP shall be submitted to the Engineer for approval. The Contractor shall implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP shall be reviewed regularly and updated by the Contractor, preferably in a monthly basis.					
S12.78	***Good Site Practices and Waste Reduction Measures (con't)*** C&D materials would be reused in other local concurrent projects as far as possible. If all reuse outlets are exhausted during the construction phase, the C&D materials would be disposed of at Taishan, China as a last resort.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	N/A
S12.79	***Storage, Collection and Transportation of Waste*** Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include: • Waste, such as soil, shall be handled and stored well to ensure secure containment, thus minimizing the potential of pollution; • Maintain and clean storage areas routinely; • Stockpiling area shall be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and • Different locations shall be designated to stockpile each material to enhance reuse.	To minimize potential adverse environmental impacts arising from waste storage	Contractor	Work Sites	Construction Phase	N/A N/A N/A N/A
S12.80	***Storage, Collection and Transportation of Waste (con't)*** Waste haulier with appropriate permits shall be employed by the Contractor for the collection and transportation of waste from works areas to respective disposal outlets. The following suggestions shall be enforced to minimize the potential adverse impacts: • Remove waste in timely manner • Waste collectors shall only collect wastes prescribed by their permits • Impacts during transportation, such as dust and odour, shall be mitigated by the use of covered trucks or in enclosed containers • Obtain relevant waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28) • Waste shall be disposed of at licensed waste disposal facilities • Maintain records of quantities of waste generated, recycled and disposed	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	Work Sites	Construction Phase	V V N/A V V V
S12.81	***Storage, Collection and Transportation of Waste (con't)*** • Implementation of trip ticket system with reference to DevB TC(W) No.6/2010 to monitor disposal of waste and to control fly-tipping at PFRFs or landfills. A recording system for the amount of waste generated, recycled and disposed (including disposal sites) shall be proposed.	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.83 – 12.86	***Sorting of C&D Materials*** • Sorting to be performed to recover the inert materials, reusable and recyclable materials before disposal off-site. • Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. • The C&D materials shall at least be segregated into inert and non-inert materials, in which the inert portion could be reused and recycled as far as practicable before delivery to PFRFs as mentioned for beneficial use in other projects. While opportunities for reusing the non-inert portion shall be investigated before disposal of at designated landfills. • Possibility of reusing the spoil in the Project will be continuously investigated in the detailed design and construction stages, it includes backfilling to cut and cover construction works for the Hung Hom south and north approach tunnels.	To minimize potential adverse environmental impacts during the handling, transportation and disposal of C&D materials	Contractor	Work Sites	Construction Phase	V N/A V N/A
S12.88	***Sediments*** • The basic requirements and procedures for excavated / dredged sediment disposal specified under ETWB TC(W) No. 34/2002 shall be followed. MFC is managing the disposal facilities in Hong Kong for the dredged and excavated sediment, while EPD is the authority of issuing marine dumping permit under the Dumping at Sea Ordinance.	To ensure the sediment to be disposed of in an authorized and least impacted way	Contractor	All works areas with sediments concern	Construction Phase	N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S12.89	***Sediments (con't)*** • The contractor for the excavation / dredging works shall apply for the site allocations of marine sediment disposal based on the prior agreement with MFC/CEDD. A request for reservation of sediment disposal space have been submitted to MFC for onward discussions of disposal approach and feasible disposal sites and the letter is attached in Appendix 12.6. The Project proponent shall also be responsible for the application of all necessary permits from relevant authorities, including the dumping permit as required under DASO from EPD, for the disposal of dredged and excavated sediment prior to the commencement of the excavation works.	To determine the best handling and disposal option of the sediments	MTR / Contractor	All works areas with sediments concern	Detailed Design Stage and Construction Phase	N/A
S12.91 – 12.94	***Sediments (con't)*** • Stockpiling of contaminated sediments shall be avoided as far as possible. If temporary stockpiling of contaminated sediments is necessary, the excavated sediment shall be covered by tarpaulin and the area shall be placed within earth bunds or sand bags to prevent leachate from entering the ground, nearby drains and/or surrounding water bodies. The stockpiling areas shall be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas shall be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, shall be collected and discharged according to the Water Pollution Control Ordinance (WPCO). • In order to minimise the potential odour / dust emissions during excavation and transportation of the sediment, the excavated sediments shall be wetted during excavation / material handling and shall be properly covered when placed on trucks or barges. Loading of the excavated sediment to the barge shall be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water. • The barge transporting the sediments to the designated disposal sites shall be equipped with tight fitting seals to prevent leakage and shall not be filled to a level that would cause overflow of materials or laden water during loading or transportation. In addition, monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as specified by the DEP. • In order to minimise the exposure to contaminated materials, workers shall, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities shall also be provided on site.	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A
S12.95	***Sediments (con't)*** • A possible arrangement for Type 3 disposal is by geosynthetic containment. A geosynthetic containment method is a method whereby the sediments are sealed in geosynthetic containers and, at the disposal site, the containers would be dropped into the designated contaminated mud pit where they would be covered by further mud disposal and later by the mud pit capping, thereby meeting the requirements for fully confined mud disposal. The technology is readily available for the manufacture of the geosynthetic containers to the project-specific requirements. Similar disposal methods have been used for projects in Europe, the USA and Japan and the issues of fill retention by the geosynthetic fabrics, possible rupture of the containers and sediment loss due to impact of the container on the seabed have been addressed.	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A
S12.97	***Containers for Storage of Chemical Waste*** The Contractor shall register with EPD as a chemical waste producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Containers used for storage of chemical waste shall: • Be compatible with the chemical wastes being stored, maintained in good condition and securely sealed; • Have a capacity of less than 450 litters unless the specifications have been approved by EPD; and • Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation.	To register with EPD as a Chemical waste producer and store chemical waste in appropriate containers	Contractor	Work Sites	Construction Phase	V V V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S12.98	***Chemical Waste Storage Area*** • Be clearly labeled to indicate corresponding chemical characteristics of the chemical waste and used for storage of chemical waste only; • Be enclosed on at least 3 sides; • Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest; • Have adequate ventilation; • Be covered to prevent rainfall from entering; and • Be properly arranged so that incompatible materials are adequately separated.	To prepare appropriate storage areas for chemical waste at works areas	Contractor	Work Sites	Construction Phase	V V V V V V
S12.99	***Chemical Waste*** • Lubricants, waste oils and other chemical wastes would be generated during the maintenance of vehicles and mechanical equipments. Used lubricants shall be collected and stored in individual containers which are fully labelled in English and Chinese and stored in a designated secure place.	To clearly label the chemical waste at works areas	Contractor	Work Sites	Construction Phase	N/A
S12.100	***Collection and Disposal of Chemical Waste*** ***A trip-ticket system shall be operated in accordance with the Waste Disposal*** *(Chemical Waste) (General) Regulation* to monitor all movements of chemical waste. The Contractor shall employ a licensed collector to transport and dispose of the chemical wastes, to either the approved CWTC at Tsing Yi, or another licensed facility, in accordance with the *Waste Disposal (Chemical Waste) (General) Regulation*.	To monitor the generation, reuse and disposal of chemical waste	Contractor	Work Sites	Construction Phase	N/A
S12.101	***General Refuse*** General refuse shall be stored in enclosed bins or compaction units separate from C&D materials and chemical waste. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D materials and chemical wastes. Preferably, an enclosed and covered area shall be provided to reduce the occurrence of wind-blown light material.	To properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.102	***General Refuse (con't)*** The recyclable component of general refuse, such as aluminum cans, paper and cleansed plastic containers shall be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste shall be set up by the Contractor. The Contractor shall also be responsible for arranging recycling companies to collect these materials.	To facilitate recycling of recyclable portions of refuse	Contractor	Work Sites	Construction Phase	V
S12.103	***General Refuse (con't)*** The Contractor shall carry out an education programme for workers in avoiding, reducing, reusing and recycling of materials generation. Posters and leaflets advising on the use of the bins shall also be provided in the sites as reminders.	To raise workers' awareness on recycling issue	Contractor	Work Sites	Construction Phase	V
/	***Accidental spillage*** To prevent accidental spillage of chemicals, the following is recommended: • Proper storage and handling facilities will be provided. • All the tanks, containers, storage area will be bunded and the locations will be locked as far as possible from the sensitive watercourse and stormwater drains. • The contractor will register as a chemical waste producer if chemical wastes would be generated. Storage of chemical waste arising from the construction activities will be stored with suitable labels and warnings. • Disposal of chemical wastes will be conducted in compliance with the requirements as stated in the Waste disposal (Chemical Waste) (General) Regulation.	To minimize potential adverse environmental impacts arising from accidental spillage	Contractor	Work Sites	Construction Phase	V V V V
Land Contamination Impact						
S13.23–13.24	For construction works at sites under the current stage of site investigation (Stage 1 SI): • Precautionary measures such as visual inspection are recommended to be undertaken during construction activities that disturb soil. The inspection process shall involve a visual observation of excavated soils for discolouration and the presence of oils, together with identifying the presence of odours, which may also indicate soil and/or groundwater contamination. • If soil materials suspected to be contaminated are encountered during excavation, sampling and testing shall be undertaken to verify the presence of contamination. The soil extracted during	To act as a general precautionary measure to screen soils for the presence contamination during excavation works for Cut-and-Cover.	Contractor	Within Project Boundary where signs of contamination is identified	During excavation works for Cut-and-Cover	N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	demolition, excavation and cut & cover construction shall be temporary stockpiled. Shall concentrations of contaminants of concern (COCs) exceed relevant RBRGs as indicated by laboratory analyses, remediation works shall be undertaken with reference to the Contamination Assessment Report (CAR) and Remediation Action Plans (RAP).					
S13.30	For some sites with currently no SI proposed (i.e. sites ID 2-02, 2-18, 2-22, 2-23, 2-27, 2-28), to be conservative, visual inspection shall be conducted during demolition and excavation to detect any abnormal colour, smell or other characteristics of the soil, due to the nearby land use and/ or construction method. If abnormal colour, smell or other characteristics of contamination are identified for any of these sites, sampling and testing shall be undertaken to verify the presence of contamination. The soil extracted during demolition, excavation and cut & cover construction shall be temporary stockpiled. Should the concentrations of contaminants of concern (COCs) exceed relevant RBRGs as indicated by laboratory analyses, remediation works shall be undertaken with reference to the CAR and RAP.	To act as a general precautionary measure to screen soils for the presence contamination during excavation works for Cut-and-Cover.	Contractor	Areas with no SI proposed (Sites ID 2-02, 2-18, 2-22, 2-23, 2-27, 2-28)	During excavation works for Cut-and-Cover	N/A
S13.36 – 13.38	For areas inaccessible for proper site appraisal and investigation (Stage 2 SI) (i) Site 2-15 • Upon site access being granted, visual inspection shall be carried out where intrusive works and soil excavation is encountered, for attention on any potential contamination due to its current operation • A supplementary CAP shall then be submitted to EPD for endorsement. • A CAR/RAP shall be prepared and submitted to EPD for endorsement on completion of the SI and analytical testing. • Shall remediation be undertaken a Remediation Report (RR) shall be prepared and submitted to EPD for endorsement to demonstrate that the decontamination work is adequate and is carried out in accordance with the endorsed CAR and RAP. Information such as soil treatment/ disposal records (including trip tickets), confirmatory sampling results, and photographs shall be included in the aforesaid RR. • No construction work shall be carried out prior to the endorsement of the RR by EPD.	To identify areas with land contamination concern, report laboratory results and propose remediation measures if necessary. To ensure remediation works have been undertaken to before the commencement of any construction works of the Project.	Contractor	Areas unable to be accessed during Stage 1 SI (Site 2-15)	After land resumption and prior to the construction works commencement at the site	N/A
S13.39	Potential Remediation of Contaminated Soil • Excavation profiles must be properly designed and executed with attention to the relevant requirements for environment, health and safety; • Excavation shall be carried out during dry season as far as possible to minimise contaminated runoff from contaminated soils; • Supply of suitable clean backfill material is needed after excavation; • If remediation is required with chemical oxidation proposed as a contaminant mass reduction technology, chemicals will be securely and separately stored away from sources of ignition or oxidisable items. Handling will be undertaken by personnel with appropriate training and personal protective equipment (PPE). • Vehicles containing any excavated materials shall be suitably covered to limit potential dust emissions or contaminated wastewater run-off, and truck bodies and tailgates shall be sealed to prevent any discharge during transport or during wet conditions; • Speed control for the trucks carrying contaminated materials shall be enforced; • Vehicle wheel and body washing facilities at the site's exit points shall be established and used; and • Pollution control measures for air emissions e.g. from biopile blower, noise emissions e.g. from blower, and water discharges e.g. runoff control shall be implemented and complied with relevant regulations and guidelines.	To remediate contaminated soil	Contractor	Identified contaminated sites	Site remediation	N/A
S13. 40	In order to minimize the potential adverse effects on health and safety of construction workers during the course of site remediation, the Occupation Safety and Health Ordinance (OSHO) (Chapter 509) and its subsidiary Regulations shall be followed by all site personnel working on the site at all times. In addition, the following basic health and safety measures shall be implemented as far as possible: • Set up a list of safety measures for site workers; • Provide written information and training on safety for site workers; • Keep a log-book and plan showing the contaminated zones and clean zones; • Maintain a hygienic working environment; • Avoid dust generation; • Provide face and respiratory protection gear to site workers;	To minimise the potentially adverse effects on health and safety of construction workers during the course of site remediation.	Contractor	Identified contaminated sites	Site remediation and prior to construction phase	N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	• Provide personal protective clothing (e.g. chemical resistant jackboot, liquid tight gloves) to site workers; and • Provide first aid training and materials to site workers.					

Legend: V = implemented;
x = not implemented;
@ = partially implemented;
N/A = not applicable

APPENDIX D

Summary of Action and Limit Levels

Appendix D – Summary of Action and Limit Levels

Table 1 Action and Limit Levels for 24-hour TSP

ID	Location	Action Level	Limit Level
AM2*	Wan Chai Sports Ground	160 $\mu g/m^3$	260 $\mu g/m^3$
AM3	Existing Harbour Road Sports Centre	169 $\mu g/m^3$	260 $\mu g/m^3$

* The monitoring station at AM2 was handed over from Contract SCL1128 on 28 October 2015.

Table 2 Action and Limit Levels for Construction Noise (0700 – 1900 hrs of normal weekdays)

ID	Location	Action Level	Limit Level
NM2*	Harbour Centre	When one documented complaint is received	75 dB(A)

* The Access to the designated monitoring location NM2 (i.e. Block A, Causeway Centre) was denied before the commencement of impact monitoring under Works Contract 1126. An alternative monitoring location at Harbour Centre was approved by the ER, agreed by IEC and EPD's formal approval is awaited in August 2014.

APPENDIX E

Calibration Certificates of Equipments

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station	Wanchai Sports Ground	Operator:	Choi Wing Ho
Cal. Date:	9-Nov-18	Next Due Date:	9-Jan-19
Equipment No.:	A-001-72T	Serial No.	809

Ambient Condition			
Temperature, Ta (K)	300	Pressure, Pa (mmHg)	761.3

Orifice Transfer Standard Information					
Serial No:	843	Slope, mc	2.00314	Intercept, bc	-0.01725
Last Calibration Date:	26-Dec-17	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	26-Dec-18				

Calibration of TSP Sampler

Resistance Plate No.	Orfice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) **X-axis**	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) **Y-axis**
18	7.2	2.68	1.34	46.0	45.89
13	6.3	2.50	1.26	42.0	41.90
10	4.6	2.14	1.08	32.0	31.92
7	3.4	1.84	0.93	24.0	23.94
5	2.7	1.64	0.83	19.0	18.95

By Linear Regression of Y on X

Slope , mw = **52.6291** **Intercept, bw =** **-24.6751**

Correlation Coefficient* = **0.9996**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m^3/min

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = IC \times [(Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; $IC = (mw \times Qstd + bw) \times [(760 / Pa) \times (Ta / 298)]^{1/2}$ = **43.85**

Remarks:

QC Reviewer: WS CHAN Signature: Date: 09/11/18

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station	Wanchai Sports Ground	Operator:	Choi Wing Ho
Cal. Date:	9-Jan-19	Next Due Date:	9-Mar-19
Equipment No.:	A-001-72T	Serial No.	809

Ambient Condition			
Temperature, Ta (K)	291	Pressure, Pa (mmHg)	765.5

Orifice Transfer Standard Information					
Serial No:	988	Slope, mc	2.01748	Intercept, bc	-0.02651
Last Calibration Date:	22-May-18	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	22-May-19				

Calibration of TSP Sampler

Resistance Plate No.	Orfice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) **X - axis**	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) **Y-axis**
18	7.1	2.71	1.35	47.0	47.73
13	6.3	2.55	1.28	42.0	42.66
10	4.6	2.18	1.09	32.0	32.50
7	3.3	1.84	0.93	24.0	24.37
5	2.6	1.64	0.82	18.0	18.28

By Linear Regression of Y on X

Slope , mw = **54.6249** **Intercept, bw =** **-26.7216**

Correlation Coefficient* = **0.9987**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m^3/min

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = IC \times [(Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)]$^{1/2}$= **43.61**

Remarks:

QC Reviewer: WS CHAN Signature: Date: 09/01/19

TISCH Environmental

RECALIBRATION DUE DATE:
December 26, 2018

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	December 26, 2017	**Rootsmeter S/N:** 438320	**Ta:** 291	°K
Operator:	Jim Tisch		**Pa:** 763.3	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **0843**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4140	3.2	2.00
2	3	4	1	1.0010	6.4	4.00
3	5	6	1	0.8910	7.9	5.00
4	7	8	1	0.8480	8.8	5.50
5	9	10	1	0.7030	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)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
1.0241	0.7243	1.4342	0.9958	0.7042	0.8732
1.0198	1.0188	2.0283	0.9916	0.9906	1.2349
1.0178	1.1423	2.2677	0.9896	1.1107	1.3807
1.0166	1.1988	2.3783	0.9885	1.1656	1.4481
1.0113	1.4386	2.8684	0.9834	1.3988	1.7464
QSTD	**m=**	**2.00314**	**QA**	**m=**	**1.25433**
	b=	**-0.01725**		**b=**	**-0.01050**
	r=	**0.99996**		**r=**	**0.99996**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
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= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

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

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9009

TISCH Environmental

RECALIBRATION DUE DATE:
May 22, 2019

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	May 22, 2018	**Rootsmeter S/N:** 438320	**Ta:** 296	°K
Operator:	Jim Tisch		**Pa:** 749.3	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **0988**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3840	3.2	2.00
2	3	4	1	0.9840	6.4	4.00
3	5	6	1	0.8790	7.9	5.00
4	7	8	1	0.8420	8.7	5.50
5	9	10	1	0.6900	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)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
0.9883	0.7141	1.4090	0.9957	0.7195	0.8889
0.9841	1.0001	1.9926	0.9915	1.0076	1.2570
0.9821	1.1173	2.2278	0.9895	1.1257	1.4054
0.9811	1.1652	2.3365	0.9884	1.1739	1.4740
0.9758	1.4141	2.8179	0.9831	1.4247	1.7777
QSTD	**m=**	**2.01748**	**QA**	**m=**	**1.26331**
	b=	**-0.02651**		**b=**	**-0.01673**
	r=	**0.99988**		**r=**	**0.99988**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
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= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

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

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9009

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

HOKLAS 028
CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 18CA0914 03 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2238	,	4188
Serial/Equipment No.:	2800927	,	2791211
Adaptors used:	-	,	-

Item submitted by

Customer Name:	AECOM ASIA CO., LTD.
Address of Customer:	-
Request No.:	-
Date of receipt:	14-Sep-2018

Date of test: 17-Sep-2018

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	23-Aug-2019	CIGISMEC
Signal generator	DS 360	33873	24-Apr-2019	CEPREI
Signal generator	DS 360	61227	23-Apr-2019	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	55 ± 10 %
Air pressure:	1005 ± 5 hPa

Test specifications

1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.

2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.

3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory: Feng Junqi **Date:** 18-Sep-2018 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 18CA0914 03 **Page** 2 **of** 2

1, Electrical Tests

The electrical tests were perfomed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	1.0	2.1
	Lin	Pass	2.0	2.2
Linearity range for Leq	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
Frequency weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100μs rectangular pulse	Pass	0.3	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor $1/10^3$ at 4kHz	Pass	0.3	
	1 ms burst duty factor $1/10^4$ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertainty (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: Fung Chi Yip **Date:** 17-Sep-2018

Checked by: Shek Kwong Tat **Date:** 18-Sep-2018

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

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Fax: (852) 2555 7533

CERTIFICATE OF CALIBRATION

Certificate No.: 18CA1019 01-01 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Preamp
Manufacturer:	B & K	B & K	B & K
Type/Model No.:	2250	4950	ZC0032
Serial/Equipment No.:	3001291	2665582	17190
Adaptors used:	-	-	-

Item submitted by

Customer Name:	AECOM ASIA CO LIMITED
Address of Customer:	-
Request No.:	-
Date of receipt:	19-Oct-2018

Date of test: 19-Oct-2018

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	23-Aug-2019	CIGISMEC
Signal generator	DS 360	33873	24-Apr-2019	CEPREI
Signal generator	DS 360	61227	23-Apr-2019	CEPREI

Ambient conditions

Temperature:	20 ± 1 °C
Relative humidity:	50 ± 10 %
Air pressure:	1005 ± 5 hPa

Test specifications

1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.

2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.

3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory: Feng Junqi **Date:** 20-Oct-2018 **Company Chop:** 綜合試驗有限公司 SOILS AND MATERIALS ENGINEERING COMPANY LTD.

Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 18CA1019 01-01 **Page** 2 **of** 2

1, Electrical Tests

The electrical tests were perfomed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	0.8	
	Lin	Pass	1.6	
Linearity range for Leq	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
Frequency weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100μs rectangular pulse	Pass	0.3	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor $1/10^3$ at 4kHz	Pass	0.3	
	1 ms burst duty factor $1/10^4$ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertainty (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: Fung Chi Yip Date: 19-Oct-2018

Checked by: shek Kwong Tat Date: 20-Oct-2018

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

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HOKLAS 028
CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 18CA0406 02-02 **Page:** 1 of 2

Item tested

Description:	Acoustical Calibrator (Class 1)
Manufacturer:	B & K
Type/Model No.:	4231
Serial/Equipment No.:	3006428 / N004.03
Adaptors used:	-

Item submitted by

Curstomer:	AECOM ASIA CO LIMITED
Address of Customer:	-
Request No.:	-
Date of receipt:	06-Apr-2018

Date of test: 09-Apr-2018

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	11-Apr-2018	SCL
Preamplifier	B&K 2673	2743150	05-May-2018	CEPREI
Measuring amplifier	B&K 2610	2346941	03-May-2018	CEPREI
Signal generator	DS 360	33873	25-Apr-2018	CEPREI
Digital multi-meter	34401A	US36087050	25-Apr-2018	CEPREI
Audio analyzer	8903B	GB41300350	21-Apr-2018	CEPREI
Universal counter	53132A	MY40003662	22-Apr-2018	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	50 ± 10 %
Air pressure:	1005 ± 5 hPa

Test specifications

1. The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
2. The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
3. The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on **page 2** of this certificate.

