Dragages -China Harbour-VSL JV

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge

Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Monthly EM&A Report

February 2017
(Version 2.0)

Certified By

Dr. Priscilla Choy
Environmental Team Leader
(Date: 13 March 2017)

REMARKS:

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

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

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EXECUTIVE SUMMARY

Introduction

1. This is the 49th monthly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for the project "Contract No. HY/2011/09 – Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill" (hereinafter called the "Contract"). This report documents the findings of EM&A Works conducted in February 2017.

Environmental Monitoring and Audit Progress

2. A summary of the monitoring activities in this reporting month is listed in **Table I** below:

Table I Summary Table for Monitoring Activities in the Reporting Month

Parameter(s)	**Date(s)**
1-hr TSP Monitoring	1st, 7th, 13th, 17th and 23rd February 2017
24-hr TSP Monitoring	1st, 7th, 13th, 17th and 23rd February 2017
Noise Monitoring	2nd, 8th, 14th and 24th February 2017
Water Quality Monitoring	1st, 3rd, 6th, 8th, 10th, 13th, 15th, 17th, 21st, 23rd, 25th and 27th February 2017
Dolphin Monitoring (Line-transect Vessel Surveys)	6th and 13th February 2017
Environmental Site Inspection	2nd, 7th, 14th, 21st and 28th February 2017

Breaches of Action and Limit Levels

3. Summary of the environmental exceedances of the reporting month is tabulated in **Table II**.

Table II Summary Table for Events Recorded in the Reporting Month

Environmental Monitoring	Parameter	No. of Exceedance		Total No. of Exceedance	No. of Exceedance related to the Construction Activities of this Contract		Total No. of Exceedance related to the Construction Activities of this Contract
		Action Level	Limit Level		Action Level	Limit Level	
Air Quality	1-hr TSP	0	0	0	0	0	0
	24-hr TSP	0	0	0	0	0	0
Noise	$L_{eq(30min)}$	0	0	0	0	0	0
Water Quality	Dissolved Oxygen (DO) (Surface & Middle)	0	0	0	0	0	0
	Dissolved Oxygen (DO) (Bottom)	0	0	0	0	0	0
	Turbidity	0	0	0	0	0	0
	Suspended Solids (SS)	4	8	12	0	0	0

1-hour TSP Monitoring

4. All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

24-hour TSP Monitoring

5. All 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

Construction Noise

6. All construction noise monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

Water Quality

7. All water quality monitoring was conducted as scheduled in the reporting month. There are four Action Level and eight Limit Level exceedances were recorded for suspended solids. No Action/Limit Level exceedance for dissolved oxygen and turbidity were recorded.

8. According to the investigation, the exceedances are considered not due to the Contract due to the following reasons:

   1) No pollution discharge from construction activity was observed;
   2) Localized sediment plume due to the rough water condition was observed.
   3) Adverse water quality outside the site boundary was observed while no construction vessel for this Contract was travelling nearby.

Complaint Log

9. No environmental complaint was received in the reporting month.

Notification of Summons and Successful Prosecutions

10. No notification of summons and successful prosecution was received in the reporting month.

Reporting Changes

11. This report has been developed in compliance with the reporting requirements for the subsequent monthly EM&A Report as required by the EM&A Manual for Hong Kong Link Road (EM&A Manual).

Future Key Issues

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

WA4

- Cross Beam Precast Shell construction

Ancillary and Associated Facilities

- E&M installation
- E&M ducting installation
- Construction of Load Centre (CL1)
- Installation of carrier drains
- Installation of precast parapet skins
- Erection of Radar Platform
- Construction of median and side barriers
- Construction of longitudinal stitching
- Erection of gantry posts for Sign gantry

- Reinstatement of slope area and drainage works
- Reinstatement of sloping seawall

Marine Viaduct (P0 to P80)

Deck Erection

- Segment erection
- Erection of SOP segments
- Erection of cantilever
- Construction of cross beam precase shell
- In-situ RC works
- Erection of precase SOP unit to Turnaround
- Alignment and levels adjustment
- Construction of temporary platform

External Prestressing Tendon Installation

Internal Prestressing Grouting

1 INTRODUCTION

1.1 Cinotech Consultants Limited (Cinotech) was appointed by Dragages -China Harbour-VSL JV (hereinafter called "the Contractor") as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) programme during construction phase of the Contract No. HY/2011/09 – Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill" (hereinafter called the "Contract") in accordance with EP Conditions 2.1.

Purpose of the report

1.2 This is the 49th EM&A report which summarises the impact monitoring results and audit findings for the EM&A programme in February 2017.

Structure of the report

1.3 The structure of the report is as follows:

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

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

Section 3: **Air Quality Monitoring -** summarises the monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations, Action and Limit Levels, monitoring results and Event / Action Plans.

Section 4: **Noise Monitoring -** summarises the monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations,

Action and Limit Levels, monitoring results and Event / Action Plans.

Section 5: **Water Quality Monitoring -** summarises the monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations, Action and Limit Levels, monitoring results and Event / Action Plans.

Section 6: **Dolphin-Related Monitoring -** summarises the monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations and monitoring results.

Section 7: **Environmental Site Inspection -** summarises the audit findings of the weekly site inspections undertaken within the reporting month.

Section 8: **Environmental Non-conformance -** summarises any monitoring exceedance, environmental complaints, environmental summons and successful prosecutions within the reporting month.

Section 9: **Future Key Issues -** summarises the impact forecast and monitoring schedule for the next three months.

Section 10: **Conclusions and Recommendation**

2 CONTRACT INFORMATION

Background

2.1 The proposed Hong Kong - Zhuhai - Macao Bridge Hong Kong Link Road (HKLR) is 12km long connecting the Hong Kong-Zhuhai-Macao Bridge (HZMB) at the HKSAR Boundary with the Hong Kong Boundary Crossing Facilities (HKBCF) situated at the north eastern waters of the Hong Kong International Airport, opening a new and direct connection route between Hong Kong, Macao and the Western Pearl River Delta.

2.2 The HKLR comprises a 9.4km long viaduct section from the HKSAR boundary to Scenic Hill on the Airport Island; a 1km tunnel section to the reclamation formed along the east coast of the Airport Island and a 1.6km long at-grade road section on the reclamation connecting to the HKBCF. The tunnel section of HKLR will pass under Scenic Hill, Airport Road and Airport Railway to minimize the environmental and visual impacts to Tung Chung residents.

2.3 An application (No ESB-110/2003) for an Environmental Impact Assessment (EIA) Study Brief under Section 5(1) of the Environmental Impact Assessment Ordinance (EIAO) was submitted by Highways Department (the Project Proponent) on 8 October 2003 with a Project Profile (No. No. PP-201/2003) for the Hong Kong - Zhuhai - Macao Bridge Hong Kong Section and North Lantau Highway Connection. The Hong Kong - Zhuhai - Macao Bridge Hong Kong Section and North Lantau Highway Connection has subsequently been renamed as HKLR. EPD issued an EIA Study Brief (No: ESB-110/2003) in November 2003 to the Project Proponent to carry out an EIA study.

2.4 An EIA Study (Reg. No. AEIAR-144/2009) has been undertaken to provide information on nature and extent of environmental impacts arising from the construction and operation of HKLR. The Environmental Permit was issued on 4 November 2009 (Permit No. EP-352/2009). Pursuant to Section 13 of the EIAO, the Director of Environmental Protection amends the Environmental Permit (No. EP-352/2009) based on the Application No. VEP-339/2011 and the environmental Permit (Permit No. EP-352/2009/A) was issued on 9 November 2011 for HKLR to the Highways Department as the Permit Holder. Subsequently, the Director of Environmental Protection amends the Environmental Permits (No. EP-352/2009/A, EP-352/2009/B, EP-352/2009/C) based on the Application No. VEP-409/2013, VEP-411/2013 and VEP-459/2014 respectively. The environmental Permit (Permit No. EP-352/2009/D) was then issued on 22 December 2014.

2.5 **Figure 1a-d** shows the layout of the Contract and the scope of the Contract works comprises the following major items:

- a dual 3-lane carriageway in the form of viaduct from the HKSAR boundary (connecting with the HZMB Main Bridge) to the Scenic Hill (connecting with the tunnel under separate Contract No. HY/2011/03), of approximately 9.4km in length with a hard shoulder for each bound of carriageway and a utilities trough on the outer edge of each bound of viaducts;
- a grade-separated turnaround facility located near San Shek Wan, composed of sliproads in the form of viaduct with single-lane carriageway bifurcated from the HKLR mainline with an elevated junction above the mainline;

- provision of ancillary facilities including, but not limited to, meteorological enhancement measures including the provisioning of anemometers and modification of the wind profiler station at hillside of Sha Lo Wan, provisioning of a compensatory marine radar, and provisioning of security systems; and
- associated civil, structural, geotechnical, marine, environmental protection, landscaping, drainage and highways electrical and mechanical (E&M) works, street lightings, traffic aids and sign gantries, marine navigational aids, ship impact protection system, water mains and fire hydrants, lightning protection system, structural health monitoring and maintenance management system (SHM&MMS), supervisory control and data acquisition (SCADA) system, as well as operation and maintenance provisions of viaducts, provisioning of facilities for installation of traffic control and surveillance system (TCSS), provisioning of facilities for installation of telecommunication cables/equipments and reprovisioning works of affected existing facilities/utilities.

Contract Organisation

2.6 Different parties with different levels of involvement in the Contract organization include:

- Supervising Officer's Representative (SOR) – Ove Arup & Partners Hong Kong Limited (ARUP)
- Contractor –Dragages -China Harbour-VSL JV (DCVJV)
- Environmental Team (ET) – Cinotech Consultants Ltd. (Cinotech)

2.7 The proposed project organization and lines of communication with respect to the on-site environmental management structure are shown in **Figure 2**. The key personnel contact names and numbers are summarized in **Table 2.1.**

Table 2.1 Key Contacts of the Contract

Party	Position	Position	Phone No.	Fax No.
SOR (ARUP)	CRE	Mr. Michael Chan	3767 5803	3767 5922
		Mr. Colin Meadows	3767 5801	
ENPO/IEC (Ramboll Environ)	Environmental Project Office Leader	Mr. Y. H Hui	3465 2888	3465 2899
	Independent Environmental Checker	Mr. Antony Wong	3465 2888	3465 2899
Contractor (DCVJV)	Deputy Project Director	Mr. W.K Poon	3121 6638	3121 6688
	Environmental Officer	Mr. CHU Chung Sing	3121 6672	
	24-hour Hotline	--	6898 6161	--
ET (Cinotech)	Environmental Team Leader	Dr. Priscilla Choy	2151 2089	3107 1388

2.8 Ramboll Environ Hong Kong Limited (Ramboll Environ) is employed by the Highways Department as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO) for the Project.

Construction Programme

2.9 A copy of Contractor's construction programme is provided in **Appendix A**.

Summary of Construction Works Undertaken During Reporting Month

2.10 The major site activities undertaken in the reporting month included:

Ancillary and Associated Facilities

(a) P115 & P114 interface area - Reinstatement of slope area temporarily on-hold pending for drainage and reinstatement detailing coupling with the additional maintenance path;
(b) Reinstatement of sloping seawall at P103, P104 and P101, P102 are in progress;
(c) The precast parapet progress is summarized as follows:

Item	Number in this month	Cumulative No. of Precast Parapet Completed (up to end of month)
Parapet Casting	623	4151
Parapet Installation	583	2632
In-situ concreting works	1393	629

(d) The central barrier progress is summarized as follows:

Type	Item	Monthly Workdone	Cumulative Workdone (up to end of month)
Central barrier (precast method)	Precast	757	3623
	Installation	230	926
Central barrier (precast + in-situ method)	In-fill concreting #	458	1275

"In-fill concreting" will be carried out after installation of precast units or formworks for precast method and in-situ method respectively. After the in-fill concreting works, the central barrier shall be regarded as completed.

(e) The side barrier progress is summarized as follows:

Type	Item	Monthly Workdone	Cumulative Workdone (up to 28th of month)
Side barrier (precast method)	Precast	870	3961
	Installation	394	1634
Side barrier (precast + in-situ method)	In-fill concreting #	177	2546

"In-fill concreting" will be carried out after installation of precast units or formworks for precast method and in-situ method respectively. After the in-fill concreting works, the side barrier shall be regarded as completed.

(f) Construction of the longitudinal stitching from P92 to P87 & P40 to P33 is in progress;
(g) Installation of carrier drains at P89L is in progress;
(h) Sealing of deck openings and preparation deck surface for waterproofing is in progress;
(i) Waterproofing and asphalt laying at ML16 to ML19 is in progress;

(j) Watermain installation from P99 to P97 and P44 to P42 is in progress;Watermain installation from P98 to P115 was completed;

(k) Sign gantry GW13, GE15 and GE13, GE14 were erected, posts for sign gantry GE12 and GW12 were erected.

E&M Works

(a) E&M works from ML3 to ML1 is in progress, E&M ducting installation at ML3 commenced;
(b) E&M ducting installation from ML5 to ML4 is in progress;
(c) E&M works inside SHT building is in progress;
(d) Street light cables and poles installation in ML19 & ML18 is in progress;
(e) Cable hanger installation from ML19 to ML15 is in progress;
(f) E&M ducting installation inside deck void from ML19 to ML15 was completed;
(g) E&M ducting installation at ML6 was completed;
(h) Cable hanger installation from ML6 to ML4 commenced;
(i) E&M ducting installation at radar platform commenced;
(j) Construction of Load Centre 7 commenced.

Deck Erection

(a) Segment erection in February 2017:

Type	Location of Segments erected in this reporting period	Number of Segments erected in this reporting period	Cumulative No. of Segments erected (up to 28th of each month)
Launching Gantry 1 (LG1)	All completed	0	1020
Launching Gantry 2 (LG2)	P0	0	1776
Lifting Frames 1 (LF1), Hanger Beam (HB) and Crane Barge	P67, P75, P78, P82 and P83	109	1141
Lifting Frames 1 (LF1), Hanger Beam (HB) and Crane Barge	P80	24	842
Typical Span SOP	P0	0	242
Long Span SOP	All completed	0	96
Movement Joint (MJ) SOP Airport Channel	All completed	0	20
Short Span (SS) and Movement Joint (MJ) SOP type B	All completed	0	16
Typical Span Segment type B	P55R, P56R&L, P57R&L & P58L	78	210
Segment Lifter / Crane Barge	P68 and P69	68	118

External Prestressing Tendon Installation

Viaduct	Activities	Quantities	Unit	Done %
	Threading	47.55	T	100%

Viaduct	Activities	Quantities	Unit	Done %
ML19C	Stressing Grouting	12 9.42	U M3	100% 100%
ML19R	Threading Stressing Grouting	48.65 12 9.64	T U M3	100% 100% 100%
ML19L	Threading Stressing Grouting	46.91 12 9.29	T U M3	100% 100% 100%
ML18R	Threading Stressing Grouting	77.90 18 15.38	T U M3	100% 100% 100%
ML18L	Threading Stressing Grouting	76.40 18 15.08	T U M3	100% 100% 100%
ML17R	Threading Stressing Grouting	63.09 16 12.44	T U M3	100% 100% 100%
ML17L	Threading Stressing Grouting	62.86 16 12.39	T U M3	100% 100% 100%
ML16R	Threading Stressing Grouting	56.69 15 9.91	T U M3	100% 100% 100%
ML16L	Threading Stressing Grouting	87.34 18 17.2	T U M3	100% 100% 100%
ML15R	Threading Stressing Grouting	108.74 18 21.15	T U M3	87% 66% 72%
ML15L	Threading Stressing Grouting	106.26 18 21.45	T U M3	87% 66% 72%
ML11R	Threading Stressing Grouting	164.83 24 32.72	T U M3	50% 0% 0%
ML11L	Threading Stressing Grouting	166.74 24 33.10	T U M3	50% 0% 0%
ML10R	Threading Stressing Grouting	121.69 16 24.17	T U M3	0% 0% 0%
ML10L	Threading Stressing Grouting	122.16 16 24.26	T U M3	0% 0% 0%
ML09R	Threading Stressing Grouting	140.32 32 27.73	T U M3	0% 0% 0%
ML09L	Threading Stressing Grouting	129.46 32 25.56	T U M3	0% 0% 0%
ML08R	Threading Stressing Grouting	85.72 24 16.89	T U M3	100% 16% 0%
ML08L	Threading Stressing Grouting	85.72 24 16.89	T U M3	100% 16% 0%
ML07R	Threading Stressing	129.58 32	T U	93% 17%

Viaduct	Activities	Quantities	Unit	Done %
	Grouting	25.59	M3	0%
ML07L	Threading Stressing Grouting	140.43 32 27.76	T U M3	44% 16% 0%
ML06R	Threading Stressing Grouting	113.04 24 22.35	T U M3	100% 100% 100%
ML06L	Threading Stressing Grouting	113.04 24 22.35	T U M3	100% 100% 100%
ML05R	Threading Stressing Grouting	113.68 24 22.48	T U M3	100% 100% 100%
ML05L	Threading Stressing Grouting	112.39 24 22.22	T U M3	100% 100% 100%
ML04R	Threading Stressing Grouting	113.04 24 22.35	T U M3	100% 100% 100%
ML04L	Threading Stressing Grouting	113.04 24 22.35	T U M3	100% 100% 100%
ML03R	Threading Stressing Grouting	199.65 32 39.615	T U M3	100% 100% 100%
ML03L	Threading Stressing Grouting	201.13 32 29.9	T U M3	100% 100% 100%
ML02R	Threading Stressing Grouting	113.72 24 22.49	T U M3	100% 100% 95%
ML02L	Threading Stressing Grouting	113.73 24 22.49	T U M3	100% 100% 100%
ML1R	Threading Stressing Grouting	113.72 24 22.49	T U M3	70% 66% 30%
ML1L	Threading Stressing Grouting	113.73 24 22.49	T U M3	70% 66% 30%

Internal Prestressing Grouting Progress

Viaduct	Activities	Quantities	Unit	Done %
ML19C	Air test & Grouting	14.09	M3	100%
ML19R	Air test & Grouting	14.90	M3	100%
ML19L	Air test & Grouting	13.90	M3	100%
ML18R	Air test & Grouting	25.24	M3	100%
ML18L	Air test & Grouting	24.76	M3	96%
ML17R	Air test & Grouting	23.47	M3	100%
ML17L	Air test & Grouting	23.46	M3	100%
ML16R	Air test & Grouting	36.54	M3	99%
ML16L	Air test & Grouting	35.46	M3	99%
ML15R	Air test & Grouting	39.34	M3	100%

Viaduct	Activities	Quantities	Unit	Done %
ML15L	Air test & Grouting	39.69	M3	100%
ML09R	Air test & Grouting	63.27	M3	24%
ML09L	Air test & Grouting	57.86	M3	32%
ML08R	Air test & Grouting	36.58	M3	31%
ML08L	Air test & Grouting	36.56	M3	31%
ML07R	Air test & Grouting	59.61	M3	46%
ML07L	Air test & Grouting	60.05	M3	55%
ML06R	Air test & Grouting	58.31	M3	100%
ML06L	Air test & Grouting	58.31	M3	100%
ML05R	Air test & Grouting	58.62	M3	100%
ML05L	Air test & Grouting	58.01	M3	100%
ML04R	Air test & Grouting	57.64	M3	100%
ML04L	Air test & Grouting	57.69	M3	100%
ML03R	Air test & Grouting	126.65	M3	31%
ML03L	Air test & Grouting	127.63	M3	62%
ML02R	Air test & Grouting	62.74	M3	32%
ML02L	Air test & Grouting	62.74	M3	32%
ML01R	Air test & Grouting	53.80	M3	0%
ML01L	Air test & Grouting	53.80	M3	0%

Turnaround Facilities

(a) Stitching works between 2 Box Girders BG03, BG04 and SOPs is in progress with the soffit casted;
(b) BG02 was completed;
(c) Steel fixing for BG01 top slab is in progress;
(d) Erection of formwork and steel fixing for 1st I-beam is in progress;
(e) Erection of extended platform at P56R is in progress.

Delivery for Precast Concrete Elements (by barge)

(a) Precast Deck Segments:

- Number of barges engaged in this period: 18.
- Number of deck segment deliveries in this period: 61 trips.
- Cumulative number of deck segment deliveries: 1112 trips.

Segment Types	Segment Delivered in this reporting period	Cumulative No. of Precast Segment Delivered (up to end of month)
A	2	2462
B	78	248
C	208	1602
D	0	216
E	0	1014

Status of Environmental Licences, Notification and Permits

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

Table 2.2 Status of Environmental Licences, Notification and Permits

Permit / License No.	Valid Period		Status
	From	To	
Environmental Permit (EP)			
EP-352/2009/D	22/12/2014	N/A	Valid
Consruction Noise Permit (CNP)			
P84 – P115: GW-RS1248-16	16/12/2016 (19:00)	15/06/2017 (23:00)	Valid
P69, P79 – P83: GW-RS1269-16	21/12/2016 (01:30)	20/03/2017 (07:00)	Valid
P69-P83: GW-RS1040-16	06/10/2016 (19:00)	05/04/2017 (24:00)	Valid
P0-P68: GW-RS1039-16	06/10/2016 (19:00)	05/04/2017 (24:00)	Valid
PWA4: GW-RW0576-16	07/10/2016 (00:00)	04/04/2017 (24:00)	Valid
Notification pursuant to Air Pollution Control (Construction Dust) Regulation			
345773	04/06/2012	N/A	Receipt acknowledged by EPD
Billing Account for Construction Waste Disposal			
A/C# 7015341 (Construction Site)	11/06/2012	N/A	Valid
Registration of Chemical Waste Producer			
WPN 5213-951-D2499-01	18/07/2012	N/A	Valid
Effluent Discharge License under Water Pollution Control Ordinance			
WA6A (DCVJV site office): WT00014053-2012	12/09/2012	30/09/2017	Valid
WA6B (SOR site office): WT00014447-2012	30/10/2012	31/10/2017	Valid
WA3: WT00015118-2013	30/01/2013	31/01/2018	Valid
Portion C: WT00023624-2016	17/02/2016	28/02/2018	Valid
Portion A: WT00016076-2013	21/05/2013	31/05/2018	Valid
WA4B: WT00014750-2012	12/08/2013	31/08/2018	Valid
WA7: WT00015722-2013	16/01/2013	31/01/2019	Site was handed over on 30 Jun 2016
P0 – P80: WT00018203-2014	30/01/2013	31/01/2019	Valid
P114: WT00018631-2014	31/03/2014	31/03/2019	Valid
P81-P83: WT00023608-2016	01/04/2016	31/07/2020	Valid

3 AIR QUALITY MONITORING

Monitoring Requirements

3.1 In accordance with the EM&A Manual, impact 1-hour TSP and 24-hour TSP monitoring were conducted to monitor the air quality for the Contract. **Appendix B** shows the established Action/Limit Levels for the air quality monitoring works.

3.2 Impact 1-hour TSP monitoring was conducted for at least three times every 6 days, while impact 24-hour TSP monitoring was conducted for at least once every 6 days at 2 air quality monitoring stations.

Monitoring Location

3.3 Impact air quality monitoring was conducted at the 2 monitoring stations under the Contract, as shown in **Figure 3**. **Table 3.1** describes the locations of the air quality monitoring stations.

Table 3.1 Location for Air Quality Monitoring Locations

Monitoring Stations	Location
AMS1	Sha Lo Wan
AMS4	San Tau

Monitoring Equipment

3.4 **Table 3.2** summarizes the equipment used in the impact air monitoring programme. Copies of calibration certificates are attached in **Appendix C**.

Table 3.2 Air Quality Monitoring Equipment

Equipment	Model and Make	Quantity
HVS Sampler	TISCH Model: TE-5170	2
Calibrator	TISCH Model: TE-5025A	1
Wind Anemometer	DAVIS Model: Vantage PRO2 6152CUK	1

Monitoring Parameters, Frequency and Duration

3.5 **Table 3.3** summarizes the monitoring parameters and frequencies of impact dust monitoring during the course of the Contract activities. The air quality monitoring schedule for the reporting month is shown in **Appendix D**.

Table 3.3 Impact Dust Monitoring Parameters, Frequency and Duration

Parameters	Frequency
1-hr TSP	Three times / 6 days
24-hr TSP	Once / 6 days

Monitoring Methodology and QA/QC Procedure

1-hour and 24-hour TSP Air Quality Monitoring

Instrumentation

3.6 High Volume Samplers (HVS) completed with appropriate sampling inlets were employed for air quality monitoring. Each sampler was composed of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complies with that required by USEPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50).

HVS Installation

3.7 The following guidelines were adopted during the installation of HVS:

- Sufficient support was provided to secure the sampler against gusty wind.
- No two samplers were placed less than 2 meters apart.
- The distance between the sampler and an obstacle, such as buildings, was at least twice the height that the obstacle protrudes above the sampler.
- A minimum of 2 meters of separation from walls, parapets and penthouses was required for rooftop samples.
- A minimum of 2 meters separation from any supporting structure, measured horizontally was required.
- No furnaces or incineration flues were nearby.
- Airflow around the sampler was unrestricted.
- The samplers were more than 20 meters from the drip line.
- Any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring.
- Permission must be obtained to set up the samples and to obtain access to the monitoring stations; and
- A secured supply of electricity is needed to operate the samplers.

Filters Preparation

3.8 Filter paper of size 8" X 10" was used. A HOKLAS accredited laboratory, ETS – Testconsult Limited (ETS), was responsible for the preparation of 24-hr conditioned and pre-weighed filter papers for Cinotech's monitoring team.

3.9 All filters, which were prepared by ETS, 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%.

3.10 ETS has comprehensive quality assurance and quality control programmes.

Operating/Analytical Procedures

3.11 Operating/analytical procedures for the air quality monitoring were highlighted as follows:

- Prior to the commencement of the dust sampling, the flow rate of the HVS was properly set (between 1.1 m^3/min. and 1.4 m^3/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50.
- The power supply was checked to ensure the sampler worked properly.
- On sampling, the sampler was operated for 5 minutes to establish thermal equilibrium before placing any filter media at the designated air quality monitoring station.
- The filter holding frame was then removed by loosening the four nuts and carefully a weighted and conditioned filter was centered with the stamped number upwards, on a supporting screen.
- The filter was aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter. Then the filter holding frame was tightened to the filter holder with swing bolts. The applied pressure should be sufficient to avoid air leakage at the edges.
- The shelter lid was closed and secured with the aluminum strip.
- The timer was then programmed. Information was recorded on the record sheet, which included the starting time, the weather condition and the filter number (the initial weight of the filter paper can be found out by using the filter number).
- After sampling, the filter was removed and sent to the ETS for weighing. The elapsed time was also recorded.
- Before weighing, all filters were equilibrated in a conditioning environment for 24 hours. The conditioning environment temperature should be between 25°C and 30°C and not vary by more than ±3°C; the relative humidity (RH) should be < 50% and not vary by more than ±5%. A convenient working RH is 40%. Weighing results were returned to Cinotech for further analysis of TSP concentrations collected by each filter.

Maintenance/Calibration

3.12 The following maintenance/calibration was required for the HVS:

- The high volume motors and their accessories were properly maintained. Appropriate maintenance such as routine motor brushes replacement and electrical wiring checking were made to ensure that the equipment and necessary power supply are in good working condition.
- All HVS were calibrated (five point calibration) using Calibration Kit prior to the commencement of the baseline monitoring and thereafter at bi-monthly intervals.

Results and Observations

3.13 The monitoring results for 1-hour TSP and 24-hour TSP are summarized in **Table 3.4 and 3.5** respectively. Detailed monitoring results and graphical presentations of 1-hour and 24-hour TSP monitoring results are shown in **Appendices E and F** respectively.

Table 3.4 Summary Table of 1-hour TSP Monitoring Results during the Reporting Month

Monitoring Station	Concentration (µg/m3)		Action Level, µg/m^3	Limit Level, µg/m^3
	Average	Range		
AMS1	113	24 – 243	381	500
AMS4	62	21 – 144	352	

Table 3.5 Summary Table of 24-hour TSP Monitoring Results during the Reporting Month

Monitoring Station	Concentration (µg/m3)		Action Level, µg/m^3	Limit Level, µg/m^3
	Average	Range		
AMS1	50	13 – 83	170	260
AMS4	56	46 – 73	171	

3.14 All 1-hour TSP monitoring was conducted as scheduled in the reporting. No Action/Limit Level exceedances were recorded.

3.15 All 24-hour TSP monitoring was conducted as scheduled in the reporting. No Action/Limit Level exceedances were recorded.

3.16 According to our field observations, the major dust source identified at the designated air quality monitoring stations in the reporting month are as follows:

Table 3.6 Observation at Dust Monitoring Stations

Monitoring Station	Major Dust Source
AMS1	Exhaust from marine traffic
AMS4	N/A

3.17 The wind speed and wind direction were recorded by the installed Wind Anemometer set at AMS4. The location is shown in **Figure 3**.

3.18 The wind data for the reporting month is summarized in **Appendix J**.

Event and Action Plan

3.19 Should non-compliance of the criteria occur, action in accordance with the Action Plan in **Appendix K** shall be carried out.

4 NOISE MONITORING

Monitoring Requirements

4.1 In accordance with EM&A Manual, two noise monitoring stations, namely NMS1 and NMS4 were selected for impact monitoring for the Contract. Impact noise monitoring was conducted for at least once per week during the construction phase of the Contract. **Appendix B** shows the established Action and Limit Levels for the noise monitoring works.

Monitoring Location

4.2 Impact noise monitoring was conducted at the 2 monitoring stations under the Contract, as shown in **Figure 3**. **Table 4.1** describes the locations of the noise monitoring stations.

Table 4.1 Location for Noise Monitoring Stations

Monitoring Stations	Location
NMS1	Sha Lo Wan
NMS4	San Tau

Monitoring Equipment

4.3 **Table 4.2** summarizes the noise monitoring equipment. Copies of calibration certificates are provided in **Appendix C**.

Table 4.2 Noise Monitoring Equipment

Equipment	Model and Make	Qty.
Integrating Sound Level Meter	SVAN977	1
Calibrator	SV 30A	1

Monitoring Parameters, Frequency and Duration

4.4 **Table 4.3** summarizes the monitoring parameters, frequency and total duration of monitoring. The noise monitoring schedule is shown in **Appendix D**.

Table 4.3 Noise Monitoring Parameters, Frequency and Duration

Monitoring Stations	Parameter	Period	Frequency
NMS1 NMS4	L_{10}(30 min.) dB(A) L_{90}(30 min.) dB(A) L_{eq}(30 min.) dB(A) (as six consecutive $L_{eq, 5min}$ readings)	0700-1900 hrs on normal weekdays	Once per week

Monitoring Methodology and QA/QC Procedures

- The microphone head of the sound level meter was positioned 1m exterior of the noise sensitive facade and lowered sufficiently so that the building's external wall acts as a reflecting surface.
- The battery condition was checked to ensure the correct functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
  - frequency weighting : A
  - time weighting : Fast
  - time measurement : L_{eq}(30 min.) dB(A) (as six consecutive $L_{eq, 5min}$ readings) during non-restricted hours (i.e. 0700-1900 hrs on normal weekdays)

- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94.0 dB at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1.0 dB, the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.
- During the monitoring period, the L_{eq}, L_{90} and L_{10} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- Noise measurement was paused temporarily during periods of high intrusive noise (e.g. dog barking, helicopter noise) if possible and observation was recorded when intrusive noise was not avoided.
- Noise monitoring was cancelled in the presence of fog, rain, and wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m/s.

Maintenance and Calibration

4.5 The microphone head of the sound level meter and calibrator were cleaned with a soft cloth at quarterly intervals.

4.6 The sound level meter and calibrator were checked and calibrated at yearly intervals.

4.7 Immediately prior to and following each noise measurement the accuracy of the sound level meter shall be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements may be accepted as valid only if the calibration levels from before and after the noise measurement agree to within 1.0 dB.

Results and Observations

4.8 The noise monitoring results are summarized in **Table 4.4**. Detailed monitoring results and graphical presentations of noise monitoring are shown in **Appendices G**.

Table 4.4 Summary Table of Noise Monitoring Results during the Reporting Month

Monitoring Station	Noise Level, $L_{eq\ (30min)}$ dB(A)		Limit Level
	Average	Range	
NMS1	64	61 – 67	75 dB(A)
NMS4	62	61 – 63	

Remark: +3dB(A) Façade correction included

4.9 All noise monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

4.10 According to our field observations, the major noise source identified at the designated noise monitoring stations in the reporting month are as follows:

Table 4.5 Observation at Noise Monitoring Stations

Monitoring Station	Major Noise Source
NMS1	Air traffic & marine traffic noise
NMS4	Air traffic & marine traffic noise

Event and Action Plan

4.11 Should non-compliance of the criteria occur, action in accordance with the Action Plan in **Appendix K** shall be carried out.

5 WATER QUALITY MONITORING

Monitoring Requirements

5.1 According to EM&A Manual, impact water quality monitoring shall be carried out three days per week during the construction period. The interval between two sets of monitoring will not be less than 36 hours.

5.2 Replicate in-situ measurements and samples collected from each independent sampling event shall be collected to ensure a robust statistically interpretable database.

5.3 Impact water quality monitoring was conducted two times per monitoring day during mid ebb (within ± 1.75 hours of the predicted time) and mid flood tides (within ± 1.75 hours of the predicted time) at three depths (i.e. 1m below surface, mid-depth and 1m above seabed, except where the water depth less than 6m, mid-depth station may be omitted. Should the water depth be less than 3m, only the mid-depth station was monitored) Dissolved oxygen, Suspended solids (SS), turbidity, pH, salinity and temperature were monitored in accordance with the requirements set out in the EM&A Manual.

5.4 The proposal for changing Action and Limit Levels for water quality monitoring was submitted to EPD on 15 March 2013. No objection was received from EPD according to the letter (ref. (10) in Ax(3) to EP2/G/A/129pt.4) dated 25 March 2013. Therefore, the updated Action and Limit Levels for water quality monitoring was used for comparison starting from 25 March 2013.

5.5 **Appendix B** shows the established Action/Limit Levels for the water quality monitoring works.

Monitoring Locations

5.6 Impact water quality monitoring was conducted at 14 monitoring stations under the Contract which are summarized in **Table 5.1**. The monitoring station is also shown in **Figure 4**.

Table 5.1 Location for Marine Water Quality Monitoring Locations

Monitoring Stations	Coordinates	
	Easting	Northing
IS1	803474	815060
IS2	804851	815715
IS3	806502	815743
IS4	807008	816986
CS1	801784	812711
CS2	805849	818780
SR1	803126	812379
SR2	807856	816953
SR3	810525	816456
SR6	805837	821818
ST1	802677	816006
ST2	804055	818840

Monitoring Stations	Coordinates	
	Easting	Northing
ST3	800667	810126
SRA	809872	817152

Monitoring Equipment

Instrumentation

5.7 A multi-parameter meters (Model YSI 6820-C-M) were used to measure DO, turbidity, salinity, pH and temperature.

Dissolved Oxygen (DO) and Temperature Measuring Equipment

5.8 The instrument for measuring dissolved oxygen and temperature was portable and weatherproof complete with cable, sensor, comprehensive operation manuals and use DC power source. It was capable of measuring:

- a dissolved oxygen level in the range of 0-20 mg/L and 0-200% saturation; and
- a temperature of 0-45 degree Celsius.

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

5.10 Sufficient stocks of spare electrodes and cables were available for replacement where necessary.

5.11 Salinity compensation was built-in in the DO equipment.

Turbidity

5.12 Turbidity was measured in situ by the nephelometric method. The instrument was portable and weatherproof using a DC power source complete with cable, sensor and comprehensive operation manuals. The equipment was capable of measuring turbidity between 0-1000 NTU. The probe cable was not less than 25m in length. The meter was calibrated in order to establish the relationship between NTU units and the levels of suspended solids. The turbidity measurement was carried out on split water sample collected from the same depths of suspended solids samples.

Sampler

5.13 A water sampler, consisting of a transparent PVC or glass cylinder of a capacity of not less than two litres which can be effectively sealed with cups at both ends was used. The water sampler has a positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler was at the selected water depth.

Water Depth Detector

5.14 A portable, battery-operated echo sounder was used for the determination of water depth

at each designated monitoring station.

pH

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

Salinity

5.16 A portable salinometer capable of recording salinity within the range of 0-40 ppt was used for salinity measurements.

Monitoring Position Equipment

5.17 A hand held Differential Global Positioning System (DGPS) was used during water quality monitoring to ensure the monitoring vessel is at the correct location before taking measurements.

Sample Container and Storage

5.18 Following collection, water samples for laboratory analysis were stored in high density polythene bottles (250ml/1L) with no preservatives added, packed in ice (cooled to 4°C without being frozen) and kept in dark during both on-site temporary storage and shipment to the testing laboratory. The samples were delivered to the laboratory as soon as possible and the laboratory determination works were started within 24 hours after collection of the water samples. Sufficient volume of samples was collected to achieve the detection limit.

Calibration of In Situ Instruments

5.19 All in situ monitoring instruments were checked, calibrated and certified by a laboratory accredited under HOKLAS or other international accreditation scheme before use, and subsequently re-calibrated at 3 monthly intervals throughout all stages of the water quality monitoring programme. 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 event.

5.20 For the on site calibration of field equipment (Multi-parameter Water Quality System), the BS 1427:2009, "Guide to on-site test methods for the analysis of waters" was observed.

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

5.22 The equipment used for impact water quality monitoring is shown in **Table 5.2** and copies of the calibration certificates are shown in **Appendix C**. All the monitoring

equipment complied with the requirements set out in the EM&A Manual.

Table 5.2 Water Quality Monitoring Equipment

Equipment	Model and Make	Qty
Sonar Water Depth Detector	Garmin Fishfinder 140	2
Monitoring Position Equipment	KODEN DGPS (KGP913MKIID, GA-08 & BA-03)	2
Multi-parameter Water Quality System	YSI EXO	2
Water Sampler	Kahlsico Water-Bottle Model 135DW 150	2

Monitoring Parameters, Frequency

5.23 **Table 5.3** summarizes the monitoring parameters, monitoring period and frequencies of the water quality monitoring. The water quality monitoring schedule for the reporting month is shown in **Appendix D**.

Table 5.3 Water Quality Monitoring Parameters and Frequency

Monitoring Stations	Parameters, unit	Depth	Frequency
IS1, IS2, IS3 IS4, CS1, CS2, SR1, SR2, SR3, SR6, ST1, ST2, ST3, SRA	• Temperature(°C) • pH(pH unit) • turbidity (NTU) • water depth (m) • salinity (ppt) • dissolved oxygen (DO) (mg/L and % of saturation) • suspended solids (SS) (mg/L)	• 3 water depths: 1m below sea surface, mid-depth and 1m above sea bed. • If the water depth is less than 3m, mid-depth sampling only. • If water depth less than 6m, mid-depth may be omitted.	• Impact monitoring: 3 days per week, at mid-flood and mid-ebb tides during the construction period of the Contract

5.24 Monitoring location/position, time, water depth, sampling depth, pH, salinity, DO saturation, water temperature, tidal stages, weather conditions and any special phenomena or work underway nearby were recorded.

Monitoring Methodology

Instrumentation

5.25 A multi-parameter meters (Model YSI 6820-C-M) were used to measure DO, turbidity, salinity, pH and temperature.

Operating/Analytical Procedures

5.26 The monitoring stations were accessed by the guide of a hand-held Differential Global Positioning System (DGPS) during water quality monitoring in accordance with the EM&A Manual. The depth of the monitoring location was measured using depth meter

in order to determine the sampling depths. Afterwards, the probes of the in-situ measurement equipment were lowered to the predetermined depths (1 m below water surface, mid-depth and 1 m above seabed) and the measurements were carried out accordingly.

5.27 At each measurement, two consecutive measurements of DO concentration, DO saturation, salinity, turbidity, pH and temperature were taken. The probes were retrieved out of the water after the first measurement and then re-deployed for the second measurement. Where the difference in the value between the first and second readings of each set was more than 25% of the value of the first reading, the reading was discarded and further readings were taken.

5.28 Water sampler was lowered into the water to the required depths of sampling. Upon reaching the pre-determined depth, a messenger to activate the sampler was then released to travel down the wire. The water sample was sealed within the sampler before retrieving. At each station, water samples at three depths (1 m below water surface, mid-depth and 1 m above seabed) were collected accordingly. Water samples were stored in a cool box and kept at less than 4°C but without frozen and sent to the laboratory as soon as possible. In addition, field information as described in Section 5.23 was also recorded.

Laboratory Analytical Methods

5.29 The testing of all parameters was conducted by CMA Testing and Certification Laboratories (HOKLAS Registration No.004) and comprehensive quality assurance and control procedures in place in order to ensure quality and consistency in results. The testing method, reporting limit and detection limit are provided in **Table 5.4**.

Table 5.4 Methods for Laboratory Analysis for Water Samples

Determinant	Instrumentation	Analytical Method	Detection Limit
Suspended Solid (SS)	Weighing	APHA 21e 2540D	0.5 mg/L

QA/QC Requirements

Decontamination Procedures

5.30 Water sampling equipment used during the course of the monitoring programme was decontaminated by manual washing and rinsed clean seawater/distilled water after each sampling event. All disposal equipment was discarded after sampling.

Sampling Management and Supervision

5.31 All sampling bottles were labelled with the sample I.D (including the indication of sampling station and tidal stage e.g. IS1_me_a), laboratory number and sampling date. Water samples were dispatched to the testing laboratory for analysis as soon as possible after the sampling. All samples were stored in a cool box and kept at less than 4°C but without frozen. All water samples were handled under chain of custody protocols and relinquished to the laboratory representatives at locations specified by the laboratory.

5.32 The laboratory determination works were started within 24 hours after collection of the water samples.

Quality Control Measures for Sample Testing

5.33 The samples testing were performed by CMA Testing and Certification Laboratories.

5.34 The following quality control programme was performed by the CMA Testing and Certification Laboratories for every batch of 20 samples:

- ✧ One set of quality control (QC) samples.

Maintenance and Calibration

5.35 All in situ monitoring instruments were checked, calibrated and certified by a laboratory accredited under HOKLAS or other international accreditation scheme before use, and subsequently re-calibrated at 3 monthly intervals throughout all stages of the water quality monitoring programme.

Results and Observations

5.36 The monitoring results and graphical presentation of water quality at the monitoring stations is shown in **Appendix H.**

5.37 The summary of exceedance record in reporting month is shown in **Appendix L** and summarized in the **Table 5.5**.

Table 5.5 Summary of Water Quality Exceedances

Station	Exceedance Level	DO (Surface & Middle)		DO(Bottom)		Turbidity		SS		Total Number of Exceedances	
		Mid-Ebb	Mid-Flood	Mid-Ebb	Mid-Flood	Mid-Ebb	Mid-Flood	Mid-Ebb	Mid-Flood	Mid-Ebb	Mid-Flood
IS1	Action Level								01/02/2017	0	1
	Limit Level								13/02/2017	0	1
IS2	Action Level								01/02/2017	0	1
	Limit Level								13/02/2017	0	1
IS3	Action Level									0	0
	Limit Level									0	0
IS4	Action Level								01/02/2017	0	1
	Limit Level								13/02/2017	0	1
SR1	Action Level									0	0
	Limit Level									0	0
SR2	Action Level									0	0
	Limit Level									0	0
SR3	Action Level									0	0
	Limit Level									0	0
SR6	Action Level									0	0
	Limit Level								01/02/2017 13/02/2017	0	2
ST1	Action Level								01/02/2017	0	1
	Limit Level								13/02/2017	0	1
ST2	Action Level									0	0
	Limit Level								01/02/2017 13/02/2017	0	2
ST3	Action Level									0	0
	Limit Level									0	0
SRA	Action Level									0	0
	Limit Level									0	0
Total	Action Level	0	0	0	0	0	0	0	4	4	
	Limit Level	0	0	0	0	0	0	0	8	8	

5.38 All water quality monitoring was conducted as scheduled in the reporting month. There are four Action Level and eight Limit Level exceedances were recorded for suspended solids. No Action/Limit Level exceedance for dissolved oxygen and turbidity were recorded.

5.39 According to the investigation, the exceedances are considered not due to the Contract due to the following reasons:

1) No pollution discharge from construction activity was observed;
2) Localized sediment plume due to the rough water condition was observed.
3) Adverse water quality outside the site boundary was observed while no construction vessel for this Contract was travelling nearby.

Event and Action Plan

5.40 Should non-compliance of the criteria occur, action in accordance with the Action Plan in **Appendix K** shall be carried out.

6 DOLPHIN-RELATED MONITORING

Monitoring Requirements

6.1 According to Section 10 of the EM&A Manual, four kinds of ecological monitoring works are required during the construction phase, namely dolphin monitoring, construction-phase underwater noise monitoring, dolphin behavior monitoring and land-based dolphin behavior and movement monitoring. The 30 days of construction-phase underwater noise monitoring, dolphin behavior monitoring and land-based dolphin behavior and movement monitoring were completed in July 2013.

6.2 The monitoring work shall be undertaken by suitably qualified specialist(s), (i.e. dolphin specialist and bio-acoustician), who shall have sufficient (at least 5-10 years) relevant post-graduate experience and publication in the respective aspects. They should be approved by Agriculture, Fisheries and Conservation Department (AFCD) and Environmental Protection Department (EPD).

Dolphin Monitoring (Line-transect Vessel Survey)

Monitoring Requirements

6.3 According to EM&A Manual Section 10.3.2, a dolphin monitoring programme should be set up to verify the predictions of impacts and to ensure that there are no unforeseen impacts on the dolphin population during construction phase.

6.4 Following the requirement in the EM&A Manual Section 10.4.1, the dolphin monitoring should adopt line-transect vessel survey method, and cover the following line-transect survey areas as in AFCD annual marine mammal monitoring programme.

Monitoring Location

6.5 For this contract, dolphin monitoring will be carried out in the West Lantau (WL) along the line transect as depicted in **Figure 1** of **Appendix I**. The co-ordinates of all transect lines are shown in **Table 6.1**.

Table 6.1 Co-ordinates of transect lines in WL survey area

Line No.		Easting	Northing	Line No.		Easting	Northing
1	Start Point	803750	818500	7	Start Point	800200	810450
1	End Point	803750	815500	7	End Point	801400	810450
2	Start Point	803750	815500	8	Start Point	801300	809450
2	End Point	802940	815500	8	End Point	799750	809450
3	Start Point	802550	814500	9	Start Point	799400	808450
3	End Point	803700	814500	9	End Point	801430	808450
4	Start Point	803120	813600	10	Start Point	801500	807450
4	End Point	801640	813600	10	End Point	799600	807450

Line No.		Easting	Northing	Line No.		Easting	Northing
5	Start Point	801100	812450	11	Start Point	800300	806500
5	End Point	802900	812450	11	End Point	801750	806500
6	Start Point	802400	811500	12	Start Point	801760	805450
6	End Point	800660	811500	12	End Point	800700	805450

Monitoring Frequency

6.6 Dolphin transect survey was carried out at least twice a month (i.e. complete all the transect lines of West Lantau survey area twice per month) throughout the construction period.

Monitoring Day

6.7 Dolphin monitoring was carried out on 6th and 13th February 2017. The dolphin monitoring schedule for the reporting period is shown in **Appendix D**.

Monitoring Results

6.8 From these surveys, a total of 65.67 km of survey effort was collected, with 82.2% of the total survey effort being conducted under favorable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility) Out of the 65.67 km of survey effort, the total survey effort conducted on primary lines (the horizontal lines perpendicular to the coastlines) was 43.63 km.

6.9 10 groups of 36 Chinese White Dolphins were sighted from primary lines. Notably, two of the 10 dolphin groups were associated with operating gill-netters. Distribution of the dolphin sightings made during February's surveys is shown in Figure 4 of Appendix D. These sightings were evenly spread in the middle portion of WL survey area, with slightly higher concentration to the west of Tai O Peninsula and to the southwest of Peaked Hill (Figure 4 of Appendix D). Only one dolphin group was sighted in the vicinity of the HKLR09 alignment (Figure 4 of Appendix D).

6.10 Dolphin encounter rates deduced from the survey effort and on-effort sighting data made under favourable conditions (Beaufort 3 or below) are shown in **Table 6.2**.

Table 6.2 Dolphin encounter rates (sightings per 100 km of survey effort) in September's surveys

		Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)	**Encounter rate (ANI)** (no. of dolphins from all on-effort sightings per 100 km of survey effort)
		Primary Lines Only	**Primary Lines Only**
WL	Set 1: February 6th	21.8	116.4
	Set 2: February 13th	18.6	69.6

6.11 The average group size of Chinese White Dolphins was 3.6 individuals per group during February's surveys, which was slightly higher than the averages in previous months of monitoring surveys.

6.12 Half of the 10 dolphin groups were small in size with only 1-3 animals per group, while the other five groups were medium-sized with 5-7 animals per group.

6.13 During this month of dolphin monitoring, marine construction activities have continued under this contract. However, no adverse impact on Chinese white dolphins was noticeable from general observations.

6.14 Evaluation of impacts on dolphins due to construction work will be conducted in the quarterly EM&A report.

6.15 Detailed monitoring methodology and results can be found in **Appendix I**.

Additional Land-based Dolphin Behaviour and Movement Monitoring

6.16 A total of 64 days of additional monitoring according to the Proposal for Land-based Dolphin Behaviour and Movement Monitoring had been completed in August 2016.

6.17 Detailed monitoring methodology and results will be provided in a separate report.

7 ENVIRONMENTAL SITE INSPECTION

Site Audits

7.1 Site audits were carried out by ET on weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Contract site. The summaries of site audits are attached in **Appendix M**.

7.2 Site audits were conducted on 2nd, 7th, 14th, 21st and 28th February 2017 by ET after the commencement of construction works for the Contract. A joint site audit with the representative with IEC, SOR, the Contractor and the ET was carried out on 21st February 2017. The details of observations during site audit can refer to **Table 7.1**.

7.3 According to EP condition 4.7 and EM&A Manual, periodic monitoring (every three months) of construction works shall be conducted to ensure the avoidance of any impacts on Sha Lo Wan (West) Archaeological Site. Access to Sha Lo Wan (West) Archaeological site for works areas and storage of construction equipment is not allowed. The 16th inspection to the Sha Lo Wan (West) Archaeological Site was conducted on 13th December 2016 and next inspection will be conducted in March 2017.

Implementation Status of Environmental Mitigation Measures

7.4 According to the EIA Study Report, Environmental Permit and the EM&A Manual, the mitigation measures detailed in the documents are recommended to be implemented during the construction phase. An updated summary of the EMIS is provided in **Appendix N**.

7.5 Regular marine travel route for marine vessels were implemented properly in accordance with the submitted plan and relevant records were kept properly.

7.6 Acoustic decoupling measures for the stationary equipment (generators, winch generators and air compressors) mounted on boards were adopted according to EP Condition 3.7 and EM&A Manual, Section 10.2.18.

7.7 Dolphin exclusion zone and dolphin watching plan according to EM&A Manual, Section 10.2.12 and EP Condition 3.5 was implemented by DCVJV's trained dolphin watcher.

7.8 Spill kits and booms are ready on site for the event of accidental spillage of oil or other hazardous chemicals from construction activities including vessels operating for the Contract.

7.9 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 7.1**.

Table 7.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Water Quality	170207-R02	Sand and debris near the site boundary of P69 should be cleared.	Rectification/improvement was observed during the follow-up audit session on 14 February 2017.
	170221-R05	Contaminated sand near the site boundary at P55 should be cleared to prevent muddy discharge into sea.	Rectification/improvement was observed during the follow-up audit session on 28 February 2017.
Ecology	N/A(1)	N/A(1)	N/A(1)
Air Quality	170214-R01	Dusty material at P54 should be cleared.	Rectification/improvement was observed during the follow-up audit session on 28 February 2017.
	170221-R03	Dusty material along P54-58 should be cleared.	Rectification/improvement was observed during the follow-up audit session on 28 February 2017.
Noise	170207-R04	NRMM label should be provided to the plant at P76.	Rectification/improvement was observed during the follow-up audit session on 14 February 2017.
Waste / Chemical Management	170202-R01	Oil stain should be cleared at P11 and Portion C.	Rectification/improvement was observed during the follow-up audit session on 14 February 2017.
	170202-R02	Accumulated waste at P10 should be cleared.	Rectification/improvement was observed during the follow-up audit session on 7 February 2017.
	170202-R03	Drip tray should be provided to the chemical containers at P11 and the plant at Portion C.	Rectification/improvement was observed during the follow-up audit session on 14 February 2017.
	170202-R04	Chemical container at P57 should be provided with chemical label.	Rectification/improvement was observed during the follow-up audit session on 7 February 2017.
	170207-R01	Chemical containers at P69 should be provided with drip trays.	Rectification/improvement was observed during the follow-up audit session on 14 February 2017.
	170207-R03	Oil stain at P69, 75, 76 should be cleared.	Rectification/improvement was observed during the follow-up audit session on 14 February 2017.
	170207-R05	Power plant at Portion C should be provided with drip tray and oil stain should be removed.	Rectification/improvement was observed during the follow-up audit session on 14 February 2017.
	170214-R02	Oil stain at P56 and Portion A P89 should be cleared.	Rectification/improvement was observed during the follow-up audit session on 21 February 2017.
	170214-R03	Drip tray should be provided to chemical containers at P57 and Portion A P89.	Rectification/improvement was observed during the follow-up audit session on 21 February 2017.

Parameters	Date	Observations and Recommendations	Follow-up
	170214-R04	General waste at Portion A P83 and chemical waste at Portion C should be cleared.	Rectification/improvement was observed during the follow-up audit session on 21 February 2017.
	170221-R01	House-keeping should be enhanced at P59, P82 Portion A.	Rectification/improvement was observed during the follow-up audit session on 28 February 2017.
	170221-R02	Oil stain at P57 should be cleared.	Rectification/improvement was observed during the follow-up audit session on 28 February 2017.
	170221-R04	Chemical waste at P57 should be properly stored.	Rectification/improvement was observed during the follow-up audit session on 28 February 2017.
	170228-R01	Accumulated waste at P57 and Portion A(P84) should be cleared regularly.	Rectification/improvement was observed during the follow-up audit session on 7 March 2017.
	170228-R02	Chemical containers at Portion C(P107) should be with chemical labels and provided with drip tray.	Rectification/improvement was observed during the follow-up audit session on 7 March 2017.
Landscape & Visual Impact	N/A(1)	N/A(1)	N/A(1)
Permits/Licences	N/A(1)	N/A(1)	N/A(1)
Other	N/A(1)	N/A(1)	N/A(1)
Cultural Heritage (Sha Lo Wan (West) Archaeological Site)	13/12/2016	N/A(1)	N/A(1)

Remark: N/A(1) - No major environmental deficiency was identified during the site inspection in the reporting month.

Advice on the Solid and Liquid Waste Management Status

7.10 According to the Contractor, 7781m^3 inert C&D materials were generated during the reporting month.

7.11 The Contractor was advised to minimize the wastes generated through the recycling or reusing. All mitigation measures stipulated in approved waste management plan shall be fully implemented.

7.12 The amount of wastes generated by the activities of the Contract during the reporting month is shown in **Appendix O**.

8 ENVIRONMENTAL NON-CONFORMANCE (EXCEEDANCES)

Summary of Exceedances

8.1 Summary of exceedance is provided in **Appendix L**.

8.2 No Action/Limit Level exceedance was recorded for air quality and construction noise.

8.3 There are four Action Level and eight Limit Level exceedances were recorded for suspended solids. No Action/Limit Level exceedance for dissolved oxygen and turbidity were recorded.

8.4 According to the investigation, the exceedances are considered not due to the Contract due to the following reasons:

1) No pollution discharge from construction activity was observed;
2) Localized sediment plume due to the rough water condition was observed.
3) Adverse water quality outside the site boundary was observed while no construction vessel for this Contract was travelling nearby.

Summary of Environmental Complaint

8.5 No environmental related complaint was received in the reporting month. The Complaint Log is attached in **Appendix P**.

Summary of Notification of Summons and Successful Prosecution

8.6 There was one prosecution or notification of summons received since the Contract commencement. Summary of successful prosecution as attached in **Appendix Q**.

9 FUTURE KEY ISSUES

Key Issues in the Coming Month

9.1 Major site activities for the coming reporting month will include:

WA4

- Cross Beam Precast Shell construction

Ancillary and Associated Facilities

- E&M installation
- E&M ducting installation
- Construction of Load Centre (CL1)
- Installation of carrier drains
- Installation of precast parapet skins
- Erection of Radar Platform
- Construction of median and side barriers
- Construction of longitudinal stitching
- Erection of gantry posts for Sign gantry
- Reinstatement of slope area and drainage works
- Reinstatement of sloping seawall

Marine Viaduct (P0 to P80)

Deck Erection

- Segment erection
- Erection of SOP segments
- Erection of cantilever
- Construction of cross beam precase shell
- In-situ RC works
- Erection of precase SOP unit to Turnaround
- Alignment and levels adjustment
- Construction of temporary platform

External Prestressing Tendon Installation

Internal Prestressing Grouting

Monitoring Schedule for the Next Month

9.2 The tentative environmental monitoring schedule for the next month is shown in **Appendix D**.

Construction Programme for the Next Month

9.3 A tentative construction programme is provided in **Appendix A**.

10 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

10.1 The Environmental Monitoring and Audit (EM&A) Report presents the EM&A works undertaken in February 2017 in accordance with EM&A Manual.

10.2 No Action/Limit Level exceedance was recorded for air quality and construction noise.

10.3 For water quality, there are four Action Level and eight Limit Level exceedances for suspended solids were recorded. No Action/Limit Level exceedance for dissolved oxygen and turbidity were recorded.

10.4 Dolphin transect survey was carried out on 6th and 13th February 2017. No adverse impact on Chinese White Dolphins was noticeable from general observations.

10.5 Environmental site inspection was conducted on 2nd, 7th, 14th, 21st and 28th February 2017 by ET in the reporting month. All deficiencies identified during the site inspection have already rectified / improved during the follow-up audit session.

10.6 The inspection to the Sha Lo Wan (West) Archaeological Site was conducted on 13rd December 2016. No access to Sha Lo Wan (West) Archaeological site for works areas and storage of construction equipment was observed.

10.7 There was no environmental complaint, no notification of summons and successful prosecution received in the reporting month.

10.8 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

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

Air Quality Impact

- To regularly maintain the quality of machinery and vehicles on site.
- To implement dust suppression measures on all haul roads, stockpiles, dry surfaces and excavation works.
- To provide hoarding along the entire length of that portion of the site boundary.

Noise Impact

- To inspect the noise sources inside the site.
- To space out noisy equipment and position the equipment as far away as possible from sensitive receivers.
- To provide temporary noise barriers for operations of noisy equipment near the noise sensitive receivers, if necessary.

Water Impact

- To prevent any surface runoff discharge into any stream course and sea.
- To review and implement temporary drainage system.
- To identify any wastewater discharges from site.
- To ensure properly maintenance for de-silting facilities.
- To clear the silt and sediment in the sedimentation tanks.
- To review the capacity of de-silting facilities for discharge.
- To divert all the water generated from construction site to de-silting facilities with enough handling capacity before discharge.
- To avoid accumulation of stagnant and ponding water on site.

Ecology Impact

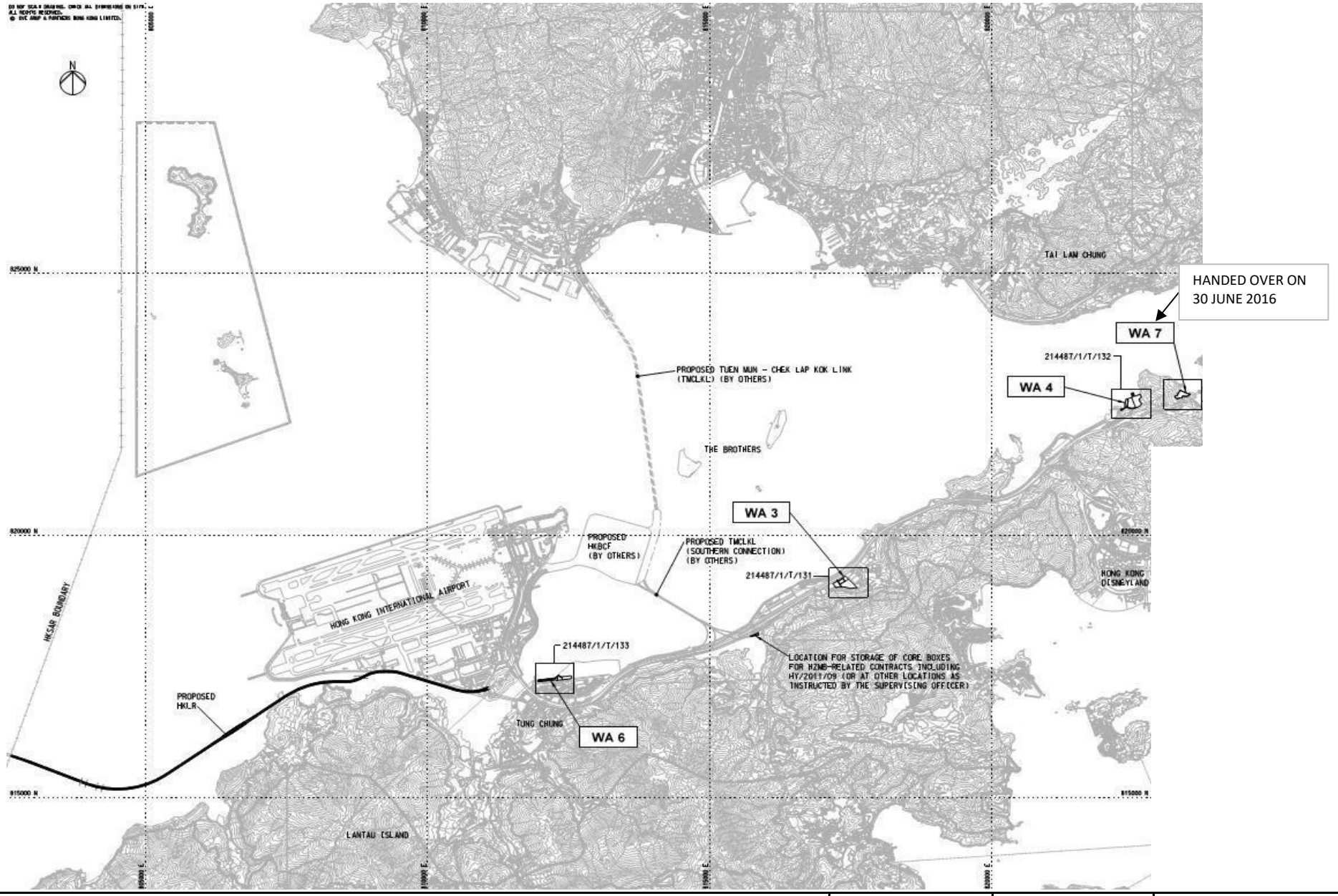
- To implement Spill Response Plan in the event of accidental spillage of or other hazardous chemicals.
- To implement Dolphin Exclusion Zone during the installation of bored pile casing located in the waters to the west of Airport.
- To implement Dolphin Watching Plan after the bored piling casing is installed.
- To ensure the acoustically-decoupled measures were implemented for air compressors and other noisy equipment mounted on construction vessels according

to acoustic decoupling measures plan.