Approved Signatory: Feng Jun Qi **Date:** 11-Apr-2018 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the conditon of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 18CA0406 02-02 Page: 2 of 2

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

(Output level in dB re 20 μPa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.20	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz **STF = 0.015 dB**

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz **Actual Frequency = 999.96 Hz**

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz **TND = 0.4 %**

Estimated expanded uncertainty 0.7 %

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: Fung Chi Yip **Date:** 09-Apr-2018

Checked by: Lam Tze Wai **Date:** 11-Apr-2018

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

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APPENDIX F

EM&A Monitoring Schedules

Shatin to Central Link Contract 1123 - Exhibition Station and Western Approach Tunnel
Impact Monitoring Schedule for January 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1-Jan	2-Jan	3-Jan	4-Jan	5-Jan
				Air Quality	Noise	
6-Jan	7-Jan	8-Jan	9-Jan	10-Jan	11-Jan	12-Jan
			Air Quality	Noise		
13-Jan	14-Jan	15-Jan	16-Jan	17-Jan	18-Jan	19-Jan
		Air Quality	Noise			
20-Jan	21-Jan	22-Jan	23-Jan	24-Jan	25-Jan	26-Jan
	Air Quality	Noise				Air Quality
27-Jan	28-Jan	29-Jan	30-Jan	31-Jan		
	Noise			Air Quality		

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

Air Quality Monitoring Station
AM2 Wan Chai Sports Ground

Noise Monitoring Station
NM2 Harbour Centre

Monitoring Frequency
24-hr TSP Once every 6 days

Monitoring Frequency
Once per week

Shatin to Central Link Contract 1123 - Exhibition Station and Western Approach Tunnel
Tentative Impact Monitoring Schedule for February 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1-Feb	2-Feb
3-Feb	4-Feb	5-Feb	6-Feb	7-Feb	8-Feb	9-Feb
	Air Quality				Noise	Air Quality
10-Feb	11-Feb	12-Feb	13-Feb	14-Feb	15-Feb	16-Feb
	Noise				Air Quality	
17-Feb	18-Feb	19-Feb	20-Feb	21-Feb	22-Feb	23-Feb
				Air Quality	Noise	
24-Feb	25-Feb	26-Feb	27-Feb	28-Feb		
			Air Quality	Noise		

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

Air Quality Monitoring Station
AM2 Wan Chai Sports Ground

Noise Monitoring Station
NM2 Harbour Centre

Monitoring Frequency
24-hr TSP Once every 6 days

Monitoring Frequency
Once per week

Shatin to Central Link Contract 1123 - Exhibition Station and Western Approach Tunnel
Tentative Impact Monitoring Schedule for March 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1-Mar	2-Mar
3-Mar	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	9-Mar
		Air Quality	Noise			
10-Mar	11-Mar	12-Mar	13-Mar	14-Mar	15-Mar	16-Mar
	Air Quality	Noise				Air Quality
17-Mar	18-Mar	19-Mar	20-Mar	21-Mar	22-Mar	23-Mar
	Noise				Air Quality	
24-Mar	25-Mar	26-Mar	27-Mar	28-Mar	29-Mar	30-Mar
				Air Quality	Noise	
31-Mar						

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

Air Quality Monitoring Station
AM2 Wan Chai Sports Ground

Noise Monitoring Station
NM2 Harbour Centre

Monitoring Frequency
24-hr TSP Once every 6 days

Monitoring Frequency
Once per week

Shatin to Central Link Contract 1123 - Exhibition Station and Western Approach Tunnel
Tentative Impact Monitoring Schedule for April 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr
			Air Quality	Noise		
7-Apr	8-Apr	9-Apr	10-Apr	11-Apr	12-Apr	13-Apr
		Air Quality	Noise			
14-Apr	15-Apr	16-Apr	17-Apr	18-Apr	19-Apr	20-Apr
	Air Quality	Noise		Air Quality		
21-Apr	22-Apr	23-Apr	24-Apr	25-Apr	26-Apr	27-Apr
			Air Quality	Noise		
28-Apr	29-Apr	30-Apr				
		Air Quality				

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

Air Quality Monitoring Station
AM2 Wan Chai Sports Ground

Noise Monitoring Station
NM2 Harbour Centre

Monitoring Frequency
24-hr TSP Once every 6 days

Monitoring Frequency
Once per week

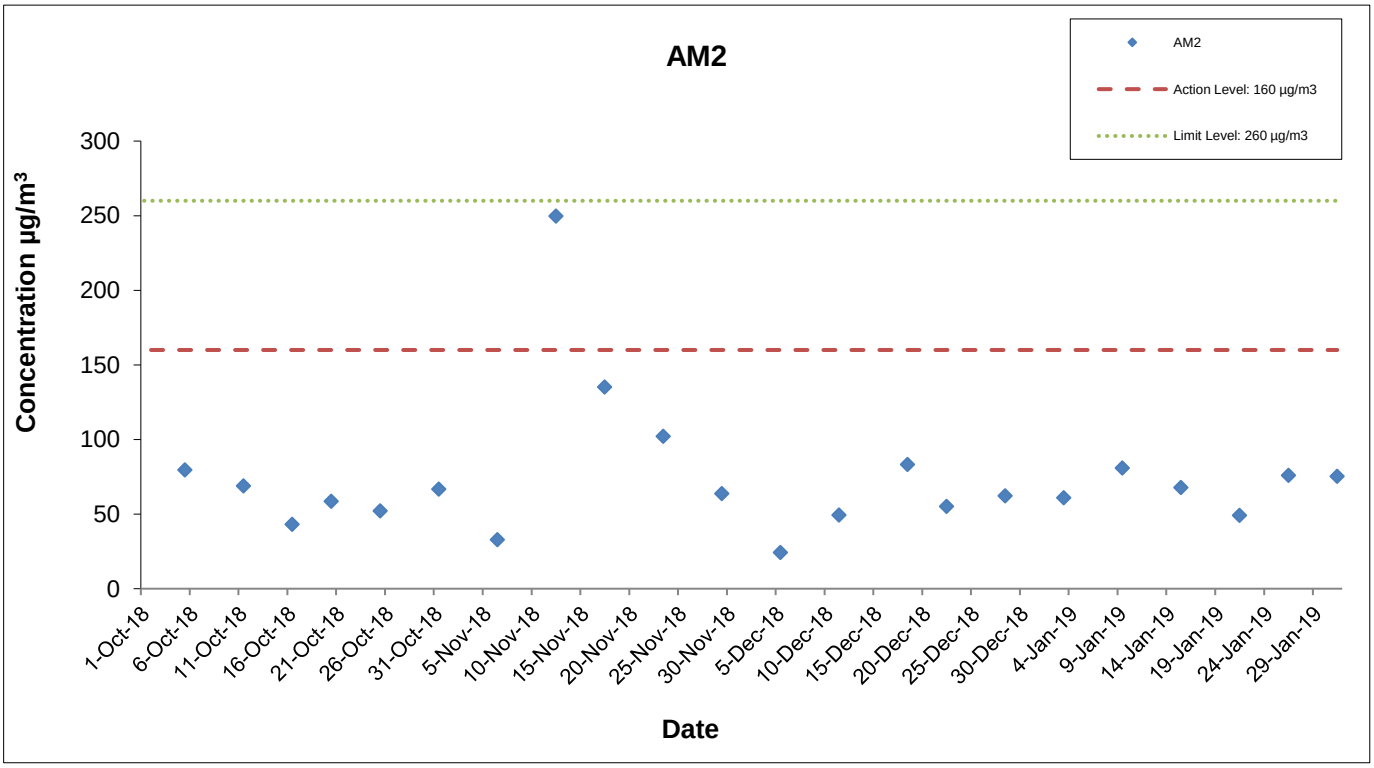
APPENDIX G

Air Quality Monitoring Results and their Graphical Presentations

Appendix G
Air Quality Monitoring Results

24-hour TSP Monitoring Results at Station AM2 (Wan Chai Sports Ground)

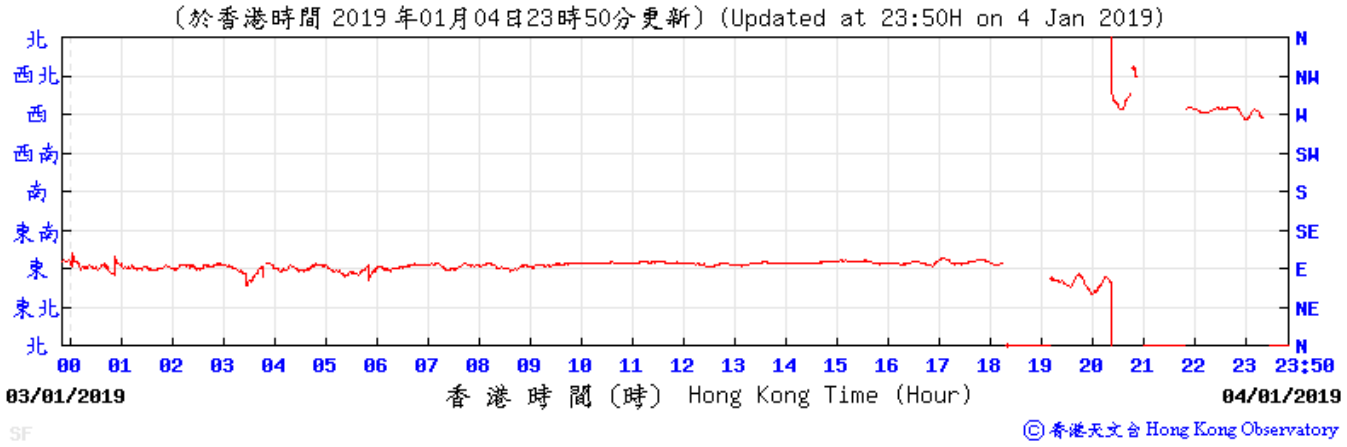
Start		End		Weather	Air	Atmospheric	Flow Rate (m^3/min.)		Av. flow	Total vol.	Filter Weight (g)		Particulate	Elapse Time		Sampling	Conc.
Date	Time	Date	Time	Condition	Temp. (^oC)	Pressure (hPa)	Initial	Final	(m^3/min)	(m^3)	Initial	Final	weight(g)	Initial	Final	Time(hrs.)	($\mu g/m^3$)
3-Jan-19	0:00	4-Jan-19	0:00	Sunny	16.2	1024.3	1.34	1.34	1.34	1935.4	2.6608	2.7786	0.1178	22626.00	22650.00	24.00	60.9
9-Jan-19	0:00	10-Jan-19	0:00	Sunny	19.2	1021.3	1.34	1.34	1.34	1935.4	2.6462	2.8027	0.1565	22650.00	22674.00	24.00	80.9
15-Jan-19	0:00	16-Jan-19	0:00	Sunny	19.0	1018.8	1.34	1.34	1.34	1935.4	2.6566	2.7877	0.1311	22674.00	22698.00	24.00	67.7
21-Jan-19	0:00	22-Jan-19	0:00	Sunny	17.8	1021.8	1.34	1.34	1.34	1935.4	2.6529	2.7479	0.0950	22698.00	22722.00	24.00	49.1
26-Jan-19	0:00	27-Jan-19	0:00	Cloudy	18.2	1023.1	1.34	1.34	1.34	1935.4	2.6764	2.8232	0.1468	22722.00	22746.00	24.00	75.9
31-Jan-19	0:00	1-Feb-19	0:00	Cloudy	21.7	1018.9	1.34	1.34	1.34	1935.4	2.6807	2.8263	0.1456	22746.00	22770.00	24.00	75.2
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																Minimum	**49.1**
																Maximum	**80.9**

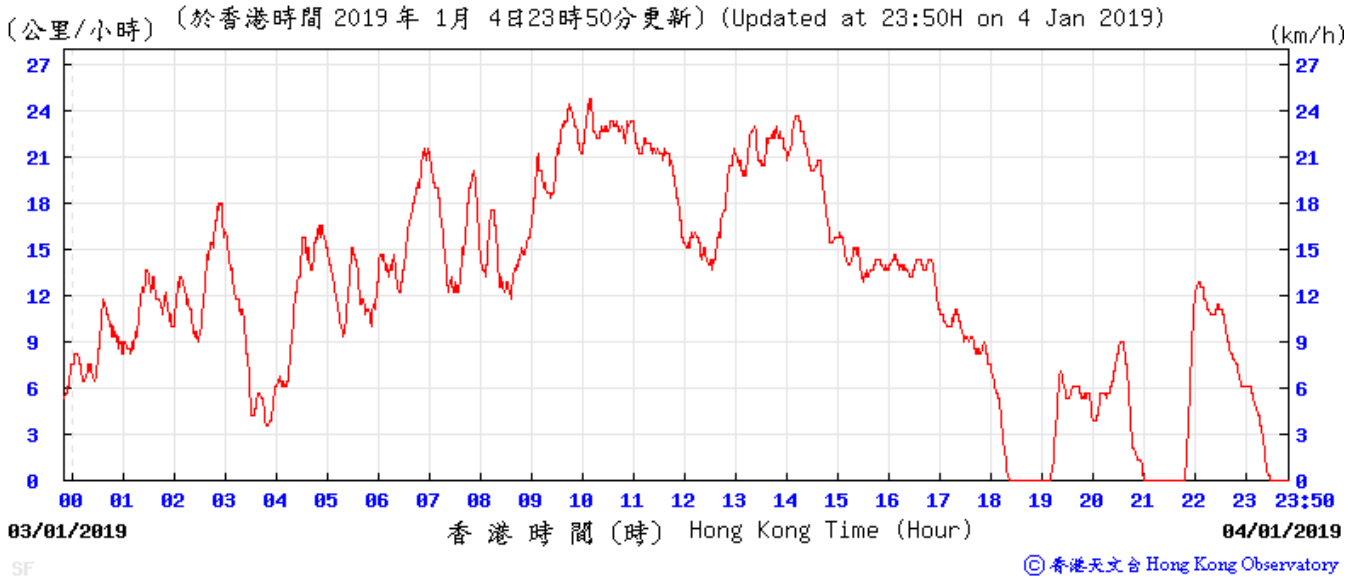


* The monitoring station at AM2 was handed over from Contract SCL1128 on 28 October 2015.

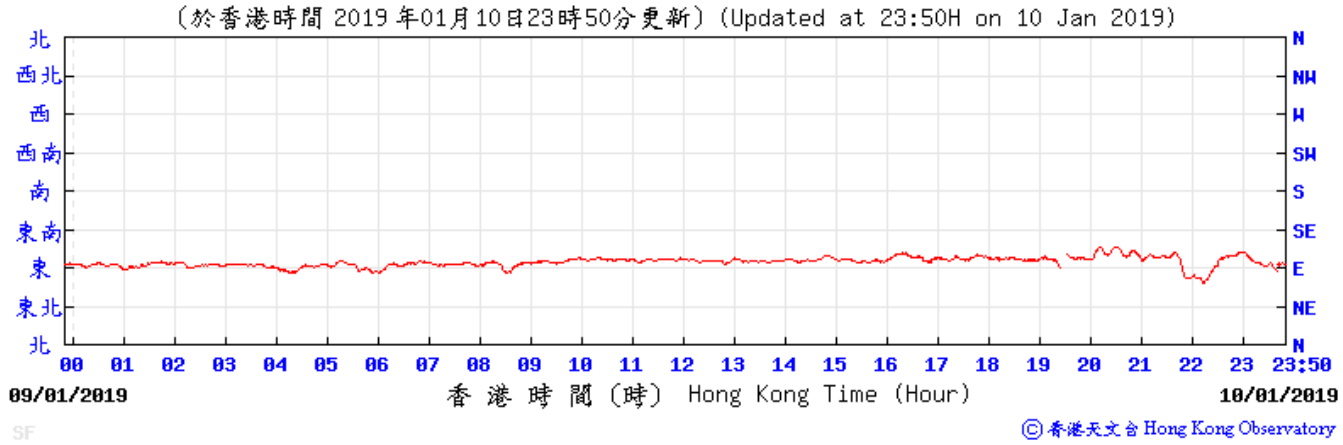
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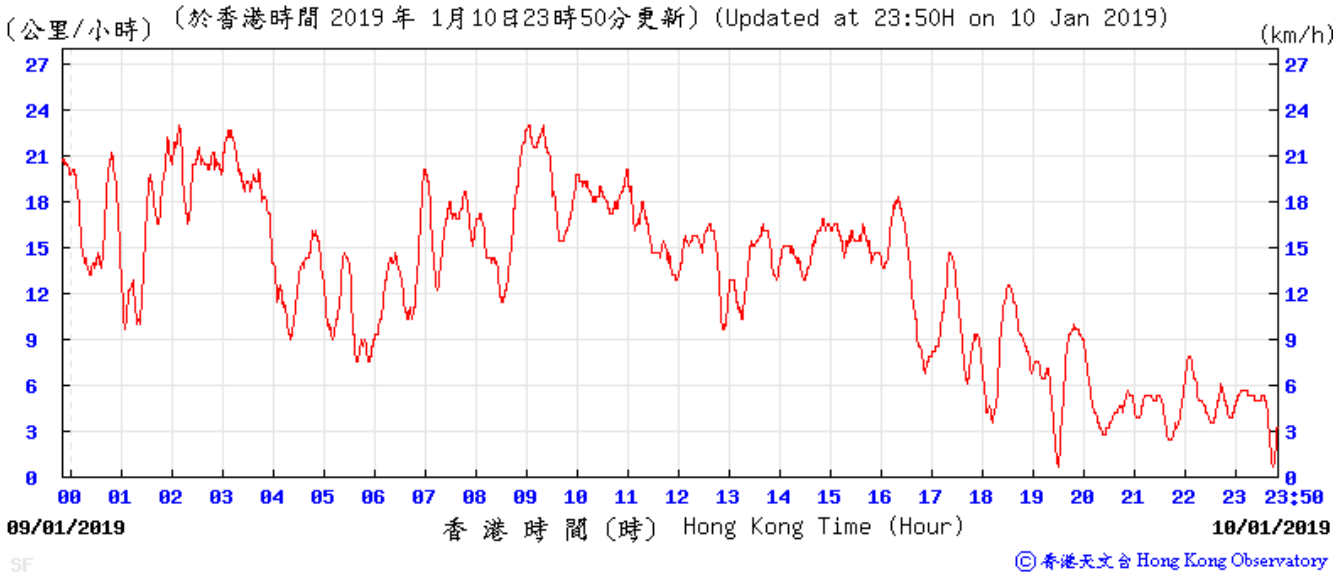
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, January 2019



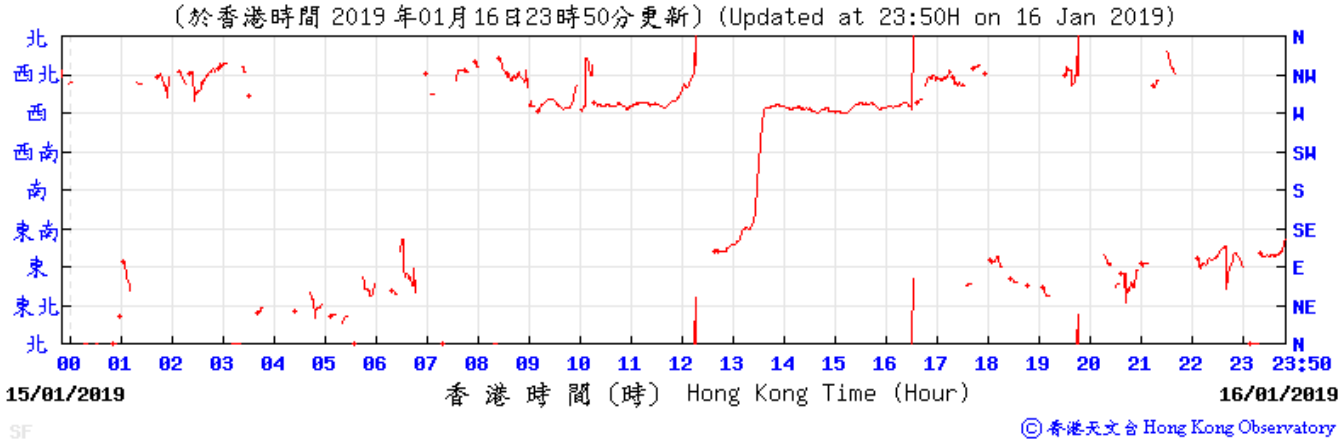


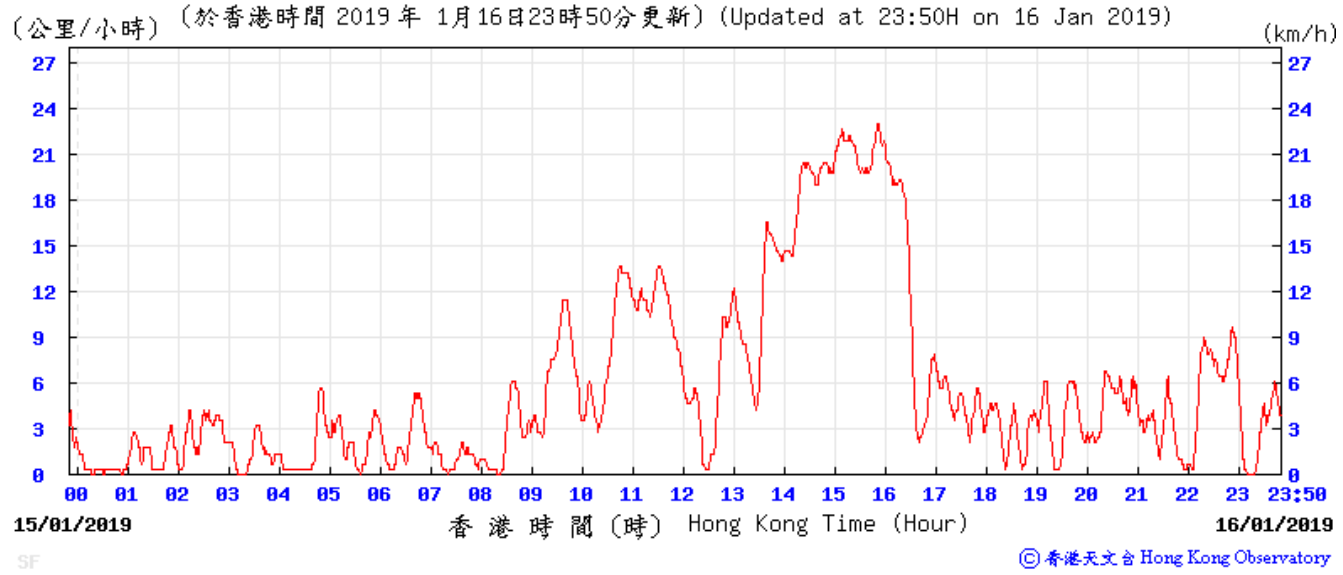
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, January 2019