Waste/Chemical Management

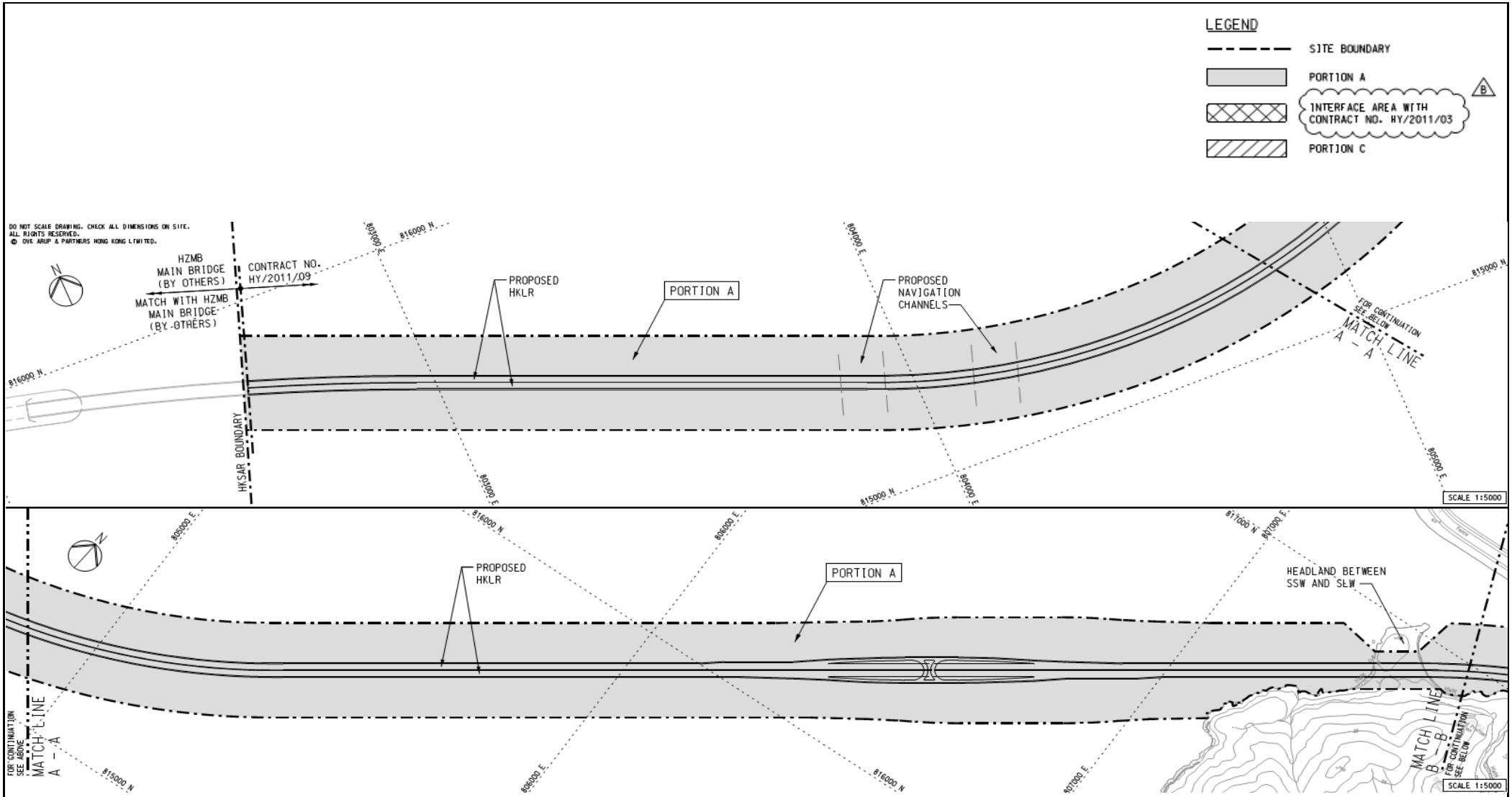
- To check for any accumulation of waste materials or rubbish on site.
- To ensure the performance of sorting of C&D materials at source (during generation);
- To carry out inspection of dump truck at site exit to ensure inert and non-inert C&D materials are properly segregated before removing off site.
- To avoid any discharge or accidental spillage of chemical waste or oil directly from the site.
- To avoid improper handling or storage of oil drum on site.

FIGURE(S)



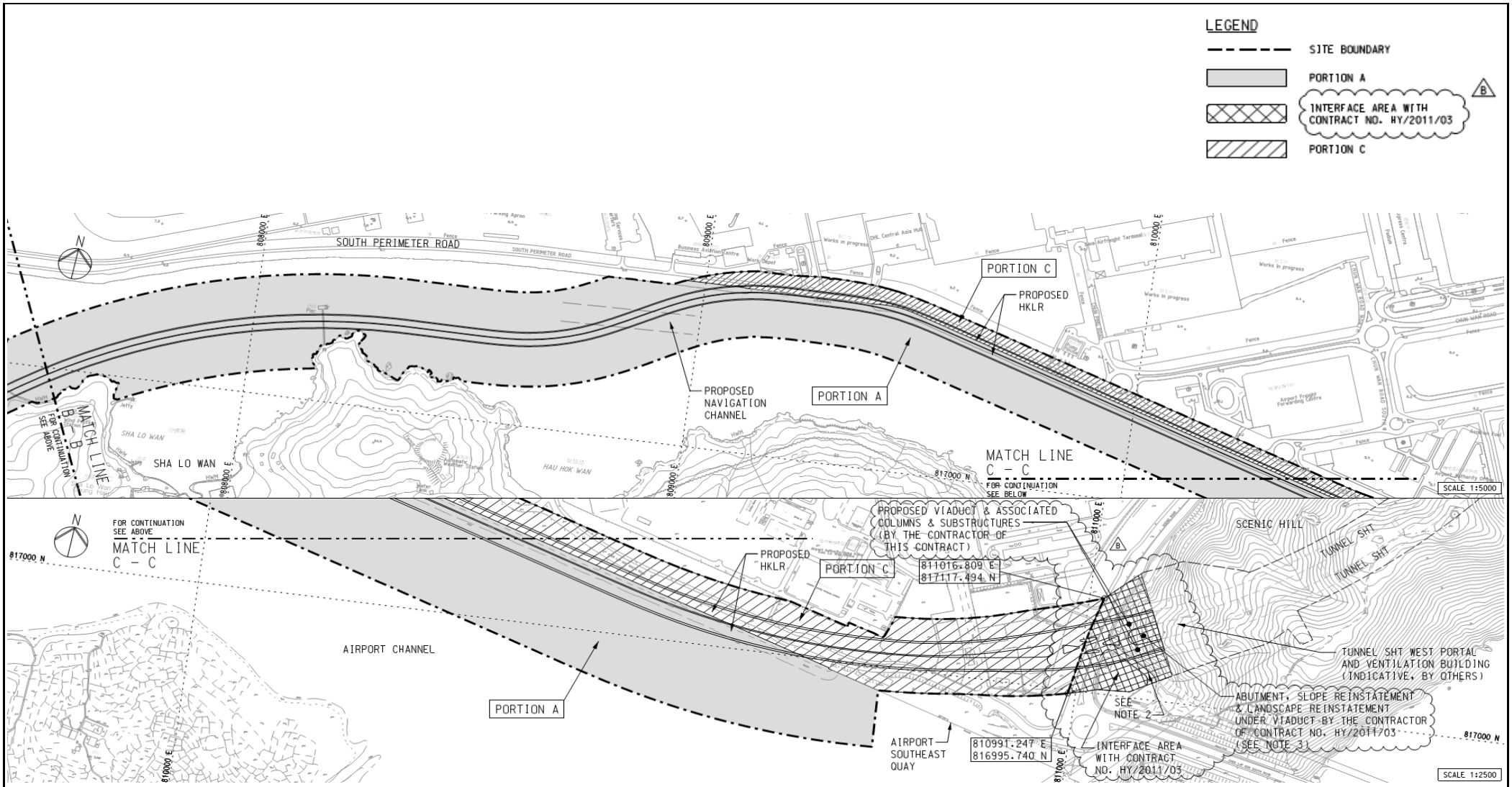
Title	Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Site Layout Plan (WA3, WA4, WA6 and WA7)	Scale: N.T.S Date: Jul-16	Proposal No.: MA12014 Figure: 1a

CINOTECH



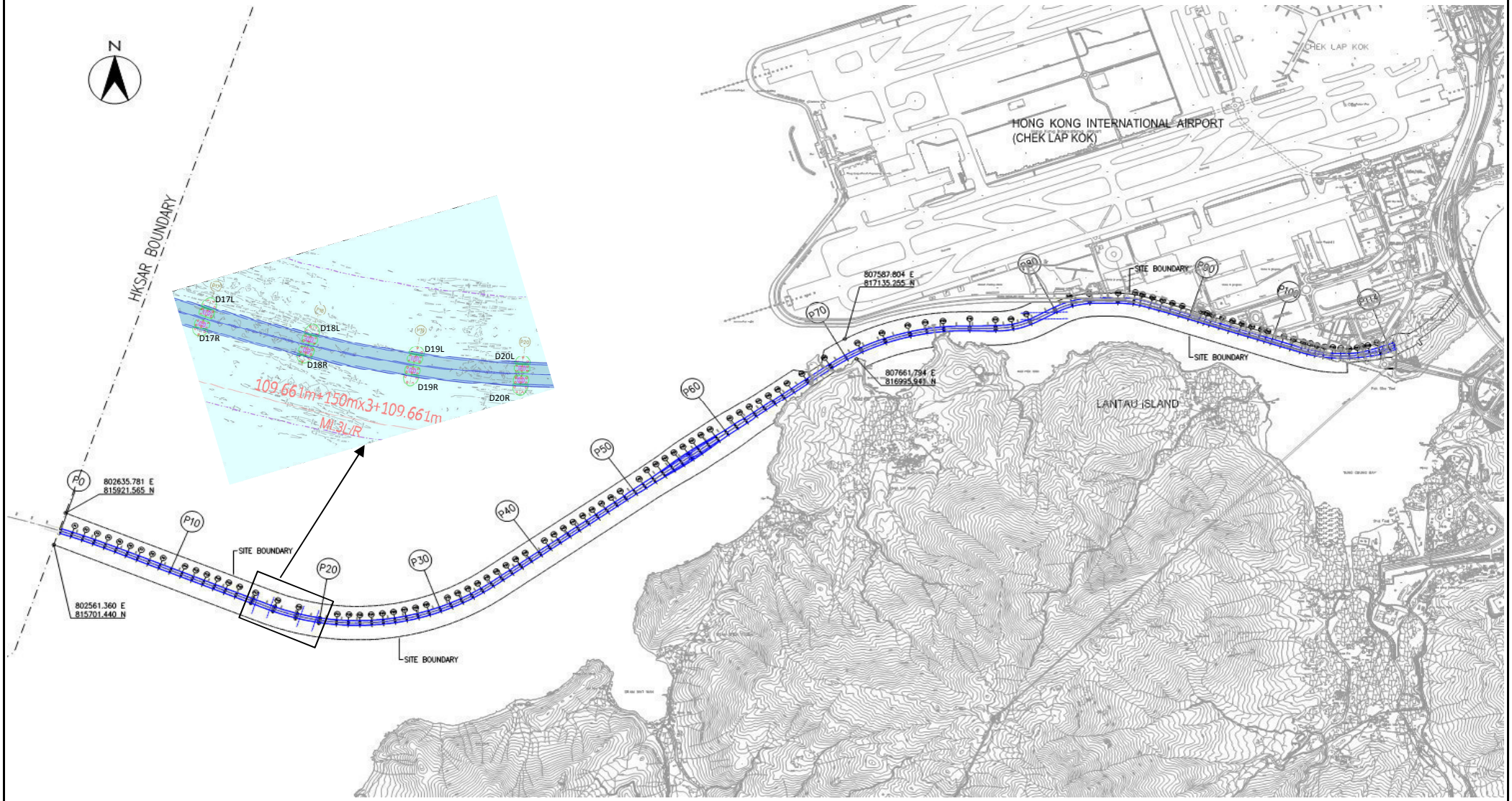
Title	Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Site Layout Plan (Portion A)	Scale: N.T.S Date: Oct-15	Proposa No.: MA12014 Figure: 1b

CINOTECH



Title	Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Site Layout Plan (Portion A and C)	Scale N.T.S	Proposa No. MA12014
		Date 五月-13	Figure 1c

CINOTECH



Title	Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Site Layout Plan (Pier(s) Site)	Scale: N.T.S Date: Oct-15	Proposa No. MA12014 Figure: 1d

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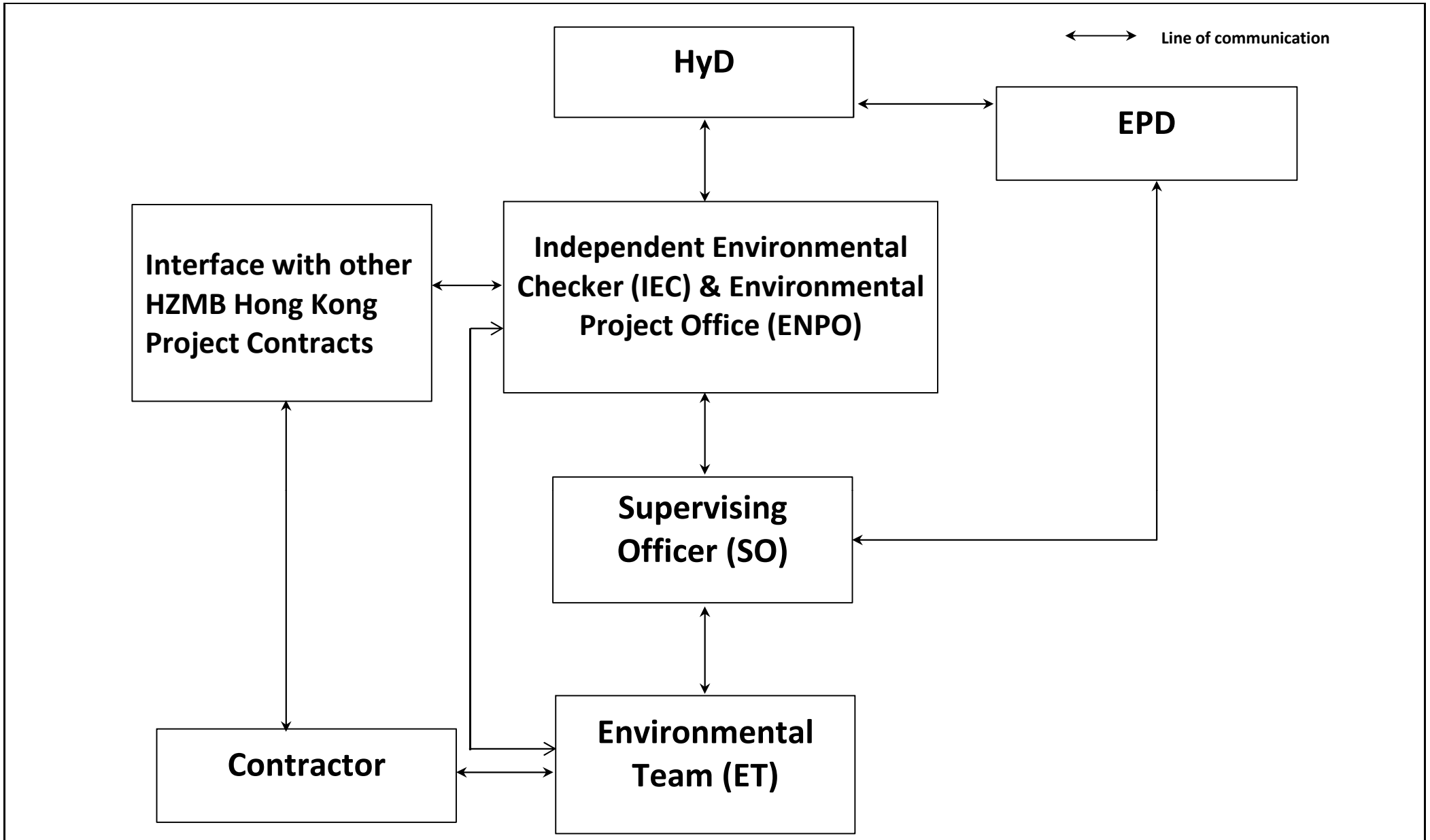
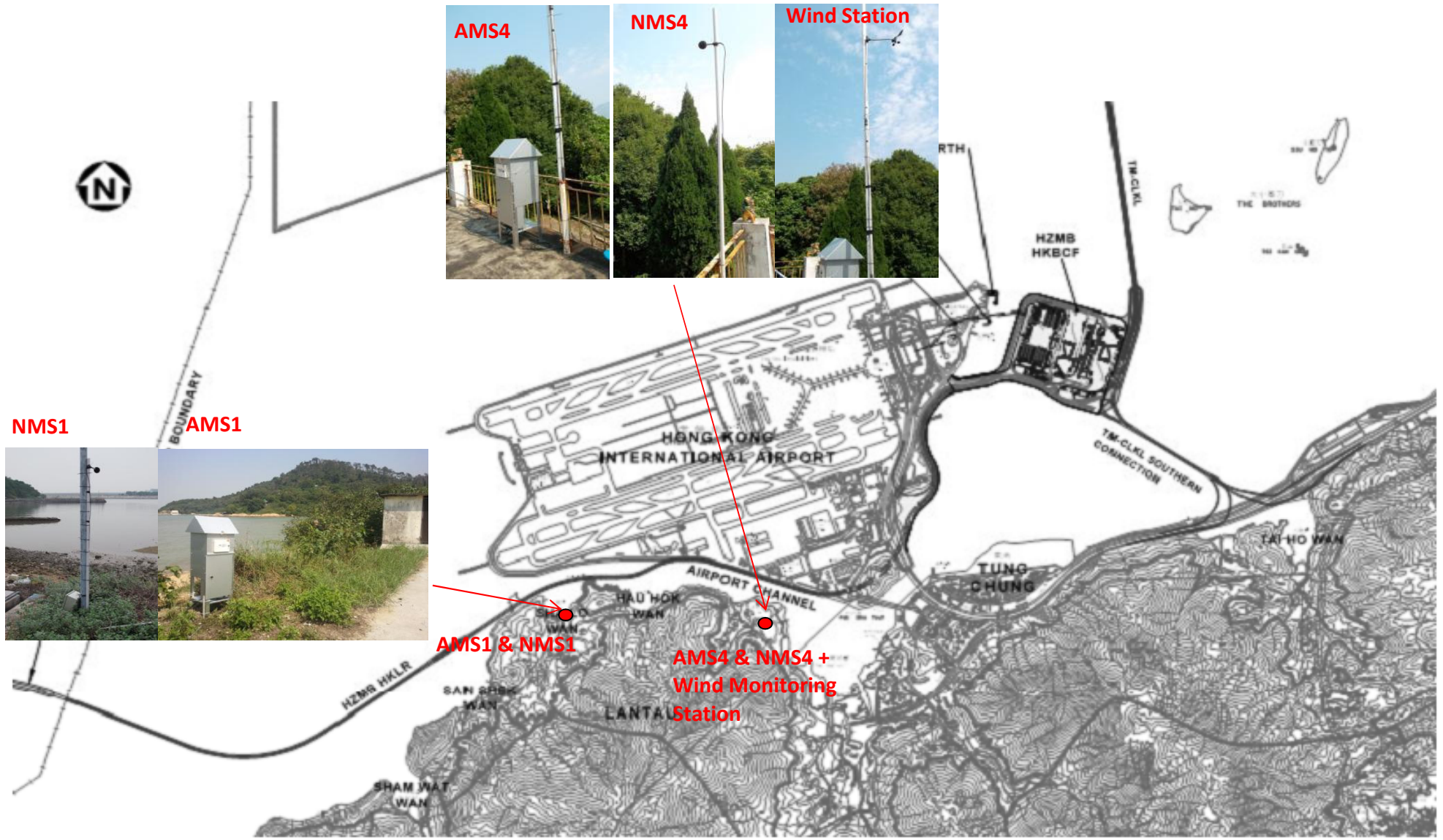


Title	Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Project Organisation for Environmental Works	Scale N.T.S Date Feb-13	Proposa No. MA12014 Figure 2	CINOTECH



Title	Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Locations of Air Quality and Noise Monitoring Stations	Scale: N.T.S Date: Feb-13	Proposa No. MA12014 Figure: 3

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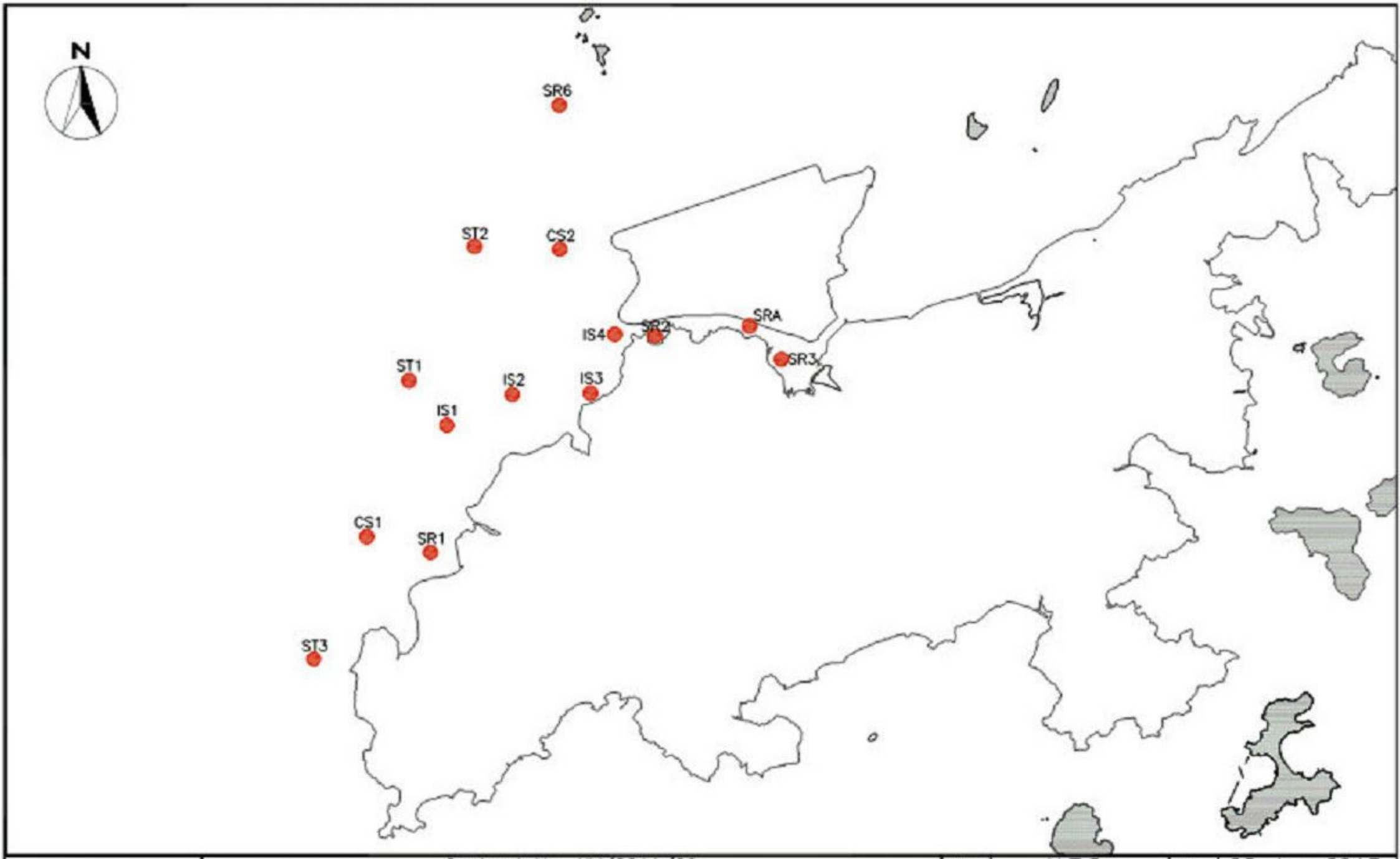


CINOTECH
Cinotech Consultants Limited

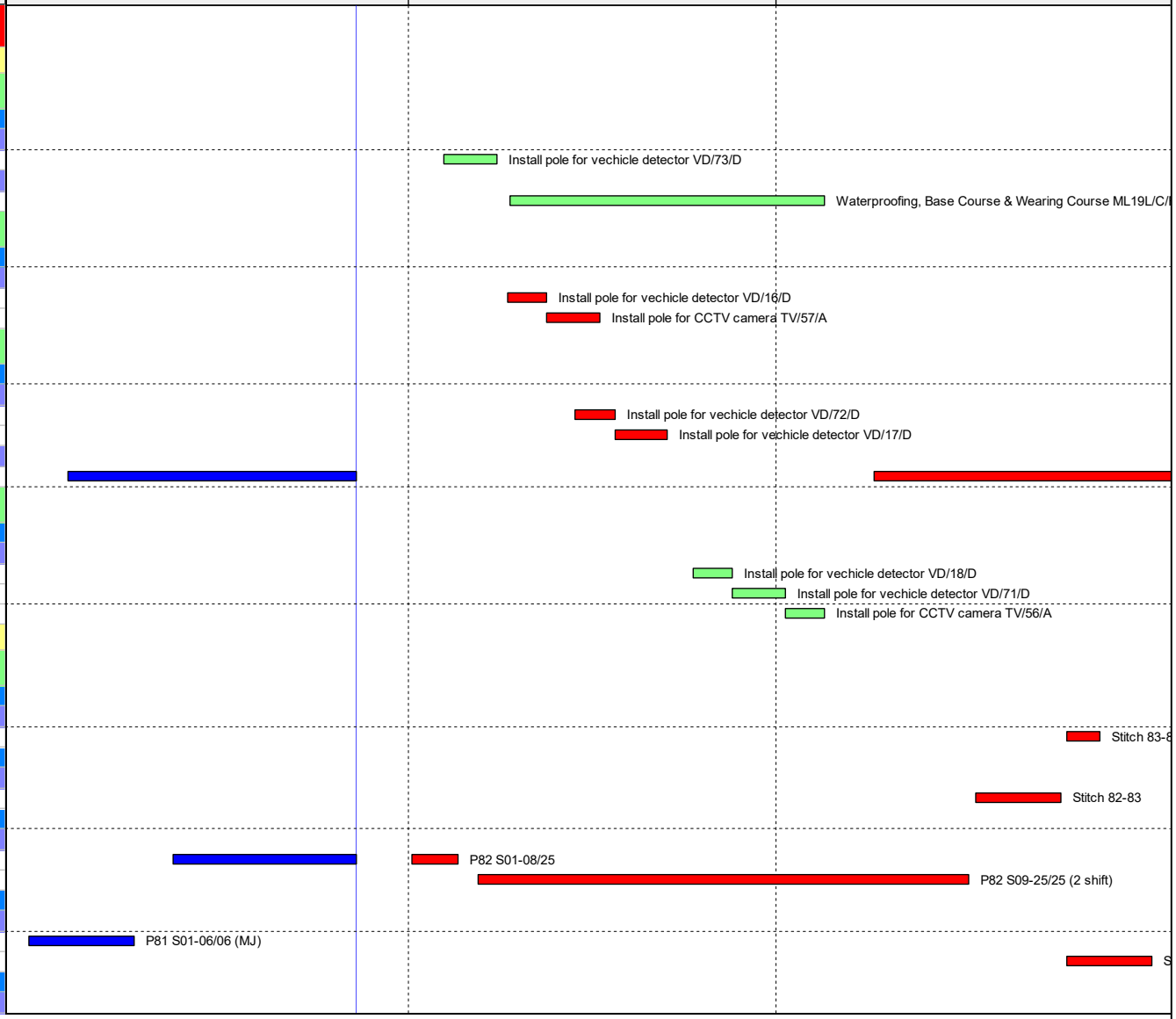
Contract No. HY/2011/09
Hong Kong–Zhuhai–Macao Bridge Hong Kong Link Road – Section Between HKSAR Boundary and Scenic Hill
Locations of Marine Water Quality Monitoring Stations

SCALE	N.T.S	DATE	28 Jan 2013
CHECK	PC	DRAWN	IT
PROJECT NO.	MA12014	FIGURE NO.	4
		REV	–

APPENDIX A
CONSTRUCTION PROGRAMME

CONTRACT NO. HY/2011/09
HONG KONG-ZHUHAI-MACAO BRIDGE
HONG KONG LINK ROAD
- SECTION BETWEEN HKSAR BOUNDARY AND SCENIC HILL

Activity ID	Activity Name
	HKZB Hong Kong Link Road - 3 Months F
	LAND VIADUCT
	ML19
	DECK FINISHING WORKS
	CIVIL PROVISION FOR TCSS
M19F_1080	Install pole for vechicle detector VD/73/D
	E&M AND ROAD FINISHING WORKS
M19L_2030	Waterproofing, Base Course & Wearing Course ML19L/C/R
	ML18
	DECK FINISHING WORKS
	CIVIL PROVISION FOR TCSS
ML18F_1080	Install pole for vechicle detector VD/16/D
ML18F_1090	Install pole for CCTV camera TV/57/A
	ML17
	DECK FINISHING WORKS
	CIVIL PROVISION FOR TCSS
ML17F_1080	Install pole for vechicle detector VD/72/D
ML17F_1090	Install pole for vechicle detector VD/17/D
	E&M AND ROAD FINISHING WORKS
M17L_2030	Waterproofing, Base Course & Wearing Course ML17L/R
	ML16
	DECK FINISHING WORKS
	CIVIL PROVISION FOR TCSS
ML16F_1080	Install pole for vechicle detector VD/18/D
ML16F_1085	Install pole for vechicle detector VD/71/D
ML16F_1090	Install pole for CCTV camera TV/56/A
	AIRPORT CHANNEL
	ML14
	P84 MJ
	DECK ERECTION WORKS
P084_1060	Stitch 83-84
	P83
	DECK ERECTION WORKS
P083_1190	Stitch 82-83
	P82
	DECK ERECTION WORKS
P082_1030	P82 S01-08/25
P082_1050	P82 S09-25/25 (2 shift)
	P81 MJ
	DECK ERECTION WORKS
P081_1130	P81 S01-06/06 (MJ)
P081_1140	Stitch 81-82
	DECK FINISHING WORKS
	EXTERNAL PT

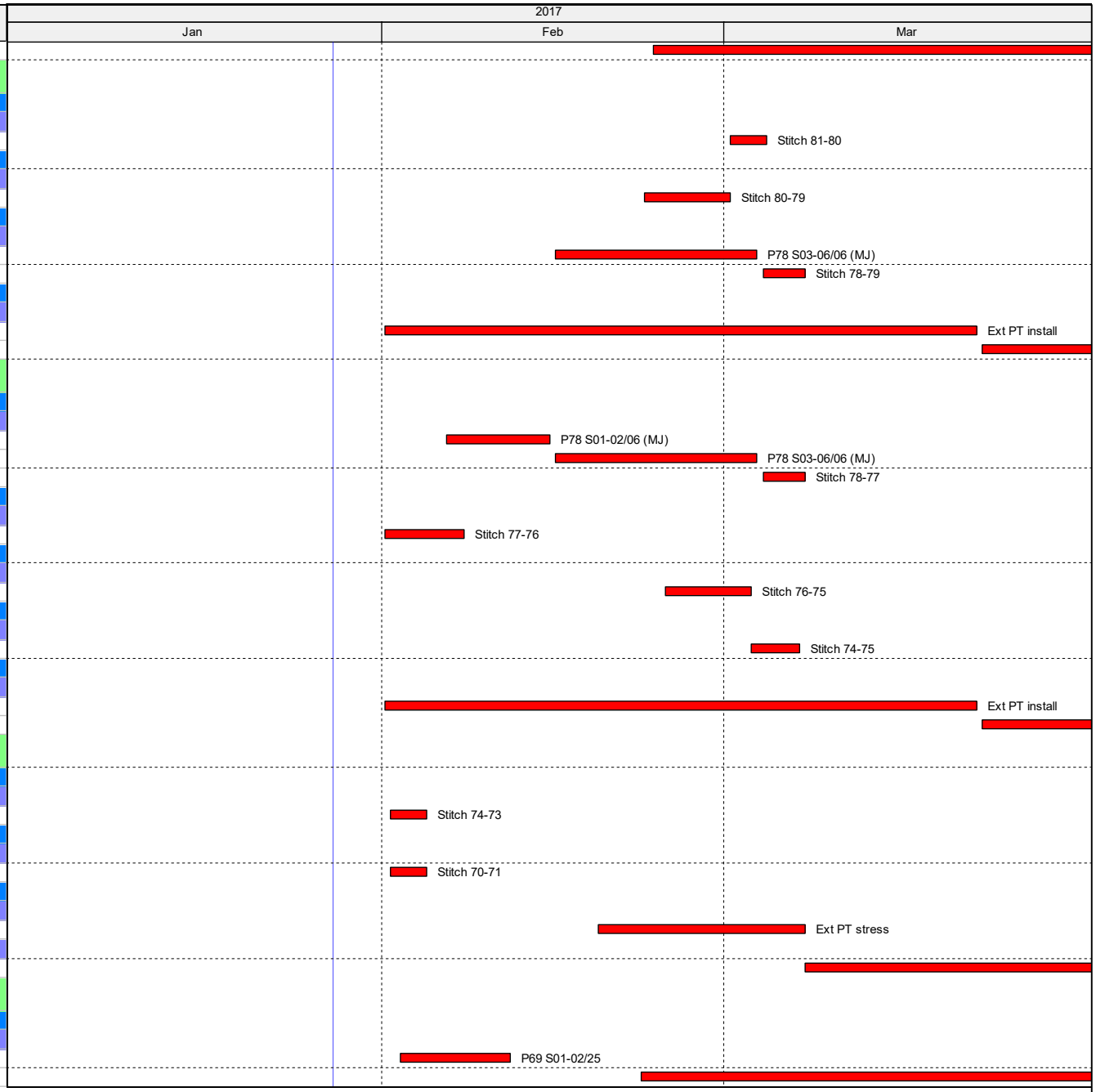


Actual Work
Remaining Work
Critical Remaining Work
Milestone

HKLR EMA report (Jan 17 to Mar 17)
Page 1 of 6

Date	Revision
10/2/17	EM&A Report Jan 17 to Mar 17

Activity ID	Activity Name
ML14F_1000	Ext PT install
ML13	
P81 MJ	
DECK ERECTION WORKS	
P081_1090	Stitch 81-80
P80	
DECK ERECTION WORKS	
P080_1100	Stitch 80-79
P78 MJ	
DECK ERECTION WORKS	
P078_1120	P78 S03-06/06 (MJ)
P078_1130	Stitch 78-79
DECK FINISHING WORKS	
EXTERNAL PT	
ML13F_1000	Ext PT install
ML13F_1010	Ext PT stress
ML12	
P78 MJ	
DECK ERECTION WORKS	
P078_1015	P78 S01-02/06 (MJ)
P078_1020	P78 S03-06/06 (MJ)
P078_1140	Stitch 78-77
P77	
DECK ERECTION WORKS	
P077_1120	Stitch 77-76
P76	
DECK ERECTION WORKS	
P076_1120	Stitch 76-75
P74 MJ	
DECK ERECTION WORKS	
P074_1150	Stitch 74-75
DECK FINISHING WORKS	
EXTERNAL PT	
ML12F_1000	Ext PT install
ML12F_1010	Ext PT stress
ML11	
P74 MJ	
DECK ERECTION WORKS	
P074_1160	Stitch 74-73
P70 MJ	
DECK ERECTION WORKS	
P070_1130	Stitch 70-71
DECK FINISHING WORKS	
EXTERNAL PT	
ML11F_1010	Ext PT stress
UTILITY TROUGH & ROAD BARRIER	
ML11F_1020	Utility trough, road barrier and firemain installation for ML11
ML10	
P69	
DECK ERECTION WORKS	
P069_1030	P69 S01-02/25
P069_1040	P69 S03-25/25 (2 shift)