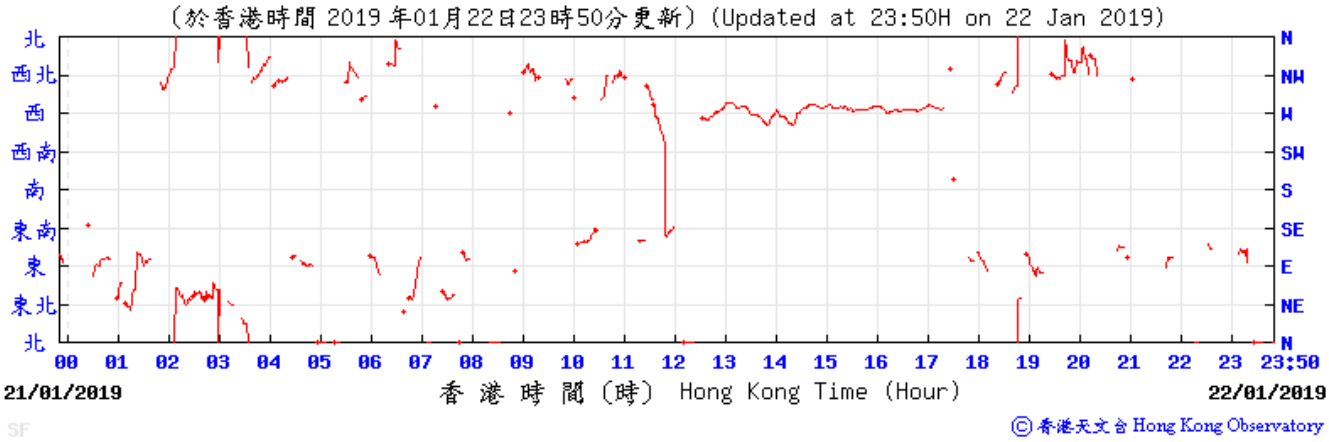


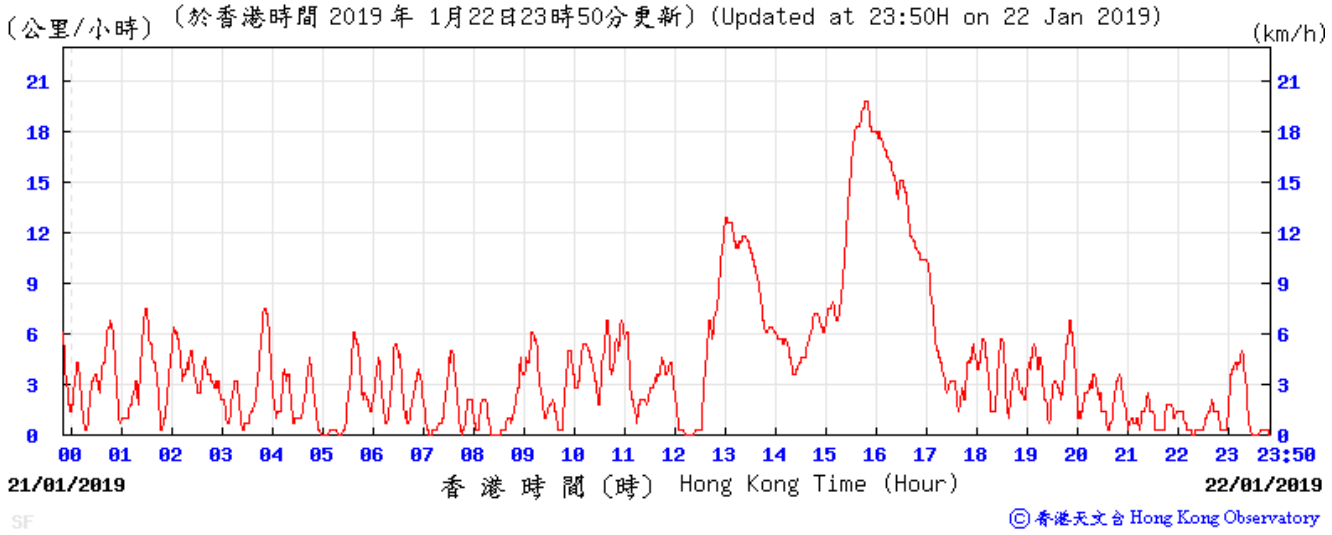
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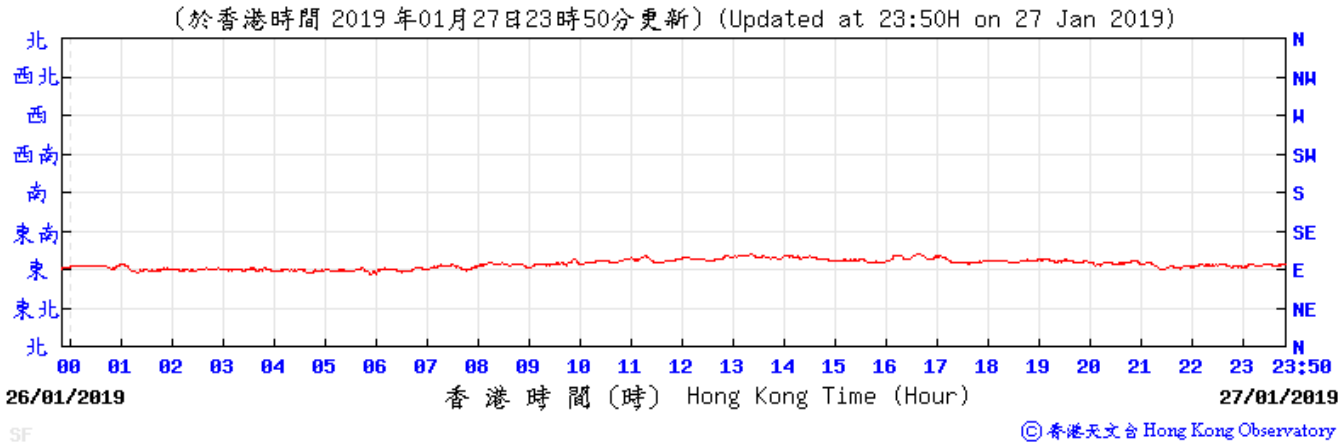


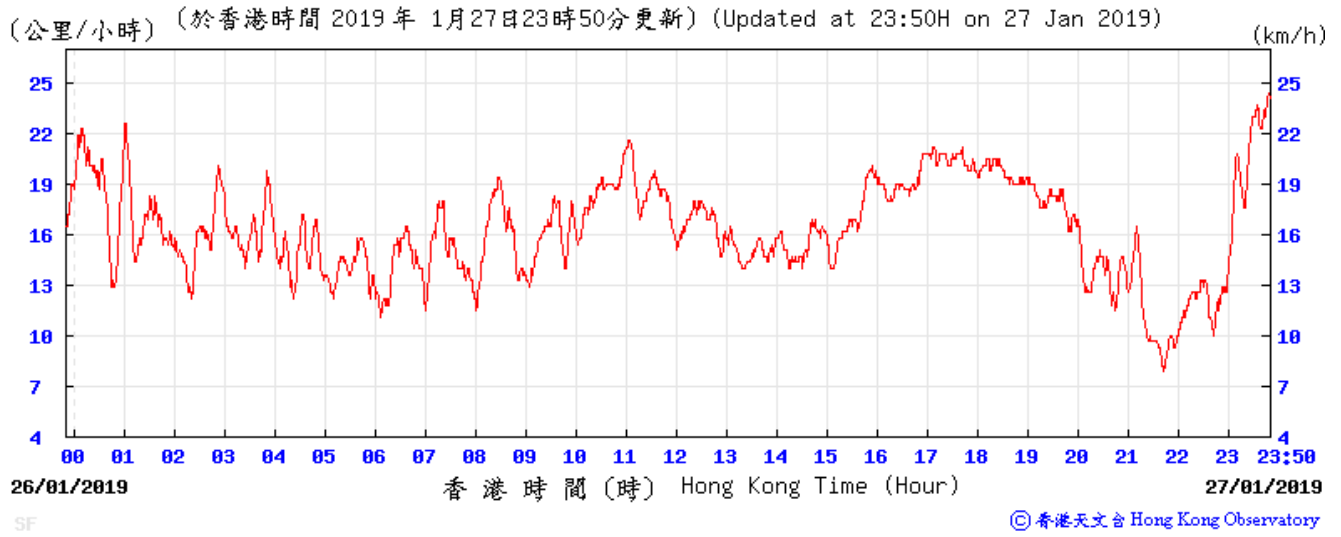
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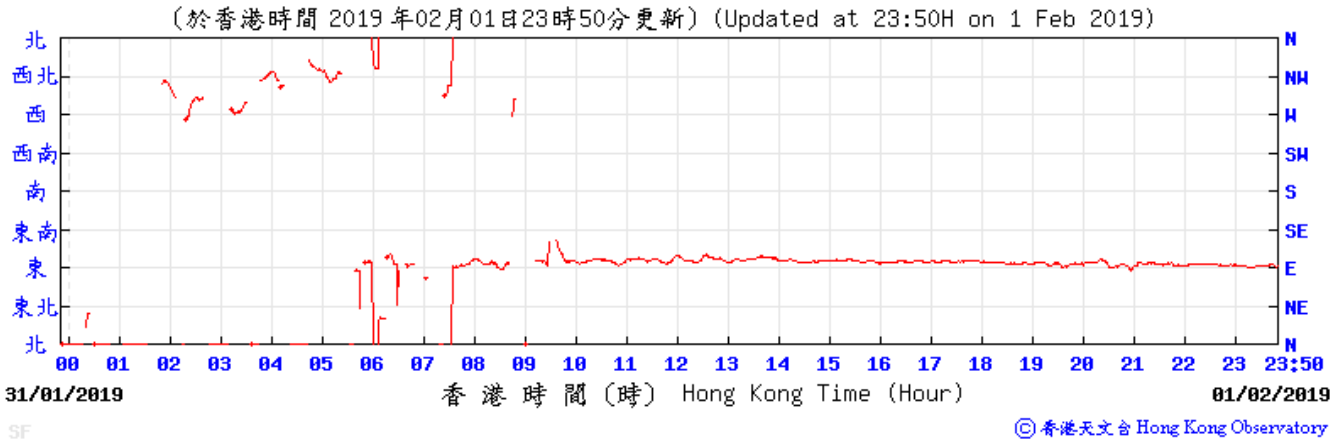


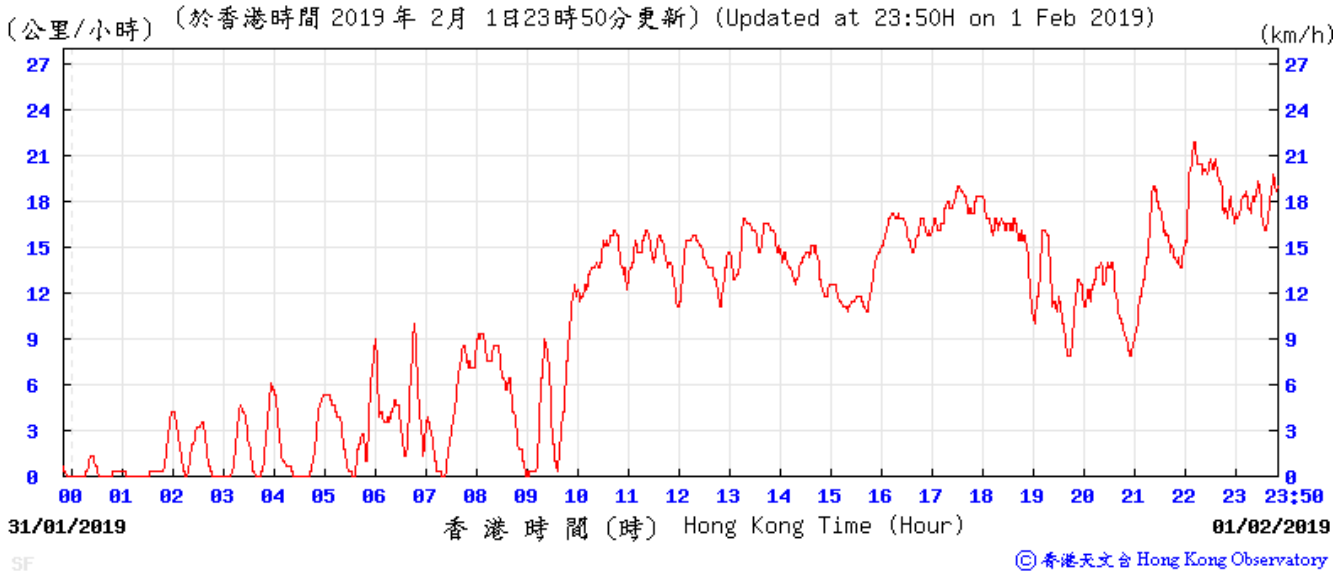
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, January 2019





Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, January 2019





APPENDIX H

Noise Monitoring Results and their Graphical Presentations

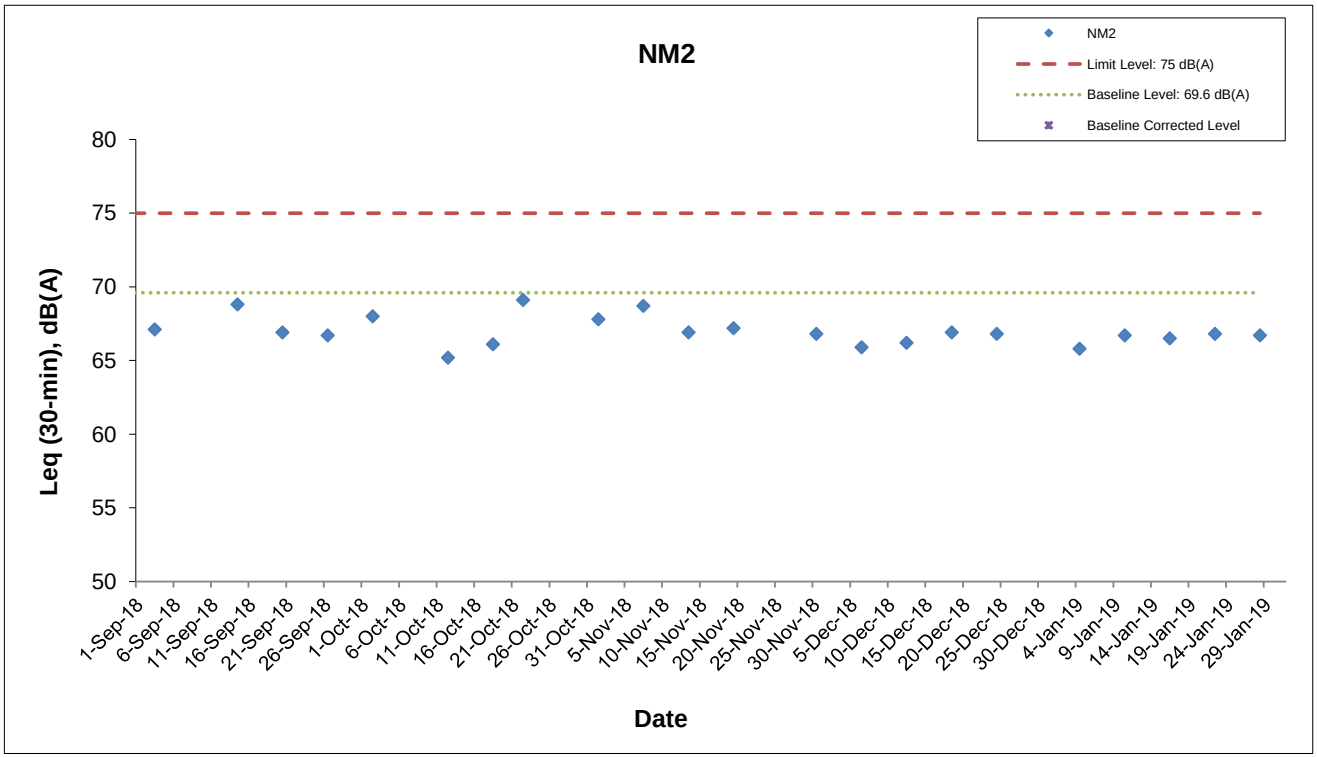
Appendix H Regular Construction Noise Monitoring Results

Daytime Noise Monitoring Results at Station NM2 (Harbour Centre)

Date	Weather Condition	Noise Level for 30-min, dB(A)+				Baseline Corrected Level, dB(A)	Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	L90	L10	Leq				
4-Jan-19	Fine	14:50	62.7	67.1	65.8	<Baseline	69.6	75	N
10-Jan-19	Sunny	13:15	63.3	67.3	66.7	<Baseline	69.6	75	N
16-Jan-19	Fine	13:15	63.1	67.2	66.5	<Baseline	69.6	75	N
22-Jan-19	Sunny	13:20	63.5	67.4	66.8	<Baseline	69.6	75	N
28-Jan-19	Cloudy	16:23	65.0	68.5	66.7	<Baseline	69.6	75	N

+ - Façade measurement

Appendix H Regular Construction Noise Monitoring Results



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Shatin Central Link Contract No. 1123
Exhibition Station and Western Approach Tunnel

Graphical Presentation of Impact Noise Monitoring Results

Date: February 2019

Appendix H

APPENDIX I

Event Action Plan

Appendix I Event Action Plan

Event / Action Plan for Construction Dust Monitoring

EVENT	ACTION			
	ET	IEC	ER	Contractor
ACTION LEVEL				
Exceedance for one sample	1. Inform the Contractor, IEC and ER; 2. Discuss with the Contractor and IEC on the remedial measures required; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency	1. Check monitoring data submitted by the ET; 2. Check Contractor's working method; 3. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of exceedance in writing.	1. Identify source(s), investigate the causes of exceedance and propose remedial measures; 2. Implement remedial measures; 3. Amend working methods agreed with the ER as appropriate.
Exceedance for two or more consecutive samples	1. Inform the Contractor, IEC and ER; 2. Discuss with the ER, IEC and Contractor on the remedial measures required; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency to daily; 5. If exceedance continues, arrange meeting with the IEC, ER and Contractor; 6. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by the ET; 2. Check Contractor's working method; 3. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Review and agree on the remedial measures proposed by the Contractor; 3. Supervise Implementation of remedial measures.	1. Identify source and investigate the causes of exceedance; 2. Submit proposals for remedial measures to the ER with a copy to ET and IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal as appropriate.

Appendix I Event Action Plan

EVENT	ACTION			
	ET	IEC	ER	Contractor
LIMIT LEVEL				
Exceedance for one sample	1. Inform the Contractor, IEC, EPD and ER; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency to daily; 4. Discuss with the ER, IEC and contractor on the remedial measures and assess the effectiveness.	1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with the ET, ER and Contractor on possible remedial measures; 4. Review and advise the ER and ET on the effectiveness of Contractor's remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Review and agree on the remedial measures proposed by the Contractor; 3. Supervise implementation of remedial measures.	1. Identify source(s) and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to ER with a copy to ET and IEC within three working days of notification; 4. Implement the agreed proposals; 5. Amend proposal if appropriate.
Exceedance for two or more consecutive samples	1. Notify Contractor, IEC, EPD and ER ; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency to daily; 4. Carry out analysis of the Contractor's working procedures with the ER to determine possible mitigation to be implemented; 5. Arrange meeting with the IEC and ER to discuss the remedial measures to be taken; 6. Review the effectiveness of the Contractor's remedial measures and keep IEC, EPD and ER informed of the results; 7. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with ET, ER, and Contractor on the potential remedial measures; 4. Review and advise the ER and ET on the effectiveness of Contractor's remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; 3. Supervise the implementation of remedial measures; 4. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Identify source(s) and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to the ER with a copy to the IEC and ET within three working days of notification; 4. Implement the agreed proposals; 5. Revise and resubmit proposals if problem still not under control; 6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Appendix I Event Action Plan

Event and Action Plan for Construction Noise Monitoring

EVENT	ACTION			
	ET	IEC	ER	Contractor
Exceedance of Action Level	1. Notify the Contractor, IEC and ER; 2. Discuss with the ER, IEC and Contractor on the remedial measures required; and 3. Increase monitoring frequency to check mitigation effectiveness.	1. Review the investigation results submitted by the contractor; and 2. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor.	1. Confirm receipt of notification of complaint in writing; 2. Review and agree on the remedial measures proposed by the Contractor; and 3. Supervise implementation of remedial measures.	1. Investigate the complaint and propose remedial measures; 2. Report the results of investigation to the IEC, ET and ER; 3. Submit noise mitigation proposals to the ER with copy to the IEC and ET within 3 working days of notification; and 4. Implement noise mitigation proposals.
Exceedance of Limit Level	1. Notify the Contractor, IEC, EPD and ER ; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency; 4. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 5. Arrange meeting with the IEC and ER to discuss the remedial measures to be taken; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7. Review the effectiveness of Contractor's remedial measures and keep IEC, EPD and ER informed of the results; and 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with the ER, ET and Contractor on the potential remedial measures; and 4. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor.	1. Confirm receipt of notification of exceedance in writing; 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; 3. Supervise the implementation of remedial measures; and 4. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Identify source and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to the ER with copy to the IEC and ET within 3 working days of notification; 4. Implement the agreed proposals; 5. Revise and resubmit proposals if problem still not under control; and 6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Appendix I Event Action Plan

Event and Action Plan for Continuous Noise Monitoring

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
Action/Limit Level	1. Identify source ; 2. Repeat measurement. If two consecutive measurements exceed Action/Limit Level, the exceedance is then confirmed; 3. If exceedance is confirmed, notify IEC, ER and Contractor; 4. Investigate the cause of exceedance and ckeck Contractor's working procedures to determine possible mitigation to be implemented; 5. Discuss jointly with the IEC, ER and Contractor and formulate remedial measures; and 6. Assess effectiveness of Contractor's remedial actions and keep IEC and ER informed of the results.	1. Check monitoring data submitted by the Works Contract 1123 ET; 2. Check the Contractor's working method; 3. Discuss with the ER, Works Contract 1123 ET and Contractor on the potential remedial measures; and 4. Review and advise the Works Contract 1123 ET and ER on the effectiveness of the remedial measures proposed by the Contractor.	1. Confirm receipt of notification of exceedance in writing; 2. In consultation with the Works Contract 1123 ET and IEC, agree with the Contractor on the remedial measures to be implemented; 3. Ensure the proper implementation of remedial measures; and 4. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Identify source with the Works Contract 1123 ET; 2. If exceedance is confirmed, investigation the cause of exceedance and take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to the ER with copy to the IEC and ET of notification; 4. Implement the agreed proposals; 5. Liaise with ER to optimize the effectiveness of the agreed mitigation; 6. Revise and resubmit proposals if problem still not under control; and 7. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

APPENDIX J

Cumulative Statistics of Exceedances, Complaints, Notification of Summons and Successful Prosecutions

Appendix J

Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

	Date Received	Subject	Status	Total no. received in this month	Total no. received since project commencement
Environmental complaints	-	-	-	0	13
Notification of summons	-	-	-	0	2
Successful Prosecutions	-	-	-	0	0

APPENDIX K

Waste Flow Table

Appendix K
MONTHLY SUMMARY WASTE FLOW TABLE

Contract No.:MTR SCL 1123 - Exhibition Station and Western Approach

Monthly Summary Waste Flow Table for 2019

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly					Actual Quantities of Marine Dumping Monthly	
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in Other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper / Cardboard Packaging	Plastics	Chemical Waste	Others, e.g. general refuse	Type 1	Type 2
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)	(in '000m^3)	(in '000m^3)
Jan	6.687	0.000	0.076	0.357	6.255	0.134	131.388	0.280	0.057	0.000	0.205	0.000	0.000
Feb													
Mar													
Apr													
May													
Jun													
Sub-total	6.687	0.000	0.076	0.357	6.255	0.134	131.388	0.280	0.057	0.000	0.205	0.000	0.000
July													
August													
September													
October													
November													
December													
Total	6.687	0.000	0.076	0.357	6.255	0.134	131.388	0.280	0.057	0.000	0.205	0.000	0.000

Comments:

1) Assumption: The densities of Rock, Soil, Mixed Rock and Soil, and Regular Spoil are 2.0 ton/m^3; the density of general refuse is 1.0 ton/m^3; the density of waste oil is 1.0 kg/L.
2) The cut-off date of waste amount in Jan is 31/1/2019 for Public Fill Facilities and Landfill.
3) The amounts of waste in Jan are 204.94 tons for Landfill and 12509.29 tons for Public Fill.
4) The amounts of C&D waste reused in the contract in Jan is 152 tons, for cut-off date as 31/1/2019.
5) The amounts of C&D waste reused in other projects in Jan is 713 tons for Tailor Recycled Aggregate (Lung Kwu Tan) for cut-off date as 31/1/2019.
6) The amount of import fill in Jan is 268.55 tons, for cut-off date as 31/1/2019.
7) The amount of metal waste generated in Jan is 131388 kg, for cut-off date as 31/1/2019.
8) The amount of paper waste generated in Jan is 280 kg, for cut-off date as 31/1/2019.
9) The amount of plastic waste generated in Jan is 57 kg, for cut-off date as 31/1/2019.