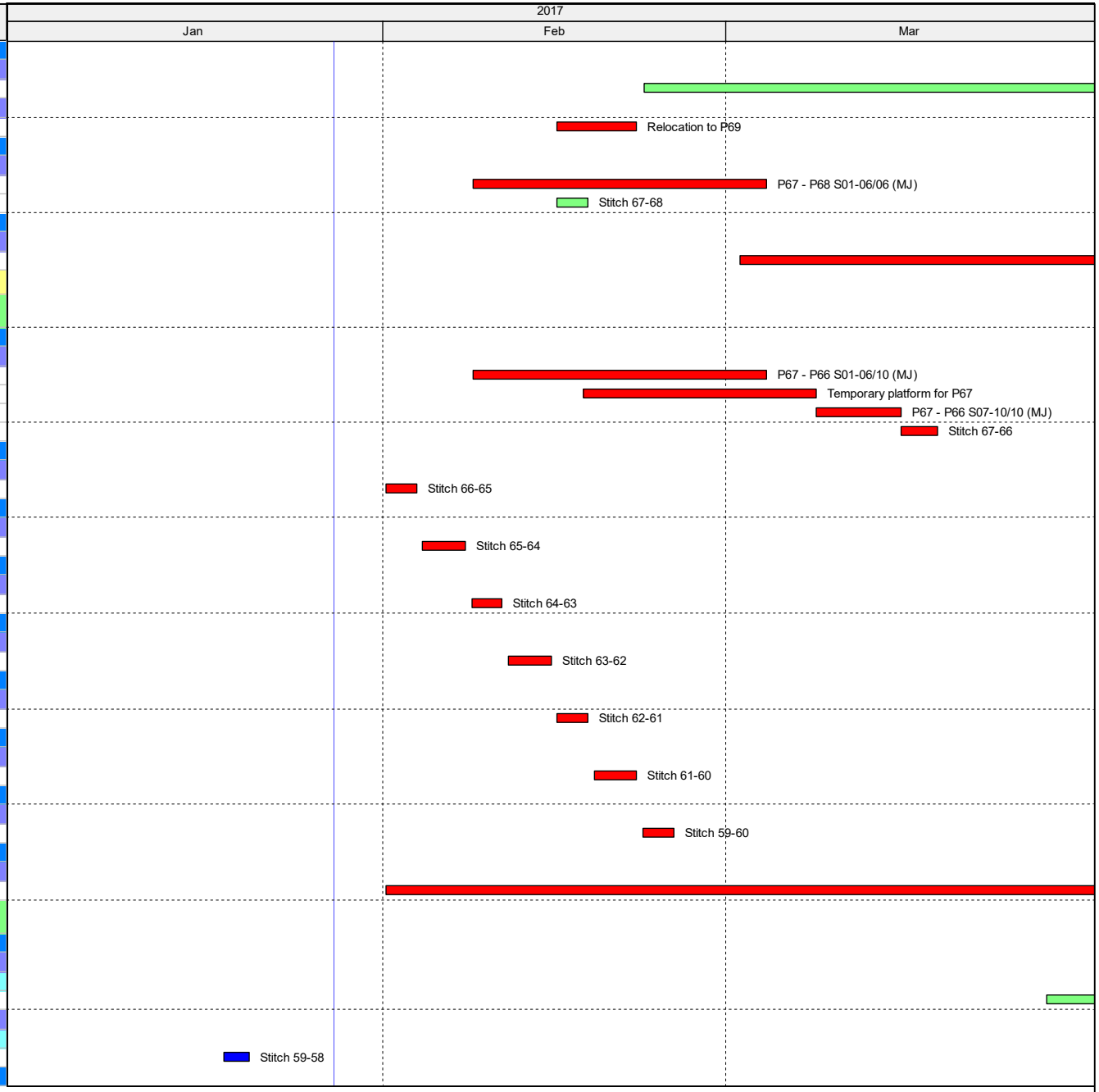


Actual Work
Remaining Work
Critical Remaining Work
Milestone

HKLR EMA report (Jan 17 to Mar 17)
Page 2 of 6

Date	Revision
10/2/17	EM&A Report Jan 17 to Mar 17

Activity ID	Activity Name
P68	
TEMPORARY WORKS	
P068_1150	Remove temporary jetty for pier P68
DECK ERECTION WORKS	
P068_1090	Relocation to P69
P67 MJ	
DECK ERECTION WORKS	
P067_1110	P67 - P68 S01-06/06 (MJ)
P067_1120	Stitch 67-68
DECK FINISHING WORKS	
EXTERNAL PT	
ML10F_1000	Ext PT install
WESTERN WATER (ML07 TO ML09)	
ML9	
P67 MJ	
DECK ERECTION WORKS	
P067_1020	P67 - P66 S01-06/10 (MJ)
P067_1025	Temporary platform for P67
P067_1030	P67 - P66 S07-10/10 (MJ)
P067_1130	Stitch 67-66
P66 SB	
DECK ERECTION WORKS	
P066_1110	Stitch 66-65
P65 SB	
DECK ERECTION WORKS	
P065_1100	Stitch 65-64
P64	
DECK ERECTION WORKS	
P064_1090	Stitch 64-63
P63	
DECK ERECTION WORKS	
P063_1120	Stitch 63-62
P62	
DECK ERECTION WORKS	
P062_1120	Stitch 62-61
P61	
DECK ERECTION WORKS	
P061_1110	Stitch 61-60
P59 MJ	
DECK ERECTION WORKS	
P059_1200	Stitch 59-60
DECK FINISHING WORKS	
EXTERNAL PT	
ML09F_1000	Ext PT install
ML8	
P59 MJ	
SOP AND PORTAL WORKS	
TURNAROUND	
P059_1050	Insitu beam between main deck and turnaround at P59
DECK ERECTION WORKS	
MAIN DECK	
P059_1210	Stitch 59-58
P58	



Actual Work
Remaining Work
Critical Remaining Work
Milestone

HKLR EMA report (Jan 17 to Mar 17)
Page 3 of 6

Date	Revision
10/2/17	EM&A Report Jan 17 to Mar 17

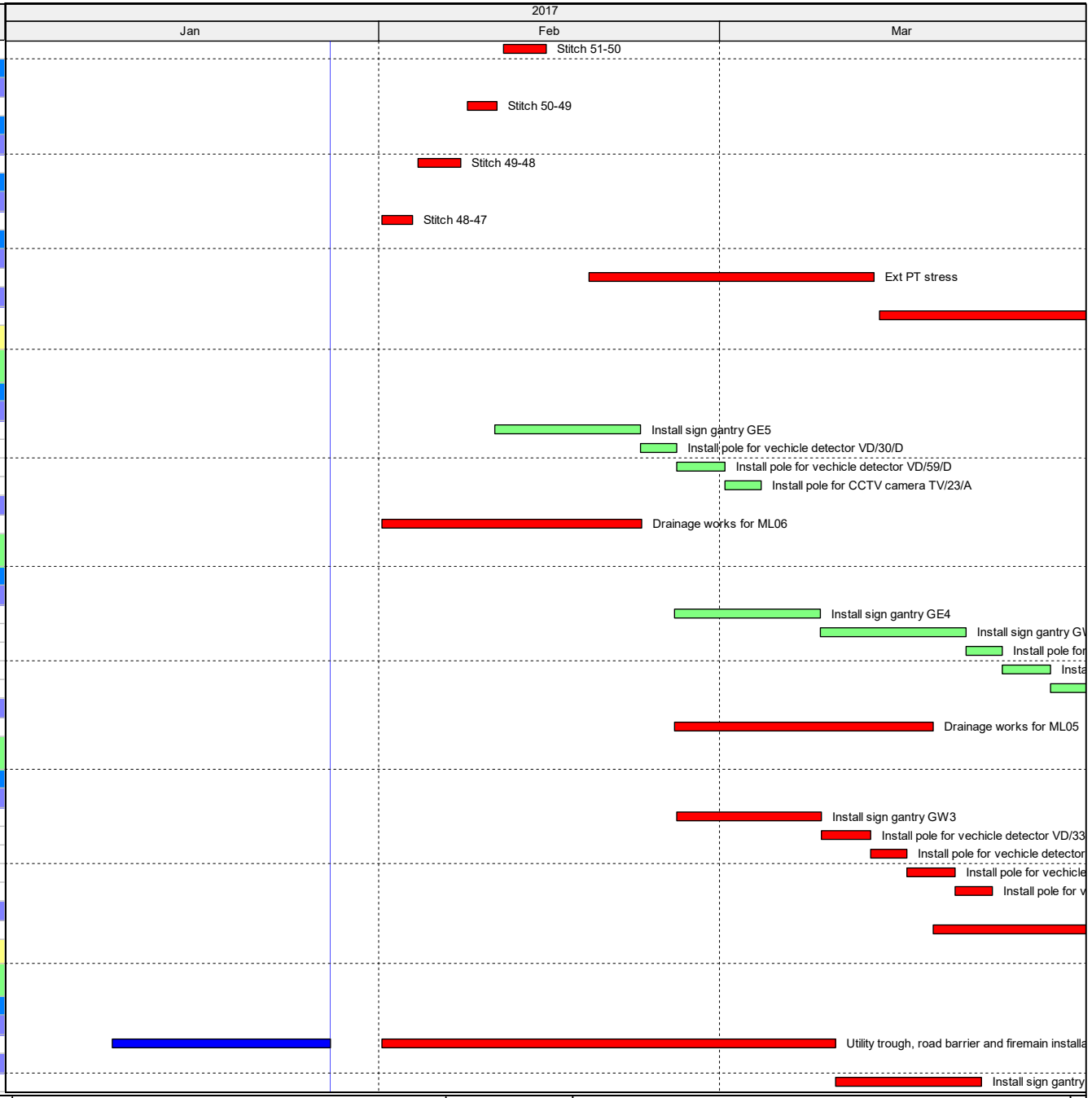
Activity ID	Activity Name
	DECK ERECTION WORKS
	MAIN DECK
P058_1150	Stitch 58-57
	TURNAROUND
P058_1060	Segment erection P58N
P058_1070	Segment erection P58S
	P57
	DECK ERECTION WORKS
	MAIN DECK
P057_1150	Stitch 57-56
	TURNAROUND
P057_1060	Segment erection P57N
P057_1070	Segment erection P57S
	P56
	DECK ERECTION WORKS
	MAIN DECK
P056_1190	Stitch 56-55
	TURNAROUND
P056_1010	Erect Cross beams
P056_1030	Erect precast segments 20 nos.
P056_1040	Erect 3rd webs, stich cross beams
P056_1050	Bridge slabs
	P55
	DECK ERECTION WORKS
	TURNAROUND
P055_1070	Segment erection P55N
P055_1080	Segment erection P55S
	P54
	DECK ERECTION WORKS
	TURNAROUND
P054_1060	Segment erection P54N
	DECK FINISHING WORKS
	MAIN DECK
	EXTERNAL PT
ML08F_1010	Ext PT stress
	UTILITY TROUGH & ROAD BARRIER
ML08F_1020	Utility trough, road barrier and firemain installation for ML08
	CIVIL PROVISION FOR TCSS
ML08F_1070	Install sign gantry GW6
ML08F_1200	Remain civil provisions for TCSS ML08
	E&M AND ROAD FINISHING WORKS
M08L_2020	Drainage works for ML08
	ML7
	P53 MJ
	SOP AND PORTAL WORKS
	TURNAROUND
P053_1060	Insitu beam between main deck and turnaround at P53
	DECK ERECTION WORKS
	MAIN DECK
P053_1220	Stitch 53-52
	P52 SB (Portal)
	DECK ERECTION WORKS
P052_1160	Stitch 52-51
	P51
	DECK ERECTION WORKS

Actual Work
Critical Remaining Work
Remaining Work
Milestone

HKLR EMA report (Jan 17 to Mar 17)
Page 4 of 6

Date	Revision
10/2/17	EM&A Report Jan 17 to Mar 17

Activity ID	Activity Name
P051_1100	Stitch 51-50
P50	
DECK ERECTION WORKS	
P050_1120	Stitch 50-49
P49	
DECK ERECTION WORKS	
P049_1130	Stitch 49-48
P48	
DECK ERECTION WORKS	
P048_1120	Stitch 48-47
DECK FINISHING WORKS	
EXTERNAL PT	
ML07F_1010	Ext PT stress
UTILITY TROUGH & ROAD BARRIER	
ML07F_1020	Utility trough, road barrier and firemain installation for ML07
WESTERN WATER (ML04 TO ML06)	
ML6	
DECK FINISHING WORKS	
CIVIL PROVISION FOR TCSS	
ML06F_1060	Install sign gantry GE5
ML06F_1090	Install pole for vechicle detector VD/30/D
ML06F_1100	Install pole for vechicle detector VD/59/D
ML06F_1130	Install pole for CCTV camera TV/23/A
E&M AND ROAD FINISHING WORKS	
M06L_2020	Drainage works for ML06
ML5	
DECK FINISHING WORKS	
CIVIL PROVISION FOR TCSS	
ML05F_1070	Install sign gantry GE4
ML05F_1080	Install sign gantry GW4
ML05F_1090	Install pole for vechicle detector VD/31/D
ML05F_1100	Install pole for vechicle detector VD/58/D
ML05F_1130	Install pole for CCTV camera TV/52/A
E&M AND ROAD FINISHING WORKS	
M05L_2020	Drainage works for ML05
ML4	
DECK FINISHING WORKS	
CIVIL PROVISION FOR TCSS	
ML04F_1080	Install sign gantry GW3
ML04F_1090	Install pole for vechicle detector VD/33/D
ML04F_1100	Install pole for vechicle detector VD/56/D
ML04F_1110	Install pole for vechicle detector VD/32/D
ML04F_1120	Install pole for vechicle detector VD/57/D
E&M AND ROAD FINISHING WORKS	
M04L_2030	Drainage works for ML04
NAVIGATION CHANNEL	
ML3	
DECK FINISHING WORKS	
UTILITY TROUGH & ROAD BARRIER	
ML03F_1020	Utility trough, road barrier and firemain installation for ML03
CIVIL PROVISION FOR TCSS	
ML03F_1060	Install sign gantry GE3

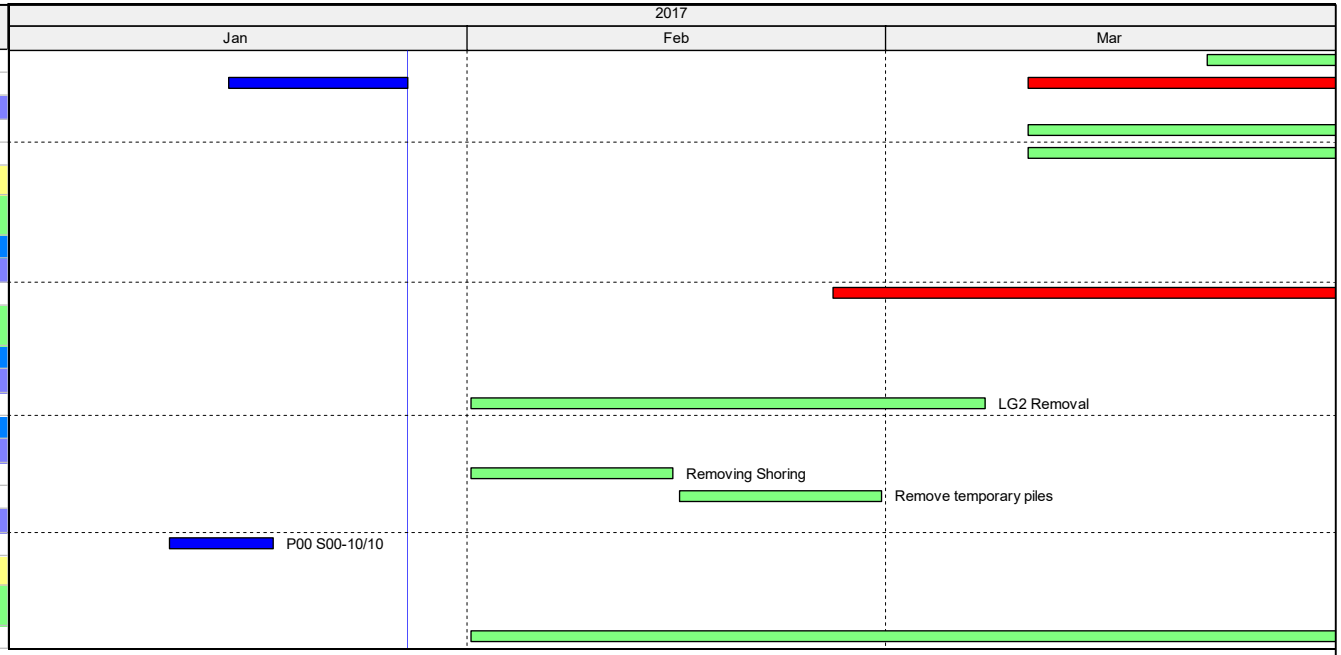


Actual Work
Remaining Work
Critical Remaining Work
Milestone

HKLR EMA report (Jan 17 to Mar 17)
Page 5 of 6

Date	Revision
10/2/17	EM&A Report Jan 17 to Mar 17

Activity ID	Activity Name
ML03F_1070	Install sign gantry GW2
ML03F_1200	Remain civil provisions for TCSS ML03
E&M AND ROAD FINISHING WORKS	
M03L_2030	Re-provisioning the Platform & Radar at Pier P20
M03L_2050	Install Nevigation lights for navigation spans ML3
WESTERN WATER (ML01 TO ML02)	
ML2	
DECK FINISHING WORKS	
UTILITY TROUGH & ROAD BARRIER	
ML02F_1020	Utility trough, road barrier and firemain installation for ML02
ML1	
P1 SB	
DECK ERECTION WORKS	
P001_1090	LG2 Removal
P0 MJ	
TEMPORARY WORKS	
P000_1110	Removing Shoring
P000_1120	Remove temporary piles
DECK ERECTION WORKS	
P000_1100	P00 S00-10/10
GROUND LEVEL ROAD WORKS	
GROUND LEVEL ROAD WORKS	
RD1060	Re-alignment works for Chep Lap Kok South Road (CLKSR)



Actual Work
Critical Remaining Work
Remaining Work
Milestone

HKLR EMA report (Jan 17 to Mar 17)
Page 6 of 6

Date	Revision
10/2/17	EM&A Report Jan 17 to Mar 17

APPENDIX B
ACTION AND LIMIT LEVELS

Appendix B - Action and Limit Levels

Table B-1 Action and Limit Levels for 1-Hour TSP

Location	Action Level, µg/m^3	Limit Level, µg/m^3
AMS1	381	500
AMS4	352	

Table B-2 Action and Limit Levels for 24-Hour TSP

Location	Action Level, µg/m^3	Limit Level, µg/m^3
AMS1	170	260
AMS4	171	

Table B-3 Action and Limit Levels for Construction Noise

Time Period	Action Level	Limit Level
0700-1900 hrs on normal weekdays	When one documented complaint is received	75 dB(A) *

Noted: If works are to be carried during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed.
(*) reduce to 70 dB(A) for schools and 65 dB(A) during school examination periods.

Table B-4 Action and Limit Levels for Water Quality

Parameter (unit)	Water Depth	Action Level	Limit Level
Dissolved Oxygen (mg/L) (surface, middle, bottom)	Surface and Middle	***5.0***	***4.2*** except 5 for FCZ
	Bottom	***4.7***	***3.6***
Turbidity (NTU)	Depth average	***27.5*** and 120% of upstream control station's turbidity at the same tide of the same day	***47.0*** and 130% of turbidity at the upstream control station at the same tide of same day
Suspended Solids (mg/L)	Depth average	***23.5*** and 120% of upstream control station's SS at the same tide of the same day	***34.4*** and 130% of SS at the upstream control station at the same tide of same day and 10mg/L for WSD Seawater Intakes

Note:
(1) Depth-averaged is calculated by taking the arithmetic means of reading of all three depths
(2) For DO, non-compliance of the water quality limit occurs when monitoring result is lower that the limit.
(3) For SS & turbidity non-compliance of the water quality limits occur when monitoring result is higher than the limits.
(4) All the figures given in the table are used for reference only and the EPD may amend the figures whenever it is considered as necessary.
(5) The 1%-ile of baseline data for dissolved oxygen (surface and middle) and dissolved oxygen (bottom) are 4.2mg/L and 3.6mg/L respectively.

APPENDIX C
COPIES OF CALIBRATION CERTIFCATES

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA12014/67/0026

Project No. AMS 1 - Sha Lo Wan Operator: WK

Date: 23-Jan-17 Next Due Date: 22-Mar-17

Equipment No.: A-01-67 Serial No. 3218

Ambient Condition			
Temperature, Ta (K)	289.8	Pressure, Pa (mmHg)	773.7

Orifice Transfer Standard Information					
Serial No.:	2896	Slope, mc	0.0598	Intercept, bc	-0.05079
Last Calibration Date:	4-Mar-16	**mc x Qstd + bc = $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$**			
Next Calibration Date:	3-Mar-17	**Qstd = $\{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ -bc} / mc**			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	16.8	4.19	70.99	10.5	3.32
2	14.5	3.90	66.01	8.8	3.04
3	10.3	3.28	55.77	6.7	2.65
4	6.9	2.69	45.80	4.5	2.17
5	4.4	2.15	36.75	3.1	1.80

By Linear Regression of Y on X

Slope , mw = 0.0438 **Intercept, bw =** 0.1851

Correlation coefficient* = 0.9990

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

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

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

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **4.08**

Remarks:

Conducted by: wk Tang Signature: Kwon Date: 23/1/17

Checked by: [illegible] Signature: [illegible] Date: 23 January 2017

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA12014/74/0026

Project No. AMS 4 - San Tau Operator: WK

Date: 23-Jan-17 Next Due Date: 22-Mar-17

Equipment No.: A-01-74 Serial No. 2202

Ambient Condition			
Temperature, Ta (K)	290.4	Pressure, Pa (mmHg)	773

Orifice Transfer Standard Information					
Serial No.:	2896	Slope, mc	0.0598	Intercept, bc	-0.05079
Last Calibration Date:	4-Mar-16	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	3-Mar-17	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	16.5	4.15	70.26	10.8	3.36
2	11.8	3.51	59.55	7.6	2.82
3	9.5	3.15	53.52	6.2	2.54
4	5.8	2.46	42.00	4.0	2.04
5	3.3	1.86	31.89	2.2	1.52

By Linear Regression of Y on X

Slope , mw = 0.0473 **Intercept, bw =** 0.0221

Correlation coefficient* = 0.9995

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

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

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

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **4.05**

Remarks:

Conducted by: wk Tang Signature: Kwai Date: 23/1/17

Checked by: Ian Signature: Date: 23 January 2017

TISCH Environmental

TISCH ENVIRONMENTAL, INC.
145 SOUTH MIAMI AVE
VILLAGE OF CLEVES, OH
45002
513.467.9000
877.263.7610 TOLL FREE
513.467.9009 FAX

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Mar 04, 2016 Rootsmeter S/N 0438320 Ta (K) - 295
Operator Tisch Orifice I.D. - 2896 Pa (mm) - 755.65

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.4340	3.2	2.00
2	NA	NA	1.00	1.0250	6.4	4.00
3	NA	NA	1.00	0.9150	7.9	5.00
4	NA	NA	1.00	0.8770	8.7	5.50
5	NA	NA	1.00	0.7210	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
1.0001	0.6974	1.4173		0.9957	0.6944	0.8836
0.9959	0.9716	2.0044		0.9915	0.9674	1.2496
0.9938	1.0861	2.2410		0.9894	1.0814	1.3971
0.9928	1.1320	2.3503		0.9885	1.1271	1.4653
0.9875	1.3696	2.8346		0.9831	1.3636	1.7672
Qstd slope (m) =		2.11176		Qa slope (m) =		1.32235
intercept (b) =		-0.05079		intercept (b) =		-0.03166
coefficient (r) =		0.99982		coefficient (r) =		0.99982
y axis = SQRT[H2O(Pa/760)(298/Ta)]				y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

Vstd = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta)
Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]
Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{[SQRT(H2O(Pa/760)(298/Ta))]- b}
Qa = 1/m{[SQRT H2O(Ta/Pa)]- b}

Hong Kong Calibration Ltd.
香港校正有限公司

Calibration Certificate

Certificate No. 700906

Customer : Dragages - China Habour - VSL Joint Venture

Address : 3/F., Island Place Tower, 510 King's Road, North Point, H. K.

Order No. : Q70364 **Date of receipt :** 27-Jan-17

Item Tested

Description : Weather Stations,Vantage Pro2

Manufacturer : Davis **I.D.** : --

Model : 6152 **Serial No.** : AR160809018

Test Conditions

Date of Test : 27-Jan-17 **Supply Voltage** : --

Ambient Temperature : (23 ± 3)°C **Relative Humidity :** (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure : Z04.

Test Results

The results are shown in the attached page(s).

Main Test equipment used:

Equipment No.	Description	Cert. No.	Traceable to
S155	Std. Anemometer	611074	NIM-PRC

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

The test equipment used for calibration are traceable to International System of Units (SI), or by reference to a natural constant.
The test results apply to the above Unit-Under-Test only

Calibrated by : C H Chan

Approved by : Steve Kwan

Date: 27-Jan-17

This Certificate is issued by:
Hong Kong Calibration Ltd.
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street,Kwai Chung, NT,Hong Kong.
Tel: 2425 8801 Fax: 2425 8646

Calibration Certificate

Certificate No. 700906

Results :

1. Wind Speed

Applied Value (m/s)	UUT Reading (m/s)
0.0	0.0
2.5	2.4
5.0	4.9
7.5	7.6
10.0	10.3
15.0	15.2
19.0	19.2

Uncertainty : ± (0.9 % + 0.16 m/s)

2. Wind Direction

Reference Value	UUT Indication
N (0°)	N (0°)
NE (45°)	NE (45°)
E (90°)	E (90°)
SE (135°)	SE (135°)
S (180°)	S (180°)
SW (225°)	SW (225°)
W (270°)	W (270°)
NW (315°)	NW (315°)

Remark : 1. UUT: Unit-Under-Test
2. Atmospheric Pressure : 1 024 hPa
3. Before the calibration of the Wind Direction function, the Arrow Head was adjusted to the magnetic NORTH direction while the monitor indicated N. The customer is reminded to do the alignment again after installation.
4. The UUT was equipped with ISS Transmitter -- Mfg code: AR160809018.

---------- END ----------

輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C167187
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC16-2886) Date of Receipt / 收件日期 : 16 December 2016

Description / 儀器名稱	:	Acoustic Calibrator
Manufacturer / 製造商	:	Svantek
Model No. / 型號	:	SV30A
Serial No. / 編號	:	24780
Supplied By / 委託者	:	Dragages - China Harbour - VSL Joint Venture 3/F, Island Place Tower, 510 King's Road, North Point, Hong Kong

TEST CONDITIONS / 測試條件

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

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 29 December 2016

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA
- Rohde & Schwarz Laboratory, Germany

Tested By 測試 : H T Wong
Technical Officer

Certified By 核證 : K C Lee
Project Engineer

Date of Issue 簽發日期 : 30 December 2016

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址:: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C167187
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C163709
CL281	Multifunction Acoustic Calibrator	PA160023
TST150A	Measuring Amplifier	C161175

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.2	± 0.3	± 0.2
114 dB, 1 kHz	114.2		

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	0.999 99	1 kHz ± 0.02 %	± 0.01

Remark : - The uncertainties are for a confidence probability of not less than 95 %.

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

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

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
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輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C167188
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC16-2886) Date of Receipt / 收件日期 : 16 December 2016

Description / 儀器名稱	:	Sound & Vibration Analyser
Manufacturer / 製造商	:	Svantek
Model No. / 型號	:	SVAN977
Serial No. / 編號	:	45482
Supplied By / 委託者	:	Dragages - China Harbour - VSL Joint Venture 3/F, Island Place Tower, 510 King's Road, North Point, Hong Kong

TEST CONDITIONS / 測試條件

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

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 29 December 2016

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA
- Rohde & Schwarz Laboratory, Germany

Tested By 測試 : H T Wong, Technical Officer

Certified By 核證 : K C Lee, Project Engineer

Date of Issue 簽發日期 : 30 December 2016

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C167188
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration using the Svantek acoustic calibrator SV30A, S/N : 24780 was performed before the test.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C160077
CL281	Multifunction Acoustic Calibrator	PA160023

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
HIGH	SPL	A	Fast	114.00	1	113.8	± 1.1

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
HIGH	SPL	A	Fast	114.00	1	113.8 (Ref.)
				104.00		103.8
				94.00		93.8

IEC 61672 Class 1 Spec. : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
HIGH	SPL	A	Fast	114.00	1	113.8	Ref.
			Slow			113.8	± 0.3

Certificate of Calibration
校正證書

Certificate No. : C167188
證書編號

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
HIGH	SPL	A	Fast	114.00	63 Hz	87.6	-26.2 ± 1.5
					125 Hz	97.6	-16.1 ± 1.5
					250 Hz	105.1	-8.6 ± 1.4
					500 Hz	110.5	-3.2 ± 1.4
					1 kHz	113.8	Ref.
					2 kHz	115.0	+1.2 ± 1.6
					4 kHz	114.8	+1.0 ± 1.6
					8 kHz	112.8	-1.1 (+2.1 ; -3.1)
					12.5 kHz	109.5	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
HIGH	SPL	C	Fast	114.00	63 Hz	113.0	-0.8 ± 1.5
					125 Hz	113.6	-0.2 ± 1.5
					250 Hz	113.8	0.0 ± 1.4
					500 Hz	113.8	0.0 ± 1.4
					1 kHz	113.8	Ref.
					2 kHz	113.6	-0.2 ± 1.6
					4 kHz	113.0	-0.8 ± 1.6
					8 kHz	110.9	-3.0 (+2.1 ; -3.1)
					12.5 kHz	107.6	-6.2 (+3.0 ; -6.0)

Certificate of Calibration
校正證書

Certificate No. : C167188
證書編號

Remarks : - UUT Microphone Model No. : ACO 7052E & S/N : 63626

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

114 dB	63 Hz - 125 Hz	: ± 0.45 dB
	250 Hz - 500 Hz	: ± 0.40 dB
	1 kHz	: ± 0.30 dB
	2 kHz - 4 kHz	: ± 0.45 dB
	8 kHz	: ± 0.55 dB
	12.5 kHz	: ± 0.80 dB
	1 kHz	: ±0.10 dB (Ref. 94 dB)
104 dB	1 kHz	: ± 0.10 dB (Ref. 94 dB)
94 dB	1 kHz	: ± 0.20 dB

- The uncertainties are for a confidence probability of not less than 95 %.

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

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

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
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CASTCO

佳力高試驗中心有限公司
CASTCO TESTING CENTRE LTD.