Appendix D

Monthly EM&A Report for January 2019 – SCL Works Contract 1122 Admiralty South Overrun Tunnel

AECOM

Vinci Construction Grands Projets

Shatin to Central Link -
Hung Hom to Admiralty Section

Works Contract 1122 -
Admiralty South Overrun Tunnel

Monthly EM&A Report for
January 2019

[February 2019]

	Name	Signature
Prepared & Checked:	Ray Cheng	
Reviewed, Approved & Certified:	Y W Fung (Contractor's Environmental Team Leader)	

Version: 0	Date: 11 February 2019

Disclaimer

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EXECUTIVE SUMMARY

Shatin to Central Link Contract 1122 – Admiralty South Overrun Tunnel (hereafter called "the Project") covers part of the construction of the Shatin to Central Link (SCL).

Admiralty Station will be the major interchange station between the Island Line (ISL), Tsuen Wan Line (TWL), South Island Line (East) (SIL(E)) and the Shatin to Central Link (North South Line) (SCL(NSL)). The Admiralty South Overrun Tunnel (ASOR) is located to the south of Hong Kong Park Ventilation Building (HKB) and is approximately 700m long.

The EM&A programme commenced on 8 August 2016.

This report documents the findings of EM&A works conducted in the period between 1 and 31 January 2019. As informed by the Contractor, major activities in the reporting period were:

Location	Site Activities
HKB	• Wall concreting for L8 and L9 • Erecting scaffolds for L8 Slab • Sliding doors and access panels installation • BS installation works for tunnel connection
Refuse collection point	• Reinstatment work on the ground

Complaint, Notification of Summons and Successful Prosecution

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

Reporting Changes

There was no reporting change in the reporting month.

Future Key Issues
Key issues to be considered in the coming month included:

Location	Site Activities
HKB	• Erecting scaffolds and bracket installation for L6 Slab construction • Sliding doors and access panels installation • BS installation works for tunnel connection
Refuse collection point	• Footing construction

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

1 INTRODUCTION

Vinci Construction Grands Projets (VCGP) was commissioned by MTR as the Civil Contractor for Works Contract 1122. AECOM Asia Company Limited (AECOM) was appointed by VCGP as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) programme during construction phase of the Project.

1.1 Purpose of the Report

1.1.1 This is the thirtieth monthly EM&A Report which summaries audit findings for the Project during the reporting period between 1 and 31 January 2019.

1.2 Report Structure

1.2.1 This monthly EM&A Report is organized as follows:

- Section 1: Introduction
- Section 2: Project Information
- Section 3: Environmental Monitoring Requirement
- Section 4: Implementation Status of Environmental Mitigation Measures
- Section 5: Monitoring Results
- Section 6: Environmental Site Inspection and Audit
- Section 7: Environmental Non-conformance
- Section 8: Future Key Issues
- Section 9: Conclusions and Recommendations

2 PROJECT INFORMATION

2.1 Background

2.1.1 The Shatin to Central Link (SCL) is a 17km extension of the existing Ma On Shan Line (MOL) and East Rail Line (EAL) comprising (i) The East-West Corridor which extends the MOL from Tai Wai via East Kowloon to connect with the West Rail Line (WRL) at Hung Hom Station (HUH); and (ii) The North-South Corridor which is an extension of the East Rail Line (EAL) at Hung Hom across the harbour to Admiralty Station (ADM).

2.1.2 The Environmental Impact Assessment (EIA) Reports for SCL – Hung Hom to Admiralty Section [SCL (HUH-ADM)] (Register No.: AEIAR-166/2012) was approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, an Environmental Permit (EP) was granted on 22 March 2012, which covers SCL (HUH-ADM) EP No.: EP-436/2012), for the construction and operation. Variation of EP (VEP) was subsequently applied and the latest EP (EP No. EP-436/2012/F) was issued by the Director of Environmental Protection (DEP) on 23 January 2019.

2.1.3 The site layout plan of the Project is shown in **Figure 1.1**.

2.2 Site Description

2.2.1 The scope of the major Permanent Works include the following:

(a) Approx. 700m of single bore tunnel south of HKB including, among others, breakthrough of a temporary headwall in the tunnel stub at HKB, tunnel fan niche structure, drainage, secondary structures including overtrack ducts, plenums, side walls, protected corridors, walkways and all the related fitting-out works;
(b) Secondary structures inside SCL Overrun Tunnel (SCLOR) including overtrack ducts, plenums, side walls, walkways and all the related fitting-out works;
(c) Alteration and Addition Works (A&A Works) from Level L10 to Upper Roof Level of HKB including removal of precast planks at G/F;
(d) Re-provisioning of LCSD Refuse Collection Point No. 2 (RCP);
(e) Roadworks including drainage, traffic aids, road markings, lighting, signage, utilities diversion, demolition, reinstatement and TTM schemes to facilitate the construction works and any works require TTM submission;
(f) Tree planting and soft and hard landscaping works;
(g) Design and construction of ABWF at HKB, ASOR, SCLOR and RCP; and
(h) Design and construction of building services works at HKB, ASOR, SCLOR and RCP

2.3 Construction Programme and Activities

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

Location	Site Activities
HKB	• Wall concreting for L8 and L9 • Erecting scaffolds for L8 Slab • Sliding doors and access panels installation • BS installation works for tunnel connection
Site Surface	• Reinstatment work on the ground

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

2.4 Project Organisation

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

Table 2.1 Contact Information of Key Personnel

Party	Role	Position	Name	Telephone	Fax
MTR	Residential Engineer (ER)	Construction Manager	Mr. Brian Suen	2176 2788	2171 3829
		SCL Project Environmental Team Leader	Ms. Lisa Poon	3127 6295	3127 6422
Meinhardt	Independent Environmental Checker (IEC)	Independent Environmental Checker	Mr. Fredrick Leong	2859 1739	2540 1580
VCGP	Contractor	Project Director	Mr. Francois Dudouit	3765 5610	2824 2991
		Environmental Manager	Mr. Keith Lee	5191 8251	
AECOM	Contractor's Environmental Team (ET)	ET Leader	Mr. Y W Fung	3922 9366	2317 7609

2.5 Status of Environmental Licences, Notification and Permits

2.5.1 Relevant valid environmental licenses, permits and/or notifications on environmental protection for this Project in the reporting month are summarized in **Table 2.2**.

Table 2.2 Status of Environmental Licenses, Notifications and Permits

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
Environmental Permit				
EP-436/2012/E	23 Nov 2016	-	Valid until 23 Jan 2019	-
EP-436/2012/F	23 Jan 2019	-	Valid on 23 Jan 2019	-
Construction Noise Permit				
GW-RS1131-18	11 Dec 2018	10 Jun 2019	Valid	Operation of Crane, Wastewater Treatment System, Drilling
Wastewater Discharge License				
WT00028501-2017	10 Oct 2017	31 Oct 2022	Valid	-
Chemical Waste Producer Registration				
5213-124-V2232-01	12 May 2016	End of Project	Valid	-
Billing Account for Construction Waste Disposal				
7023777	20 Nov 2015	End of Project	Account Active	-
Notification Under Air Pollution Control (Construction Dust) Regulation				
405362	22 Jul 2016	End of Project	Notified	-

3 ENVIRONMENTAL MONITORING REQUIREMENTS

3.1 Landscape and Visual

3.1.1 As per the EM&A Manuals, the landscape and visual mitigation measures shall be implemented and site inspections should be undertaken once every two weeks during the construction period. A summary of the implementation status is presented in **Section 6.**

4 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

4.1.1 The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Reports, the EP and EM&A Manuals. The implementation status of the environmental mitigation measures during the reporting period is summarized in **Appendix C.** Status of required submissions under the EP during the reporting period is summarised in **Table 4.1.**

Table 4.1 Status of Required Submission under Environmental Permit

EP Condition	Submission	Submission Date
Condition 3.4	Monthly EM&A Report for December 2018	14 January 2019

5 MONITORING RESULTS

5.1 Waste Management

5.1.1 C&D materials and wastes sorting were carried out on site. Receptacles were available for C&D wastes and general refuse collection.

5.1.2 As advised by the Contractor, No inert C&D material was generated in the reporting month. 23 m^3 of general refuse was generated in the reporting month. No paper/cardboard packaging material, metal or plastic was collected by recycling contractor in the reporting month. No inert C&D materials were reused on site. No chemical waste was collected by licensed contractor.

5.1.3 The waste flow table with detail breakdown is annexed in **Appendix E**.

5.1.4 The Contractor is advised to properly maintain on site C&D materials and wastes collection, sorting and recording system and maximize reuse / recycle of C&D materials and wastes. The Contractor is reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly.

5.1.5 The Contractor is reminded that chemical waste containers should be properly treated and stored 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.

5.2 Landscape and Visual

5.2.1 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 14 and 28 January 2019. A summary of the site inspection is provided in **Appendix C**. The observations and recommendations made during the site inspections are presented in **Table 6.1**.

6 ENVIRONMENTAL SITE INSPECTION AND AUDIT

6.1.1 Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. A summary of the mitigation measures implementation schedule is provided in **Appendix C**.

6.1.2 In the reporting month, 4 site inspections were carried out on 7, 14, 21 and 28 January 2019. Joint inspection with the IEC, ER, the Contractor and the ET was conducted on 14 January 2019. No non-compliance was recorded during the site inspections. Details of observations recorded during the site inspections are presented in **Table 6.1**.

Table 6.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Air Quality	Nil	Nil	Nil
Noise	Nil	Nil	Nil
Water Quality	Nil	Nil	Nil
Waste/ Chemical Management	14 January 2019	Reminder: • The Contractor was reminded to remove the construction material and general refuse from chemical storage area.	15 January 2019
Landscape & Visual	Nil	Nil	Nil
Permits/ Licenses	Nil	Nil	Nil

6.1.1 No follow up action was requested during the site inspection on 7, 21 and 28 January 2019.

6.1.2 All of the follow-up actions requested by Contractor's ET and IEC during the site inspection were undertaken as reported by the Contractor and confirmed into the following weekly site inspection conducted during the reporting period.

7 ENVIRONMENTAL NON-CONFORMANCE

7.1 Summary of Environmental Non-Compliance

7.1.1 No environmental non-compliance was recorded in the reporting month.

7.2 Summary of Environmental Complaints

7.2.1 No environmental complaint was recorded in the reporting month. Cumulative statistics on environmental complaints is provided in **Appendix D.**

7.3 Summary of Environmental Summon and Successful Prosecutions

7.3.1 No environmental related prosecution or notification of summons was received in the reporting month. Cumulative statistics on notification of summons and successful prosecutions is provided in **Appendix D**.

8 FUTURE KEY ISSUES

8.1 Construction Programme for the Next Three Month

8.1.1 The tentative major construction works in between February and April 2019 will be:

Location	Site Activities
HKB	• Erecting scaffolds and bracket installation for L6 Slab construction • Sliding doors and access panels installation • BS installation works for tunnel connection
Refuse collection point	• Footing construction

8.2 Key Issues for the Coming Month

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

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

9.1.1 4 nos. of environmental site inspections were carried out in January 2019. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.

9.1.2 Referring to the Contractor's information, no environmental complaint, notification of summons and successful prosecution was received in the reporting month.

9.2 Recommendations

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

Air Quality Impact

- No specific observation was identified in the reporting month.

Construction Noise Impact

- No specific observation was identified in the reporting month.

Water Quality Impact

- No specific observation was identified in the reporting month.

Chemical and Waste Management

- Chemical waste container should be maintained properly.

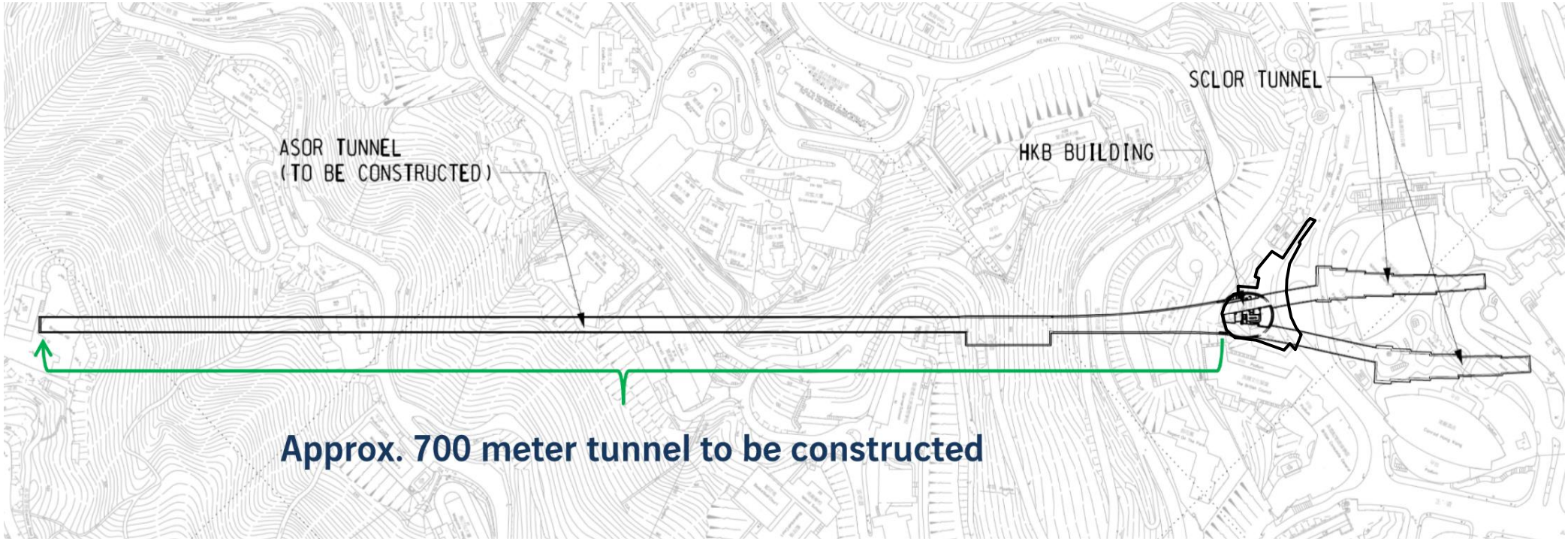
Landscape & Visual Impact

- No specific observation was identified in the reporting month.

Permits/licenses

- No specific observation was identified in the reporting month.

FIGURES



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SCL Contract 1122
Admiralty South Overrun Tunnel

AECOM

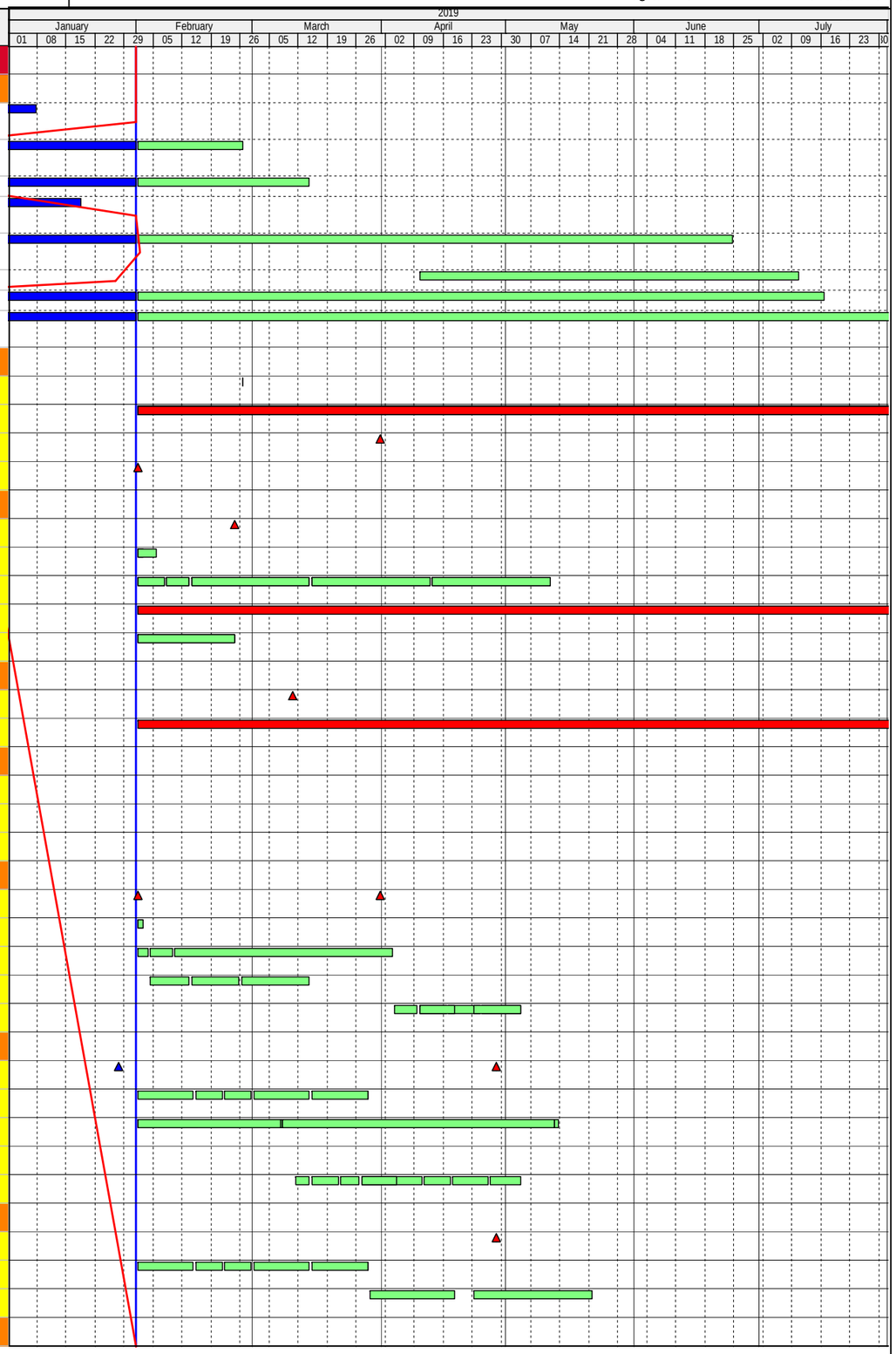
SITE LAYOUT PLAN of SCL1122

Project No.: 60515692 **Date: October 2016** **Figure 1.1**

APPENDIX A

Construction Programme

Activity ID	Activity Name	Original Duration	Actual/Forecast Start	PMP Start	Actual/Forecast Finish	PMP Finish	Physical % Complete	Total Float
Contract 1122 - Shatin to Central Link - Admiralty South Overrun Tunnel (PMP)								
Construction Summary Programme (Critical Path - Longest Path)								
01122.S.1050	Tunnel ABWF	81	09-Jun-18 A	25-Aug-18	07-Jan-19 A	13-Nov-18	100%	
01122.S.1060	Tunnel BS Installation	111	14-May-18 A	18-Aug-18	26-Feb-19	04-Dec-18	92%	123
01122.S.1070	HKB RC Structures	163	30-Jul-18 A	25-Aug-18	14-Mar-19	29-Jan-19	74%	166
01122.S.1080	HKB A&A Works	82	15-Aug-18 A	30-Jan-19	18-Jan-19 A	17-Apr-19	100%	
01122.S.1090	HKB ABWF	82	21-Dec-18 A	30-Mar-19	24-Jun-19	25-Jun-19	16%	306
01122.S.1100	HKB BS Installation	92	10-Apr-19	04-Apr-19	10-Jul-19	05-Jul-19	0%	290
01122.S.1110	LCSD RCP	142	15-Oct-18 A	23-Nov-18	16-Jul-19	13-Apr-19	33%	501
01122.S.1120	LCSD External Works	169	15-Dec-18 A	11-Feb-19	09-Sep-19	27-Jul-19	0%	446
PROJECT DATES								
Schedule of Critical Dates (Contractor Achievements)								
Schedule of Access Dates for Works Areas (PS App. F3)								
Schedule of Programme Data (PS App. C2)								
Exchange of Design Information with the DC & Interfacing Contractors (P10.26)								
COST CENTER A - GENERAL PRELIMINARIES								
CC A - IPS Milestones (FOT App 4)								
CCA - General Requirements								
CCA - O & M Manual and As-built Record								
CCA - Site Set-up and Facilities								
CCA - Engineer Audit								
COST CENTER B - INSTRUMENTATION AND MONITORING								
CCB - IPS Milestones (FOT App 4)								
CCB - Instrumentation and Monitoring								
COST CENTER C - OVERRUN TUNNEL								
C2 - Bifurcation Tunnel Section (BTS)								
C3 - Tunnel Fan Niche (TFN)								
C1 - Single Track Section (STS)								
COST CENTER D - HKB A&A WORKS								
CCD - IPS Milestones (FOT App 4)								
CCD - EDOC and Interface (Operations and RP) - HKB								
CCD - Procurement								
D1 - Civil and Structural Works								
D2 - ABWF and Association Works								
COST CENTER E - REFUSE COLLECTION POINT (RCP)								
CCE - IPS Milestones (FOT App 4)								
CCE - EDOC and Interface (Operations and RP) (N/A)								
CCE - Procurement								
E1 - Civil and Structural Works								
E2 - ABWF Works								
CCF - ASSOCIATED WORKS FOR HKB								
CCF - IPS Milestones (FOT App 4)								
CCF - EDOC and Interface (Operations and RP) - Associated Works (N/A)								
F1 - Utilities and Drainage								
COST CENTRE G - BS FOR OVERRUN TUNNEL								



Milestone | Remaining Work | Baseline (PMP) | Baseline Milestone

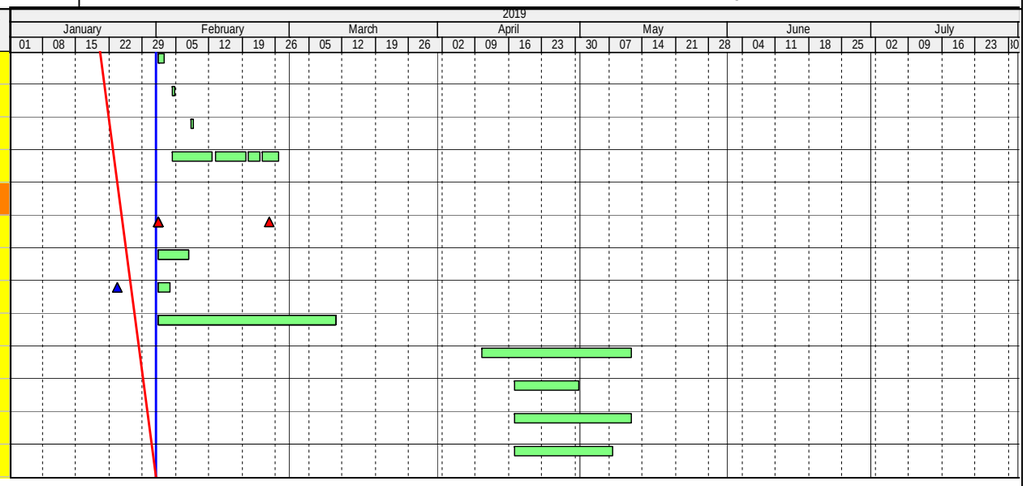
Critical Milestone | Actual MS | Baseline (Last Month) | Baseline Milestone

Critical Remaining Work | Actual Level of Effort | Actual Work

Three Month Rolling Programme
Data Date: 01-Feb-19

Date	Revision	Checked	Approved
31-Jan-19	Submission of Monthly Report to MTR	QT	KN

Activity ID	Activity Name	Original Duration	Actual/Forecast Start	PMP Start	Actual/Forecast Finish	PMP Finish	Physical % Complete	Total Float
	CCG - EDOC and Interface (Operations and RP) - Tunnel BS							
	G1 - Electrical Installation							
	G2 - Fire Services Installation							
	G3 - Special Tools & Test Equipment Installation							
	COST CENTRE H - BS FOR HKB							
	CCH - IPS Milestones (FOT App 4)							
	CCH - Design and Submission							
	CCH - EDOC and Interface (Operations and RP) - HKB BS							
	CCH - Procurement							
	H1- Environmental Control System Installation							
	H2 - Electrical Installation							
	H3 - Fire Services Installation							
	H4 - Plumbing & Drainage System Installation							