TEST REPORT
Chemical Analysis of Water
Accuracy check of YSI Sondes Environmental Monitoring System

Date of issue: 11-11-2016
Page 1 of 1 page(s) Castco LRN: EN0161103-32

Sample details as supplied by customer:-

Customer : Dragages-China Harbour-VSL Joint Venture Customer Ref. No. : --
Address: Tung Chung Waterfront Road, adjacent to Tung Chung New Development Pier
Job Title : Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road - Section between HKSAR Boundary and Scenic Hill
Contract No.: HY/2011/09

Laboratory Test Results:-

Instrument Name: Sonde Environmental Monitoring System
Manufacturer : YSI Instrument No. : SW-08-06
Model No. : EXO Date of Calibration : 03-11-2016
Serial No. : 16J100680 Date of Next Calibration : 03-02-2017

pH Value Check (pH Probe : 16J100416)

Expected Reading (pH Unit)	Sonde Reading (pH Unit)	Tolerance (pH Unit)	Tolerance Limit (pH Unit)	Method Reference
4.00	4.13	0.13	± 0.2	APHA 21e, 4500-H^+B
7.02	7.00	-0.02		
10.06	9.96	-0.10		

Turbidity Check (Turbidity Sensor : 16H102463)

Expected Reading (NTU)	Sonde Reading (NTU)	Tolerance (%)	Tolerance Limit (%)	Method Reference
4.00	4.33	8.3	± 10	APHA 21e, 2130B
10.00	10.88	8.8		
20.00	20.59	3.0		
50.00	54.70	9.4		
100.00	105.68	5.7		

Conductivity Performance Check (Conductivity Sensor : 16G102307)

Expected Reading (µS/cm)	Sonde Reading (µS/cm)	Tolerance (%)	Tolerance Limit (%)	Method Reference
1412 at 25 °C	1332 at 25 °C	-5.7	± 10	APHA 21e, 2510B

Salinity Performance Check (Salinity Sensor : 16G102307)

Expected Reading (µS/cm)	Sonde Reading (µS/cm)	Tolerance (%)	Tolerance Limit (%)	Method Reference
33	33.72	2.2	± 10	APHA 19e, 2520B

Dissolved Oxygen Check (Dissolved Oxygen Sensor: 16H102985)

DO from Winkler Titration (mg/L)	Sonde Reading (mg/L)	Tolerance (mg/L)	Tolerance Limit (mg/L)	Method Reference
8.88	8.94	0.06	± 0.20	APHA 21e, 4500-O C&G
4.94	4.95	0.01		

Water Level Meter Check

Expected Reading (m)	Sonde Reading (m)	Tolerance (m)	Tolerance Limit (m)	Method Reference
1.06	1.02	-0.04	± 0.05	YSI Sondes Procedure Manual

Temperature Check

Expected Reading (℃)	Sonde Reading (℃)	Tolerance (℃)	Tolerance Limit (℃)	Method Reference
25.0	25.072	0.07	± 2.0	Telarc Technical Guide No.3 1986

Checked by : _____
Au Kwok Kin
Senior Chemist

Certified by : _____
Cheng Chi Fai
Senior Manager

End of Report

Form No. ENV SONDE_T1 dd 02/16/2013

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E-mail: castco@netvigator.com Website: www.castco.com.hk

CASTCO

佳力高試驗中心有限公司
CASTCO TESTING CENTRE LTD.

TEST REPORT
Chemical Analysis of Water
Accuracy check of YSI Sondes Environmental Monitoring System

Date of issue: 11-11-2016
Page 1 of 1 page(s)

Castco LRN: EN0161103-31

Sample details as supplied by customer:-

Customer : Dragages-China Harbour-VSL Joint Venture Customer Ref. No. : --
Address: Tung Chung Waterfront Road, adjacent to Tung Chung New Development Pier
Job Title : Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road - Section between HKSAR Boundary and Scenic Hill
Contract No.: HY/2011/09

Laboratory Test Results:-

Instrument Name: Sonde Environmental Monitoring System
Manufacturer : YSI
Model No. : EXO
Serial No. : 16J100679
Instrument No. : SW-08-05
Date of Calibration : 03-11-2016
Date of Next Calibration : 03-02-2017

pH Value Check (pH Probe : 16J100415)

Expected Reading (pH Unit)	Sonde Reading (pH Unit)	Tolerance (pH Unit)	Tolerance Limit (pH Unit)	Method Reference
4.00	4.08	0.08	± 0.2	APHA 21e, 4500-H^+B
7.02	7.19	0.17		
10.06	10.06	0.00		

Turbidity Check (Turbidity Sensor : 16H102462)

Expected Reading (NTU)	Sonde Reading (NTU)	Tolerance (%)	Tolerance Limit (%)	Method Reference
4.00	4.39	9.7	± 10	APHA 21e, 2130B
10.00	10.86	8.6		
20.00	21.11	5.6		
50.00	50.22	0.4		
100.00	96.55	-3.5		

Conductivity Performance Check (Conductivity Sensor : 16G102306)

Expected Reading (µS/cm)	Sonde Reading (µS/cm)	Tolerance (%)	Tolerance Limit (%)	Method Reference
1412 at 25 °C	1346 at 25 °C	-4.7	± 10	APHA 21e, 2510B

Salinity Performance Check (Salinity Sensor : 16G102306)

Expected Reading (µS/cm)	Sonde Reading (µS/cm)	Tolerance (%)	Tolerance Limit (%)	Method Reference
33	34.24	3.8	± 10	APHA 19e, 2520B

Dissolved Oxygen Check (Dissolved Oxygen Sensor: 16H102984)

DO from Winkler Titration (mg/L)	Sonde Reading (mg/L)	Tolerance (mg/L)	Tolerance Limit (mg/L)	Method Reference
8.88	9.02	0.14	± 0.20	APHA 21e, 4500-O C&G
4.66	4.79	0.13		

Water Level Meter Check

Expected Reading (m)	Sonde Reading (m)	Tolerance (m)	Tolerance Limit (m)	Method Reference
1.06	1.02	-0.04	± 0.05	YSI Sondes Procedure Manual

Temperature Check

Expected Reading (℃)	Sonde Reading (℃)	Tolerance (℃)	Tolerance Limit (℃)	Method Reference
25.0	25.027	0.03	± 2.0	Telarc Technical Guide No.3 1986

Checked by : _____
Au Kwok Kin
Senior Chemist

Certified by : _____
Cheng Chi Fai
Senior Manager

End of Report

Form No. ENV SONDE_T1 dd 02/16/2013

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CASTCO
佳力高試驗中心有限公司
CASTCO TESTING CENTRE LIMITED

TEST REPORT
Chemical Analysis of Water
Accuracy check of YSI Sondes Environmental Monitoring System

Date of issue: 20-02-2017

Castco LRN: 170208-0119-001

Sample details as supplied by customer:-

Customer : Dragages-China Harbour-VSL Joint Venture Customer Ref. No. : --
Address: Tung Chung Waterfront Road, adjacent to Tung Chung New Development Pier
Job Title : Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road - Section between HKSAR Boundary and Scenic Hill
Contract No.: HY/2011/09

Laboratory Test Results:-

Instrument Name: Sonde Environmental Monitoring System
Manufacturer : YSI
Model No. : EXO
Serial No. : 16J100679
Instrument No. : SW-08-05
Date of Calibration : 04-02-2017
Date of Next Calibration : 04-05-2017

pH Value Check (pH Probe : 16J100415)

Expected Reading (pH Unit)	Sonde Reading (pH Unit)	Tolerance (pH Unit)	Tolerance Limit (pH Unit)	Method Reference
4.00	4.18	0.18	± 0.2	APHA 21e, 4500-H^+B
7.02	7.17	0.15		
10.06	10.22	0.16		

Turbidity Check (Turbidity Sensor : 16H102462)

Expected Reading (NTU)	Sonde Reading (NTU)	Tolerance (%)	Tolerance Limit (%)	Method Reference
4.00	4.30	7.5	± 10	APHA 21e, 2130B
10.00	10.55	5.5		
20.00	21.41	7.1		
50.00	52.92	5.8		
100.00	107.26	7.3		

Conductivity Performance Check (Conductivity Sensor : 16G102306)

Expected Reading (µS/cm)	Sonde Reading (µS/cm)	Tolerance (%)	Tolerance Limit (%)	Method Reference
1412 at 25 °C	1311 at 25 °C	-7.15	± 10	APHA 21e, 2510B

Salinity Performance Check (Salinity Sensor : 16G102306)

Expected Reading (µS/cm)	Sonde Reading (µS/cm)	Tolerance (%)	Tolerance Limit (%)	Method Reference
33	33.93	2.82	± 10	APHA 19e, 2520B

Dissolved Oxygen Check (Dissolved Oxygen Sensor: 16H102984)

DO from Winkler Titration (mg/L)	Sonde Reading (mg/L)	Tolerance (mg/L)	Tolerance Limit (mg/L)	Method Reference
8.91	9.11	0.2	± 0.20	APHA 21e, 4500-O C&G
4.01	4.12	0.11		

Water Level Meter Check

Expected Reading (m)	Sonde Reading (m)	Tolerance (m)	Tolerance Limit (m)	Method Reference
1.00	0.96	-0.04	± 0.05	YSI Sondes Procedure Manual

Temperature Check

Expected Reading (℃)	Sonde Reading (℃)	Tolerance (℃)	Tolerance Limit (℃)	Method Reference
25.0	24.960	-0.04	± 2.0	Telarc Technical Guide No.3 1986

Checked by : _____
Au Kwok Kin
Senior Chemist

Certified by : _____
CASTCO TESTING CENTRE Preliminary Report

End of Report

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CASTCO
佳力高試驗中心有限公司
CASTCO TESTING CENTRE LIMITED

TEST REPORT
Chemical Analysis of Water
Accuracy check of YSI Sondes Environmental Monitoring System

Date of issue: 20-02-2017

Castco LRN: 170208-0119-002

Sample details as supplied by customer:-

Customer : Dragages-China Harbour-VSL Joint Venture Customer Ref. No. : --
Address: Tung Chung Waterfront Road, adjacent to Tung Chung New Development Pier
Job Title : Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road - Section between HKSAR Boundary and Scenic Hill
Contract No.: HY/2011/09

Laboratory Test Results:-

Instrument Name: Sonde Environmental Monitoring System
Manufacturer : YSI Instrument No. : SW-08-06
Model No. : EXO Date of Calibration : 04-02-2017
Serial No. : 16J100680 Date of Next Calibration : 04-05-2017

pH Value Check (pH Probe : 16J100416)

Expected Reading (pH Unit)	Sonde Reading (pH Unit)	Tolerance (pH Unit)	Tolerance Limit (pH Unit)	Method Reference
4.00	4.17	0.17	± 0.2	APHA 21e, 4500-H^+B
7.02	7.16	0.14		
10.06	10.12	0.06		

Turbidity Check (Turbidity Sensor : 16H102463)

Expected Reading (NTU)	Sonde Reading (NTU)	Tolerance (%)	Tolerance Limit (%)	Method Reference
4.00	4.22	5.5	± 10	APHA 21e, 2130B
10.00	10.86	8.6		
20.00	20.82	4.1		
50.00	54.82	9.6		
100.00	109.25	9.3		

Conductivity Performance Check (Conductivity Sensor : 16G102307)

Expected Reading (µS/cm)	Sonde Reading (µS/cm)	Tolerance (%)	Tolerance Limit (%)	Method Reference
1412 at 25 °C	1273 at 25 °C	-9.84	± 10	APHA 21e, 2510B

Salinity Performance Check (Salinity Sensor : 16G102307)

Expected Reading (µS/cm)	Sonde Reading (µS/cm)	Tolerance (%)	Tolerance Limit (%)	Method Reference
33	33.50	1.51	± 10	APHA 19e, 2520B

Dissolved Oxygen Check (Dissolved Oxygen Sensor: 16H102985)

DO from Winkler Titration (mg/L)	Sonde Reading (mg/L)	Tolerance (mg/L)	Tolerance Limit (mg/L)	Method Reference
8.93	9.07	0.14	± 0.20	APHA 21e, 4500-O C&G
4.21	4.06	-0.15		

Water Level Meter Check

Expected Reading (m)	Sonde Reading (m)	Tolerance (m)	Tolerance Limit (m)	Method Reference
1.00	0.95	-0.05	± 0.05	YSI Sondes Procedure Manual

Temperature Check

Expected Reading (℃)	Sonde Reading (℃)	Tolerance (℃)	Tolerance Limit (℃)	Method Reference
25.0	24.950	-0.05	± 2.0	Telarc Technical Guide No.3 1986

Checked by : _____
Au Kwok Kin
Senior Chemist

Certified by : _____
CASTCO TESTING CENTRE LIMITED Preliminary Report

End of Report

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APPENDIX D
ENVIRONMENTAL MONITORING SCHEDULES

Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill
Impact Air Quality and Noise Monitoring Schedule in February 2017

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

Air Quality Monitoring Stations
AMS1 - Sha Lo Wan
AMS4 - San Tau

Noise Monitoring Stations
NMS1 - Sha Lo Wan
NMS4 - San Tau

Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill
Tentative Impact Air Quality and Noise Monitoring Schedule in March 2017

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

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

Air Quality Monitoring Stations
AMS1 - Sha Lo Wan
AMS4 - San Tau

Noise Monitoring Stations
NMS1 - Sha Lo Wan
NMS4 - San Tau

Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill
Impact Water Quality Monitoring Schedule in February 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1-Feb	2-Feb	3-Feb	4-Feb
			Water Quality Monitoring Mid-Flood 10:01 Mid-Ebb 15:59		Water Quality Monitoring Mid-Flood 10:38 Mid-Ebb 16:46	
5-Feb	6-Feb	7-Feb	8-Feb	9-Feb	10-Feb	11-Feb
	Water Quality Monitoring Mid-Ebb 8:24 Mid-Flood 14:16		Water Quality Monitoring Mid-Ebb 11:06 Mid-Flood 16:26		Water Quality Monitoring Mid-Flood 12:45 Mid-Ebb 18:13	
12-Feb	13-Feb	14-Feb	15-Feb	16-Feb	17-Feb	18-Feb
	Water Quality Monitoring Mid-Flood 8:44 Mid-Ebb 14:32		Water Quality Monitoring Mid-Flood 9:42 Mid-Ebb 15:38		Water Quality Monitoring Mid-Flood 10:42 Mid-Ebb 16:56	
19-Feb	20-Feb	21-Feb	22-Feb	23-Feb	24-Feb	25-Feb
	Water Quality Monitoring Mid-Flood 12:49 Mid-Ebb 20:59		Water Quality Monitoring Mid-Ebb 10:35 Mid-Flood 15:22		Water Quality Monitoring Mid-Ebb 11:59 Mid-Flood 17:13	
26-Feb	27-Feb	28-Feb				
	Water Quality Monitoring Mid-Ebb 13:40 Mid-Flood 19:27					

Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill
Tentative Impact Water Quality Monitoring Schedule in March 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1-Mar	2-Mar	3-Mar	4-Mar
			Water Quality Monitoring Mid-Flood 8:51 Mid-Ebb 14:54		Water Quality Monitoring Mid-Flood 9:54 Mid-Ebb 16:14	
5-Mar	6-Mar	7-Mar	8-Mar	9-Mar	10-Mar	11-Mar
	Water Quality Monitoring Mid-Flood 12:22 Mid-Ebb 19:39		Water Quality Monitoring Mid-Ebb 10:08 Mid-Flood 15:14		Water Quality Monitoring Mid-Ebb 11:54 Mid-Flood 17:21	
12-Mar	13-Mar	14-Mar	15-Mar	16-Mar	17-Mar	18-Mar
	Water Quality Monitoring Mid-Flood 7:35 Mid-Ebb 13:31		Water Quality Monitoring Mid-Flood 8:30 Mid-Ebb 14:32		Water Quality Monitoring Mid-Flood 9:20 Mid-Ebb 15:34	
19-Mar	20-Mar	21-Mar	22-Mar	23-Mar	24-Mar	25-Mar
	Water Quality Monitoring Mid-Flood 10:43 Mid-Ebb 17:56			Water Quality Monitoring Mid-Ebb 10:18 Mid-Flood 14:52		Water Quality Monitoring Mid-Ebb 11:34 Mid-Flood 16:57
26-Mar	27-Mar	28-Mar	29-Mar	30-Mar	31-Mar	
	Water Quality Monitoring Mid-Ebb 12:41 Mid-Flood 18:34		Water Quality Monitoring Mid-Flood 7:44 Mid-Ebb 13:54		Water Quality Monitoring Mid-Flood 8:47 Mid-Ebb 15:10	

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

Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill
Construction-Phase Dolphin Monitoring in West Lantau (Line Transect Vessel Survey) in February 2017

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	10-Feb	11-Feb
	Line Transect Vessel Survey					
12-Feb	13-Feb	14-Feb	15-Feb	16-Feb	17-Feb	18-Feb
	Line Transect Vessel Survey					
19-Feb	20-Feb	21-Feb	22-Feb	23-Feb	24-Feb	25-Feb
26-Feb	27-Feb	28-Feb				

Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill
Tentative Construction-Phase Dolphin Monitoring in West Lantau (Line Transect Vessel Survey) in March 2017

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

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

APPENDIX E
1-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATION

Appendix E - 1-hour TSP Monitoring Results

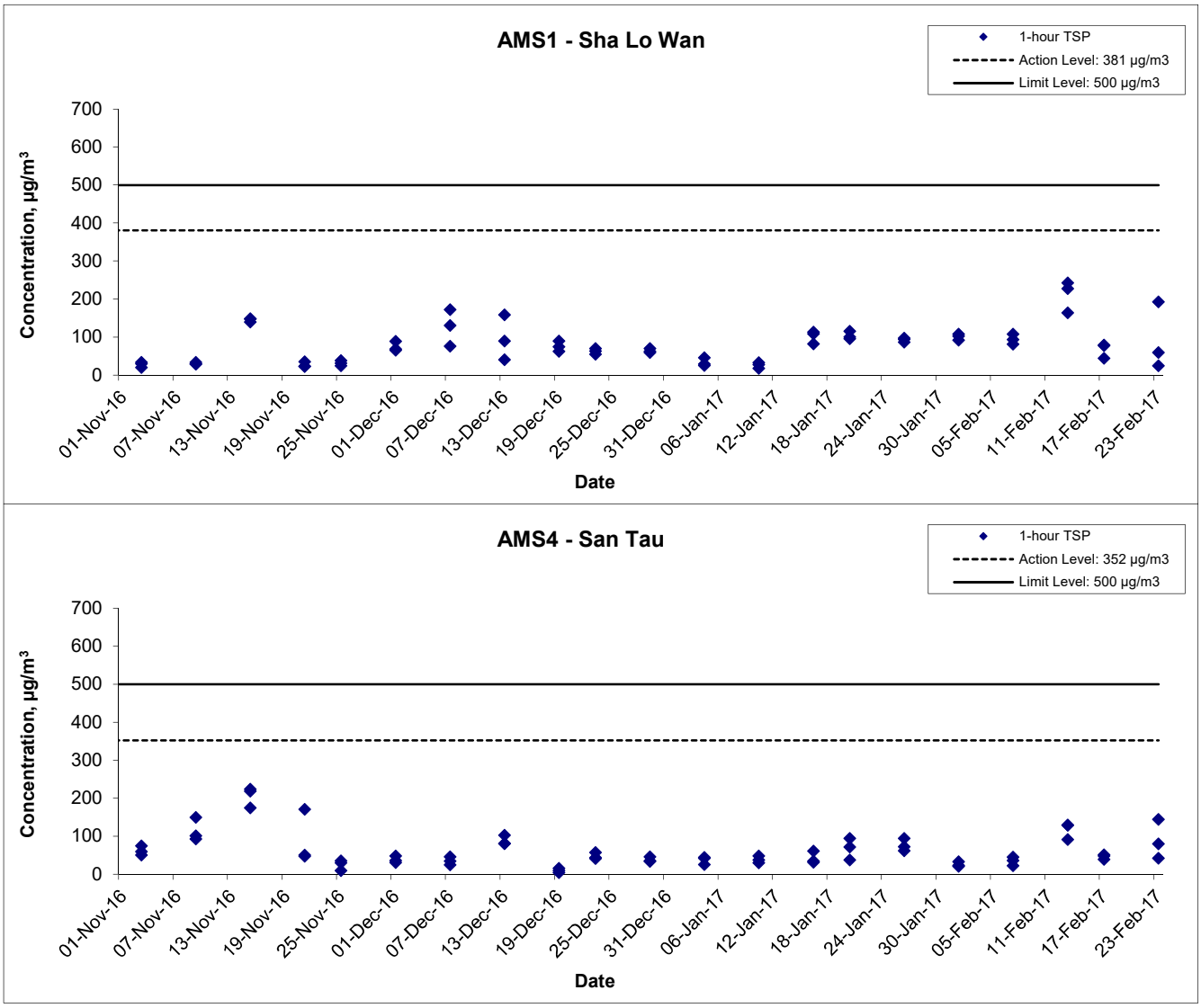
Location AMS1 - Sha Lo Wan

Sampling Date	Start Time	Weather Condition	Air Temp. (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. ($\mu g/m^3$)
					Initial	Final		Initial	Final		Initial	Final			
1-Feb-17	11:00	Sunny	291.3	769.7	2.7578	2.7645	0.0067	1213.9	1214.9	1.0	1.21	1.21	1.21	72.7	92
1-Feb-17	13:00	Sunny	293.8	769.7	2.7414	2.7488	0.0074	1214.9	1215.9	1.0	1.21	1.21	1.21	72.4	102
1-Feb-17	14:00	Sunny	294.0	769.5	2.7456	2.7534	0.0078	1215.9	1216.9	1.0	1.21	1.21	1.21	72.3	108
7-Feb-17	9:00	Cloudy	290.4	765.2	2.7601	2.7660	0.0059	1240.9	1241.9	1.0	1.21	1.21	1.21	72.6	81
7-Feb-17	10:00	Cloudy	290.6	765.0	2.7501	2.7569	0.0068	1241.9	1242.9	1.0	1.21	1.21	1.21	72.6	94
7-Feb-17	11:00	Cloudy	290.8	764.8	2.7531	2.7609	0.0078	1242.9	1243.9	1.0	1.21	1.21	1.21	72.5	108
13-Feb-17	9:00	Sunny	288.3	774.1	2.7510	2.7677	0.0167	1267.9	1268.9	1.0	1.22	1.22	1.22	73.4	228
13-Feb-17	10:00	Sunny	288.5	773.9	2.7370	2.7548	0.0178	1268.9	1269.9	1.0	1.22	1.22	1.22	73.3	243
13-Feb-17	11:00	Sunny	288.7	773.7	2.7485	2.7605	0.0120	1269.9	1270.9	1.0	1.22	1.22	1.22	73.3	164
17-Feb-17	13:00	Sunny	295.4	767.1	2.7666	2.7723	0.0057	1295.7	1296.7	1.0	1.20	1.20	1.20	72.0	79
17-Feb-17	14:00	Sunny	295.6	766.9	2.7512	2.7568	0.0056	1296.7	1297.7	1.0	1.20	1.20	1.20	72.0	78
17-Feb-17	15:00	Sunny	295.8	766.7	2.7417	2.7449	0.0032	1297.7	1298.7	1.0	1.20	1.20	1.20	72.0	44
23-Feb-17	10:30	Cloudy	283.4	769.6	2.6872	2.7014	0.0142	1322.7	1323.7	1.0	1.23	1.23	1.23	73.8	192
23-Feb-17	13:30	Cloudy	283.8	768.5	2.6866	2.6910	0.0044	1323.7	1324.7	1.0	1.23	1.23	1.23	73.7	60
23-Feb-17	14:30	Cloudy	284.0	768.3	2.6911	2.6929	0.0018	1324.7	1325.7	1.0	1.23	1.23	1.23	73.7	24
														Min	24
														Max	243
														Average	113

Location AMS4 - San Tau

Sampling Date	Start Time	Weather Condition	Air Temp. (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. ($\mu g/m^3$)
					Initial	Final		Initial	Final		Initial	Final			
1-Feb-17	9:00	Sunny	291.6	768.4	2.7655	2.7679	0.0024	8280.7	8281.7	1.0	1.22	1.22	1.22	73.1	33
1-Feb-17	11:00	Sunny	292.2	768.0	2.7608	2.7623	0.0015	8281.7	8282.7	1.0	1.22	1.22	1.22	73.0	21
1-Feb-17	13:00	Sunny	292.5	767.5	2.7401	2.7418	0.0017	8282.7	8283.7	1.0	1.22	1.22	1.22	72.9	23
7-Feb-17	9:00	Cloudy	291.4	766.1	2.7587	2.7603	0.0016	8307.7	8308.7	1.0	1.22	1.22	1.22	73.0	22
7-Feb-17	10:00	Cloudy	291.6	765.9	2.7520	2.7546	0.0026	8308.7	8309.7	1.0	1.22	1.22	1.22	73.0	36
7-Feb-17	13:00	Cloudy	292.3	764.6	2.7585	2.7618	0.0033	8309.7	8310.7	1.0	1.21	1.21	1.21	72.8	45
13-Feb-17	9:00	Sunny	289.4	773.7	2.7573	2.7668	0.0095	8334.7	8335.7	1.0	1.23	1.23	1.23	73.6	129
13-Feb-17	10:00	Sunny	289.6	773.5	2.7589	2.7684	0.0095	8335.7	8336.7	1.0	1.23	1.23	1.23	73.6	129
13-Feb-17	11:00	Sunny	289.8	773.3	2.7466	2.7533	0.0067	8336.7	8337.7	1.0	1.23	1.23	1.23	73.6	91
17-Feb-17	13:00	Sunny	295.5	766.6	2.7522	2.7559	0.0037	8361.7	8362.7	1.0	1.21	1.21	1.21	72.5	51
17-Feb-17	14:00	Sunny	295.7	766.4	2.7556	2.7591	0.0035	8362.7	8363.7	1.0	1.21	1.21	1.21	72.5	48
17-Feb-17	15:00	Sunny	295.9	766.2	2.7523	2.7551	0.0028	8363.7	8364.7	1.0	1.21	1.21	1.21	72.5	39
23-Feb-17	11:00	Cloudy	283.3	770.4	2.6875	2.6982	0.0107	8388.7	8389.7	1.0	1.24	1.24	1.24	74.3	144
23-Feb-17	13:00	Cloudy	283.7	769.3	2.6879	2.6938	0.0059	8389.7	8390.7	1.0	1.24	1.24	1.24	74.2	80
23-Feb-17	14:00	Cloudy	283.9	769.1	2.6893	2.6924	0.0031	8390.7	8391.7	1.0	1.24	1.24	1.24	74.1	42
														Min	21
														Max	144
														Average	62

1-hour TSP Concentration Levels



Title: Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Graphical Presentation of 1-hour TSP Monitoring Results	Scale: N.T.S	Project No.: MA12014	CINOTECH
	Date: Feb 17	Appendix: E	

APPENDIX F
24-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATION

Appendix F - 24-hour TSP Monitoring Results

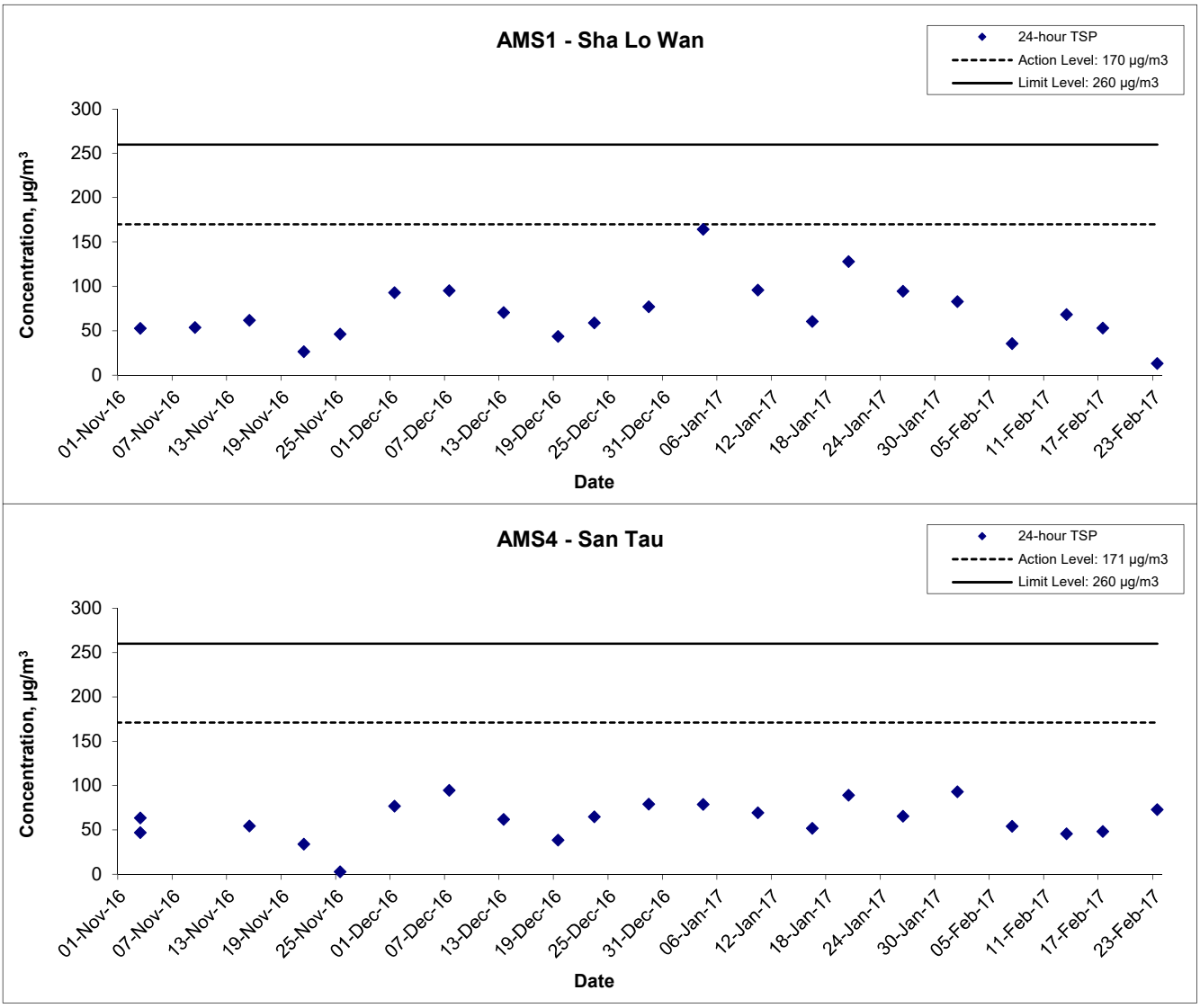
Location AMS1 - Sha Lo Wan

Sampling Date	Start Time	Weather Condition	Air Temp. (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. ($\mu g/m^3$)
					Initial	Final		Initial	Final		Initial	Final			
1-Feb-17	15:00	Cloudy	292.7	769.3	2.7695	2.9138	0.1443	1216.9	1240.9	24.0	1.21	1.21	1.21	1740.3	83
7-Feb-17	14:00	Sunny	291.7	763.9	2.7627	2.8242	0.0615	1243.9	1267.9	24.0	1.21	1.21	1.21	1736.8	35
13-Feb-17	14:00	Sunny	290.4	772.7	2.7535	2.8731	0.1196	1270.9	1294.9	24.0	1.22	1.22	1.22	1752.1	68
17-Feb-17	16:00	Sunny	296.0	766.5	2.7646	2.8559	0.0913	1298.7	1322.7	24.0	1.20	1.20	1.20	1726.1	53
23-Feb-17	15:30	Cloudy	284.2	768.1	2.6754	2.6984	0.0230	1325.7	1349.7	24.0	1.23	1.23	1.23	1767.2	13
														Min	13
														Max	83
														Average	50

Location AMS4 - San Tau

Sampling Date	Start Time	Weather Condition	Air Temp. (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. ($\mu g/m^3$)
					Initial	Final		Initial	Final		Initial	Final			
1-Feb-17	15:00	Cloudy	292.7	767.3	2.7386	2.8449	0.1063	8283.7	8307.7	24.0	1.22	1.21	1.22	1749.7	61
7-Feb-17	14:00	Sunny	292.5	764.4	2.7542	2.8487	0.0945	8310.7	8334.7	24.0	1.21	1.21	1.21	1746.9	54
13-Feb-17	15:00	Sunny	290.7	772.0	2.7715	2.8520	0.0805	8337.7	8361.7	24.0	1.22	1.22	1.22	1761.2	46
17-Feb-17	16:00	Sunny	296.1	766.0	2.7430	2.8267	0.0837	8364.7	8388.7	24.0	1.21	1.21	1.21	1738.0	48
23-Feb-17	15:00	Cloudy	284.1	768.9	2.6756	2.8050	0.1294	8391.7	8415.7	24.0	1.24	1.23	1.23	1778.1	73
														Min	46
														Max	73
														Average	56