Milestone | Remaining Work | Baseline (PMP) | Baseline Milestone
Critical Milestone | Actual MS | Baseline (Last Month) | Baseline Milestone
Critical Remaining Work | Actual Level of Effort | Actual Work

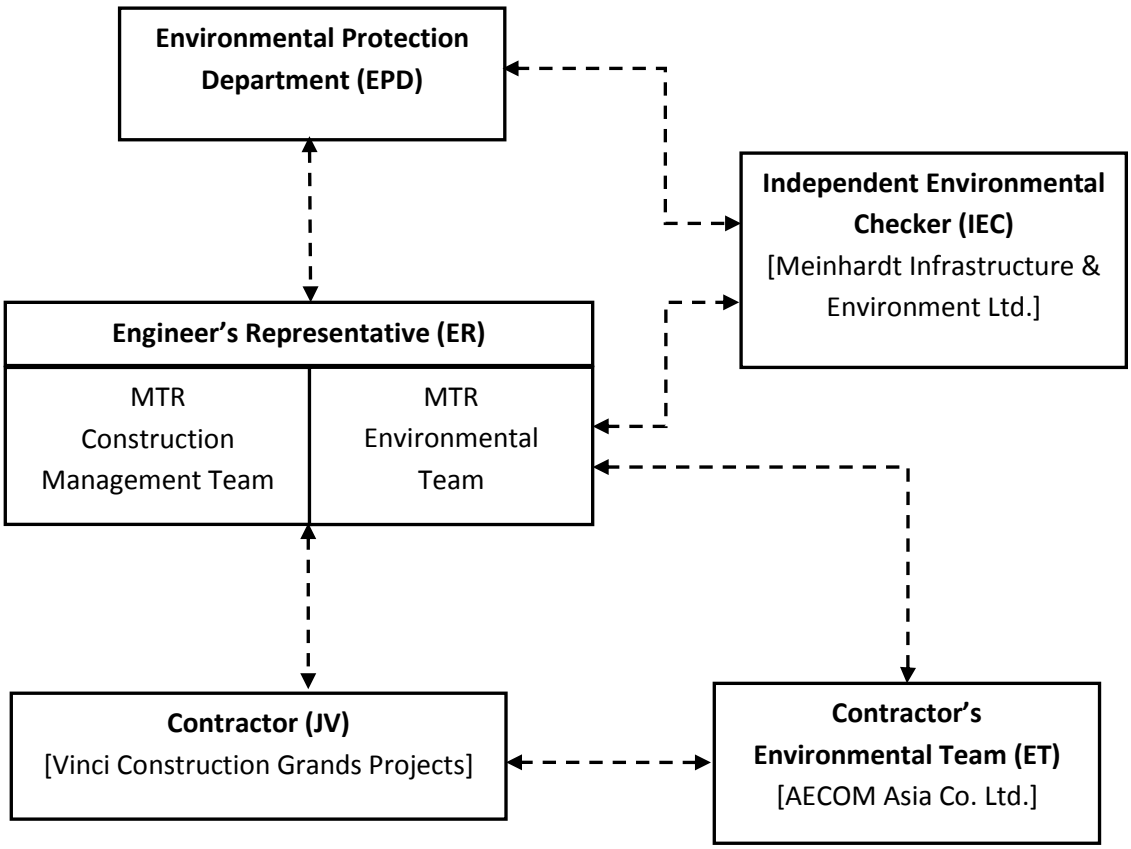
Three Month Rolling Programme
Data Date: 01-Feb-19

Date	Revision	Checked	Approved
31-Jan-19	Submission of Monthly Report to MTR	QT	KN

APPENDIX B

Project Organization Structure

Appendix B Project Organisation Structure



APPENDIX C

Implementation Schedule of Environmental Mitigation Measures

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Cultural Heritage Impact						
S4.93 & Table 4.2	Erection of decorative and sensibly designed hoarding along the boundary of the works area	To mitigate the temporary visual impact due to surface works.	Contractor	Works Areas in Causeway Bay and Wan Chai, and Works Shaft in Admiralty	Construction Phase	V
Ecological Impact						
S5.134	Accidental chemical spillage and construction site run-off to the receiving water bodies, mitigation measures such as removing the pollutants before discharge into storm drain and paving the section of construction road between the wheel washing bay and the public road as suggested in Sections 11.216 and 11.219 to 11.256 of the EIA Report shall be adopted.	To minimize the contamination of wastewater discharge	Contractor	All land based works areas	Construction Phase	N/A
Landscape and Visual Impact						
Construction Phase						
Table 7.9	CM1 - Trees unavoidably affected by the works shall be transplanted as far as possible in accordance with ETWB TC(W) 3/2006 – Tree Preservation.	Transplanting and reuse of affected trees.	MTR	Works Sites	Construction Phase	V
Table 7.9	CM2a - Compensatory tree planting shall be provided in accordance with ETWB TC(W) 3/2006 – Tree Preservation to compensate for felled trees and maintained until end of the establishment period.	Compensation for the removal of existing trees due to the Project.	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM2b - Compensatory shrub planting shall be provided to compensate for the loss of shrub planting in amenity areas.	Compensation for the removal of existing shrub planting due to the Project.	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM3 - Control of night-time lighting glare	Minimize the night time glare due to the Project during construction phase	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM4 - Erection of decorative screen hoarding compatible with the surrounding setting.	Minimize the visual impact of the Project during construction phase	MTR	Works Sites	Construction Phase	V
Table 7.9	CM5 - Management of facilities on work sites which give control on the height and disposition/arrangement of all facilities on the works site to minimize visual impact to adjacent VSRs	Control of height and deposition/ arrangement of temporary facilities in works areas	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM6 - All hard and soft landscape areas disturbed temporarily during construction shall be reinstated on like-to-like basis to the satisfaction of the relevant Government Departments.	Reinstatement of temporary works areas.	MTR	Works Sites	Construction Phase	N/A
/	All retained/exist trees shall be properly protected during construction period.	Tree protection	Contractor	Works areas	Construction phase	V
Air Quality						
/	Emission from Vehicles and Plants • All vehicles shall be shut down in intermittent use. • Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke. • All diesel fuelled construction plant within the works areas shall be powered by ultra low sulphur diesel fuel (ULSD)	Reduce air pollution emission from construction vehicles and plants	Contractor	Works areas	Construction phase	V V V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Construction Dust Impact						
Table 8.5	Barging facilities: (i) Transportation of spoils to the barging point – Pave all road surfaces within the barging facilities and provide watering once along with the haul road for every working hours to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.0 L/m^2 once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.0L/m^2 to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual. (ii) Unloading of spoil materials – Undertake the unloading process within a 3-sided screen with top tipping hall. Provide water spraying and flexible dust curtains at the discharge point for dust suppression. (iii) Vehicles leaving the barging facilities – Pass vehicles through the wheel washing facilities provided at site exits.	To minimize dust impacts	Contractor	All barging points	Construction phase	N/A
S8.63	For concrete batching plant, the requirements and mitigation measures stipulated in the *Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93)* shall be followed and implemented.	To minimize dust impact	Contractor	Concrete Batching Plant	Construction phase	N/A
Table 8.6	During operation of concrete batching plant: (i) Unloading of aggregates from the tipper trucks to receiving hopper – unload the aggregates from the tipper trucks to the receiving hopper equipped with enclosures on 3 sides and top cover, and water spraying system. (ii) Unloading of cement and PFA from tankers into the silo – Directly load the cement and PFA into the silo via a flexible duct. Install dust collectors at cement/PFA silos. (iii) Storage of aggregates in overhead storage bins – Store the aggregates in fully enclosed overhead storage bins. Cover the top of overhead storage bins with cladding. Install water spraying system at the top of storage bins for watering the aggregates, and fully enclose aggregates storage bins. (iv) Weighing and batching of cementitious materials – Perform the whole process of weighing and mixing in a fully enclosed environment. Equip all the mixers with dust collectors. (v) Loading of concrete from mixer into transit mixer of a truck – Directly load the concrete from the mixer into the transit mixer of a truck in “wet form”. (vi) Tipper trucks and cement tankers leaving the Concrete Batching Plant – Haul road within the site is unpaved. Install wheel washing pit at the gate of the concrete batching plant. (vii) Transportation of materials within the plant – Provide watering twice a day would be provided.	To minimize dust impacts	Contractor	Concrete Batching Plant	Construction phase	N/A
S8.89	Watering once every working hour on active works areas, exposed areas and paved haul roads to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.7 L/m2 for Kowloon side and 1.0 L/m2 for Hong Kong side once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.7 L/m2 for Kowloon side and 1.0 L/m2 for Hong Kong side to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual.	To minimize dust impact	Contractor	Works areas	Construction Phase	V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S8.89	Enclosing the unloading process at barging point by a 3-sided screen with top tipping hall, provision of water spraying and flexible dust curtains to reduce dust emission	To minimize dust impact	Contractor	All barging points	Construction phase	N/A
S8.90	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: • Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. • Use of frequent watering for particularly dusty construction areas and areas close to ASRs. • Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. • Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. • Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. • Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. • Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. • Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit. • Imposition of speed controls for vehicles on site haul roads. • Where possible, routing of vehicles and positioning of construction plant shall be at the maximum possible distance from ASRs. • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. • Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise	To minimize dust impacts	Contractor	Works areas	Construction phase V V V V V V V V V V V
/	***Dust suppression measures (con't)*** • De-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement	To minimize dust impacts	Contractor	Works areas	Construction phase	V
Airborne Noise Impact						
Construction Phase						
S9.55	The following good site practices shall be implemented: • Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program • Silencers or mufflers on construction equipment shall be utilized and shall be properly maintained during the construction program • Mobile plant, if any, shall be sited as far from NSRs as possible • Machines and plant (such as trucks) that may be in intermittent use shall be shut down between work periods or shall be throttled down to a minimum • Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs • Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities	To minimize construction noise impact	Contractor	Works areas	Construction phase	V V V V V N/A
/	• Install movable noise barriers, acoustic mat or full enclosure, screen the noisy plants during operation • Air compressors shall be fitted with valid noise emission labels during operation	To minimize construction noise impact	Contractor	Works areas	Construction phase	V V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S9.56 & Table 9.16	The following quiet PME shall be used: • Crane lorry, mobile • Crane, mobile • Asphalt paver • Backhoe with hydraulic breaker • Breaker, excavator mounted (hydraulic) • Hydraulic breaker • Concrete lorry mixer • Poker, vibrator, hand-held • Concrete pump • Crawler crane, mobile • Mobile crane • Dump truck • Excavator • Truck • Rock drill • Lorry • Wheel loader • Roller vibratory	To minimize construction noise impact	Contractor	Works areas at: • Hung Hom • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunnel	Construction phase	N/A V N/A V N/A N/A N/A N/A N/A N/A V V V V N/A N/A V N/A
S9.58 – S9.59 & Table 9.17	Movable noise barrier shall be used for the following PME: • Air compressor • Asphalt paver • Backhoe with hydraulic breaker • Bar bender • Bar bender and cutter (electric) • Breaker, excavator mounted • Concrete pump • Concrete pump, stationary/lorry mounted • Excavator • Generator • Grout pump • Hand held breaker • Hydraulic breaker • Saw, concrete	To minimize construction noise impact	Contractor	Works areas at: • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunnel	Construction phase	N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
S9.60 & Table 9.17	Noise insulating fabric shall be used for • Drill rig, rotary type • Piling, diaphragm wall, bentonite filtering plant • Piling, diaphragm wall, grab and chisel • Piling, diaphragm wall, hydraulic extractor • Piling, large diameter bored, grab and chisel • Piling, hydraulic extractor • Piling, earth auger, auger • Rock drill, crawler mounted (pneumatic)	To minimize construction noise impact	Contractor	Works areas at: • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunnel	Construction phase	N/A N/A N/A N/A N/A N/A N/A N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Water Quality Impact						
Construction Phase						
S11.216	The following mitigation measures are proposed to minimize the potential water quality impacts from the construction works at or close to the seafront: • Temporary storage of construction materials (e.g. equipment, filling materials, chemicals and fuel) and temporary stockpile of construction and demolition materials shall be located well away from the seawater front and storm drainage during carrying out of the works. • Stockpiling of construction and demolition materials and dusty materials shall be covered and located away from the seawater front and storm drainage. • Construction debris and spoil shall be covered up and/or disposed of as soon as possible to avoid being washed into the nearby receiving waters.	To minimize release of construction wastes from construction works at or close to the seafront	Contractor	Construction works at or close to the seafront	Construction Phase	V V V
S11.222 to 11.245	The site practices outlined in ProPECC PN 1/94 “Construction Site Drainage” shall be followed where practicable. <u>Surface Run-off</u> • Surface run-off from construction sites shall be discharged into storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sedimentation basins. Channels or earth bunds or sand bag barriers shall be provided on site to properly direct stormwater to such silt removal facilities. Perimeter channels at site boundaries shall be provided where necessary to intercept storm run-off from outside the site so that it will not wash across the site. Catchpits and perimeter channels shall be constructed in advance of site formation works and earthworks. • Silt removal facilities, channels and manholes shall be maintained and the deposited silt and grit shall be removed regularly, at the onset of and after each rainstorm to prevent local flooding. Any practical options for the diversion and re-alignment of drainage shall comply with both engineering and environmental requirements in order to provide adequate hydraulic capacity of all drains. Minimum distances of 100 m shall be maintained between the discharge points of construction site runoff and the existing saltwater intakes. • Construction works shall be programmed to minimize soil excavation works in rainy seasons (April to September). If excavation in soil cannot be avoided in these months or at any time of year when rainstorms are likely, for the purpose of preventing soil erosion, temporary exposed slope surfaces shall be covered e.g. by tarpaulin, and temporary access roads shall be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels shall be provided (e.g. along the crest / edge of excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements shall always be in place in such a way that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm. • Earthworks final surfaces shall be well compacted and the subsequent permanent work or surface protection shall be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels shall be provided where necessary. • Measures shall be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they shall be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations shall be discharged into storm drains via silt removal facilities. • Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites shall be covered with tarpaulin or similar fabric during rainstorms. • Manholes (including newly constructed ones) shall 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. Discharge of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system. • Good site practices shall be adopted to remove rubbish and litter from construction sites so as to prevent the rubbish and litter from spreading from the site area. It is recommended to clean the construction sites on a regular basis.	To minimize water quality impacts from construction site runoff and general construction activities	Contractor	Works areas	Construction Phase	V V V N/A V V V V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	Boring and Drilling Water • Water used in ground boring and drilling for site investigation or rock / soil anchoring shall as far as practicable be re-circulated after sedimentation. When there is a need for final disposal, the wastewater shall be discharged into storm drains via silt removal facilities.					V
	Wheel Washing Water • All vehicles and plant shall be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay shall be provided at every site exit if practicable and wash-water shall have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road shall be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.					V
	Bentonite Slurries • Bentonite slurries used in diaphragm wall and bore-pile construction shall be reconditioned and used again wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the bentonite slurries shall either be dewatered or mixed with inert fill material for disposal to a public filling area.					N/A
	• If the used bentonite slurry is intended to be disposed of through the public drainage system, it shall be treated to the respective effluent standards applicable to foul sewer, storm drains or the receiving waters as set out in the TM-DSS.					N/A
	Water for Testing & Sterilization of Water Retaining Structures and Water Pipes • Water used in water testing to check leakage of structures and pipes shall be used for other purposes as far as practicable. Surplus unpolluted water will be discharged into storm drains.					N/A
	• Sterilization is commonly accomplished by chlorination. Specific advice from EPD shall be sought during the design stage of the works with regard to the disposal of the sterilizing water. The sterilizing water shall be used again wherever practicable.					N/A
	Acid Cleaning, Etching and Pickling Wastewater • Acidic wastewater generated from acid cleaning, etching, pickling and similar activities shall be neutralized to within the pH range of 6 to 10 before discharging into foul sewers. If there is no public foul sewer in the vicinity, the neutralized wastewater shall be tankered off site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters.					N/A
	Wastewater from Site Facilities • Wastewater collected from any temporary canteen kitchens, including that from basins, sinks and floor drains, shall be discharged into foul sewer via grease traps. In case connection to the public foul sewer is not feasible, wastewater generated from kitchens or canteen, if any, shall be collected in a temporary storage tank. A licensed waste collector shall be deployed to clean the temporary storage tank on a regular basis.					N/A
	• Drainage serving an open oil filling point shall be connected to storm drains via petrol interceptors with peak storm bypass.					N/A
	• Vehicle and plant servicing areas, vehicle wash bays and lubrication bays shall as far as possible be located within roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor. Oil leakage or spillage shall be contained and cleaned up immediately. Waste oil shall be collected and stored for recycling or disposal in accordance with the Waste Disposal Ordinance.					N/A
S11.246 & 11.247	Construction work force sewage discharges on site are expected to be discharged to the nearby existing trunk sewer or sewage treatment facilities. If disposal of sewage to public sewerage system is not feasible, appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. The Contractor shall also be responsible for waste disposal and maintenance practices. Notices shall be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.	To minimize water quality impacts due to sewage generated from construction workforce	Contractor	Works areas	Construction Phase	N/A
S11.248	In case seepage of uncontaminated groundwater occurs, groundwater shall be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process shall also be discharged into the storm system via silt traps.	To minimize impact from discharge of uncontaminated groundwater	Contractor	Works areas	Construction Phase	N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S11.249	If land contaminated site is identified from the Stage 2 SI work (refer to Sections 11.188 to 11.191 of the EIA Report), the following mitigation measures shall be implemented for the identified contaminated area. Any transient pile of contaminated soil / material shall be minimized and shall be bottom-lined, bunded and covered with impervious membrane during rain event to avoid generation of contaminated runoff. Appropriate intercepting channels and partial shelters shall be provided where necessary to prevent rainwater from collecting within trenches or footing excavations. Any contaminated water and wastewater generated from the decontamination process shall not be directly discharged to public sewers or site drainage. They shall be treated or tanked away as necessary for proper disposal in compliance with the TM-DSS.	To control site run-off generated from any potential contaminated works areas.	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
S11.250 & S11.251	No direct discharge of groundwater from contaminated areas shall be adopted. If land contamination impact and generation of contaminated groundwater is identified from the Stage 2 SI works (refer to Sections 11.189 to 11.192 of the EIA Report), the following mitigation measures shall be adopted. Any contaminated groundwater shall be either properly treated in compliance with the requirements of the TM-DSS or properly recharged into the ground. If wastewater treatment is deployed for treating the contaminated groundwater, the wastewater treatment unit shall deploy suitable treatment processes (e.g. oil interceptor / activated carbon) to reduce the pollution level to an acceptable standard and remove any prohibited substances (such as TPH) to an undetectable range. All treated effluent from the wastewater treatment plant shall meet the requirements as stated in TM-DSS and shall be discharged into the foul sewers. If groundwater recharging wells are deployed, the recharging wells shall be installed as appropriate for recharging the contaminated groundwater back into the ground. The recharging wells shall be selected at places where the groundwater quality will not be affected by the recharge operation as indicated in Section 2.3 of the TM-DSS. The baseline groundwater quality shall be determined prior to the selection of the recharge wells, and submit a working plan (including the laboratory analytical results showing the quality of groundwater at the proposed recharge location(s) as well as the pollutant levels of groundwater to be recharged) to EPD for agreement. Pollution levels of groundwater to be recharged shall not be higher than pollutant levels of ambient groundwater at the recharge well. Prior to recharge, any prohibited substance such as TPH products shall be removed as necessary by installing the petrol interceptor. The Contractor shall apply for a discharge licence under the WPCO through the Regional Office of EPD for groundwater recharge operation or discharge of treated groundwater.	To minimize potential water quality impact from discharge of contaminated groundwater	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
S11.252	The following good site practices shall be adopted for the proposed barging points: • all vessels shall be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash • all hopper barges shall be fitted with tight fitting seals to their bottom openings to prevent leakage of material • construction activities shall not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site • loading of barges and hoppers shall be controlled to prevent splashing of material into the surrounding water. Barges or hoppers shall not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation	To minimize water quality impacts generated from the barging points.	Contractor	Barging points	Construction Phase	N/A
S11.253	There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas shall be treated so that it satisfies all the standards listed in the TM-DSS. Minimum distances of 100 m shall be maintained between the discharge points of construction site effluent and the existing seawater intakes. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., can minimise water consumption and reduce the effluent discharge volume. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring shall be carried out in accordance with the WPCO license which is under the ambit of Regional Office (RO) of EPD.	To minimize water quality impact from effluent discharges from construction sites	Contractor	All construction works areas	Construction Phase	V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S11.254	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation shall be observed and complied with for control of chemical wastes.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	V
S11.255	Any service shop and maintenance facilities shall be located on hard standings within a bunded area, and sumps and oil interceptors shall be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage shall only be undertaken within the areas appropriately equipped to control these discharges.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	N/A
S11.256	Disposal of chemical wastes shall be carried out in compliance with the Waste Disposal Ordinance. The "Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes" published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: • Suitable containers shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport. • Chemical waste containers shall be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents. • Storage area shall be selected at a safe location on site and adequate space shall be allocated to the storage area.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	V V V
Waste Management Implications						
Construction Phase						
S12.75	***Good Site Practices and Waste Reduction Measures*** • Prepare a Waste Management Plan (WMP) approved by the Engineer/Supervising Officer of the Project based on current practices on construction sites; • Training of site personnel in, site cleanliness, proper waste management and chemical handling procedures; • Provision of sufficient waste disposal points and regular collection of waste; • Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and • Separation of chemical wastes for special handling and appropriate treatment.	To reduce waste management impacts	Contractor	All Work Sites	Construction Phase	V @ V N/A N/A V
S12.76	***Good Site Practices and Waste Reduction Measures (con't)*** • Sorting of demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions (i.e. soil, broken concrete, metal etc.); • Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; • Encourage collection of aluminum cans by providing separate labeled bins to enable this waste to be segregated from other general refuse generated by the workforce; • Proper storage and site practices to minimize the potential for damage or contamination of construction materials; • Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; and • Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	N/A V N/A V V V
S12.77	***Good Site Practices and Waste Reduction Measures (con't)*** The Contractor shall prepare and implement a WMP as part of the EMP in accordance with ETWB TCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. Such a management plan shall incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	The EMP shall be submitted to the Engineer for approval. The Contractor shall implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP shall be reviewed regularly and updated by the Contractor, preferably in a monthly basis.					
S12.78	***Good Site Practices and Waste Reduction Measures (con't)*** C&D materials would be reused in other local concurrent projects as far as possible. If all reuse outlets are exhausted during the construction phase, the C&D materials would be disposed of at Taishan, China as a last resort.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	V
S12.79	***Storage, Collection and Transportation of Waste*** Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include: • Waste, such as soil, shall be handled and stored well to ensure secure containment, thus minimizing the potential of pollution; • Maintain and clean storage areas routinely; • Stockpiling area shall be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and • Different locations shall be designated to stockpile each material to enhance reuse.	To minimize potential adverse environmental impacts arising from waste storage	Contractor	Work Sites	Construction Phase	V V V V
S12.80	***Storage, Collection and Transportation of Waste (con't)*** Waste haulier with appropriate permits shall be employed by the Contractor for the collection and transportation of waste from works areas to respective disposal outlets. The following suggestions shall be enforced to minimize the potential adverse impacts: • Remove waste in timely manner • Waste collectors shall only collect wastes prescribed by their permits • Impacts during transportation, such as dust and odour, shall be mitigated by the use of covered trucks or in enclosed containers • Obtain relevant waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28) • Waste shall be disposed of at licensed waste disposal facilities • Maintain records of quantities of waste generated, recycled and disposed	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	Work Sites	Construction Phase	V V V V V V
S12.81	***Storage, Collection and Transportation of Waste (con't)*** • Implementation of trip ticket system with reference to DevB TC(W) No.6/2010 to monitor disposal of waste and to control fly-tipping at PFRFs or landfills. A recording system for the amount of waste generated, recycled and disposed (including disposal sites) shall be proposed.	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.83 – 12.86	***Sorting of C&D Materials*** • Sorting to be performed to recover the inert materials, reusable and recyclable materials before disposal off-site. • Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. • The C&D materials shall at least be segregated into inert and non-inert materials, in which the inert portion could be reused and recycled as far as practicable before delivery to PFRFs as mentioned for beneficial use in other projects. While opportunities for reusing the non-inert portion shall be investigated before disposal of at designated landfills. • Possibility of reusing the spoil in the Project will be continuously investigated in the detailed design and construction stages, it includes backfilling to cut and cover construction works for the Hung Hom south and north approach tunnels.	To minimize potential adverse environmental impacts during the handling, transportation and disposal of C&D materials	Contractor	Work Sites	Construction Phase	V V V V
S12.88	***Sediments*** • The basic requirements and procedures for excavated / dredged sediment disposal specified under ETWB TC(W) No. 34/2002 shall be followed. MFC is managing the disposal facilities in Hong Kong for the dredged and excavated sediment, while EPD is the authority of issuing marine dumping permit under the Dumping at Sea Ordinance.	To ensure the sediment to be disposed of in an authorized and least impacted way	Contractor	All works areas with sediments concern	Construction Phase	N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S12.89	***Sediments (con't)*** • The contractor for the excavation / dredging works shall apply for the site allocations of marine sediment disposal based on the prior agreement with MFC/CEDD. A request for reservation of sediment disposal space have been submitted to MFC for onward discussions of disposal approach and feasible disposal sites and the letter is attached in Appendix 12.6. The Project proponent shall also be responsible for the application of all necessary permits from relevant authorities, including the dumping permit as required under DASO from EPD, for the disposal of dredged and excavated sediment prior to the commencement of the excavation works.	To determine the best handling and disposal option of the sediments	MTR / Contractor	All works areas with sediments concern	Detailed Design Stage and Construction Phase	N/A
S12.91 – 12.94	***Sediments (con't)*** • Stockpiling of contaminated sediments shall be avoided as far as possible. If temporary stockpiling of contaminated sediments is necessary, the excavated sediment shall be covered by tarpaulin and the area shall be placed within earth bunds or sand bags to prevent leachate from entering the ground, nearby drains and/or surrounding water bodies. The stockpiling areas shall be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas shall be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, shall be collected and discharged according to the Water Pollution Control Ordinance (WPCO). • In order to minimise the potential odour / dust emissions during excavation and transportation of the sediment, the excavated sediments shall be wetted during excavation / material handling and shall be properly covered when placed on trucks or barges. Loading of the excavated sediment to the barge shall be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water. • The barge transporting the sediments to the designated disposal sites shall be equipped with tight fitting seals to prevent leakage and shall not be filled to a level that would cause overflow of materials or laden water during loading or transportation. In addition, monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as specified by the DEP. • In order to minimise the exposure to contaminated materials, workers shall, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities shall also be provided on site.	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A
S12.95	***Sediments (con't)*** • A possible arrangement for Type 3 disposal is by geosynthetic containment. A geosynthetic containment method is a method whereby the sediments are sealed in geosynthetic containers and, at the disposal site, the containers would be dropped into the designated contaminated mud pit where they would be covered by further mud disposal and later by the mud pit capping, thereby meeting the requirements for fully confined mud disposal. The technology is readily available for the manufacture of the geosynthetic containers to the project-specific requirements. Similar disposal methods have been used for projects in Europe, the USA and Japan and the issues of fill retention by the geosynthetic fabrics, possible rupture of the containers and sediment loss due to impact of the container on the seabed have been addressed.	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A
/	***Accidental spillage*** To prevent accidental spillage of chemicals, the following is recommended: • Proper storage and handling facilities will be provided. • All the tanks, containers, storage area will be bunded and the locations will be locked as far as possible from the sensitive watercourse and stormwater drains. • The contractor will register as a chemical waste producer if chemical wastes would be generated. Storage of chemical waste arising from the construction activities will be stored with suitable labels and warnings. • Disposal of chemical wastes will be conducted in compliance with the requirements as stated in the Waste disposal (Chemical Waste) (General) Regulation.	To minimize potential adverse environmental impacts arising from accidental spillage	Contractor	Work Sites	Construction Phase	@ V V V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S12.97	***Containers for Storage of Chemical Waste*** The Contractor shall register with EPD as a chemical waste producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Containers used for storage of chemical waste shall: • Be compatible with the chemical wastes being stored, maintained in good condition and securely sealed; • Have a capacity of less than 450 litters unless the specifications have been approved by EPD; and • Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation.	To register with EPD as a Chemical waste producer and store chemical waste in appropriate containers	Contractor	Work Sites	Construction Phase	V N/A V
S12.98	***Chemical Waste Storage Area*** • Be clearly labeled to indicate corresponding chemical characteristics of the chemical waste and used for storage of chemical waste only; • Be enclosed on at least 3 sides; • Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest; • Have adequate ventilation; • Be covered to prevent rainfall from entering; and • Be properly arranged so that incompatible materials are adequately separated.	To prepare appropriate storage areas for chemical waste at works areas	Contractor	Work Sites	Construction Phase	V V V V V V
S12.99	***Chemical Waste*** • Lubricants, waste oils and other chemical wastes would be generated during the maintenance of vehicles and mechanical equipments. Used lubricants shall be collected and stored in individual containers which are fully labelled in English and Chinese and stored in a designated secure place.	To clearly label the chemical waste at works areas	Contractor	Work Sites	Construction Phase	N/A
S12.100	***Collection and Disposal of Chemical Waste*** ***A trip-ticket system shall be operated in accordance with the Waste Disposal*** *(Chemical Waste) (General) Regulation* to monitor all movements of chemical waste. The Contractor shall employ a licensed collector to transport and dispose of the chemical wastes, to either the approved CWTC at Tsing Yi, or another licensed facility, in accordance with the *Waste Disposal (Chemical Waste) (General) Regulation*.	To monitor the generation, reuse and disposal of chemical waste	Contractor	Work Sites	Construction Phase	N/A
S12.101	***General Refuse*** General refuse shall be stored in enclosed bins or compaction units separate from C&D materials and chemical waste. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D materials and chemical wastes. Preferably, an enclosed and covered area shall be provided to reduce the occurrence of wind-blown light material.	To properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.102	***General Refuse (con't)*** The recyclable component of general refuse, such as aluminum cans, paper and cleansed plastic containers shall be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste shall be set up by the Contractor. The Contractor shall also be responsible for arranging recycling companies to collect these materials.	To facilitate recycling of recyclable portions of refuse	Contractor	Work Sites	Construction Phase	V
S12.103	***General Refuse (con't)*** The Contractor shall carry out an education programme for workers in avoiding, reducing, reusing and recycling of materials generation. Posters and leaflets advising on the use of the bins shall also be provided in the sites as reminders.	To raise workers' awareness on recycling issue	Contractor	Work Sites	Construction Phase	V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Land Contamination Impact						
S13.23–13.24	For construction works at sites under the current stage of site investigation (Stage 1 SI): • Precautionary measures such as visual inspection are recommended to be undertaken during construction activities that disturb soil. The inspection process shall involve a visual observation of excavated soils for discolouration and the presence of oils, together with identifying the presence of odours, which may also indicate soil and/or groundwater contamination. • If soil materials suspected to be contaminated are encountered during excavation, sampling and testing shall be undertaken to verify the presence of contamination. The soil extracted during demolition, excavation and cut & cover construction shall be temporary stockpiled. Shall concentrations of contaminants of concern (COCs) exceed relevant RBRGs as indicated by laboratory analyses, remediation works shall be undertaken with reference to the Contamination Assessment Report (CAR) and Remediation Action Plans (RAP).	To act as a general precautionary measure to screen soils for the presence contamination during excavation works for Cut-and-Cover.	Contractor	Within Project Boundary where signs of contamination is identified	During excavation works for Cut-and-Cover	N/A
S13.30	For some sites with currently no SI proposed (i.e. sites ID 2-02, 2-18, 2-22, 2-23, 2-27, 2-28), to be conservative, visual inspection shall be conducted during demolition and excavation to detect any abnormal colour, smell or other characteristics of the soil, due to the nearby land use and/ or construction method. If abnormal colour, smell or other characteristics of contamination are identified for any of these sites, sampling and testing shall be undertaken to verify the presence of contamination. The soil extracted during demolition, excavation and cut & cover construction shall be temporary stockpiled. Should the concentrations of contaminants of concern (COCs) exceed relevant RBRGs as indicated by laboratory analyses, remediation works shall be undertaken with reference to the CAR and RAP.	To act as a general precautionary measure to screen soils for the presence contamination during excavation works for Cut-and-Cover.	Contractor	Areas with no SI proposed (Sites ID 2-02, 2-18, 2-22, 2-23, 2-27, 2-28)	During excavation works for Cut-and-Cover	N/A
S13.36 – 13.38	For areas inaccessible for proper site appraisal and investigation (Stage 2 SI) (i) Site 2-15 • Upon site access being granted, visual inspection shall be carried out where intrusive works and soil excavation is encountered, for attention on any potential contamination due to its current operation • A supplementary CAP shall then be submitted to EPD for endorsement. • A CAR/RAP shall be prepared and submitted to EPD for endorsement on completion of the SI and analytical testing. • Shall remediation be undertaken a Remediation Report (RR) shall be prepared and submitted to EPD for endorsement to demonstrate that the decontamination work is adequate and is carried out in accordance with the endorsed CAR and RAP. Information such as soil treatment/ disposal records (including trip tickets), confirmatory sampling results, and photographs shall be included in the aforesaid RR. • No construction work shall be carried out prior to the endorsement of the RR by EPD.	To identify areas with land contamination concern, report laboratory results and propose remediation measures if necessary. To ensure remediation works have been undertaken to before the commencement of any construction works of the Project.	Contractor	Areas unable to be accessed during Stage 1 SI (Site 2-15)	After land resumption and prior to the construction works commencement at the site	N/A
S13.39	Potential Remediation of Contaminated Soil • Excavation profiles must be properly designed and executed with attention to the relevant requirements for environment, health and safety; • Excavation shall be carried out during dry season as far as possible to minimise contaminated runoff from contaminated soils; • Supply of suitable clean backfill material is needed after excavation; • If remediation is required with chemical oxidation proposed as a contaminant mass reduction technology, chemicals will be securely and separately stored away from sources of ignition or oxidisable items. Handling will be undertaken by personnel with appropriate training and personal protective equipment (PPE). • Vehicles containing any excavated materials shall be suitably covered to limit potential dust emissions or contaminated wastewater run-off, and truck bodies and tailgates shall be sealed to prevent any discharge during transport or during wet conditions; • Speed control for the trucks carrying contaminated materials shall be enforced; • Vehicle wheel and body washing facilities at the site's exit points shall be established and used; and • Pollution control measures for air emissions e.g. from biopile blower, noise emissions e.g. from blower, and water discharges e.g. runoff control shall be implemented and complied with relevant regulations and guidelines.	To remediate contaminated soil	Contractor	Identified contaminated sites	Site remediation	N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S13. 40	In order to minimize the potential adverse effects on health and safety of construction workers during the course of site remediation, the Occupation Safety and Health Ordinance (OSHO) (Chapter 509) and its subsidiary Regulations shall be followed by all site personnel working on the site at all times. In addition, the following basic health and safety measures shall be implemented as far as possible: • Set up a list of safety measures for site workers; • Provide written information and training on safety for site workers; • Keep a log-book and plan showing the contaminated zones and clean zones; • Maintain a hygienic working environment; • Avoid dust generation; • Provide face and respiratory protection gear to site workers; • Provide personal protective clothing (e.g. chemical resistant jackboot, liquid tight gloves) to site workers; and • Provide first aid training and materials to site workers.	To minimise the potentially adverse effects on health and safety of construction workers during the course of site remediation.	Contractor	Identified contaminated sites	Site remediation and prior to construction phase	N/A