24-hour TSP Concentration Levels



Title: Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Graphical Presentation of 24-hour TSP Monitoring Results	Scale: N.T.S	Project No.: MA12014	CINOTECH
	Date: Feb 17	Appendix: F	

APPENDIX G
NOISE MONITORING RESULTS AND GRAPHICAL PRESENTATION

Appendix G - Noise Monitoring Results

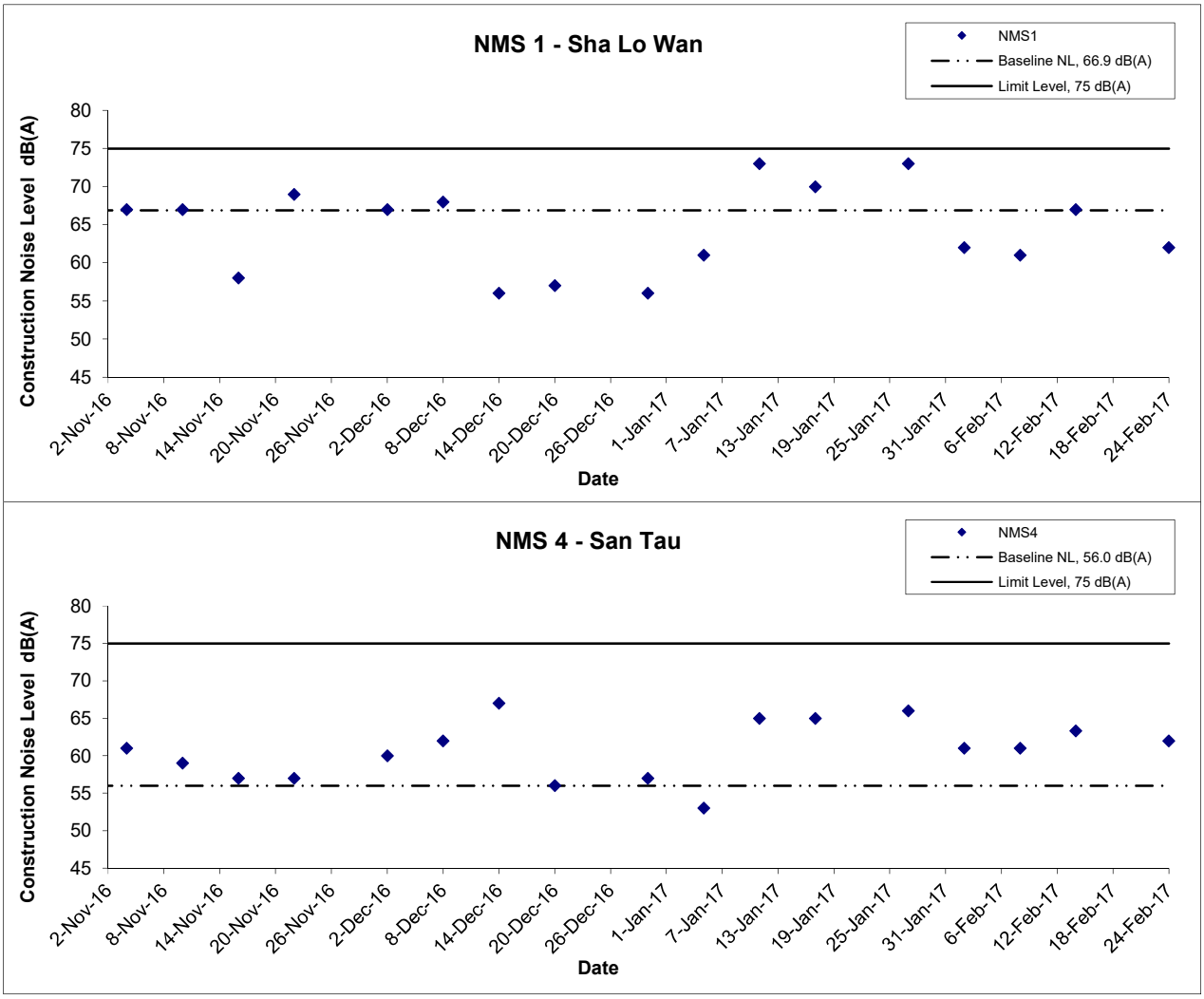
Location NMS 1 - Sha Lo Wan								
Date	Weather	Time	Unit: dB (A) (5-min)			Average	Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
2-Feb-17	Cloudy	13:00	60.1	61.9	57.5	62	66.9	62 Measured ≦ Limit Level
		13:05	59.5	61.7	57.2			
		13:10	62.1	64.9	56.9			
		13:15	64.9	69.3	57.4			
		13:20	63.1	66.6	57.4			
		13:25	60.8	66.5	57.3			
8-Feb-17	Sunny	15:00	60.2	62.0	57.3	61		61 Measured ≦ Limit Level
		15:05	59.7	62.3	57.1			
		15:10	62.2	64.8	56.7			
		15:15	63.2	67.3	57.1			
		15:20	61.1	67.4	58.1			
		15:25	60.1	67.3	58.2			
14-Feb-17	Sunny	14:30	66.8	69.8	51.6	67		67 Measured ≦ Limit Level
		14:35	66.6	69.5	51.7			
		14:40	66.7	69.6	51.7			
		14:45	66.6	69.4	51.8			
		14:50	66.7	69.4	51.7			
		14:55	66.6	69.5	51.7			
24-Feb-17	Cloudy	11:00	60.7	66.5	57.4	62		62 Measured ≦ Limit Level
		11:05	62.6	65.9	57.3			
		11:10	63.6	65.2	57.5			
		11:15	61.1	66.3	57.4			
		11:20	60.8	65.2	57.7			
		11:25	64.0	66.8	57.3			

Remark: * +3dB(A) Façade correction included

Location NMS 4 - San Tau								
Date	Weather	Time	Unit: dB (A) (5-min)			Average	Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}
2-Feb-17	Cloudy	15:00	61.7	63.4	559.5	61	56.0	61 Measured ≦ Limit Level
		15:05	61.4	62.9	60.0			
		15:10	60.9	61.9	60.0			
		15:15	60.7	61.7	59.6			
		15:20	61.5	63.2	59.4			
		15:25	60.8	61.5	59.3			
8-Feb-17	Sunny	15:50	61.3	63.4	59.6	61		61 Measured ≦ Limit Level
		15:55	61.6	64.4	59.7			
		16:00	60.8	62.3	60.1			
		16:05	60.5	62.4	59.6			
		16:10	62.1	63.4	59.5			
		16:15	60.8	61.4	59.8			
14-Feb-17	Sunny	15:30	63.2	66.4	50.4	63		63 Measured ≦ Limit Level
		15:35	63.3	66.5	50.6			
		15:40	63.5	66.2	50.5			
		15:45	63.4	66.4	50.5			
		15:50	63.4	66.3	50.4			
		15:55	63.3	66.2	50.2			
24-Feb-17	Cloudy	16:30	61.7	63.6	59.2	62		62 Measured ≦ Limit Level
		16:35	62.1	63.9	59.4			
		16:40	61.3	63.4	59.4			
		16:45	61.8	63.7	59.6			
		16:50	61.1	63.8	59.5			
		16:55	61.7	63.3	59.1			

Remark: * +3dB(A) Façade correction included

Noise Levels



Title: Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S	Project No.: MA12014	CINOTECH
	Feb 17	Appendix: G	

APPENDIX H
WATER QUALITY MONITORING RESULTS AND GRAPHICAL PRESENTATION

Water Quality Monitoring Results at CS1 - 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*
1-Feb-17	Sunny	Moderate	15:06	Surface	1	19.4 19.4	19.4	8.3 8.3	8.3	27.6 27.6	27.6	99.4 98.6	99.0	7.8 7.7	7.8	7.9	4.2 4.5	4.4	5.0	14.1 10.8	12.5	12.6
				Middle	5.5	18.8 18.7	18.8	8.3 8.3	8.3	30.0 30.1	30.1	100.8 99.8	100.3	7.9 7.8	7.9		4.9 5.7	5.3		14.0 13.4	13.7	
				Bottom	10	18.3 18.3	18.3	8.3 8.3	8.3	32.2 32.2	32.2	95.1 95.9	95.5	7.4 7.5	7.5	7.5	5.7 4.8	5.3		12.8 10.2	11.5	
3-Feb-17	Cloudy	Moderate	16:44	Surface	1	19.8 19.3	19.6	8.1 8.1	8.1	30.2 30.3	30.3	101.3 100.2	100.8	7.7 7.7	7.7	7.6	4.4 4.5	4.5	5.0	14.8 14.0	14.4	14.0
				Middle	6	18.7 18.7	18.7	8.1 8.1	8.1	30.5 30.5	30.5	95.3 94.2	94.8	7.4 7.3	7.4		4.3 4.6	4.5		11.1 17.7	14.4	
				Bottom	11	18.0 18.1	18.1	8.2 8.2	8.2	30.9 30.7	30.8	88.9 90.2	89.6	7.0 7.1	7.1	7.1	6.1 5.8	6.0		13.5 13.1	13.3	
6-Feb-17	Cloudy	Moderate	08:24	Surface	1	19.5 19.5	19.5	8.1 8.1	8.1	32.0 32.0	32.0	93.9 94.5	94.2	7.1 7.2	7.2	7.2	9.5 8.4	9.0	8.2	11.5 9.6	10.6	10.4
				Middle	5	19.5 19.5	19.5	8.1 8.1	8.1	32.4 32.4	32.4	95.3 95.2	95.3	7.2 7.2	7.2		7.8 7.6	7.7		10.6 9.1	9.9	
				Bottom	9	19.4 19.4	19.4	8.0 8.0	8.0	32.6 32.6	32.6	94.2 93.3	93.8	7.2 7.1	7.2	7.2	7.8 7.8	7.8		10.7 10.9	10.8	
8-Feb-17	Cloudy	Moderate	10:36	Surface	1	18.7 18.7	18.7	8.1 8.1	8.1	27.2 27.2	27.2	92.4 91.3	91.9	7.3 7.3	7.3	7.2	2.9 3.0	3.0	4.2	16.1 16.0	16.1	17.6
				Middle	5.5	18.1 18.1	18.1	8.2 8.3	8.3	33.4 33.2	33.3	90.2 90.0	90.1	7.0 7.0	7.0		5.8 4.8	5.3		20.2 17.7	19.0	
				Bottom	10	18.2 18.2	18.2	8.2 8.3	8.3	32.7 32.8	32.8	84.7 84.2	84.5	6.6 6.5	6.6	6.6	4.1 4.3	4.2		17.3 18.1	17.7	
10-Feb-17	Cloudy	Rough	17:18	Surface	1	18.2 18.3	18.3	8.0 8.0	8.0	27.2 27.1	27.2	92.2 91.8	92.0	7.4 7.4	7.4	7.4	4.6 4.3	4.5	6.4	11.9 12.3	12.1	14.7
				Middle	6	18.1 18.1	18.1	8.1 8.1	8.1	29.4 29.6	29.5	91.7 91.4	91.6	7.3 7.2	7.3		5.6 5.9	5.8		15.2 19.2	17.2	
				Bottom	11	17.8 17.8	17.8	8.1 8.1	8.1	32.3 32.2	32.3	92.4 92.4	92.4	7.2 7.2	7.2	7.2	8.7 8.8	8.8		15.3 14.5	14.9	
13-Feb-17	Sunny	Rough	13:39	Surface	1	18.8 18.9	18.9	8.0 8.0	8.0	27.2 27.1	27.2	95.1 94.7	94.9	7.5 7.5	7.5	7.5	4.7 4.4	4.6	6.5	8.4 7.1	7.8	8.3
				Middle	6	18.7 18.7	18.7	8.1 8.1	8.1	29.4 29.5	29.5	94.6 94.4	94.5	7.4 7.4	7.4		5.7 6.0	5.9		8.0 7.7	7.9	
				Bottom	11	18.4 18.4	18.4	8.1 8.1	8.1	32.2 32.2	32.2	95.4 95.4	95.4	7.4 7.4	7.4	7.4	8.8 8.9	8.9		10.5 7.6	9.1	
15-Feb-17	Cloudy	Rough	15:11	Surface	1	21.1 21.1	21.1	8.3 8.3	8.3	28.7 28.6	28.7	104.5 103.7	104.1	7.9 7.8	7.9	8.0	3.8 4.1	4.0	4.6	10.0 11.5	10.8	13.5
				Middle	5.5	20.5 20.4	20.5	8.3 8.3	8.3	31.1 31.1	31.1	106.0 105.0	105.5	8.0 7.9	8.0		4.5 5.3	4.9		14.3 12.7	13.5	
				Bottom	10	20.0 20.0	20.0	8.3 8.3	8.3	33.2 33.2	33.2	100.1 100.9	100.5	7.5 7.6	7.6	7.6	5.3 4.4	4.9		18.8 13.4	16.1	
17-Feb-17	Cloudy	Rough	16:25	Surface	1	20.8 20.8	20.8	8.2 8.2	8.2	29.1 29.0	29.1	99.0 98.2	98.6	7.5 7.4	7.5	7.6	4.1 4.4	4.3	4.9	10.0 13.7	11.9	14.6
				Middle	5.5	20.2 20.1	20.2	8.2 8.2	8.2	31.5 31.6	31.6	100.5 99.5	100.0	7.6 7.5	7.6		4.8 5.6	5.2		13.6 18.5	16.1	
				Bottom	10	19.7 19.7	19.7	8.2 8.2	8.2	33.6 33.7	33.7	94.6 95.4	95.0	7.1 7.2	7.2	7.2	5.6 4.7	5.2		18.3 13.1	15.7	
20-Feb-17	Sunny	Moderate	20:01	Surface	1	19.5 19.5	19.5	8.2 8.2	8.2	25.6 25.6	25.6	94.6 93.9	94.3	7.5 7.4	7.5	7.6	1.8 2.1	2.0	2.6	9.4 8.4	8.9	9.7
				Middle	5.5	18.9 18.8	18.9	8.2 8.2	8.2	28.0 28.1	28.1	96.0 95.0	95.5	7.6 7.5	7.6		2.5 2.4	2.5		12.0 10.9	11.5	
				Bottom	10	18.4 18.4	18.4	8.2 8.2	8.2	30.2 30.2	30.2	90.4 91.1	90.8	7.1 7.2	7.2	7.2	3.3 3.4	3.4		8.7 8.5	8.6	
22-Feb-17	Cloudy	Moderate	10:06	Surface	1	18.4 18.3	18.4	7.9 8.0	8.0	30.1 30.1	30.1	98.1 98.0	98.1	7.7 7.7	7.7	7.7	5.0 4.6	4.8	6.6	5.6 5.1	5.4	8.2
				Middle	6	18.3 18.2	18.3	7.8 7.9	7.9	30.3 30.2	30.3	97.7 97.7	97.7	7.7 7.7	7.7		5.5 5.6	5.6		5.8 5.1	5.5	
				Bottom	11	18.0 18.0	18.0	7.8 7.8	7.8	30.5 30.5	30.5	97.9 98.1	98.0	7.7 7.7	7.7	7.7	9.3 9.5	9.4		14.2 13.0	13.6	
24-Feb-17	Rainy	Rough	12:27	Surface	1	19.4 19.4	19.4	7.9 7.9	7.9	23.7 23.7	23.7	81.1 81.5	81.3	6.5 6.5	6.5	6.5	4.0 4.0	4.0	5.3	7.6 7.0	7.3	9.1
				Middle	5.5	18.8 18.8	18.8	7.9 7.9	7.9	25.8 25.8	25.8	80.1 80.6	80.4	6.4 6.4	6.4		5.6 6.1	5.9		11.1 12.8	12.0	
				Bottom	10	18.4 18.4	18.4	7.9 7.9	7.9	27.7 27.8	27.8	76.7 76.1	76.4	6.1 6.1	6.1	6.1	6.1 5.6	5.9		8.7 7.4	8.1	
27-Feb-17	Cloudy	Moderate	13:15	Surface	1	17.5 17.5	17.5	8.1 8.1	8.1	31.2 31.2	31.2	95.2 95.8	95.5	7.6 7.6	7.6	7.7	9.5 8.4	9.0	8.2	11.8 9.0	10.4	11.4
				Middle	6	17.4 17.4	17.4	8.1 8.1	8.1	31.5 31.5	31.5	96.6 96.4	96.5	7.7 7.6	7.7		7.8 7.6	7.7		11.3 11.0	11.2	
				Bottom	11	17.4 17.4	17.4	8.1 8.1	8.1	31.7 31.7	31.7	95.5 94.6	95.1	7.6 7.5	7.6	7.6	7.8 7.8	7.8		12.7 12.4	12.6	

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

Water Quality Monitoring Results at CS1 - 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*
1-Feb-17	Sunny	Moderate	09:35	Surface	1	18.8 18.8	18.8	8.2 8.2	8.2	28.6 28.6	28.6	94.0 94.4	94.2	7.4 7.4	7.4	7.4	5.3 5.3	5.3	6.6	13.9 12.6	13.3	14.0
				Middle	5.5	18.2 18.2	18.2	8.2 8.2	8.2	30.7 30.7	30.7	92.9 93.5	93.2	7.3 7.3	7.3		6.9 7.4	7.2		16.0 14.2	15.1	
				Bottom	10	17.8 17.8	17.8	8.2 8.1	8.2	32.6 32.7	32.7	89.5 88.9	89.2	7.0 7.0	7.0	7.0	7.4 6.9	7.2		12.7 14.2	13.5	
3-Feb-17	Cloudy	Moderate	10:25	Surface	1	19.9 19.9	19.9	8.1 8.1	8.1	29.9 29.9	29.9	103.5 102.2	102.9	7.9 7.8	7.9	7.7	5.1 4.7	4.9	6.1	15.7 11.3	13.5	13.1
				Middle	6	18.4 18.6	18.5	8.1 8.1	8.1	29.9 30.2	30.1	95.0 95.7	95.4	7.5 7.5	7.5		5.4 5.7	5.6		13.4 12.3	12.9	
				Bottom	11	18.0 18.0	18.0	8.1 8.1	8.1	30.7 30.4	30.6	84.4 85.5	85.0	6.7 6.8	6.8	6.8	7.7 8.0	7.9		13.2 12.4	12.8	
6-Feb-17	Cloudy	Moderate	13:26	Surface	1	19.5 19.5	19.5	8.0 8.0	8.0	31.0 31.0	31.0	92.2 92.4	92.3	7.1 7.1	7.1	7.2	7.7 7.6	7.7	7.9	10.2 9.9	10.1	10.3
				Middle	5.5	19.5 19.5	19.5	8.0 8.0	8.0	31.3 31.3	31.3	93.5 93.7	93.6	7.1 7.2	7.2		7.6 7.6	7.6		11.9 9.6	10.8	
				Bottom	10	19.4 19.4	19.4	8.0 8.0	8.0	31.4 31.4	31.4	93.7 93.1	93.4	7.2 7.1	7.2	7.2	8.5 8.5	8.5		9.3 10.6	10.0	
8-Feb-17	Cloudy	Moderate	15:16	Surface	1	18.7 18.7	18.7	8.1 8.1	8.1	27.6 27.5	27.6	93.8 93.4	93.6	7.4 7.4	7.4	7.4	5.2 4.9	5.1	5.7	14.3 18.4	16.4	16.8
				Middle	5.5	18.5 18.5	18.5	8.1 8.1	8.1	29.7 29.9	29.8	93.3 93.0	93.2	7.3 7.3	7.3		6.2 6.5	6.4		19.1 17.4	18.3	
				Bottom	10	18.2 18.3	18.3	8.2 8.2	8.2	32.6 32.5	32.6	94.0 94.0	94.0	7.3 7.3	7.3	7.3	5.5 5.6	5.6		16.0 15.3	15.7	
10-Feb-17	Cloudy	Rough	12:18	Surface	1	18.2 18.2	18.2	8.1 8.0	8.1	26.9 26.9	26.9	92.7 91.6	92.2	7.4 7.4	7.4	7.3	7.4 7.5	7.5	7.8	13.0 11.4	12.2	13.1
				Middle	6	17.6 17.7	17.7	8.2 8.2	8.2	33.0 32.9	33.0	90.5 90.4	90.5	7.1 7.1	7.1		9.0 8.0	8.5		13.4 13.1	13.3	
				Bottom	11	17.8 17.7	17.8	8.2 8.2	8.2	32.4 32.5	32.5	85.1 84.6	84.9	6.7 6.6	6.7	6.7	7.3 7.5	7.4		12.5 15.1	13.8	
13-Feb-17	Sunny	Rough	08:20	Surface	1	18.8 18.8	18.8	8.1 8.0	8.1	26.9 26.9	26.9	93.8 92.6	93.2	7.4 7.4	7.4	7.3	7.5 7.6	7.6	7.9	9.1 8.3	8.7	8.9
				Middle	6	18.2 18.3	18.3	8.2 8.2	8.2	33.0 32.9	33.0	91.6 91.4	91.5	7.1 7.1	7.1		9.1 8.1	8.6		11.6 8.2	9.9	
				Bottom	11	18.4 18.3	18.4	8.2 8.2	8.2	32.4 32.5	32.5	86.1 85.6	85.9	6.7 6.6	6.7	6.7	7.4 7.6	7.5		8.9 7.4	8.2	
15-Feb-17	Cloudy	Rough	09:36	Surface	1	20.5 20.5	20.5	8.2 8.2	8.2	29.7 29.6	29.7	92.3 92.8	92.6	7.0 7.0	7.0	7.0	4.9 4.9	4.9	6.2	12.1 11.4	11.8	13.9
				Middle	6	19.9 19.9	19.9	8.2 8.2	8.2	31.8 31.8	31.8	91.3 91.8	91.6	6.9 6.9	6.9		6.5 7.0	6.8		19.2 14.4	16.8	
				Bottom	11	19.5 19.5	19.5	8.2 8.1	8.2	33.6 33.7	33.7	87.7 87.0	87.4	6.6 6.6	6.6	6.6	7.0 6.5	6.8		12.8 13.4	13.1	
17-Feb-17	Cloudy	Rough	10:31	Surface	1	20.2 20.2	20.2	8.1 8.1	8.1	30.1 30.1	30.1	93.5 93.9	93.7	7.1 7.1	7.1	7.1	5.2 5.2	5.2	6.5	17.9 12.5	15.2	15.1
				Middle	5.5	19.6 19.6	19.6	8.1 8.1	8.1	32.2 32.2	32.2	92.4 93.0	92.7	7.0 7.0	7.0		6.8 7.3	7.1		13.6 15.7	14.7	
				Bottom	10	19.3 19.2	19.3	8.1 8.1	8.1	34.0 34.1	34.1	88.8 88.2	88.5	6.7 6.7	6.7	6.7	7.3 6.8	7.1		15.4 15.6	15.5	
20-Feb-17	Sunny	Moderate	12:16	Surface	1	18.9 18.9	18.9	8.1 8.1	8.1	26.6 26.6	26.6	91.1 91.5	91.3	7.2 7.3	7.3	7.3	2.9 2.9	2.9	4.2	7.8 6.0	6.9	7.1
				Middle	5.5	18.3 18.3	18.3	8.1 8.1	8.1	28.7 28.7	28.7	90.0 90.5	90.3	7.1 7.2	7.2		4.5 5.0	4.8		5.5 7.8	6.7	
				Bottom	10	17.9 17.9	17.9	8.1 8.1	8.1	30.6 30.7	30.7	86.6 86.0	86.3	6.8 6.8	6.8	6.8	5.0 4.5	4.8		8.3 7.3	7.8	
22-Feb-17	Cloudy	Moderate	14:51	Surface	1	18.2 18.3	18.3	8.0 8.0	8.0	29.9 29.9	29.9	97.0 97.4	97.2	7.7 7.7	7.7	7.7	4.6 4.8	4.7	7.7	6.2 6.2	6.2	7.5
				Middle	6	18.1 18.1	18.1	7.9 7.9	7.9	30.4 30.5	30.5	97.8 97.9	97.9	7.7 7.7	7.7		8.1 8.3	8.2		9.8 10.8	10.3	
				Bottom	11	18.0 18.0	18.0	7.8 7.8	7.8	31.5 31.5	31.5	98.3 98.5	98.4	7.7 7.7	7.7	7.7	10.1 10.3	10.2		5.7 6.0	5.9	
24-Feb-17	Rainy	Rough	16:36	Surface	1	20.0 20.0	20.0	8.0 8.0	8.0	22.7 22.6	22.7	90.7 89.9	90.3	7.2 7.2	7.2	7.3	2.9 3.2	3.1	3.7	16.0 13.9	15.0	16.2
				Middle	5.5	19.4 19.3	19.4	8.0 8.0	8.0	25.1 25.2	25.2	92.0 91.1	91.6	7.3 7.2	7.3		3.6 4.4	4.0		17.5 16.2	16.9	
				Bottom	10	18.9 18.9	18.9	8.0 8.0	8.0	27.2 27.3	27.3	86.4 87.2	86.8	6.8 6.9	6.9	6.9	3.9 4.0	4.0		18.0 15.2	16.6	
27-Feb-17	Cloudy	Moderate	18:30	Surface	1	17.4 17.4	17.4	8.1 8.1	8.1	30.2 30.2	30.2	93.5 93.8	93.7	7.5 7.5	7.5	7.6	7.7 7.6	7.7	7.9	8.8 8.5	8.7	9.2
				Middle	6.5	17.5 17.5	17.5	8.1 8.1	8.1	30.5 30.5	30.5	94.7 95.0	94.9	7.6 7.6	7.6		7.6 7.6	7.6		11.1 8.0	9.6	
				Bottom	12	17.4 17.4	17.4	8.1 8.1	8.1	30.6 30.6	30.6	94.9 94.4	94.7	7.6 7.5	7.6	7.6	8.5 8.5	8.5		10.8 7.6	9.2	

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

Water Quality Monitoring Results at CS2 - 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*
1-Feb-17	Sunny	Moderate	14:29	Surface	1	19.1 19.2	19.2	8.0 8.0	8.0	30.0 30.0	30.0	96.6 96.6	96.6	7.5 7.5	7.5	7.5	2.6 2.6	2.6	6.6	27.3 28.7	28.0	29.3
				Middle	3.5	19.0 19.0	19.0	8.1 8.1	8.1	29.8 29.8	29.8	96.1 96.1	96.1	7.5 7.5	7.5		7.2 7.2	7.2		28.7 27.0	27.9	
				Bottom	6	18.9 18.8	18.9	8.1 8.1	8.1	30.7 30.1	30.4	95.4 95.6	95.5	7.4 7.4	7.4	7.4	10.1 10.1	10.1		33.7 30.0	31.9	
3-Feb-17	Cloudy	Moderate	16:20	Surface	1	19.1 19.1	19.1	8.1 8.1	8.1	28.7 28.6	28.7	96.8 96.5	96.7	7.6 7.5	7.6	7.5	2.9 2.7	2.8	6.5	24.5 21.8	23.2	24.1
				Middle	3.5	19.0 19.0	19.0	8.1 8.1	8.1	30.6 30.7	30.7	95.9 96.0	96.0	7.4 7.4	7.4		7.4 7.3	7.4		24.6 26.2	25.4	
				Bottom	6	19.0 19.0	19.0	8.1 8.1	8.1	31.0 30.9	31.0	95.4 95.3	95.4	7.4 7.4	7.4	7.4	9.2 9.2	9.2		22.2 25.3	23.8	
6-Feb-17	Cloudy	Moderate	07:21	Surface	1	19.4 19.4	19.4	8.1 8.1	8.1	31.4 31.4	31.4	92.7 92.8	92.8	7.1 7.1	7.1	7.2	4.5 4.5	4.5	5.2	12.9 10.5	11.7	11.9
				Middle	4	19.1 19.1	19.1	8.1 8.1	8.1	31.5 31.5	31.5	93.3 93.4	93.4	7.2 7.2	7.2		4.5 4.6	4.6		9.8 12.4	11.1	
				Bottom	7	19.0 19.0	19.0	8.1 8.1	8.1	31.6 31.6	31.6	92.5 92.4	92.5	7.1 7.1	7.1	7.1	6.6 6.6	6.6		14.9 10.8	12.9	
8-Feb-17	Cloudy	Moderate	09:36	Surface	1	18.9 18.9	18.9	8.1 8.1	8.1	30.3 30.2	30.3	96.9 96.6	96.8	7.5 7.5	7.5	7.5	5.1 4.9	5.0	6.7	20.4 15.9	18.2	18.0
				Middle	3.5	18.4 18.5	18.5	8.1 8.2	8.2	30.7 30.6	30.7	96.1 96.2	96.2	7.5 7.5	7.5		6.9 6.9	6.9		17.5 19.5	18.5	
				Bottom	6	18.5 18.5	18.5	8.1 8.2	8.2	31.1 31.1	31.1	95.8 95.9	95.9	7.5 7.5	7.5	7.5	8.3 8.3	8.3		18.2 16.1	17.2	
10-Feb-17	Cloudy	Rough	16:51	Surface	1	18.4 18.4	18.4	8.0 8.0	8.0	29.2 29.4	29.3	96.6 96.5	96.6	7.6 7.6	7.6	7.6	5.7 5.7	5.7	7.9	17.0 11.7	14.4	12.7
				Middle	3.5	18.1 18.1	18.1	8.1 8.1	8.1	29.7 29.7	29.7	95.7 95.7	95.7	7.6 7.6	7.6		7.3 8.3	7.8		13.5 11.9	12.7	
				Bottom	6	17.7 17.9	17.8	8.2 8.1	8.2	30.3 30.3	30.3	95.4 95.3	95.4	7.6 7.6	7.6	7.6	10.1 10.1	10.1		11.2 11.0	11.1	
13-Feb-17	Sunny	Rough	13:20	Surface	1	18.2 18.3	18.3	8.1 8.1	8.1	29.8 29.4	29.6	97.7 97.9	97.8	7.7 7.7	7.7	7.7	4.3 4.3	4.3	6.7	60.7 53.3	57.0	55.6
				Middle	3.5	17.8 17.8	17.8	8.1 8.1	8.1	30.7 30.9	30.8	97.3 97.2	97.3	7.7 7.7	7.7		6.7 6.7	6.7		53.0 57.0	55.0	
				Bottom	6	17.3 17.3	17.3	8.2 8.1	8.2	31.8 31.6	31.7	96.7 96.8	96.8	7.7 7.7	7.7	7.7	9.2 9.1	9.2		55.7 53.7	54.7	
15-Feb-17	Cloudy	Rough	14:19	Surface	1	20.9 20.7	20.8	8.1 8.1	8.1	31.4 31.3	31.4	95.0 93.9	94.5	7.1 7.0	7.1	7.0	2.1 2.2	2.2	2.9	14.2 16.0	15.1	14.3
				Middle	4	20.7 20.9	20.8	8.1 8.1	8.1	31.3 31.5	31.4	92.8 93.5	93.2	6.9 6.9	6.9		2.0 2.0	2.0		14.3 13.4	13.9	
				Bottom	7	20.8 20.8	20.8	8.1 8.1	8.1	31.4 31.4	31.4	92.9 92.6	92.8	6.9 6.9	6.9	6.9	4.4 4.5	4.5		14.1 13.5	13.8	
17-Feb-17	Cloudy	Rough	15:42	Surface	1	20.1 20.2	20.2	8.1 8.0	8.1	31.2 31.4	31.3	93.7 93.4	93.6	7.1 7.0	7.1	7.0	2.0 2.1	2.1	3.0	13.4 12.9	13.2	11.7
				Middle	4	20.4 20.2	20.3	8.1 8.1	8.1	31.4 31.4	31.4	92.2 92.2	92.2	6.9 6.9	6.9		2.3 2.1	2.2		13.3 9.5	11.4	
				Bottom	7	20.4 20.3	20.4	8.1 8.1	8.1	31.4 31.6	31.5	92.3 92.0	92.2	6.9 6.9	6.9	6.9	5.0 4.6	4.8		11.4 9.4	10.4	
20-Feb-17	Sunny	Moderate	19:29	Surface	1	18.9 18.9	18.9	8.0 8.0	8.0	25.4 25.8	25.6	96.6 96.5	96.6	7.7 7.7	7.7	7.7	3.8 3.8	3.8	6.0	7.4 8.4	7.9	8.7
				Middle	3.5	18.6 18.5	18.6	8.1 8.1	8.1	26.7 26.8	26.8	95.4 95.7	95.6	7.6 7.6	7.6		5.5 5.5	5.5		9.8 8.3	9.1	
				Bottom	6	18.4 18.2	18.3	8.1 8.1	8.1	27.4 27.5	27.5	94.2 94.1	94.2	7.5 7.5	7.5	7.5	8.6 8.6	8.6		8.5 9.7	9.1	
22-Feb-17	Cloudy	Moderate	09:05	Surface	1	18.8 18.8	18.8	7.7 7.7	7.7	28.9 29.0	29.0	99.7 99.6	99.7	7.8 7.8	7.8	7.8	4.0 3.9	4.0	6.2	12.6 11.3	12.0	10.5
				Middle	3.5	18.2 18.2	18.2	7.8 7.8	7.8	29.6 29.5	29.6	98.4 98.2	98.3	7.8 7.8	7.8		5.5 5.5	5.5		11.3 7.8	9.6	
				Bottom	6	17.9 17.9	17.9	7.8 7.9	7.9	30.8 30.6	30.7	97.5 97.5	97.5	7.7 7.7	7.7	7.7	9.0 8.9	9.0		11.9 8.0	10.0	
24-Feb-17	Rainy	Rough	11:32	Surface	1	19.1 19.1	19.1	7.9 7.8	7.9	18.3 19.0	18.7	76.5 76.6	76.6	6.4 6.3	6.4	6.6	7.4 7.1	7.3	9.0	10.2 13.6	11.9	14.6
				Middle	4	19.0 18.9	19.0	7.8 7.8	7.8	22.0 21.6	21.8	82.1 81.2	81.7	6.7 6.6	6.7		9.0 9.0	9.0		18.8 13.5	16.2	
				Bottom	7	18.8 18.9	18.9	7.7 7.7	7.7	24.4 24.0	24.2	84.8 84.8	84.8	6.8 6.8	6.8	6.8	10.7 10.5	10.6		18.7 12.5	15.6	
27-Feb-17	Cloudy	Moderate	12:10	Surface	1	17.5 17.5	17.5	8.1 8.1	8.1	31.1 31.1	31.1	97.4 97.5	97.5	7.7 7.7	7.7	7.7	5.6 5.6	5.6	6.6	11.5 11.2	11.4	11.2
				Middle	3.5	17.4 17.4	17.4	8.1 8.1	8.1	31.2 31.2	31.2	96.9 92.8	94.9	7.7 7.4	7.6		6.9 6.9	6.9		12.2 10.9	11.6	
				Bottom	6	17.1 17.1	17.1	8.1 8.1	8.1	31.4 31.4	31.4	95.6 95.8	95.7	7.6 7.7	7.7	7.7	7.2 7.2	7.2		11.3 9.9	10.6	

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

Water Quality Monitoring Results at CS2 - 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*
1-Feb-17	Sunny	Moderate	08:35	Surface	1	19.1 19.1	19.1	8.0 8.0	8.0	28.9 29.0	29.0	95.1 95.1	95.1	7.4 7.4	7.4	7.5	2.2 2.3	2.3	6.0	29.0 40.0	34.5	39.5
				Middle	3.5	19.0 19.0	19.0	8.1 8.1	8.1	29.3 29.3	29.3	96.4 96.4	96.4	7.5 7.5	7.5		6.1 6.1	6.1		40.0 40.7	40.4	
				Bottom	6	18.9 18.9	18.9	8.1 8.1	8.1	29.8 29.7	29.8	94.5 94.3	94.4	7.4 7.3	7.4	7.4	9.5 9.5	9.5		41.7 45.3	43.5	
3-Feb-17	Cloudy	Moderate	09:50	Surface	1	19.2 19.2	19.2	8.0 8.0	8.0	29.2 28.5	28.9	96.1 96.2	96.2	7.5 7.5	7.5	7.5	3.1 3.3	3.2	6.6	18.4 19.2	18.8	19.6
				Middle	3.5	19.2 19.2	19.2	8.1 8.1	8.1	29.9 30.0	30.0	95.2 95.3	95.3	7.4 7.4	7.4		7.1 7.2	7.2		19.3 18.6	19.0	
				Bottom	6	19.1 19.1	19.1	8.1 8.1	8.1	30.6 30.5	30.6	94.5 94.7	94.6	7.3 7.3	7.3	7.3	9.3 9.2	9.3		21.3 20.6	21.0	
6-Feb-17	Cloudy	Moderate	13:07	Surface	1	19.4 19.4	19.4	8.1 8.1	8.1	31.4 31.4	31.4	94.4 94.3	94.4	7.2 7.2	7.2	7.2	2.9 2.9	2.9	3.7	13.5 15.2	14.4	12.0
				Middle	4	19.2 19.2	19.2	8.1 8.1	8.1	31.4 31.4	31.4	94.0 94.0	94.0	7.2 7.2	7.2		2.9 2.9	2.9		9.8 9.4	9.6	
				Bottom	7	19.1 19.0	19.1	8.1 8.1	8.1	31.5 31.5	31.5	93.1 93.0	93.1	7.2 7.2	7.2	7.2	5.2 5.3	5.3		13.3 10.5	11.9	
8-Feb-17	Cloudy	Moderate	14:56	Surface	1	18.8 18.8	18.8	8.1 8.1	8.1	29.8 29.9	29.9	96.4 96.4	96.4	7.5 7.5	7.5	7.5	5.1 5.1	5.1	6.2	22.4 23.9	23.2	19.7
				Middle	3.5	18.5 18.6	18.6	8.1 8.1	8.1	30.5 30.5	30.5	95.9 95.8	95.9	7.5 7.5	7.5		6.5 6.5	6.5		15.1 14.2	14.7	
				Bottom	6	18.5 18.5	18.5	8.2 8.2	8.2	30.4 30.4	30.4	95.8 95.6	95.7	7.5 7.5	7.5	7.5	7.1 7.1	7.1		19.5 22.6	21.1	
10-Feb-17	Cloudy	Rough	11:20	Surface	1	18.4 18.4	18.4	8.1 8.1	8.1	29.6 29.5	29.6	95.8 95.8	95.8	7.5 7.5	7.5	7.6	6.5 6.5	6.5	8.5	14.1 14.0	14.1	12.3
				Middle	3.5	17.7 17.7	17.7	8.1 8.1	8.1	29.9 29.9	29.9	96.2 96.2	96.2	7.7 7.7	7.7		8.4 8.4	8.4		11.9 10.7	11.3	
				Bottom	6	17.4 17.4	17.4	8.1 8.1	8.1	30.3 30.3	30.3	94.5 94.6	94.6	7.6 7.6	7.6	7.6	10.5 10.5	10.5		12.1 10.7	11.4	
13-Feb-17	Sunny	Rough	07:19	Surface	1	18.2 18.3	18.3	8.1 8.1	8.1	30.3 30.4	30.4	97.7 97.8	97.8	7.7 7.7	7.7	7.7	4.1 4.1	4.1	6.5	56.7 52.7	54.7	55.4
				Middle	3.5	17.9 17.9	17.9	8.1 8.1	8.1	30.5 30.5	30.5	97.4 97.4	97.4	7.7 7.7	7.7		6.6 6.5	6.6		59.3 49.0	54.2	
				Bottom	6	17.6 17.7	17.7	8.2 8.2	8.2	31.5 31.5	31.5	97.1 97.0	97.1	7.7 7.7	7.7	7.7	8.7 8.8	8.8		57.7 56.7	57.2	
15-Feb-17	Cloudy	Rough	08:35	Surface	1	20.8 20.9	20.9	8.1 8.1	8.1	31.5 31.6	31.6	100.0 98.3	99.2	7.4 7.3	7.4	7.3	3.6 4.0	3.8	4.5	21.0 20.2	20.6	20.9
				Middle	4	20.9 20.8	20.9	8.1 8.1	8.1	31.5 31.4	31.5	97.0 95.7	96.4	7.2 7.1	7.2		3.9 3.6	3.8		22.6 22.4	22.5	
				Bottom	7	21.0 21.0	21.0	8.0 8.0	8.0	31.7 31.8	31.8	95.5 95.7	95.6	7.1 7.1	7.1	7.1	5.9 5.7	5.8		19.6 19.7	19.7	
17-Feb-17	Cloudy	Rough	09:30	Surface	1	20.4 20.2	20.3	8.1 8.1	8.1	31.4 31.5	31.5	99.3 97.0	98.2	7.5 7.3	7.4	7.3	3.8 3.6	3.7	4.4	11.1 11.1	11.1	14.6
				Middle	4	20.3 20.3	20.3	8.1 8.1	8.1	31.4 31.6	31.5	96.0 94.9	95.5	7.2 7.1	7.2		4.0 3.7	3.9		14.7 13.6	14.2	
				Bottom	7	20.4 20.4	20.4	8.0 8.0	8.0	31.6 31.8	31.7	94.0 95.4	94.7	7.1 7.1	7.1	7.1	5.5 5.9	5.7		20.2 16.6	18.4	
20-Feb-17	Sunny	Moderate	11:19	Surface	1	19.0 18.9	19.0	8.0 8.0	8.0	26.5 26.4	26.5	97.7 97.7	97.7	7.7 7.8	7.8	7.8	4.4 4.4	4.4	6.6	10.1 7.6	8.9	7.6
				Middle	3.5	18.6 18.6	18.6	8.1 8.1	8.1	26.6 26.6	26.6	96.3 96.5	96.4	7.7 7.7	7.7		6.1 6.2	6.2		6.5 6.2	6.4	
				Bottom	6	18.4 18.4	18.4	8.1 8.1	8.1	27.2 27.1	27.2	94.4 94.4	94.4	7.5 7.5	7.5	7.5	9.3 9.3	9.3		6.8 8.3	7.6	
22-Feb-17	Cloudy	Moderate	13:52	Surface	1	18.8 18.9	18.9	7.7 7.7	7.7	29.0 29.0	29.0	99.6 99.6	99.6	7.8 7.8	7.8	7.8	4.3 4.3	4.3	6.1	7.6 7.9	7.8	8.2
				Middle	3.5	18.3 18.4	18.4	7.8 7.8	7.8	29.8 29.7	29.8	98.3 98.2	98.3	7.7 7.7	7.7		5.3 5.3	5.3		10.2 6.0	8.1	
				Bottom	6	18.0 18.0	18.0	7.8 7.8	7.8	30.9 30.8	30.9	97.9 98.7	98.3	7.7 7.8	7.8	7.8	8.6 8.6	8.6		9.5 7.6	8.6	
24-Feb-17	Rainy	Rough	15:54	Surface	1	18.6 18.5	18.6	7.9 8.0	8.0	21.8 22.0	21.9	76.4 76.1	76.3	6.3 6.3	6.3	6.4	6.5 6.3	6.4	8.1	10.4 7.1	8.8	9.1
				Middle	4	18.5 18.5	18.5	8.0 8.0	8.0	23.9 23.8	23.9	79.4 79.3	79.4	6.5 6.5	6.5		8.4 8.8	8.6		9.5 8.6	9.1	
				Bottom	7	18.3 18.4	18.4	8.0 8.0	8.0	27.2 26.8	27.0	84.5 82.3	83.4	6.8 6.6	6.7	6.7	9.9 8.9	9.4		11.7 6.8	9.3	
27-Feb-17	Cloudy	Moderate	17:57	Surface	1	17.4 17.4	17.4	8.1 8.1	8.1	31.1 31.2	31.2	96.9 97.0	97.0	7.7 7.7	7.7	7.7	5.2 5.2	5.2	6.4	12.2 15.0	13.6	14.0
				Middle	3.5	17.1 17.2	17.2	8.1 8.1	8.1	31.2 31.3	31.3	95.5 95.6	95.6	7.6 7.6	7.6		6.3 6.4	6.4		13.4 11.3	12.4	
				Bottom	6	17.0 17.0	17.0	8.1 8.1	8.1	31.4 31.4	31.4	95.1 95.2	95.2	7.6 7.6	7.6	7.6	7.6 7.7	7.7		15.5 16.3	15.9	

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

Water Quality Monitoring Results at IS1 - 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*
1-Feb-17	Sunny	Moderate	15:27	Surface	1	18.9 18.8	18.9	8.1 8.1	8.1	31.8 31.8	31.8	96.6 96.0	96.3	7.4 7.4	7.4	7.4	3.3 3.3	3.3	6.6	29.3 30.0	29.7	34.3
				Middle	4.5	18.8 18.8	18.8	8.2 8.2	8.2	29.6 29.7	29.7	94.5 94.4	94.5	7.4 7.4	7.4		6.5 6.5	6.5		38.7 35.0	36.9	
				Bottom	8	18.7 18.7	18.7	8.2 8.2	8.2	30.1 30.1	30.1	93.9 94.0	94.0	7.3 7.3	7.3	7.3	9.9 9.9	9.9		35.7 36.7	36.2	
3-Feb-17	Cloudy	Moderate	17:20	Surface	1	19.2 19.2	19.2	8.1 8.1	8.1	29.2 29.3	29.3	97.3 97.1	97.2	7.6 7.6	7.6	7.6	3.2 3.2	3.2	5.9	25.4 20.3	22.9	21.2
				Middle	4.5	19.0 19.1	19.1	8.2 8.2	8.2	28.8 28.6	28.7	95.5 95.8	95.7	7.5 7.5	7.5		5.2 5.3	5.3		19.9 25.5	22.7	
				Bottom	8	18.9 18.9	18.9	8.2 8.2	8.2	30.1 30.1	30.1	94.2 94.5	94.4	7.3 7.4	7.4	7.4	9.3 9.2	9.3		16.9 19.1	18.0	
6-Feb-17	Cloudy	Moderate	08:28	Surface	1	19.7 19.7	19.7	8.1 8.1	8.1	31.5 31.5	31.5	91.1 91.0	91.1	6.9 6.9	6.9	6.9	4.6 4.6	4.6	5.1	14.2 13.0	13.6	12.7
				Middle	5	19.2 19.2	19.2	8.1 8.1	8.1	31.5 31.5	31.5	89.3 89.0	89.2	6.8 6.8	6.8		5.1 5.2	5.2		11.6 13.9	12.8	
				Bottom	9	19.2 19.2	19.2	8.1 8.1	8.1	31.6 31.6	31.6	88.0 87.8	87.9	6.8 6.7	6.8	6.8	5.4 5.5	5.5		12.4 10.8	11.6	
8-Feb-17	Cloudy	Moderate	10:35	Surface	1	18.6 18.6	18.6	8.0 8.1	8.1	29.7 29.7	29.7	97.3 97.5	97.4	7.6 7.7	7.7	7.7	5.5 5.5	5.5	6.4	19.5 20.2	19.9	18.2
				Middle	4.5	18.1 18.1	18.1	8.1 8.1	8.1	30.2 30.1	30.2	96.9 96.8	96.9	7.6 7.6	7.6		6.2 6.2	6.2		15.7 18.5	17.1	
				Bottom	8	17.8 17.7	17.8	8.1 8.1	8.1	30.5 30.6	30.6	96.3 96.2	96.3	7.6 7.6	7.6	7.6	7.5 7.5	7.5		19.6 15.8	17.7	
10-Feb-17	Cloudy	Rough	17:56	Surface	1	18.9 18.9	18.9	8.0 8.1	8.1	29.2 29.4	29.3	97.5 97.4	97.5	7.6 7.6	7.6	7.6	5.5 5.5	5.5	7.2	15.0 12.0	13.5	14.0
				Middle	4.5	18.7 18.7	18.7	8.1 8.1	8.1	29.7 29.8	29.8	96.2 96.3	96.3	7.5 7.5	7.5		6.3 6.4	6.4		13.1 14.1	13.6	
				Bottom	8	18.2 18.2	18.2	8.1 8.1	8.1	30.2 30.2	30.2	95.4 95.5	95.5	7.5 7.5	7.5	7.5	9.8 9.8	9.8		15.7 13.8	14.8	
13-Feb-17	Sunny	Rough	14:15	Surface	1	18.3 18.3	18.3	8.0 8.1	8.1	29.0 29.0	29.0	99.3 99.2	99.3	7.9 7.9	7.9	7.9	5.6 5.6	5.6	7.7	51.7 47.0	49.4	52.1
				Middle	4.5	18.0 18.1	18.1	8.1 8.1	8.1	29.3 29.6	29.5	98.4 98.3	98.4	7.8 7.8	7.8		7.8 7.7	7.8		45.7 52.7	49.2	
				Bottom	8	17.7 17.6	17.7	8.1 8.1	8.1	30.4 30.6	30.5	96.6 96.6	96.6	7.7 7.7	7.7	7.7	9.7 9.7	9.7		63.3 52.0	57.7	
15-Feb-17	Cloudy	Rough	15:17	Surface	1	21.0 20.8	20.9	8.0 8.0	8.0	31.2 31.3	31.3	96.7 96.6	96.7	7.2 7.2	7.2	7.2	2.7 3.1	2.9	3.4	12.3 13.8	13.1	12.8
				Middle	5	21.0 20.8	20.9	8.1 8.1	8.1	31.5 31.1	31.3	95.7 96.2	96.0	7.1 7.2	7.2		2.9 2.7	2.8		11.8 13.2	12.5	
				Bottom	9	20.9 20.8	20.9	8.1 8.1	8.1	31.4 31.6	31.5	96.0 95.8	95.9	7.1 7.1	7.1	7.1	4.2 4.6	4.4		13.4 11.9	12.7	
17-Feb-17	Cloudy	Rough	16:41	Surface	1	20.3 20.5	20.4	8.0 8.0	8.0	31.0 31.2	31.1	95.3 96.0	95.7	7.2 7.2	7.2	7.2	2.7 2.9	2.8	3.5	10.9 9.8	10.4	11.0
				Middle	5	20.6 20.3	20.5	8.1 8.1	8.1	31.4 31.4	31.4	94.5 95.2	94.9	7.1 7.2	7.2		3.1 2.8	3.0		14.2 11.3	12.8	
				Bottom	9	20.4 20.4	20.4	8.1 8.1	8.1	31.5 31.4	31.5	95.4 94.9	95.2	7.2 7.1	7.2	7.2	4.7 4.4	4.6		10.1 9.5	9.8	
20-Feb-17	Sunny	Moderate	20:30	Surface	1	18.8 18.8	18.8	8.0 8.0	8.0	25.5 25.3	25.4	97.2 97.2	97.2	7.8 7.8	7.8	7.8	6.3 6.3	6.3	7.9	7.8 10.7	9.3	7.8
				Middle	4.5	18.3 18.2	18.3	8.1 8.1	8.1	26.6 27.0	26.8	96.3 96.3	96.3	7.7 7.7	7.7		7.9 7.8	7.9		6.0 6.1	6.1	
				Bottom	8	17.8 17.9	17.9	8.2 8.2	8.2	27.1 27.3	27.2	95.8 95.6	95.7	7.7 7.7	7.7	7.7	9.5 9.5	9.5		10.3 5.7	8.0	
22-Feb-17	Cloudy	Moderate	10:08	Surface	1	18.7 18.7	18.7	7.8 7.8	7.8	29.8 29.9	29.9	99.5 99.5	99.5	7.8 7.8	7.8	7.8	3.5 3.5	3.5	6.4	9.7 9.8	9.8	9.6
				Middle	4.5	18.3 18.3	18.3	7.8 7.8	7.8	30.7 30.6	30.7	98.7 98.7	98.7	7.7 7.7	7.7		6.7 6.7	6.7		11.2 8.8	10.0	
				Bottom	8	18.0 18.0	18.0	7.9 7.9	7.9	31.4 31.3	31.4	97.7 98.7	98.2	7.7 7.8	7.8	7.8	9.1 9.1	9.1		9.7 8.3	9.0	
24-Feb-17	Rainy	Rough	12:26	Surface	1	19.1 19.0	19.1	8.0 7.9	8.0	20.6 20.4	20.5	84.8 83.3	84.1	7.0 6.9	7.0	6.9	8.3 8.1	8.2	9.6	17.8 12.6	15.2	15.4
				Middle	5	18.9 18.9	18.9	7.8 8.0	7.9	22.1 22.1	22.1	83.2 80.9	82.1	6.8 6.6	6.7		9.6 10.0	9.8		17.6 14.3	16.0	
				Bottom	9	18.9 18.7	18.8	7.9 7.9	7.9	24.2 24.5	24.4	82.7 81.2	82.0	6.7 6.6	6.7	6.7	10.4 10.9	10.7		15.4 14.6	15.0	
27-Feb-17	Cloudy	Moderate	13:11	Surface	1	17.7 17.6	17.7	8.1 8.1	8.1	30.2 30.2	30.2	97.2 97.2	97.2	7.7 7.7	7.7	7.7	3.9 3.9	3.9	5.7	14.7 12.1	13.4	14.2
				Middle	4.5	17.3 17.4	17.4	8.1 8.1	8.1	30.5 30.7	30.6	96.5 96.3	96.4	7.7 7.7	7.7		5.8 5.8	5.8		12.4 13.0	12.7	
				Bottom	8	17.0 17.1	17.1	8.2 8.1	8.2	31.3 31.2	31.3	96.2 96.0	96.1	7.7 7.7	7.7	7.7	7.4 7.5	7.5		16.9 15.9	16.4	

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

Water Quality Monitoring Results at IS1 - 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*
1-Feb-17	Sunny	Moderate	09:32	Surface	1	18.9 18.9	18.9	8.1 8.1	8.1	30.1 30.1	30.1	93.5 93.5	93.5	7.3 7.3	7.3	7.3	2.8 2.9	2.9	6.4	32.7 33.3	33.0	32.3
				Middle	4.5	18.8 18.8	18.8	8.2 8.2	8.2	29.9 29.9	29.9	93.6 93.6	93.6	7.3 7.3	7.3		6.2 6.2	6.2		29.7 33.3	31.5	
				Bottom	8	18.6 18.7	18.7	8.3 8.3	8.3	29.4 29.5	29.5	94.2 94.2	94.2	7.4 7.4	7.4	7.4	10.1 10.3	10.2		30.3 34.7	32.5	
3-Feb-17	Cloudy	Moderate	10:54	Surface	1	19.2 19.3	19.3	8.1 8.1	8.1	30.5 30.4	30.5	95.5 95.8	95.7	7.4 7.4	7.4	7.4	2.7 2.7	2.7	6.5	19.9 20.1	20.0	19.6
				Middle	4.5	19.1 19.1	19.1	8.2 8.1	8.2	29.7 29.9	29.8	95.3 95.6	95.5	7.4 7.4	7.4		6.3 6.3	6.3		19.8 18.6	19.2	
				Bottom	8	19.1 19.1	19.1	8.2 8.2	8.2	29.3 29.4	29.4	94.8 94.7	94.8	7.4 7.4	7.4	7.4	10.4 10.5	10.5		21.1 17.8	19.5	
6-Feb-17	Cloudy	Moderate	14:15	Surface	1	19.3 19.3	19.3	8.0 8.0	8.0	31.2 31.3	31.3	90.4 90.2	90.3	6.9 6.9	6.9	7.0	3.5 3.6	3.6	4.2	12.0 9.9	11.0	11.3
				Middle	5	19.1 19.1	19.1	8.1 8.1	8.1	31.4 31.4	31.4	91.4 91.5	91.5	7.0 7.0	7.0		3.7 3.6	3.7		10.4 10.4	10.4	
				Bottom	9	19.1 19.1	19.1	8.1 8.1	8.1	31.5 31.5	31.5	92.8 93.1	93.0	7.1 7.2	7.2	7.2	5.2 5.1	5.2		13.6 11.6	12.6	
8-Feb-17	Cloudy	Moderate	15:55	Surface	1	18.5 18.5	18.5	8.0 8.0	8.0	30.4 30.5	30.5	97.4 97.4	97.4	7.6 7.6	7.6	7.6	4.3 4.3	4.3	6.3	16.0 14.5	15.3	18.2
				Middle	4.5	18.3 18.3	18.3	8.1 8.1	8.1	30.8 30.9	30.9	96.5 96.6	96.6	7.6 7.6	7.6		6.6 6.6	6.6		19.2 17.7	18.5	
				Bottom	8	18.0 17.9	18.0	8.1 8.1	8.1	31.3 31.4	31.4	96.3 96.3	96.3	7.6 7.6	7.6	7.6	8.0 8.0	8.0		22.5 18.9	20.7	
10-Feb-17	Cloudy	Rough	12:25	Surface	1	18.5 18.3	18.4	8.1 8.1	8.1	30.3 30.3	30.3	96.4 95.8	96.1	7.5 7.5	7.5	7.6	5.6 5.6	5.6	8.0	11.4 10.7	11.1	10.8
				Middle	4.5	18.1 18.1	18.1	8.1 8.1	8.1	30.8 30.8	30.8	97.3 97.6	97.5	7.6 7.7	7.7		8.2 8.1	8.2		10.2 10.3	10.3	
				Bottom	8	17.9 17.9	17.9	8.2 8.2	8.2	31.5 31.5	31.5	95.4 96.4	95.9	7.5 7.6	7.6	7.6	10.2 10.2	10.2		10.6 11.6	11.1	
13-Feb-17	Sunny	Rough	08:24	Surface	1	18.2 18.2	18.2	8.1 8.1	8.1	29.4 29.1	29.3	97.5 97.6	97.6	7.7 7.7	7.7	7.7	5.7 5.7	5.7	7.7	43.3 55.0	49.2	46.2
				Middle	4.5	17.9 18.0	18.0	8.1 8.1	8.1	30.3 30.5	30.4	97.0 97.1	97.1	7.7 7.7	7.7		7.7 7.7	7.7		51.7 49.0	50.4	
				Bottom	8	17.7 17.7	17.7	8.2 8.2	8.2	31.5 31.2	31.4	95.7 96.0	95.9	7.6 7.6	7.6	7.6	9.8 9.8	9.8		39.3 38.7	39.0	
15-Feb-17	Cloudy	Rough	09:40	Surface	1	21.0 20.9	21.0	8.2 8.1	8.2	31.5 31.7	31.6	97.1 97.0	97.1	7.2 7.2	7.2	7.2	3.8 3.7	3.8	4.3	10.9 14.5	12.7	12.6
				Middle	5	21.0 21.2	21.1	8.1 8.1	8.1	31.6 31.5	31.6	96.8 96.8	96.8	7.2 7.2	7.2		4.3 4.3	4.3		14.9 10.8	12.9	
				Bottom	9	21.0 21.0	21.0	8.1 8.0	8.1	31.7 31.6	31.7	96.3 96.3	96.3	7.1 7.1	7.1	7.1	5.0 4.7	4.9		10.2 13.9	12.1	
17-Feb-17	Cloudy	Rough	10:35	Surface	1	20.4 20.5	20.5	8.2 8.2	8.2	31.7 31.6	31.7	96.7 95.9	96.3	7.2 7.2	7.2	7.2	3.8 4.3	4.1	4.6	11.4 9.8	10.6	10.8
				Middle	5	20.5 20.4	20.5	8.1 8.1	8.1	31.4 31.5	31.5	95.7 95.4	95.6	7.2 7.2	7.2		4.4 5.0	4.7		10.1 10.6	10.4	
				Bottom	9	20.5 20.5	20.5	8.1 8.1	8.1	31.5 31.8	31.7	95.0 95.8	95.4	7.1 7.2	7.2	7.2	5.0 4.8	4.9		12.4 10.4	11.4	
20-Feb-17	Sunny	Moderate	12:21	Surface	1	18.9 18.8	18.9	8.0 8.1	8.1	25.8 25.8	25.8	97.1 97.1	97.1	7.8 7.8	7.8	7.8	6.6 6.5	6.6	8.5	8.4 6.9	7.7	7.4
				Middle	4.5	18.2 18.2	18.2	8.1 8.1	8.1	26.6 27.1	26.9	96.3 96.4	96.4	7.8 7.7	7.8		8.6 8.6	8.6		7.3 5.6	6.5	
				Bottom	8	17.9 17.9	17.9	8.1 8.2	8.2	27.5 27.5	27.5	95.1 95.2	95.2	7.7 7.7	7.7	7.7	10.1 10.7	10.4		10.2 5.7	8.0	
22-Feb-17	Cloudy	Moderate	14:58	Surface	1	18.7 18.7	18.7	7.8 7.8	7.8	29.9 29.8	29.9	99.6 99.5	99.6	7.8 7.8	7.8	7.8	3.8 3.8	3.8	6.4	8.2 8.3	8.3	9.1
				Middle	4.5	18.3 18.3	18.3	7.9 7.8	7.9	30.9 31.0	31.0	98.9 98.8	98.9	7.8 7.7	7.8		6.3 6.3	6.3		9.5 8.1	8.8	
				Bottom	8	18.0 18.0	18.0	7.9 7.9	7.9	31.3 31.3	31.3	97.7 97.4	97.6	7.7 7.7	7.7	7.7	9.1 9.1	9.1		10.5 9.6	10.1	
24-Feb-17	Rainy	Rough	16:46	Surface	1	18.7 18.6	18.7	8.0 7.9	8.0	19.8 20.7	20.3	80.0 80.3	80.2	6.6 6.6	6.6	6.7	8.5 7.5	8.0	9.3	7.0 6.6	6.8	8.4
				Middle	5	18.5 18.5	18.5	8.1 8.1	8.1	22.8 23.0	22.9	81.7 80.8	81.3	6.7 6.6	6.7		9.1 8.8	9.0		7.6 7.5	7.6	
				Bottom	9	18.4 18.3	18.4	8.1 8.2	8.2	27.7 27.5	27.6	79.8 80.8	80.3	6.4 6.5	6.5	6.5	10.7 10.8	10.8		13.6 8.2	10.9	
27-Feb-17	Cloudy	Moderate	18:58	Surface	1	17.6 17.6	17.6	8.1 8.1	8.1	30.2 30.2	30.2	97.3 97.4	97.4	7.8 7.8	7.8	7.8	3.5 3.4	3.5	5.8	14.3 11.0	12.7	12.9
				Middle	4.5	17.4 17.3	17.4	8.1 8.1	8.1	30.6 30.6	30.6	96.5 96.5	96.5	7.7 7.7	7.7		5.9 5.9	5.9		11.1 11.2	11.2	
				Bottom	8	17.0 17.0	17.0	8.1 8.1	8.1	31.2 31.3	31.3	96.3 96.3	96.3	7.7 7.7	7.7	7.7	7.9 7.9	7.9		14.6 15.0	14.8	