Legend: V = implemented;
x = not implemented;
@ = partially implemented;
N/A = not applicable

APPENDIX D

Cumulative Statistics of Exceedances, Complaints, Notification of Summons and Successful Prosecutions

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

Statistics on Complaints, Notifications of Summons and Successful Prosecutions in this reporting month

	Date Received	Subject	Status	Total no. received in this month
Environmental complaints	-	-	-	0
Notification of summons	-	-	-	0
Successful Prosecutions	-	-	-	0

Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions since project commencement

Reporting Month	Number of Complaints in Reporting Month	Number of Summons in Reporting Month	Number of Prosecutions in Reporting Month
August 2016	0	0	0
September 2016	0	0	0
October 2016	0	0	0
November 2016	0	0	0
December 2016	0	0	0
January 2017	0	0	0
February 2017	0	0	0
March 2017	1	0	0
April 2017	0	0	0
May 2017	0	0	0
June 2017	0	0	0
July 2017	0	0	0
August 2017	0	0	0
September 2017	0	0	0
October 2017	0	0	0
November 2017	0	0	0
December 2017	0	0	0
January 2018	0	0	0
February 2018	0	0	0
March 2018	0	0	0
April 2018	0	0	0
May 2018	0	0	0
June 2018	0	0	0
July 2018	0	0	0
August 2018	0	0	0
September 2018	0	0	0
October 2018	0	0	0
November 2018	0	0	0
December 2018	0	0	0
January 2019	0	0	0
Total	**1**	**0**	**0**

APPENDIX E

Waste Flow Table

Contract No.:MTR-SCL1122

Monthly Summary Waste Flow Table for 2019

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in Other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper / Cardboard Packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
Jan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023
Feb											
Mar											
Apr											
May											
Jun											
Sub-total											
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Comments:

1) Assumption: The densities of Rock, Soil, Mixed Rock and Soil, and Regular Spoil are 2.0 ton/m3; the density of general refuse is 1.0 ton/m3; the density of waste oil is 1.0 ton/m3.

2) The cut-off date of waste amount in Jan is 31/01/2019 for TKO137FB/TM38FB, NENT/SENT/WENT landfill.

3) The amount of waste in Jan is 22.99 tons for NENT/SENT/WENT Landfill, 0 tons for TKO137FB/TKO137SF/TM38FB.

4) The amount of C&D waste reused in the Contract in Jan is 0 trucks, reused in other Projects is 0 tons, for cut-off date as 31/01/2019.

5) The amount of chemical waste in Jan is 0L for cut-off date as 31/01/2019.

Appendix E

Monthly EM&A Report for January 2019 – SCL Works Contract 1124 Admiralty SCL Related Works

MTR Corporation Limited

Shatin to Central Link –
Admiralty SCL Related Works

Monthly EM&A Report No. 24

[Period from 1 to 31 January 2019]

(February 2019)



Verified by: Nicola Hon

Position: Environmental Team Leader

Date: 12 February 2019

JOB NO.: TCS00838/16

MTR SHATIN TO CENTRAL LINK – CONTRACT 1124 ADMIRALTY SCL RELATED WORKS

MONTHLY ENVIRONMENTAL MONITORING AND AUDIT (EM&A) REPORT – JANUARY 2019

PREPARED FOR

BUILD KING SCL 1124 JV

Date	Reference No.	Prepared By	Certified By
12 February 2019	TCS00838/16/600/R0042v2	Martin Li (Environmental Consultant)	Nicola Hon (Environmental Team Leader)

Version	Date	Remarks
1	11 February 2019	First Submission
2	12 February 2019	Amended against IEC's comments

EXECUTIVE SUMMARY

ES.01 Build King SCL 1124 Joint Venture (hereinafter 'JV") has been awarded by the MTR Corporation Limited (MTR) of the Contract No. MTR 1124 – Admiralty SCL Related Works (hereinafter "Contract 1124').

ES.02 Admiralty Station (ADM) will become an interchange station for four railway lines. The works of Contract 1124 are mainly the Alteration and Additional (A&A) works at the interface between the existing Admiralty Station (ADM) and the new ADM, construction of internal structure at the new ADM and associated road works and building services etc.

ES.03 The Environmental Monitoring & Audit (EM&A) Programme for Contract 1124 was commenced on 1 February 2017.

ES.04 This is the **24th** Monthly Environmental Monitoring and Audit (EM&A) Report summarizing the impact monitoring results and audit findings for Contract 1124 during the period from **1** to **31 January 2019 (**the Reporting Period).

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES.05 Environmental monitoring activities under the EM&A Programme in this Reporting Period are summarized in the following table.

Issues	Environmental Monitoring Parameters / Inspection	Occasions
Inspection / Audit	ET Regular Environmental Site Inspection	**5**

ENVIRONMENTAL COMPLAINT

ES.06 No environmental complaint was recorded or received in this Reporting Period.

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.07 No environmental summons or successful prosecutions were recorded in this Reporting Period.

REPORTING CHANGE

ES.08 No reporting changes were made in this Reporting Period.

FUTURE KEY ISSUES

ES.09 Special attention should be paid to on the potential environmental impacts arising from the forthcoming activities such as water quality and waste management.

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1 INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 The Shatin to Central Link (SCL) is a 17km extension of the existing Ma On Shan Line (MOL) and East Rail Line (EAL) comprising (i) The East-West Corridor which extends the MOL from Tai Wai via East Kowloon to connect with the West Rail Line (WRL) at Hung Hom Station (HUH); and (ii) The North-South Corridor which is an extension of the East Rail Line (EAL) at Hung Hom across the harbour to Admiralty Station (ADM).

1.1.2 The Environmental Impact Assessment (EIA) Reports for SCL – Hung Hom to Admiralty Section [SCL (HUH-ADM)] (Register No.: AEIAR-166/2012) was approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, an Environmental Permit (EP) was granted on 22 March 2012, which covers SCL (HUH-ADM) EP No.: (EP-436/2012), for the construction and operation. Variation of EP (VEP) was subsequently applied and the latest EP (EP No. EP-436/2012/F) was issued by the Director of Environmental Protection (DEP) on 31 December 2018.

1.1.3 Major works of Contract 1124 including the following:-

(a) Alteration and Additional (A&A) works at the interface between the existing ADM and the new ADM;
(b) Construction of internal structures at the new ADM;
(c) Alteration and addition works for plant rooms;
(d) Demolition of Vent Shaft X;
(e) Road works including drainage, traffic aids, road markings, lighting, signage, utilities diversion, demolition, reinstatement and TTM schemes to facilitate the construction works and any works require TTM submission;
(f) Tree planting and soft and hard landscaping works;
(g) Design and construction of ABWF works.
(h) Supply and installation of doors and ironmongeries, signs and advertising panels, Customer Service Centre (CUC), Platform Supervisor Booths (PSB) and Common Station Components etc.

1.1.4 The general layout of the Project is shown in ***Appendix A***.

1.1.5 Action-United Environmental Services & Consulting (hereinafter referred as "AUES") was appointed by the Contractor as an Environmental Team (hereinafter referred as "the ET") to implement the relevant EM&A programme in accordance with the EM&A Manual and EP during construction phase of the project.

1.1.6 This is the **24th** Monthly EM&A Report summarizing the impact monitoring results and audit findings for Contract 1124 in the period of **1** to **31 January 2019.**

1.2 REPORT STRUCTURE

1.2.1 The Monthly Environmental Monitoring and Audit (EM&A) Report is structured into the following sections:-

Section 1	***Introduction***
Section 2	***Project Organization and Construction Progress***
Section 3	***Summary of Impact Monitoring Requirement***
Section 4	***Waste Management***
Section 5	***Site Inspection***
Section 6	***Environmental Complaint and Non-Compliance***
Section 7	***Implementation Statue of Mitigation Measures***
Section 8	***Conclusions and Recommendation***

2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

2.1 PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE

2.1.1 The organization structure and contact details of key personnel with respect to environmental management are shown in ***Appendix B***.

2.2 CONSTRUCTION PROGRESS

2.2.1 The Construction Program of the Contract 1124 is enclosed in ***Appendix C*** and the major construction activities undertaken in this Reporting Period are listed below:-

Civil Works

- SCL Level – SEM openings post-coring works
- Mezzanine Level – SEM openings post-coring works
- Concourse Level - De-stressing & dismantle of flying strut

ABWF Works

- Cat ladder and door installation works in North Bound
- Concourse Level - Floor Tiles and Wall painting carried out in SCR Waiting area
- Atrium – Aluminium cladding works

2.3 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.3.1 Summary of the relevant permits, licences, and/or notifications on environmental protection for Contract 1124 in this Reporting Period is presented in ***Table 2-1***.

Table 2-1 Status of Environmental Licenses and Permits

Item	Description	License/Permit Status			
		Ref. no.	Valid Period		Status
			From	To	
1	Environmental permit	EP-436/2012/E	23 Nov 2016	End of the Project	Valid
2	Notification pursuant to Air pollution Control (Construction Dust) Regulation	Ref No.: 400699	1 Apr 2016	End of the Project	Valid
3	Chemical Waste Producer Registration	Waste Producers Number: 5213-124-B2482-01	11 May 2016	End of the Project	Valid
4	Water Pollution Control Ordinance - Discharge License	No.WT00025943-2016	27 Oct 2016	31 Oct 2021	Valid until 31 Oct 2021
5	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7024833	21 April 2016	End of the Project	Valid
6	Construction Noise Permit	GW-RS0615-18	20 Jul 18	19 Jan 19	Expired on 19 Jan 19
		GW-RS1230-18	20 Jan 19	19 Jul 19	Valid until 19 Jul 19 (Extension of RS0615-18)

3 SUMMARY OF IMPACT MONITORING REQUIREMENT

3.1 GENERAL

3.1.1 The impact monitoring for air quality, construction noise as well as landscape and visual inspection are not required for Contract 1124.

3.1.2 The impact monitoring requirement for Contract 1124 shall include waste management and site inspection.

4 WASTE MANAGEMENT

4.1 GENERAL WASTE MANAGEMENT

4.1.1 Waste management was carried out by an on-site Environmental Officer or an Environmental Supervisor from time to time.

4.2 RECORDS OF WASTE QUANTITIES

4.2.1 All types of waste arising from the construction work are classified into the following:

- Construction & Demolition (C&D) Material;
- Chemical Waste;
- General Refuse; and
- Excavated Soil.

4.2.2 The quantities of waste for disposal in this Reporting Period are summarized in ***Tables 4-1*** and ***4-2*** and the Monthly Summary Waste Flow Table is shown in ***Appendix D***. Whenever possible, materials were reused on-site as far as practicable.

Table 4-1 Summary of Quantities of Inert C&D Materials for the Project

Type of Waste	Quantity			Disposal Location
	Prior Months	Reporting Month (January 2019)	Cumulated	
Total C&D Materials generated (Inert) (in '000m^3)	1.7917	0.019	1.8107	--
Reused in this Project (Inert) (in '000m^3)	0	0	0	--
Reused in other Projects (Inert) (in '000m^3)	0	0	0	--
Disposal as Public Fill (Inert) (in '000m^3)	1.7917	0.019	1.8107	TKO 137

Table 4-2 Summary of Quantities of C&D Wastes for the Project

Type of Waste	Quantity			Disposal Location
	Prior Months	Reporting Month (January 2019)	Cumulated	
Metals (‘000kg)	0	0	0	--
Paper / Cardboard Packing (‘000kg)	0	0	0	--
Plastics (‘000kg)	0	0	0	--
Chemical Wastes (‘000kg)	0	0	0	--
General Refuses (‘000m^3)	2.5897	0.119	2.7087	SENT

5 SITE INSPECTION

5.1 REQUIREMENTS

5.1.1 According to the EM&A Manual, the environmental site inspection shall be formulated by ET Leader. Weekly environmental site inspections should be carried out to monitor the implementation of mitigation measures and environmental performance.

5.2 FINDINGS / DEFICIENCIES DURING THE REPORTING MONTH

5.2.1 In the Reporting Period, joint site inspection to evaluate the site environmental performance by the MTR, ET and the Contractor were carried out on **2, 9, 16, 23 and 30 January 2019** and IEC had joined the site inspection on **23 January 2019.** Furthermore, no site inspection was conducted by EPD during the Reporting Period. No non-compliance was noted during the site inspection in the Reporting Period.

5.2.2 The observations and reminders recorded in the weekly site inspection in the Reporting Period are summarized in ***Table 5-1***.

Table 5-1 Site Observations

Parameters	Date	Observations / Reminders	Follow-Up Status
Air Quality	Nil	Nil	Nil
Noise	Nil	Nil	Nil
Water Quality	16 Jan 2019	Reminder: The Contractor was reminded to remove the silt accumulated at the WetSep when it is full.	Accumulated silt at the WetSep was removed.
Waste/ Chemical Management	Nil	Nil	Nil
Permits/ licenses	Nil	Nil	Nil
Other	28 Dec 2018, 2 & 9 January 2019	Reminder: The Contractor was reminded to remove the stagnant water at drip tray to prevent mosquito breeding.	Drip tray was kept clear of stagnant water and general refuse.

6 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

6.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

6.1.1 No environmental complaints, summons and prosecution were received in this Reporting Period. The statistical summary table of environmental complaint is presented in ***Tables 6-1, 6-2*** and ***6-3***.

Table 6-1 Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 31 January 2019	0	1	Air Quality (Uncover dump truck)

Table 6-2 Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Summons Nature
1 – 31 January 2019	0	0	NA

Table 6-3 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Prosecution Nature
1 – 31 January 2019	0	0	NA

7 IMPLEMENTATION STATUS OF MITIGATION MEASURES

7.1 GENERAL REQUIREMENTS

7.1.1 The environmental mitigation measures that recommended in the Implementation Schedule for Environmental Mitigation Measures (ISEMM) in the EM&A Manual covered the issues of dust, noise, water quality and waste management and they are summarized presented in ***Appendix E***.

7.1.2 The Contractor has implemented the environmental mitigation measures and requirements as stated in the EIA reports the EP and EM&A Manuals subject to the site condition. The major environmental mitigation measures implemented by the Contract in this Reporting Period are summarized in ***Table 7-1***.

Table 7-1 Environmental Mitigation Measures

Issues	Environmental Mitigation Measures
Water Quality	• Wastewater to be treated by the filtration systems i.e. sedimentation tank before to discharge.
Air Quality	• Maintain wet surface on access road • All vehicles must use wheel washing facility before off site • Sprayed water during breaking works
Noise	• Restrain operation time of plants from 07:00 to 19:00 on any working day except for Public Holiday and Sunday. CNP was granted for construction works during restricted hours • Keep good maintenance of plants • Shut down the plants when not in used.
Waste and Chemical Management	• On-site sorting prior to disposal • Follow requirements and procedures of the "Trip-ticket System" • Predict required quantity of concrete accurately • Collect the unused fresh concrete at designated locations in the sites for subsequent disposal
General	• The site was generally kept tidy and clean.

7.1.3 Status of required submissions under the EP during the reporting period is summarized in ***Table 7-2.***

Table 7-2 Status of Required Submission under Environmental Permit

EP Condition	Submission	Submission Date
Condition 3.4	Monthly EM&A Report for December 2018	14 January 2019

7.2 TENTATIVE CONSTRUCTION ACTIVITIES IN THE COMING MONTH

7.2.1 Construction activities listed below will be undertaken in the coming month for Contract 1124.

Civil Works

- SCL Level – SEM openings post-coring works
- Mezzanine Level – SEM openings post-coring works
- Concourse Level - De-stressing & dismantle of flying strut

ABWF Works

- Cat ladder and door installation works in North Bound
- Concourse Level - Floor Tiles and Wall painting carried out in SCR Waiting area
- Atrium – Aluminium cladding works

7.3 KEY ISSUES FOR THE COMING MONTH

7.3.1 Key issues to be considered in the coming month for the Contract include:

- Ensure dust suppression measures are implemented properly;
- Implementation of construction noise preventative control measures
- Management of chemical wastes;
- Follow-up of improvement on general waste management issues; and
- Potential wastewater quality impact

8 CONCLUSIONS AND RECOMMENTATIONS

8.1 CONCLUSIONS

8.1.1 This is the **24th** Monthly EM&A report, covering the construction period from **1 to 31 January 2019**.

8.1.2 No documented complaint, notification of summons or successful prosecution was received in the Reporting Period.

8.1.3 Joint site inspection to evaluate the site environmental performance by the RE, ET and the Contractor were carried out on **2, 9, 16, 23 and 30 January 2019** and IEC had joined the site inspection on **23 January 2019**. In general, the Contractor was requested to maintain the tidiness and cleanliness of the construction site and dispose of the C&D waste more frequently. Moreover, the wastewater treatment facilities should be properly maintained and ensure the discharge complied with the relevant licence requirement.

8.2 RECOMMENDATIONS

8.2.1 Special attention should be paid to on the potential environmental impacts arising from the forthcoming activities such as water quality and waste management.

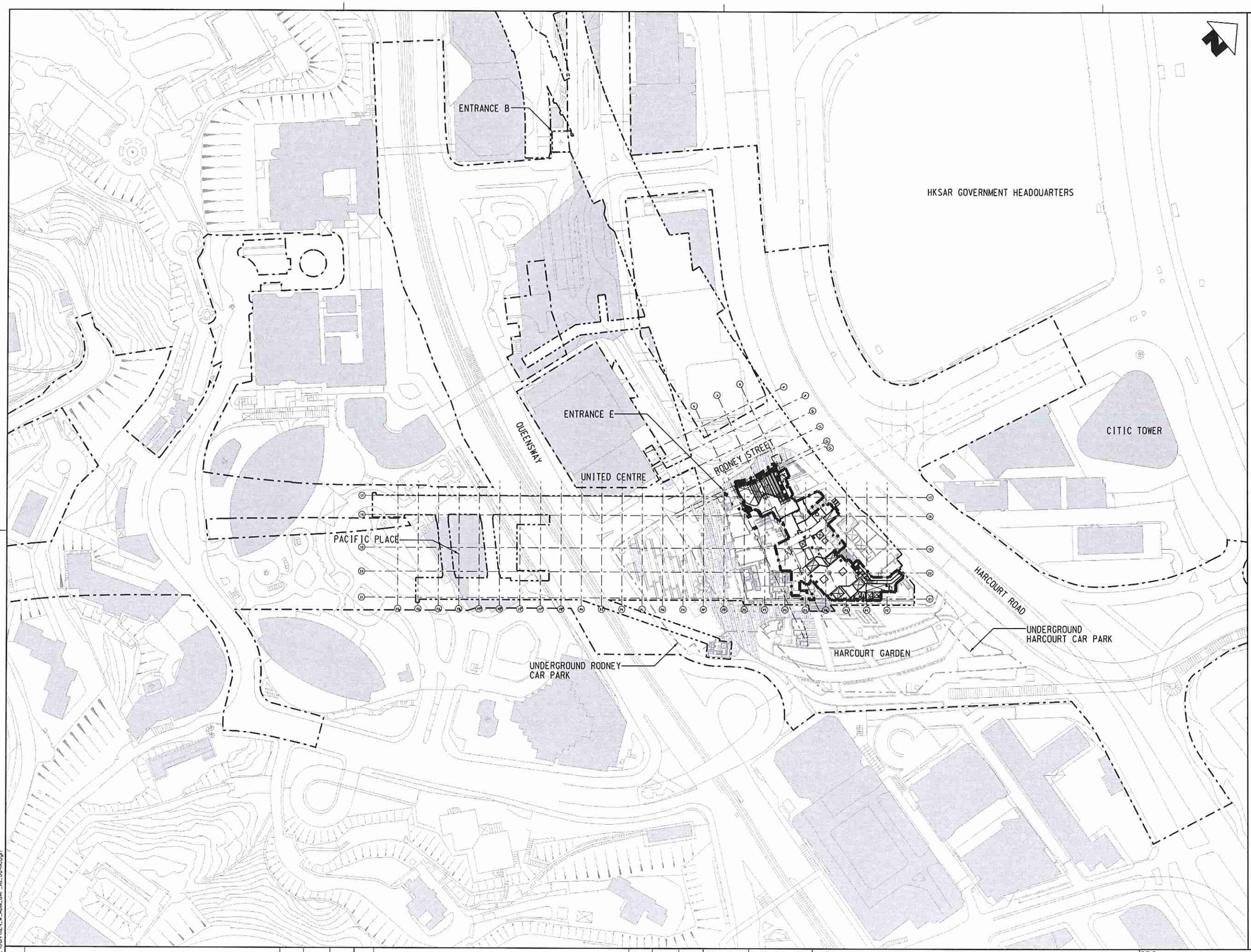
8.2.2 The Contractor was reminded to properly maintain the wastewater treatment facilities and ensure the discharge complied with the relevant licence requirement.

8.2.3 The Contractor was reminded that the C&D waste and general refuse should be disposed in a timely manner, and chemical containers should be provided with drip tray to avoid leakage on ground during construction period.

8.2.4 The Contractor is also reminded to implement the recommended environmental mitigation measures according to the EM&A Manual.

Appendix A

PROJECT SITE LAYOUT PLAN



NOTES:

- GAZETTAL BOUNDARY FOR RAILWAY DEVELOPMENT
- STATION BOUNDARY
- SCL RELATED WORKS BOUNDARY

RECEIVED
27 APR 2016
BY:.....

Build King SCL 1124 Joint Venture
FOR CONSTRUCTION

0 10 20 30 40 50
METRES
1 : 1000

REV	DESCRIPTION	BY	DATE	APPROVED
A	WORKING DRAWING	SC	18MAR16	TS

DRAWN	WSC
DESIGNED	TF
CHECKED	JH
APPROVED	IT
DATE	3/18/2016

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MTR

SHATIN TO CENTRAL LINK

ORIGINATOR
ARUP
Supported by : Widnell Limited, Urbis Limited, Kenneth Ng & Associates

CADD REF. 1124_W_ADM_OAP_A11_004A.dgn

TITLE
CONTRACT 1124
ADMIRALTY SCL RELATED WORKS

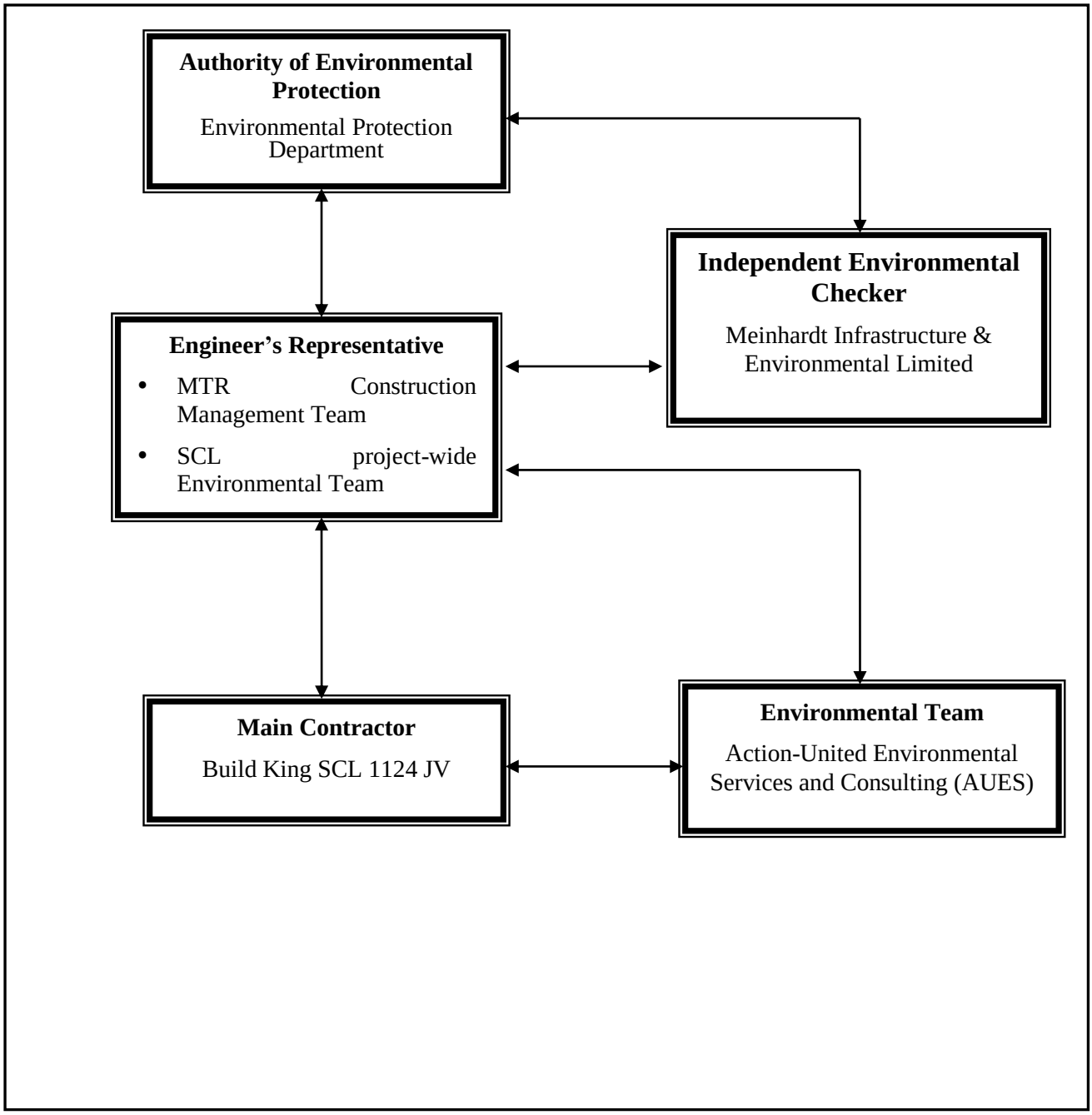
GROUND FLOOR LEVEL LOCATION PLAN
AT +6.000mPD

SCALE	DRAWING NO.	REV.
1 : 1000	1124/W/ADM/OAP/A11/004	A

PLOT DRV: G:\C90\Project office\CADD Working\CAD_ADMIN (Common)\PLOTDRIVER\ADM_PDF_COLOUR_A3-Alpit
MODELNAME: Default PRINTED BY: justin.chiu 31/03/2016 2:29:24 PM
FILENAME: C:\Plot\1124 - ARCH\ON\1124_W_ADM_OAP_A11_004A.dgn

Appendix B

ORGANIZATION STRUCTURE AND CONTACT DETAILS OF RELEVANT PARTIES



Project Organization Structure

Contact Details of Key Personnel

Organization	Role	Position	Name of Key Staff	Tel No.	Fax No.
MTR	Resident Engineer	Construction Manager	Mr. Brain Suen	2176 2788	2171 2829
MTR	Senior Environmental Engineer	SCL project-wide Environmental Team Leader	Ms. Lisa Poon	3127 6295	2993 7557
Meinhardt	Independent Environmental Checker		Mr. Fredrick Leong	2859 1739	2540 1580
Build King SCL 1124 JV	Contractor	Project Director	Mr. Simon Liu	2272 3680	2528 1751
Build King SCL 1124 JV	Contractor	General Manager	Mr. Yee Hon Wing	2272 3680	2528 1751
Build King SCL 1124 JV	Contractor	Environmental Officer	Mr. Ronald Fung	2272 3680	2528 1751
AUES	Contractor's Environmental Team (ET)	Environmental Team Leader	Ms. Nicola Hon	2959 6059	2959 6079
AUES	Contractor's Environmental Team (ET)	Environmental Consultant	Mr. Ben Tam	2959 6059	2959 6079
AUES	Contractor's Environmental Team (ET)	Environmental Consultant	Mr. Martin Li	2959 6059	2959 6079

Legend:

MTR – MTR Corporation Limited

Meinhardt – Meinhardt Infrastructure & Environmental Limited

Build King SCL 1124 JV - Build King SCL 1124 Joint Venture

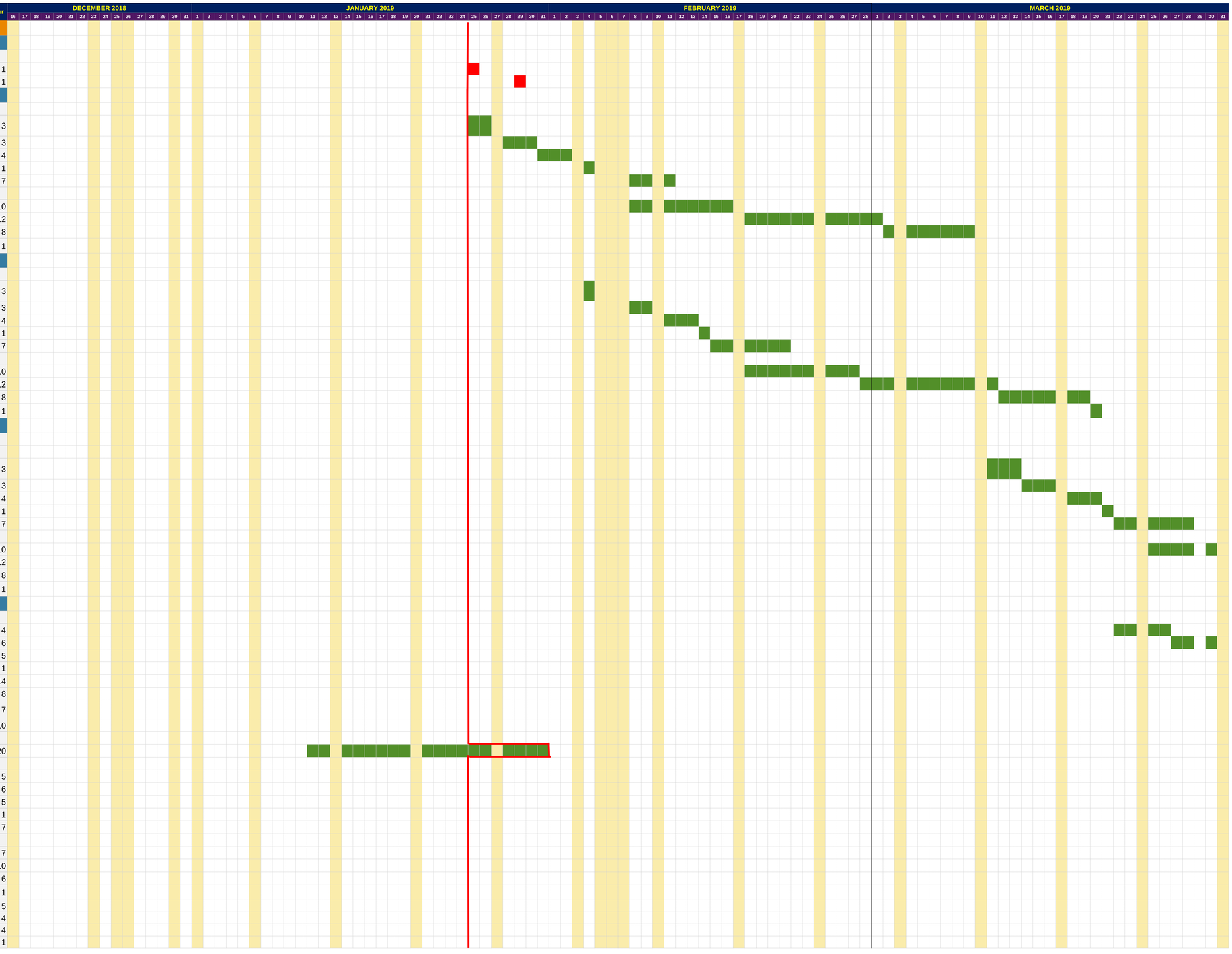
AUES – Action-United Environmental Services & Consulting

Appendix C

CONSTRUCTION PROGRAM

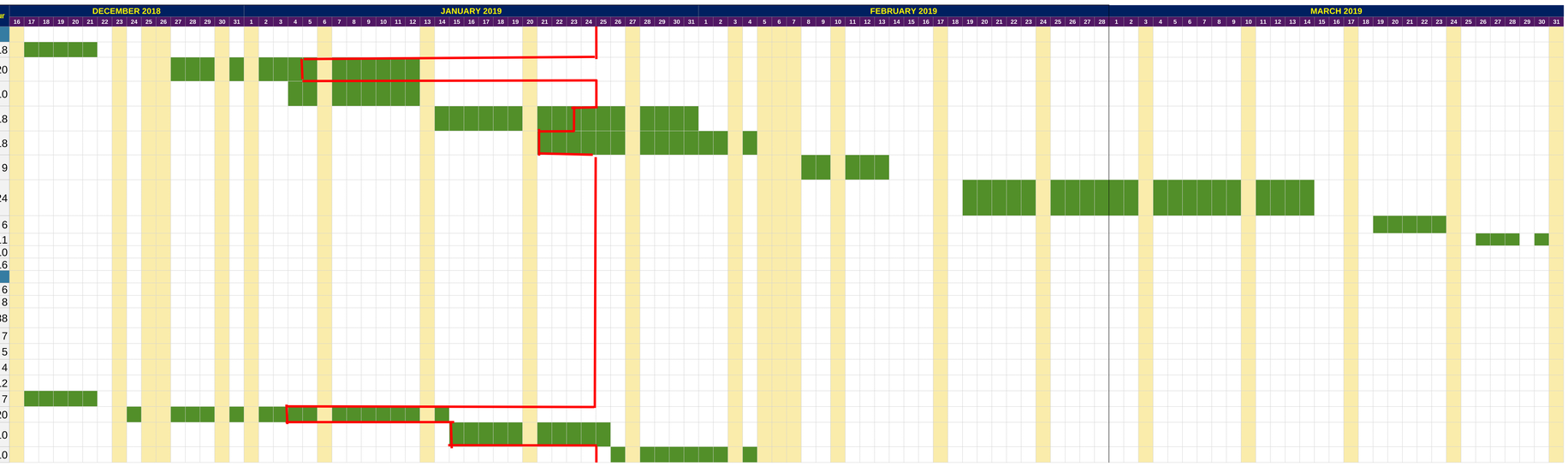
Civil Works Programme

	Description	Start	Finish	Dur
Other Remaining Areas				
SCL Level				
South Track				
	Mass concrete at Area 8 (Interface area) -Portion 1	25-Jan-19	25-Jan-19	1
	Mass concrete at Area 8 (Interface area)- Portion 2	29-Jan-19	29-Jan-19	1
Lower Platform				
PY-PZ	**Slab**			
Material Hoist area	Install Steel Props	25-Jan-19	27-Jan-19	3
	shuttering	28-Jan-19	30-Jan-19	3
	Rebar Fixing	31-Jan-19	3-Feb-19	4
	Concreting	4-Feb-19	4-Feb-19	1
	Curing	5-Feb-19	11-Feb-19	7
	Walls			
	shuttering for Wall - 1st side	8-Feb-19	17-Feb-19	10
	Rebar Fixing	18-Feb-19	1-Mar-19	12
	shuttering for Wall - 2nd side	2-Mar-19	9-Mar-19	8
	Concreting - pour 1	10-Mar-19	10-Mar-19	1
Upper Platform				
PY-PZ	**Slab**			
Material Hoist area	Install Steel Props	4-Feb-19	6-Feb-19	3
	shuttering	7-Feb-19	9-Feb-19	3
	Rebar Fixing	10-Feb-19	13-Feb-19	4
	Concreting	14-Feb-19	14-Feb-19	1
	Curing	15-Feb-19	21-Feb-19	7
	Walls			
	shuttering for Wall - 1st side	18-Feb-19	27-Feb-19	10
	Rebar Fixing	28-Feb-19	11-Mar-19	12
	shuttering for Wall - 2nd side	12-Mar-19	19-Mar-19	8
	Concreting - pour 1	20-Mar-19	20-Mar-19	1
Concourse Level				
PY-PZ	**Slab**			
Material Hoist area	Install Steel Props	11-Mar-19	13-Mar-19	3
	shuttering	14-Mar-19	16-Mar-19	3
	Rebar Fixing	17-Mar-19	20-Mar-19	4
	Concreting	21-Mar-19	21-Mar-19	1
	Curing	22-Mar-19	28-Mar-19	7
	Walls			
	shuttering for Wall - 1st side	25-Mar-19	3-Apr-19	10
	Rebar Fixing	4-Apr-19	15-Apr-19	12
	shuttering for Wall - 2nd side	16-Apr-19	23-Apr-19	8
	Concreting - pour 1	24-Apr-19	24-Apr-19	1
Ground Level				
Area 2	**Staircase - pour 2**			
	Install Formwork for pour 2	22-Mar-19	26-Mar-19	4
	Drilling/ Rebar Fixing for pour 2	27-Mar-19	2-Apr-19	6
	Install Formwork otherside for pour 2	3-Apr-19	8-Apr-19	5
	Concrete -pour 2	9-Apr-19	10-Apr-19	1
	Curing	11-Apr-19	25-Apr-19	14
	Scaffold Dismantle	26-Apr-19	4-May-19	8
Parapet Wall	Concrete for Parapet Wall Pour 1	7-Jul-18	7-Jul-18	7
	Concrete for Parapet Wall Pour 2	27-Apr-19	7-May-19	10
Material Hoist	Removal of Material Hoist	11-Jan-19	31-Jan-19	20
Room 3	**Slab**			
	Install Steel Props	10-Apr-19	14-Apr-19	5
	shuttering	15-Apr-19	20-Apr-19	6
	Rebar Fixing	21-Apr-19	25-Apr-19	5
	Concreting	26-Apr-19	26-Apr-19	1
	Curing	27-Apr-19	3-May-19	7
	Wall (2 nos)			
	shuttering for Wall - 1st side	30-Apr-19	6-May-19	7
	Rebar Fixing	7-May-19	16-May-19	10
	shuttering for Wall - 2nd side	17-May-19	22-May-19	6
	Concreting - pour 1	23-May-19	23-May-19	1
	shutteringfor Wall - 1st side	24-May-19	28-May-19	5
	Rebar Fixing	29-May-19	1-Jun-19	4
	shuttering for Wall - 2nd side	2-Jun-19	5-Jun-19	4
	Concreting - pour 2	6-Jun-19	6-Jun-19	1



Civil Works Programme

	Description	Start	Finish	Dur
Civil Works prior to Esc installation (E18-E20)				
	Preparation Works before Hoarding Erection	4-Dec-18	21-Dec-18	18
	Hoarding Erection	25-Dec-18	13-Jan-19	20
	Rolocation of Signage (by KL095)	4-Jan-19	13-Jan-19	10
	Dismantle Ceiling, Relocation of Existing Services & Relocation of Beacons (Flexible	14-Jan-19	31-Jan-19	18
	Relocation of Advestising Panels	20-Jan-19	6-Feb-19	18
	Preparation Works at Mezzanine Level	5-Feb-19	13-Feb-19	9
	Demolition of Concrete Surface with Bondek at M-Level (approx.105m2, 200THK.), Dismantle Steal	19-Feb-19	14-Mar-19	24
	Preparation Works	19-Mar-19	24-Mar-19	6
	Demolition of Existing Floor Tiles& Removal of	26-Mar-19	5-Apr-19	11
	Dismantle Steal Beam (NTH)	9-Apr-19	18-Apr-19	10
	RC Works	23-Apr-19	8-May-19	16
Demolition of Vent shaft-X				
	1. Remove existing hoist system	31-Oct-18	5-Nov-18	6
	2. Disconnect existing BS Service	31-Oct-18	7-Nov-18	8
	3. Erect external temporary scaffold	6-Oct-18	12-Nov-18	38
	4. Erect scaffold inside vent shaft	13-Nov-18	19-Nov-18	7
	5. Erect crash slab	20-Nov-18	24-Nov-18	5
	5a. Demolish structure inside vent shaft	25-Nov-18	28-Nov-18	4
	8. Erect Temporary slab (flood protection)	30-Nov-18	13-Dec-18	12
	6. Remove exisitlng roof slab	14-Dec-18	21-Dec-18	7
	7. Remove 1 m high shaft wall (5 sides/ 7 cycle)	23-Dec-18	14-Jan-19	20
	9. Excavation for new slab/ install lateral support	15-Jan-19	25-Jan-19	10
	10. Construct new slab	26-Jan-19	4-Feb-19	10



Appendix D

SUMMARY OF WASTE FLOW TABLE

Monthly Summary Waste Flow Table for 2017

Name of Employer: MTR Corporation Limited									Contract No.: MTR1124				
Month	Actual Quantities of Inert C&D Materials Generated Monthly								Actual Quantities of Non-Inert C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete	Building Debris	Mixed Rock & Soil	Bentonite	Rubbish	Rock	Soil	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)
Feb	0.0089	0	0	0	0.0089	0	0	0	0	0	0	0	0.0887
Mar	0.0115	0.007	0	0	0.0045	0	0	0	0	0	0	0	0.1526
Apr	0.0150	0	0	0	0.0150	0	0	0	0	0	0	0	0.0856
May	0.4145	0.4145	0	0	0	0	0	0	0	0	0	0	0.0290
Jun	0.4218	0.4218	0	0	0	0	0	0	0	0	0	0	0.0147
Jul	0.1560	0.1560	0	0	0	0	0	0	0	0	0	0	0.0100
Aug	0.1300	0.1300	0	0	0	0	0	0	0	0	0	0	0.0249
Sep	0.1300	0.1300	0	0	0	0	0	0	0	0	0	0	0.0650
Oct	0.0320	0.0320	0	0	0	0	0	0	0	0	0	0	0.0414
Nov	0.1230	0.1230	0	0	0	0	0	0	0	0	0	0	0.0324
Dec	0.0880	0.0880	0	0	0	0	0	0	0	0	0	0	0.0384
Total	1.5307	1.5023	0	0	0.0284	0	0	0	0	0	0	0	0.5827

MTR 1124
Monthly Summary Waste Flow Table for 2018

Name of Employer: MTR Corporation Limited									Contract No.: MTR1124				
Month	Actual Quantities of Inert C&D Materials Generated Monthly								Actual Quantities of Non-Inert C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete	Building Debris	Mixed Rock & Soil	Bentonite	Rubbish	Rock	Soil	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)
Jan	0.023	0.023	0	0	0	0	0	0	0	0	0	0	0.204
Feb	0.031	0.031	0	0	0	0	0	0	0	0	0	0	0.241
Mar	0.034	0.034	0	0	0	0	0	0	0	0	0	0	0.225
Apr	0.011	0.011	0	0	0	0	0	0	0	0	0	0	0.301
May	0.021	0.021	0	0	0	0	0	0	0	0	0	0	0.284
Jun	0.027	0.027	0	0	0	0	0	0	0	0	0	0	0.188
Jul	0.022	0.022	0	0	0	0	0	0	0	0	0	0	0.144
Aug	0.027	0.027	0	0	0	0	0	0	0	0	0	0	0.111
Sep	0.015	0.015	0	0	0	0	0	0	0	0	0	0	0.066
Oct	0.021	0.021	0	0	0	0	0	0	0	0	0	0	0.073
Nov	0.015	0.015	0	0	0	0	0	0	0	0	0	0	0.099
Dec	0.014	0.014	0	0	0	0	0	0	0	0	0	0	0.071
Total	0.261	0.261	0	0	0.00	0	0	0	0	0	0	0	2.007

Notes:

1) Density of waste materials:

Bentonite, broken concrete, building debris, mixed rock & soil , soil, slurry	=	2.0
General Refuse	=	1.0
Waste Oil	=	1.0

MTR 1124
Monthly Summary Waste Flow Table for 2019

Name of Employer: MTR Corporation Limited									Contract No.: MTR1124				
Month	Actual Quantities of Inert C&D Materials Generated Monthly								Actual Quantities of Non-Inert C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete	Building Debris	Mixed Rock & Soil	Bentonite	Rubbish	Rock	Soil	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)
Jan	0.019	0.019	0	0	0	0	0	0	0	0	0	0	0.119
Feb	0.000	0	0	0	0	0	0	0	0	0	0	0	0
Mar	0.000	0	0	0	0	0	0	0	0	0	0	0	0
Apr	0.000	0	0	0	0	0	0	0	0	0	0	0	0
May	0.000	0	0	0	0	0	0	0	0	0	0	0	0
Jun	0.000	0	0	0	0	0	0	0	0	0	0	0	0
Jul	0.000	0	0	0	0	0	0	0	0	0	0	0	0
Aug	0.000	0	0	0	0	0	0	0	0	0	0	0	0
Sep	0.000	0	0	0	0	0	0	0	0	0	0	0	0
Oct	0.000	0	0	0	0	0	0	0	0	0	0	0	0
Nov	0.000	0	0	0	0	0	0	0	0	0	0	0	0
Dec	0.000	0	0	0	0	0	0	0	0	0	0	0	0
Total	0.019	0.019	0	0	0	0	0	0	0	0	0	0	0.119

Notes:

1) Density of waste materials:

Bentonite, broken concrete, building debris, mixed rock & soil , soil, slurry	=	2.0
General Refuse	=	1.0
Waste Oil	=	1.0

Appendix E

IMPLEMENTATION SCHEDULE FOR ENVIRONMENTAL MITIGATION MEASURES (ISEMM)

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
Culture Heritage Impact (Construction Phase)					
S4.93 & Table 4.2	Erection of decorative and sensibly designed hoarding along the boundary of the works area	To mitigate the temporary visual impact due to surface works	Contractor	Works Areas in Causeway Bay and Wan Chai, and Works Shaft in Admiralty	V
Ecological Impact (Construction Phase)					
S5.134	Accidental chemical spillage and construction site run-off to the receiving water bodies, mitigation measures such as removing the pollutants before discharge into storm drain and paving the section of construction road between the wheel washing bay and the public road as suggested in Sections 11.216 and 11.219 to 11.256 of the EIA Report shall be adopted	To minimize the contamination of wastewater discharge	Contractor	All land based works areas	V
Landscape and Visual Impact (Contraction Phase)					
Table 7.9	CM1 - Trees unavoidably affected by the works shall be transplanted as far as possible in accordance with ETWB TC(W) 3/2006 – Tree Preservation.	Transplanting and reuse of affected trees.	MTR	Works Sites	N/A
Table 7.9	CM2a - Compensatory tree planting shall be provided in accordance with ETWB TC(W) 3/2006 – Tree Preservation to compensate for felled trees and maintained until end of the establishment period.	Compensation for the removal of existing trees due to the Project.	MTR	Works Sites	N/A
Table 7.9	CM2b - Compensatory shrub planting shall be provided to compensate for the loss of shrub planting in amenity areas.	Compensation for the removal of existing trees due to the Project.	MTR	Works Sites	N/A
Table 7.9	CM3 - Control of night-time lighting glare	Minimize the night time glare due to the Project during construction phase	MTR	Works Sites	V
Table 7.9	CM4 - Erection of decorative screen hoarding compatible with the surrounding setting.	Minimize the visual impact of the Project during construction phase	MTR	Works Sites	V
Table 7.9	CM5 - Management of facilities on work sites which give control on the height and disposition/arrangement of all facilities on the works	Control of height and deposition/	MTR	Works Sites	V

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	site to minimize visual impact to adjacent VSRs	arrangement of temporary facilities in works areas			
Table 7.9	CM6 - All hard and soft landscape areas disturbed temporarily during construction shall be reinstated on like-to-like basis to the satisfaction of the relevant Government Departments.	Reinstatement of temporary works areas	MTR	Works Sites	N/A
/	All retained/exist trees shall be properly protected during construction period.	Tree protection	Contractor	Works Sites	N/A
Dust Impact (Construction Phase)					
/	Emission from Vehicles and Plants • All vehicles shall be shut down in intermittent use. • Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke. • All diesel fuelled construction plant within the works areas shall be powered by ultra low sulphur diesel fuel (ULSD)	Reduce air pollution emission from construction vehicles and plants	Contractor	Works Sites	V
S8.89	Watering once every working hour on active works areas, exposed areas and paved haul roads to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.7 L/m2 for Kowloon side and 1.0 L/m2 for Hong Kong side once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.7 L/m2 for Kowloon side and 1.0 L/m2 for Hong Kong side to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual.	To minimize dust impact	Contractor	Works areas	V
S8.90	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: • Use of regular watering to reduce dust emissions from exposed site surfaces	To minimize dust impact	Contractor	Works areas	V

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	and unpaved roads, particularly during dry weather. • Use of frequent watering for particularly dusty construction areas and areas close to ASRs. • Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. • Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. • Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. • Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. • Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. • Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit. • Imposition of speed controls for vehicles on site haul roads. • Where possible, routing of vehicles and positioning of construction plant shall be at the maximum possible distance from ASRs. • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. • Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise				
/	Dust suppression measures (con't) • De-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement	To minimize construction impact	Contractor	Works areas	V
Noise Impact (Construction Phase)					
S9.55	The following good site practices shall be implemented: • Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program • Silencers or mufflers on construction equipment shall be utilized and shall be	To minimize construction noise impact	Contractor	Works areas	V

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	properly maintained during the construction program • Mobile plant, if any, shall be sited as far from NSRs as possible • Machines and plant (such as trucks) that may be in intermittent use shall be shut down between work periods or shall be throttled down to a minimum • Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs • Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities				
/	• Install movable noise barriers, acoustic mat or full enclosure, screen the noisy plants during operation • Air compressors shall be fitted with valid noise emission labels during operation	To minimize construction noise impact	Contractor	Works areas	N/A
S9.56 & Table 9.16	The following quiet PME shall be used: • Crane lorry, mobile • Crane, mobile • Asphalt paver • Backhoe with hydraulic breaker • Breaker, excavator mounted (hydraulic) • Hydraulic breaker • Concrete lorry mixer • Poker, vibrator, hand-held • Concrete pump • Crawler crane, mobile • Mobile crane • Dump truck • Excavator • Truck • Rock drill • Lorry • Wheel loader • Roller vibratory	To minimize construction noise impact	Contractor	Works areas at: • Hung Hom • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunne	N/A
S9.58 – S9.59 & Table 9.17	Movable noise barrier shall be used for the following PME: • Air compressor • Asphalt paver • Backhoe with hydraulic breaker • Bar bender • Bar bender and cutter (electric) • Breaker, excavator mounted • Concrete pump • Concrete pump, stationary/lorry mounted • Excavator • Generator • Grout pump • Hand held breaker • Hydraulic	To minimize construction noise impact	Contractor	Works areas at: • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH •	N/A

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	breaker • Saw, concrete			EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunnel	
S9.60 & Table 9.17	Noise insulating fabric shall be used for • Drill rig, rotary type • Piling, diaphragm wall, bentonite filtering plant • Piling, diaphragm wall, grab and chisel • Piling, diaphragm wall, hydraulic extractor • Piling, large diameter bored, grab and chisel • Piling, hydraulic extractor • Piling, earth auger, auger • Rock drill, crawler mounted (pneumatic)	To minimize construction noise impact	Contractor	Works areas at: • Cross Harbour section up to Breakwater of CBTS • Breakwater of CBTS to SOV • SOV to EXH • EXH • EXH to open space at the junction of Expo Drive and Convention Avenue • Open space at the junction of Expo Drive and Convention Avenue to north of ADM • South of ADM to Overrun Tunne	N/A
Water Quality Impact (Construction Phase)					
S11.222 to 11.245	The site practices outlined in ProPECC PN 1/94 "Construction Site Drainage" shall be followed where practicable.	To minimize water quality impacts from construction site runoff and general construction activities	Contractor	Works area	@
S11.246 & 11.247	Construction work force sewage discharges on site are expected to be discharged to the nearby existing trunk sewer or sewage treatment	To minimize water quality impacts from	Contractor	Works area	V

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	facilities. If disposal of sewage to public sewerage system is not feasible, appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. The Contractor shall also be responsible for waste disposal and maintenance practices. Notices shall be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.	construction site runoff and general construction activities			
S11.248	In case seepage of uncontaminated groundwater occurs, groundwater shall be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process shall also be discharged into the storm system via silt traps	To minimize impact from discharge of uncontaminated groundwater	Contractor	Works area	N/A
S11.253	There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas shall be treated so that it satisfies all the standards listed in the TM-DSS. Minimum distances of 100 m shall be maintained between the discharge points of construction site effluent and the existing seawater intakes. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., can minimise water consumption and reduce the effluent discharge volume. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring shall be carried out in accordance with the WPCO license which is under the ambit of Regional Office (RO) of EPD	To minimize water quality impact from effluent discharges from construction sites	Contractor	All construction works areas	V
S11.254	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation shall be observed and complied with for control of chemical wastes.	To minimize water quality impact from accidental spillage of chemica	Contractor	All construction works areas	V
S11.255	Any service shop and maintenance facilities shall be located on hard standings within a bunded area, and sumps and oil interceptors shall be	To minimize water quality impact from	Contractor	All construction works areas	N/A

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage shall only be undertaken within the areas appropriately equipped to control these discharges	accidental spillage of chemical			
S11.256	Disposal of chemical wastes shall be carried out in compliance with the Waste Disposal Ordinance. The "Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes" published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: - Suitable containers shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport. - Chemical waste containers shall be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents. - Storage area shall be selected at a safe location on site and adequate space shall be allocated to the storage area	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	V
Waste Management (Construction Phase)					
S12.75	Good Site Practices and Waste Reduction Measures - Prepare a Waste Management Plan (WMP) approved by the Engineer/Supervising Officer of the Project based on current practices on construction sites; - Training of site personnel in, site cleanliness, proper waste management and chemical handling procedures; - Provision of sufficient waste disposal points and regular collection of waste; - Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; - Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and - Separation of chemical wastes for special handling and appropriate treatment.	To reduce waste management impacts	Contractor	All construction works areas	V
S12.76	Good Site Practices and Waste Reduction Measures (con't) - Sorting of demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions (i.e. soil, broken concrete, metal etc.); - Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; - Encourage collection of aluminum cans by providing separate labeled bins to enable this waste	To achieve waste reduction	Contractor	All construction works areas	V

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	to be segregated from other general refuse generated by the workforce; - Proper storage and site practices to minimize the potential for damage or contamination of construction materials; - Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; and - Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle.				
S12.77	Good Site Practices and Waste Reduction Measures (con't) - The Contractor shall prepare and implement a WMP as part of the EMP in accordance with ETWBTCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. Such a management plan shall incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials. The EMP shall be submitted to the Engineer for approval. The Contractor shall implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP shall be reviewed regularly and updated by the Contractor, preferably in a monthly basis.	To achieve waste reduction	Contractor	All construction works areas	V
S12.78	C&D materials would be reused in other local concurrent projects as far as possible. If all reuse outlets are exhausted during the construction phase, the C&D materials would be disposed of at Taishan, China as a last resort	To achieve waste reduction	Contractor	All construction works areas	V
S12.79	Storage, Collection and Transportation of Waste Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include: - Waste, such as soil, shall be handled and stored well to ensure secure containment, thus minimizing the potential of pollution; - Maintain and clean storage areas routinely; - Stockpiling area shall be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and - Different locations shall be designated to stockpile each material to enhance reuse	To minimize potential adverse environmental impacts arising from waste storage	Contractor	All construction works areas	V

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
S12.80	Storage, Collection and Transportation of Waste (con't) Waste haulier with appropriate permits shall be employed by the Contractor for the collection and transportation of waste from works areas to respective disposal outlets. The following suggestions shall be enforced to minimize the potential adverse impacts: - Remove waste in timely manner- Waste collectors shall only collect wastes prescribed by their permits - Impacts during transportation, such as dust and odour, shall be mitigated by the use of covered trucks or in enclosed containers - Obtain relevant waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28) - Waste shall be disposed of at licensed waste disposal facilities - Maintain records of quantities of waste generated, recycled and disposed	To minimize potential adverse environmental impacts arising from waste storage	Contractor	All construction works areas	V
S12.81	Storage, Collection and Transportation of Waste (con't) - Implementation of trip ticket system with reference to DevB TC(W) No.6/2010 to monitor disposal of waste and to control fly-tipping at PFRFs or landfills. A recording system for the amount of waste generated, recycled and disposed (including disposal sites) shall be proposed	To minimize potential adverse environmental impacts arising from waste storage	Contractor	All construction works areas	V
S12.83 – 12.86	Sorting of C&D Materials - Sorting to be performed to recover the inert materials, reusable and recyclable materials before disposal off-site. - Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. - The C&D materials shall at least be segregated into inert and non-inert materials, in which the inert portion could be reused and recycled as far as practicable before delivery to PFRFs as mentioned for beneficial use in other projects. While opportunities for reusing the non-inert portion shall be investigated before disposal of at designated landfills. - Possibility of reusing the spoil in the Project will be continuously investigated in the detailed design and construction stages, it includes backfilling to cut and cover construction works for the Hung Hom south and north approach tunnels	To minimize potential adverse environmental impacts during the handling, transportation and disposal of C&D materials	Contractor	All construction works areas	V

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
S12.97	Containers for Storage of Chemical Waste The Contractor shall register with EPD as a chemical waste producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Containers used for storage of chemical waste shall: - Be compatible with the chemical wastes being stored, maintained in good condition and securely sealed; - Have a capacity of less than 450 litters unless the specifications have been approved by EPD; and - Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation.	To register with EPD as a Chemical waste producer and store chemical waste in appropriate containers	Contractor	All construction works areas	V
S12.98	Chemical Waste Storage Area - Be clearly labeled to indicate corresponding chemical characteristics of the chemical waste and used for storage of chemical waste only; - Be enclosed on at least 3 sides; - Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest; - Have adequate ventilation; - Be covered to prevent rainfall from entering; and - Be properly arranged so that incompatible materials are adequately separated	To prepare appropriate storage areas for chemical waste at works areas	Contractor	All construction works areas	V
S12.99	Chemical Waste - Lubricants, waste oils and other chemical wastes would be generated during the maintenance of vehicles and mechanical equipments. Used lubricants shall be collected and stored in individual containers which are fully labelled in English and Chinese and stored in a designated secure place.	To clearly label the chemical waste at works areas	Contractor	works areas	V
S12.100	Collection and Disposal of Chemical Waste A trip-ticket system shall be operated in accordance with the Waste Disposal (Chemical Waste) (General) Regulation to monitor all movements of chemical waste. The Contractor shall employ a licensed collector to transport and dispose of the chemical wastes, to either the approved CWTC at Tsing Yi, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.	To monitor the generation, reuse and disposal of chemical waste	Contractor	works areas	V
S12.101	General Refuse General refuse shall be stored in enclosed bins or compaction units separate from C&D materials and chemical waste. A reputable waste collector shall be employed by the contractor to	To properly store and separate from other C&D materials for	Contractor	works areas	V

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	Implementation Status
	remove general refuse from the site, separately from C&D materials and chemical wastes. Preferably, an enclosed and covered area shall be provided to reduce the occurrence of wind-blown light material	subsequent collection and disposal			
S12.102	General Refuse (con't) The recyclable component of general refuse, such as aluminum cans, paper and cleansed plastic containers shall be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste shall be set up by the Contractor. The Contractor shall also be responsible for arranging recycling companies to collect these materials	To facilitate recycling of recyclable portions of refuse	Contractor	works areas	V
S12.103	3 General Refuse (con't) The Contractor shall carry out an education programme for workers in avoiding, reducing, reusing and recycling of materials generation. Posters and leaflets advising on the use of the bins shall also be provided in the sites as reminders.	To raise workers' awareness on recycling issue	Contractor	works areas	V

Legend: V = implemented; x = not implemented; @ = partially implemented; N/A = not applicable