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

Water Quality Monitoring Results at IS2 - 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*
1-Feb-17	Sunny	Moderate	15:39	Surface	1	19.0 19.0	19.0	8.1 8.1	8.1	29.7 29.8	29.8	95.2 95.1	95.2	7.4 7.4	7.4	7.3	2.4 2.5	2.5	4.7	30.7 36.0	33.4	33.9
				Middle	3	18.9 18.9	18.9	8.1 8.1	8.1	30.8 30.7	30.8	92.2 92.3	92.3	7.1 7.2	7.2		4.4 4.4	4.4		38.3 35.0	36.7	
				Bottom	5	18.9 18.9	18.9	8.2 8.2	8.2	30.7 30.7	30.7	93.4 93.3	93.4	7.2 7.2	7.2	7.2	7.2 7.2	7.2		31.0 32.3	31.7	
3-Feb-17	Cloudy	Moderate	17:33	Surface	1	19.2 19.2	19.2	8.1 8.1	8.1	29.4 29.5	29.5	96.3 96.2	96.3	7.5 7.5	7.5	7.4	3.8 3.9	3.9	5.5	17.9 20.0	19.0	19.6
				Middle	3	19.1 19.1	19.1	8.2 8.2	8.2	29.7 29.8	29.8	93.2 92.9	93.1	7.2 7.2	7.2		5.3 5.4	5.4		17.7 18.8	18.3	
				Bottom	5	19.1 19.1	19.1	8.2 8.2	8.2	30.7 30.9	30.8	93.1 92.8	93.0	7.2 7.2	7.2	7.2	7.3 7.3	7.3		21.3 21.4	21.4	
6-Feb-17	Cloudy	Moderate	08:43	Surface	1	19.3 19.3	19.3	8.1 8.1	8.1	31.5 31.5	31.5	93.5 93.4	93.5	7.2 7.1	7.2	7.2	3.6 3.6	3.6	4.7	14.1 15.5	14.8	14.4
				Middle	3	19.3 19.2	19.3	8.1 8.1	8.1	31.5 31.5	31.5	93.1 93.1	93.1	7.1 7.1	7.1		4.6 4.6	4.6		14.4 14.9	14.7	
				Bottom	5	19.2 19.2	19.2	8.1 8.1	8.1	31.5 31.5	31.5	93.1 93.1	93.1	7.1 7.1	7.1	7.1	5.8 5.8	5.8		15.4 11.8	13.6	
8-Feb-17	Cloudy	Moderate	10:49	Surface	1	18.8 18.8	18.8	8.1 8.1	8.1	30.1 30.1	30.1	95.7 96.2	96.0	7.5 7.5	7.5	7.5	5.0 5.0	5.0	6.7	19.0 16.9	18.0	17.2
				Middle	3	18.5 18.5	18.5	8.1 8.1	8.1	30.9 30.9	30.9	96.3 96.3	96.3	7.5 7.5	7.5		6.3 6.3	6.3		16.3 15.2	15.8	
				Bottom	5	18.4 18.4	18.4	8.1 8.1	8.1	31.1 31.1	31.1	95.9 96.0	96.0	7.5 7.5	7.5	7.5	8.8 8.8	8.8		19.2 16.5	17.9	
10-Feb-17	Cloudy	Rough	18:14	Surface	1	18.5 18.5	18.5	8.1 8.0	8.1	29.4 29.5	29.5	97.2 97.2	97.2	7.6 7.6	7.6	7.6	5.7 5.7	5.7	7.8	12.9 11.2	12.1	10.8
				Middle	3	18.3 18.3	18.3	8.1 8.1	8.1	29.8 29.8	29.8	96.4 96.3	96.4	7.6 7.6	7.6		8.2 8.2	8.2		10.0 9.4	9.7	
				Bottom	5	18.0 18.0	18.0	8.2 8.2	8.2	30.2 30.2	30.2	95.5 95.6	95.6	7.6 7.6	7.6	7.6	9.5 9.5	9.5		10.1 11.2	10.7	
13-Feb-17	Sunny	Rough	14:29	Surface	1	18.3 18.4	18.4	8.1 8.0	8.1	30.4 30.6	30.5	97.6 97.6	97.6	7.7 7.6	7.7	7.7	5.7 5.7	5.7	7.0	53.0 54.3	53.7	57.6
				Middle	3	18.1 18.1	18.1	8.1 8.1	8.1	30.5 30.5	30.5	97.3 97.3	97.3	7.7 7.7	7.7		8.8 8.8	8.8		68.3 54.3	61.3	
				Bottom	5	17.7 17.8	17.8	8.1 8.2	8.2	31.4 31.4	31.4	96.0 96.0	96.0	7.6 7.6	7.6	7.6	6.5 6.7	6.6		64.7 51.0	57.9	
15-Feb-17	Cloudy	Rough	15:29	Surface	1	20.9 20.9	20.9	8.1 8.0	8.1	31.5 31.1	31.3	97.9 96.7	97.3	7.3 7.2	7.3	7.3	2.2 2.4	2.3	3.1	18.7 14.5	16.6	15.2
				Middle	3.5	20.9 20.8	20.9	8.1 8.1	8.1	31.3 31.5	31.4	97.4 97.5	97.5	7.2 7.3	7.3		2.7 2.8	2.8		18.3 12.7	15.5	
				Bottom	6	20.9 20.9	20.9	8.1 8.1	8.1	31.7 31.4	31.6	95.0 95.8	95.4	7.1 7.1	7.1	7.1	4.1 4.2	4.2		13.8 13.3	13.6	
17-Feb-17	Cloudy	Rough	16:53	Surface	1	20.2 20.3	20.3	8.1 8.1	8.1	31.2 31.4	31.3	96.6 95.9	96.3	7.3 7.2	7.3	7.3	2.2 2.2	2.2	3.1	11.3 10.8	11.1	11.2
				Middle	3.5	20.5 20.3	20.4	8.1 8.1	8.1	31.3 31.2	31.3	96.6 96.7	96.7	7.2 7.3	7.3		2.7 2.6	2.7		10.1 8.7	9.4	
				Bottom	6	20.4 20.2	20.3	8.1 8.1	8.1	31.5 31.3	31.4	93.8 94.3	94.1	7.0 7.1	7.1	7.1	3.9 4.7	4.3		14.1 11.8	13.0	
20-Feb-17	Sunny	Moderate	20:44	Surface	1	18.6 18.6	18.6	8.1 8.1	8.1	26.1 26.0	26.1	96.9 96.9	96.9	7.8 7.8	7.8	7.8	5.6 5.6	5.6	8.1	6.9 6.5	6.7	9.3
				Middle	3	18.1 18.0	18.1	8.1 8.1	8.1	26.3 26.5	26.4	96.6 96.6	96.6	7.8 7.8	7.8		8.4 8.4	8.4		10.0 10.0	10.0	
				Bottom	5	18.0 17.9	18.0	8.2 8.2	8.2	27.1 27.4	27.3	95.7 95.7	95.7	7.7 7.7	7.7	7.7	10.2 10.2	10.2		10.8 11.6	11.2	
22-Feb-17	Cloudy	Moderate	10:23	Surface	1	18.6 18.6	18.6	7.8 7.8	7.8	29.8 29.8	29.8	100.0 100.0	100.0	7.8 7.8	7.8	7.8	4.6 4.5	4.6	8.0	11.1 7.5	9.3	10.7
				Middle	3	18.1 18.1	18.1	7.8 7.8	7.8	30.4 30.4	30.4	99.1 99.1	99.1	7.8 7.8	7.8		10.5 10.5	10.5		13.1 8.4	10.8	
				Bottom	5	18.0 18.0	18.0	7.8 7.8	7.8	31.6 31.6	31.6	98.5 98.5	98.5	7.7 7.7	7.7	7.7	9.0 8.9	9.0		13.5 10.3	11.9	
24-Feb-17	Rainy	Rough	12:39	Surface	1	19.1 19.1	19.1	8.0 8.0	8.0	19.2 18.9	19.1	83.4 84.0	83.7	6.9 7.0	7.0	6.9	8.0 8.4	8.2	9.3	22.5 16.8	19.7	18.1
				Middle	3.5	18.9 19.0	19.0	7.9 7.9	7.9	21.1 21.0	21.1	82.5 83.3	82.9	6.8 6.8	6.8		9.2 9.4	9.3		23.3 15.8	19.6	
				Bottom	6	18.9 18.8	18.9	7.9 7.8	7.9	23.2 23.0	23.1	81.7 81.5	81.6	6.6 6.6	6.6	6.6	10.4 10.5	10.5		15.4 14.3	14.9	
27-Feb-17	Cloudy	Moderate	13:24	Surface	1	17.4 17.4	17.4	8.0 8.0	8.0	30.4 30.4	30.4	96.8 97.0	96.9	7.7 7.7	7.7	7.7	4.5 4.5	4.5	6.4	16.4 12.5	14.5	14.7
				Middle	3	17.4 17.3	17.4	8.1 8.1	8.1	31.7 31.6	31.7	97.5 97.5	97.5	7.7 7.7	7.7		5.9 5.9	5.9		16.0 14.0	15.0	
				Bottom	5	17.1 17.2	17.2	8.1 8.1	8.1	31.7 31.7	31.7	97.8 97.8	97.8	7.8 7.8	7.8	7.8	8.8 8.9	8.9		13.7 15.7	14.7	

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

Water Quality Monitoring Results at IS2 - 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*
1-Feb-17	Sunny	Moderate	09:46	Surface	1	19.0 18.9	19.0	8.1 8.1	8.1	28.2 28.2	28.2	93.4 93.5	93.5	7.3 7.4	7.4	7.3	2.3 2.4	2.4	4.6	28.3 34.7	31.5	33.8
				Middle	3	18.9 18.9	18.9	8.1 8.1	8.1	30.2 30.2	30.2	92.1 91.8	92.0	7.2 7.1	7.2		4.2 4.3	4.3		35.7 36.0	35.9	
				Bottom	5	18.9 18.9	18.9	8.2 8.3	8.3	30.5 30.4	30.5	92.2 91.7	92.0	7.2 7.1	7.2	7.2	7.1 7.2	7.2		38.0 30.0	34.0	
3-Feb-17	Cloudy	Moderate	11:08	Surface	1	19.0 19.1	19.1	8.1 8.1	8.1	28.8 28.6	28.7	94.4 94.6	94.5	7.4 7.4	7.4	7.3	3.3 3.3	3.3	4.9	19.1 17.5	18.3	18.6
				Middle	3	19.0 19.0	19.0	8.1 8.1	8.1	30.3 30.3	30.3	92.0 91.8	91.9	7.1 7.1	7.1		4.5 4.3	4.4		17.0 18.7	17.9	
				Bottom	5	18.9 18.9	18.9	8.2 8.2	8.2	30.5 30.4	30.5	91.8 91.5	91.7	7.1 7.1	7.1	7.1	6.8 6.9	6.9		20.5 18.5	19.5	
6-Feb-17	Cloudy	Moderate	14:32	Surface	1	19.7 19.8	19.8	8.1 8.1	8.1	31.3 31.3	31.3	94.3 94.3	94.3	7.2 7.2	7.2	7.2	3.0 3.0	3.0	3.8	12.2 10.2	11.2	11.2
				Middle	3.5	19.2 19.2	19.2	8.1 8.1	8.1	31.4 31.4	31.4	92.5 92.2	92.4	7.1 7.1	7.1		3.3 3.4	3.4		9.6 11.0	10.3	
				Bottom	6	19.1 19.1	19.1	8.1 8.1	8.1	31.4 31.4	31.4	90.2 89.5	89.9	6.9 6.9	6.9	6.9	4.9 5.0	5.0		11.4 12.5	12.0	
8-Feb-17	Cloudy	Moderate	16:06	Surface	1	18.8 18.8	18.8	8.1 8.1	8.1	30.1 30.1	30.1	96.4 96.4	96.4	7.5 7.5	7.5	7.5	5.3 5.3	5.3	6.4	16.2 14.5	15.4	17.5
				Middle	3	18.4 18.4	18.4	8.1 8.1	8.1	31.0 31.0	31.0	96.1 96.1	96.1	7.5 7.5	7.5		6.3 5.3	5.8		19.2 14.4	16.8	
				Bottom	5	18.4 18.4	18.4	8.1 8.1	8.1	31.1 31.1	31.1	95.8 95.8	95.8	7.5 7.5	7.5	7.5	8.1 8.1	8.1		23.2 17.6	20.4	
10-Feb-17	Cloudy	Rough	12:43	Surface	1	18.5 18.4	18.5	8.1 8.1	8.1	29.5 29.4	29.5	97.5 97.5	97.5	7.7 7.7	7.7	7.7	6.2 6.2	6.2	7.7	10.2 11.8	11.0	11.3
				Middle	3	18.2 18.0	18.1	8.1 8.1	8.1	29.7 29.9	29.8	96.3 96.2	96.3	7.6 7.6	7.6		7.8 7.8	7.8		11.2 9.6	10.4	
				Bottom	5	17.8 18.0	17.9	8.1 8.1	8.1	30.7 30.5	30.6	95.7 95.8	95.8	7.6 7.6	7.6	7.6	9.2 9.2	9.2		11.2 14.0	12.6	
13-Feb-17	Sunny	Rough	08:38	Surface	1	18.2 18.3	18.3	8.1 8.1	8.1	30.2 30.2	30.2	98.0 95.9	97.0	7.7 7.5	7.6	7.6	5.5 5.5	5.5	8.1	60.7 49.7	55.2	54.1
				Middle	3	18.0 18.0	18.0	8.1 8.1	8.1	30.3 30.3	30.3	96.5 96.5	96.5	7.6 7.6	7.6		8.2 8.1	8.2		57.0 45.7	51.4	
				Bottom	5	17.9 17.8	17.9	8.2 8.1	8.2	31.2 31.2	31.2	95.6 95.8	95.7	7.5 7.6	7.6	7.6	10.5 10.5	10.5		59.7 51.7	55.7	
15-Feb-17	Cloudy	Rough	09:54	Surface	1	20.8 20.8	20.8	8.1 8.1	8.1	31.5 31.5	31.5	96.4 97.1	96.8	7.2 7.2	7.2	7.2	2.7 3.1	2.9	4.0	11.9 15.6	13.8	12.4
				Middle	3	20.8 20.8	20.8	8.1 8.1	8.1	31.4 31.4	31.4	95.8 96.4	96.1	7.1 7.2	7.2		3.8 4.0	3.9		10.2 12.6	11.4	
				Bottom	5	20.9 21.0	21.0	8.0 8.0	8.0	31.6 31.6	31.6	96.1 96.4	96.3	7.1 7.2	7.2	7.2	5.5 5.1	5.3		11.7 12.1	11.9	
17-Feb-17	Cloudy	Rough	10:48	Surface	1	20.2 20.4	20.3	8.1 8.1	8.1	31.6 31.5	31.6	95.7 96.1	95.9	7.2 7.2	7.2	7.2	3.0 3.0	3.0	4.0	11.8 11.7	11.8	12.7
				Middle	3	20.3 20.3	20.3	8.1 8.1	8.1	31.6 31.5	31.6	95.2 95.4	95.3	7.2 7.2	7.2		4.0 3.7	3.9		16.1 10.7	13.4	
				Bottom	5	20.3 20.2	20.3	8.0 8.0	8.0	31.6 31.5	31.6	95.3 94.8	95.1	7.2 7.1	7.2	7.2	4.9 5.1	5.0		15.3 10.7	13.0	
20-Feb-17	Sunny	Moderate	12:36	Surface	1	18.8 18.8	18.8	8.0 8.0	8.0	25.9 25.9	25.9	97.1 97.2	97.2	7.8 7.8	7.8	7.8	6.3 6.3	6.3	8.3	6.1 6.8	6.5	5.6
				Middle	3	18.5 18.5	18.5	8.2 8.2	8.2	25.9 26.0	26.0	96.8 96.5	96.7	7.8 7.7	7.8		8.3 8.3	8.3		5.8 4.7	5.3	
				Bottom	5	18.2 18.3	18.3	8.2 8.2	8.2	26.8 27.1	27.0	96.3 96.2	96.3	7.7 7.7	7.7	7.7	10.2 10.2	10.2		6.9 3.3	5.1	
22-Feb-17	Cloudy	Moderate	15:12	Surface	1	18.5 18.5	18.5	7.8 7.8	7.8	29.9 29.9	29.9	100.3 100.3	100.3	7.9 7.9	7.9	7.9	5.4 5.4	5.4	7.8	13.8 7.6	10.7	10.3
				Middle	3	18.1 18.1	18.1	7.8 7.8	7.8	30.4 30.6	30.5	99.2 99.0	99.1	7.8 7.8	7.8		7.4 7.6	7.5		10.4 9.7	10.1	
				Bottom	5	18.0 18.0	18.0	7.9 7.8	7.9	31.6 31.6	31.6	98.5 98.6	98.6	7.7 7.7	7.7	7.7	10.6 10.6	10.6		11.7 8.5	10.1	
24-Feb-17	Rainy	Rough	16:57	Surface	1	18.6 18.5	18.6	8.2 8.1	8.2	25.7 25.3	25.5	83.6 83.1	83.4	6.7 6.7	6.7	6.7	8.1 8.0	8.1	9.4	8.5 10.1	9.3	8.1
				Middle	3	18.5 18.5	18.5	8.1 8.1	8.1	27.7 27.5	27.6	81.8 82.7	82.3	6.5 6.6	6.6		9.4 8.8	9.1		7.4 6.9	7.2	
				Bottom	5	18.4 18.5	18.5	8.1 8.2	8.2	29.0 28.8	28.9	79.4 80.7	80.1	6.3 6.4	6.4	6.4	10.8 11.3	11.1		7.9 7.9	7.9	
27-Feb-17	Cloudy	Moderate	19:10	Surface	1	17.5 17.4	17.5	8.1 8.1	8.1	31.4 31.4	31.4	98.1 98.1	98.1	7.8 7.8	7.8	7.8	5.6 5.7	5.7	7.2	11.8 10.1	11.0	12.5
				Middle	3	17.3 17.3	17.3	8.1 8.2	8.2	31.6 31.7	31.7	97.9 98.0	98.0	7.8 7.8	7.8		7.2 7.2	7.2		13.8 13.0	13.4	
				Bottom	5	17.1 17.0	17.1	8.2 8.2	8.2	31.7 31.7	31.7	97.0 96.9	97.0	7.7 7.7	7.7	7.7	8.7 8.8	8.8		13.6 12.7	13.2	

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

Water Quality Monitoring Results at IS3 - 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*
1-Feb-17	Sunny	Moderate	15:27	Surface	1	19.4 19.4	19.4	8.2 8.2	8.2	27.3 27.3	27.3	93.8 94.0	93.9	7.3 7.4	7.4	7.4	4.0 4.3	4.2	5.8	10.5 13.1	11.8	10.7
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.6	18.6 18.6	18.6	8.2 8.2	8.2	30.3 30.2	30.3	97.2 97.5	97.4	7.6 7.6	7.6	7.6	7.2 7.4	7.3		9.9 9.1	9.5	
3-Feb-17	Cloudy	Moderate	16:33	Surface	1	19.3 19.8	19.6	8.1 8.1	8.1	30.6 30.7	30.7	96.3 96.8	96.6	7.4 7.4	7.4	7.4	5.9 5.9	5.9	8.2	15.4 12.7	14.1	13.7
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.3	19.2 19.5	19.4	8.1 8.1	8.1	30.2 30.3	30.3	89.0 91.5	90.3	6.9 7.0	7.0	7.0	10.2 10.7	10.5		13.6 12.8	13.2	
6-Feb-17	Cloudy	Moderate	08:03	Surface	1	19.5 19.5	19.5	8.1 8.1	8.1	32.0 32.0	32.0	88.7 90.0	89.4	6.7 6.8	6.8	6.8	8.4 7.9	8.2	7.8	10.6 10.1	10.4	10.7
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.7	19.5 19.5	19.5	8.1 8.1	8.1	32.3 32.3	32.3	95.1 95.2	95.2	7.2 7.2	7.2	7.2	7.3 7.3	7.3		12.2 9.8	11.0	
8-Feb-17	Cloudy	Moderate	10:18	Surface	1	18.6 18.6	18.6	8.2 8.2	8.2	29.7 29.7	29.7	94.2 91.9	93.1	7.4 7.2	7.3	7.3	4.3 4.4	4.4	3.9	16.6 15.0	15.8	15.3
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.6	18.4 18.4	18.4	8.2 8.2	8.2	31.0 31.0	31.0	87.0 87.2	87.1	6.8 6.8	6.8	6.8	3.4 3.4	3.4		15.8 13.6	14.7	
10-Feb-17	Cloudy	Rough	17:44	Surface	1	18.2 18.2	18.2	8.0 8.0	8.0	29.3 29.3	29.3	95.3 93.5	94.4	7.5 7.4	7.5	7.5	4.3 4.1	4.2	7.1	15.8 11.8	13.8	13.2
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.6	18.1 18.1	18.1	8.0 8.0	8.0	30.1 30.0	30.1	93.3 93.5	93.4	7.4 7.4	7.4	7.4	9.9 10.1	10.0		13.8 11.3	12.6	
13-Feb-17	Sunny	Rough	14:03	Surface	1	18.8 18.8	18.8	8.0 8.0	8.0	29.3 29.3	29.3	98.3 96.5	97.4	7.7 7.6	7.7	7.7	4.4 4.2	4.3	7.2	8.8 8.1	8.5	8.8
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.5	18.7 18.7	18.7	8.0 8.0	8.0	30.1 30.0	30.1	96.3 96.5	96.4	7.5 7.5	7.5	7.5	10.0 10.2	10.1		9.7 8.3	9.0	
15-Feb-17	Cloudy	Rough	15:31	Surface	1	21.1 21.1	21.1	8.2 8.2	8.2	28.3 28.3	28.3	110.7 110.9	110.8	8.3 8.4	8.4	8.4	3.6 3.9	3.8	5.4	16.7 11.4	14.1	14.7
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.4	20.3 20.3	20.3	8.2 8.2	8.2	31.3 31.3	31.3	106.3 106.6	106.5	8.0 8.0	8.0	8.0	6.8 7.0	6.9		15.3 15.3	15.3	
17-Feb-17	Cloudy	Rough	16:45	Surface	1	20.9 20.9	20.9	8.2 8.2	8.2	28.7 28.7	28.7	105.2 105.4	105.3	7.9 8.0	8.0	8.0	3.9 4.2	4.1	5.7	17.1 13.5	15.3	15.3
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.6	20.1 20.1	20.1	8.2 8.2	8.2	31.7 31.7	31.7	100.8 101.1	101.0	7.6 7.6	7.6	7.6	7.1 7.3	7.2		18.2 12.3	15.3	
20-Feb-17	Sunny	Moderate	20:21	Surface	1	19.6 19.6	19.6	8.2 8.2	8.2	25.3 25.2	25.3	100.5 100.8	100.7	7.9 8.0	8.0	8.0	1.6 1.9	1.8	3.4	7.5 6.6	7.1	7.2
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.5	18.7 18.8	18.8	8.2 8.2	8.2	28.3 28.2	28.3	96.3 96.6	96.5	7.6 7.6	7.6	7.6	4.8 5.0	4.9		8.0 6.4	7.2	
22-Feb-17	Cloudy	Moderate	09:40	Surface	1	18.5 18.5	18.5	7.9 7.9	7.9	29.5 29.5	29.5	98.3 98.1	98.2	7.7 7.7	7.7	7.7	6.8 6.6	6.7	7.7	8.5 7.4	8.0	8.2
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.1	18.3 18.2	18.3	7.8 7.8	7.8	30.2 30.1	30.2	97.7 97.5	97.6	7.7 7.7	7.7	7.7	8.5 8.6	8.6		8.3 8.5	8.4	
24-Feb-17	Rainy	Rough	12:07	Surface	1	19.4 19.4	19.4	7.9 7.9	7.9	23.5 23.5	23.5	92.2 92.4	92.3	7.4 7.4	7.4	7.4	4.4 4.4	4.4	5.1	8.9 6.2	7.6	7.4
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.6	18.6 18.7	18.7	7.9 7.9	7.9	26.5 26.4	26.5	91.8 93.1	92.5	7.3 7.4	7.4	7.4	5.6 5.9	5.8		7.4 7.0	7.2	
27-Feb-17	Cloudy	Moderate	12:53	Surface	1	17.5 17.5	17.5	8.1 8.1	8.1	31.2 31.2	31.2	90.2 91.5	90.9	7.2 7.3	7.3	7.3	8.4 7.9	8.2	7.8	12.6 9.2	10.9	11.4
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.7	17.5 17.5	17.5	8.1 8.1	8.1	31.5 31.5	31.5	96.3 96.5	96.4	7.6 7.6	7.6	7.6	7.3 7.3	7.3		12.9 10.9	11.9	

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

Water Quality Monitoring Results at IS3 - 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*
1-Feb-17	Sunny	Moderate	09:15	Surface	1	18.8 18.8	18.8	8.1 8.1	8.1	28.4 28.4	28.4	95.0 95.3	95.2	7.5 7.5	7.5	7.5	5.7 5.7	5.7	6.4	13.3 12.7	13.0	14.1
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.6	18.0 18.0	18.0	8.1 8.1	8.1	31.4 31.3	31.4	94.7 96.0	95.4	7.4 7.5	7.5	7.5	6.9 7.2	7.1		17.1 13.0	15.1	
3-Feb-17	Cloudy	Moderate	10:13	Surface	1	19.3 19.7	19.5	8.1 8.1	8.1	30.2 30.4	30.3	98.8 100.9	99.9	7.6 7.7	7.7	7.7	4.8 5.3	5.1	7.4	14.5 10.5	12.5	11.7
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.3	18.3 18.6	18.5	8.1 8.1	8.1	29.8 30.0	29.9	87.0 88.1	87.6	6.9 6.9	6.9	6.9	9.4 9.7	9.6		9.7 12.1	10.9	
6-Feb-17	Cloudy	Moderate	13:47	Surface	1	19.5 19.5	19.5	8.0 8.0	8.0	31.0 31.0	31.0	91.6 92.0	91.8	7.0 7.0	7.0	7.0	7.2 7.3	7.3	7.6	10.5 10.2	10.4	11.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.8	19.5 19.5	19.5	8.1 8.1	8.1	31.3 31.3	31.3	93.7 93.7	93.7	7.2 7.2	7.2	7.2	7.8 7.7	7.8		13.2 9.7	11.5	
8-Feb-17	Cloudy	Moderate	15:41	Surface	1	18.7 18.7	18.7	8.1 8.1	8.1	29.7 29.6	29.7	96.9 95.1	96.0	7.6 7.5	7.6	7.6	4.9 4.7	4.8	5.8	15.8 15.6	15.7	17.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.6	18.5 18.5	18.5	8.1 8.1	8.1	30.4 30.4	30.4	95.0 95.2	95.1	7.4 7.4	7.4	7.4	6.7 6.9	6.8		18.9 17.5	18.2	
10-Feb-17	Cloudy	Rough	11:59	Surface	1	18.1 18.1	18.1	8.1 8.1	8.1	29.4 29.4	29.4	93.2 91.0	92.1	7.4 7.2	7.3	7.3	8.7 8.8	8.8	8.3	15.2 10.9	13.1	13.3
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.6	17.9 17.9	17.9	8.1 8.1	8.1	30.7 30.7	30.7	86.0 86.3	86.2	6.8 6.8	6.8	6.8	7.8 7.8	7.8		13.2 13.5	13.4	
13-Feb-17	Sunny	Rough	08:02	Surface	1	18.7 18.7	18.7	8.1 8.1	8.1	29.3 29.4	29.4	95.6 93.3	94.5	7.5 7.3	7.4	7.4	8.8 8.9	8.9	8.4	8.1 8.4	8.3	8.3
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.6	18.5 18.5	18.5	8.1 8.1	8.1	30.7 30.7	30.7	88.3 88.6	88.5	6.9 6.9	6.9	6.9	7.9 7.9	7.9		9.4 7.0	8.2	
15-Feb-17	Cloudy	Rough	09:16	Surface	1	20.5 20.5	20.5	8.1 8.1	8.1	29.5 29.4	29.5	104.0 104.3	104.2	7.9 7.9	7.9	7.9	5.3 5.3	5.3	6.0	13.7 13.0	13.4	14.7
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.4	19.7 19.7	19.7	8.1 8.1	8.1	32.4 32.4	32.4	103.7 105.0	104.4	7.8 7.9	7.9	7.9	6.5 6.8	6.7		16.9 14.8	15.9	
17-Feb-17	Cloudy	Rough	10:11	Surface	1	20.2 20.2	20.2	8.0 8.0	8.0	29.9 29.9	29.9	94.6 94.8	94.7	7.2 7.2	7.2	7.2	5.6 5.6	5.6	6.3	16.5 12.0	14.3	14.2
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.6	19.5 19.5	19.5	8.0 8.0	8.0	32.8 32.8	32.8	94.2 95.6	94.9	7.1 7.2	7.2	7.2	6.8 7.1	7.0		16.2 12.0	14.1	
20-Feb-17	Sunny	Moderate	11:56	Surface	1	18.9 18.9	18.9	8.0 8.0	8.0	26.4 26.4	26.4	90.3 90.6	90.5	7.2 7.2	7.2	7.2	3.3 3.3	3.3	4.0	6.9 6.8	6.9	6.9
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.5	18.1 18.2	18.2	8.0 8.0	8.0	29.4 29.3	29.4	90.0 91.3	90.7	7.1 7.2	7.2	7.2	4.5 4.8	4.7		6.1 7.4	6.8	
22-Feb-17	Cloudy	Moderate	14:27	Surface	1	18.5 18.5	18.5	7.9 8.0	8.0	29.8 29.9	29.9	98.0 97.8	97.9	7.7 7.7	7.7	7.7	4.5 4.6	4.6	5.6	8.0 7.8	7.9	8.4
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.2	18.4 18.4	18.4	7.9 7.9	7.9	30.1 30.2	30.2	98.1 98.3	98.2	7.7 7.7	7.7	7.7	6.5 6.7	6.6		9.7 7.8	8.8	
24-Feb-17	Rainy	Rough	16:56	Surface	1	20.1 20.1	20.1	8.0 8.0	8.0	22.4 22.3	22.4	96.5 96.7	96.6	7.7 7.7	7.7	7.7	2.7 3.0	2.9	4.5	13.3 13.3	13.3	14.6
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.6	19.2 19.3	19.3	8.0 8.0	8.0	25.3 25.3	25.3	92.3 92.6	92.5	7.3 7.4	7.4	7.4	5.9 6.1	6.0		17.4 14.4	15.9	
27-Feb-17	Cloudy	Moderate	18:51	Surface	1	17.5 17.5	17.5	8.1 8.1	8.1	30.2 30.2	30.2	92.9 93.3	93.1	7.4 7.5	7.5	7.5	7.2 7.3	7.3	7.6	9.7 9.3	9.5	9.7
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.8	17.4 17.5	17.5	8.1 8.1	8.1	30.5 30.5	30.5	94.9 95.0	95.0	7.6 7.6	7.6	7.6	7.8 7.7	7.8		11.2 8.5	9.9	

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

Water Quality Monitoring Results at IS4 - 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*
1-Feb-17	Sunny	Moderate	15:50	Surface	1	19.0 19.0	19.0	8.2 8.2	8.2	31.5 31.5	31.5	95.0 95.0	95.0	7.3 7.3	7.3	7.3	4.3 4.3	4.3	7.2	21.8 21.2	21.5	25.0
				Middle	3	19.0 19.0	19.0	8.2 8.2	8.2	29.4 29.4	29.4	93.7 93.6	93.7	7.3 7.3	7.3		7.4 7.4	7.4		24.3 24.8	24.6	
				Bottom	5	18.9 18.9	18.9	8.2 8.2	8.2	31.0 31.5	31.3	92.8 92.8	92.8	7.2 7.2	7.2	7.2	9.8 9.8	9.8		27.3 30.7	29.0	
3-Feb-17	Cloudy	Moderate	17:47	Surface	1	19.0 19.1	19.1	8.2 8.2	8.2	29.6 29.5	29.6	96.3 96.5	96.4	7.5 7.5	7.5	7.4	5.3 5.3	5.3	7.4	26.5 21.4	24.0	22.2
				Middle	3	18.9 18.9	18.9	8.2 8.2	8.2	30.0 30.1	30.1	94.2 93.6	93.9	7.3 7.3	7.3		7.6 7.6	7.6		26.5 19.8	23.2	
				Bottom	5	18.8 19.8	19.3	8.2 8.2	8.2	30.6 30.4	30.5	92.8 93.2	93.0	7.2 7.1	7.2	7.2	9.3 9.3	9.3		20.6 18.3	19.5	
6-Feb-17	Cloudy	Moderate	08:56	Surface	1	19.5 19.5	19.5	8.1 8.1	8.1	31.4 31.4	31.4	91.9 91.8	91.9	7.0 7.0	7.0	7.0	4.6 4.6	4.6	5.1	14.8 11.8	13.3	13.3
				Middle	3	19.2 19.2	19.2	8.1 8.1	8.1	31.4 31.4	31.4	91.1 91.0	91.1	7.0 7.0	7.0		4.8 4.8	4.8		14.2 11.7	13.0	
				Bottom	5	19.2 19.2	19.2	8.1 8.1	8.1	31.4 31.4	31.4	91.0 90.9	91.0	7.0 7.0	7.0	7.0	5.8 5.9	5.9		14.2 12.9	13.6	
8-Feb-17	Cloudy	Moderate	11:02	Surface	1	18.6 18.6	18.6	8.1 8.0	8.1	30.6 30.6	30.6	97.0 97.9	97.5	7.6 7.6	7.6	7.6	5.1 5.1	5.1	6.4	15.1 16.7	15.9	16.5
				Middle	3	18.3 18.3	18.3	8.1 8.1	8.1	30.7 30.6	30.7	96.6 96.6	96.6	7.6 7.6	7.6		6.3 6.3	6.3		14.5 14.2	14.4	
				Bottom	5	18.0 18.1	18.1	8.1 8.2	8.2	31.2 31.2	31.2	96.3 96.4	96.4	7.6 7.6	7.6	7.6	7.8 7.8	7.8		19.2 19.1	19.2	
10-Feb-17	Cloudy	Rough	18:25	Surface	1	18.3 18.4	18.4	8.1 8.1	8.1	29.8 29.8	29.8	97.6 97.6	97.6	7.7 7.7	7.7	7.7	7.8 7.8	7.8	8.7	12.7 10.3	11.5	12.1
				Middle	3	17.8 17.8	17.8	8.1 8.1	8.1	30.0 30.1	30.1	96.4 96.5	96.5	7.7 7.7	7.7		9.4 9.4	9.4		10.6 13.6	12.1	
				Bottom	5	17.8 17.7	17.8	8.2 8.2	8.2	30.4 30.4	30.4	95.6 95.7	95.7	7.6 7.6	7.6	7.6	8.9 8.9	8.9		13.2 12.1	12.7	
13-Feb-17	Sunny	Rough	14:42	Surface	1	18.5 18.6	18.6	8.0 8.0	8.0	29.5 29.3	29.4	99.1 99.1	99.1	7.8 7.8	7.8	7.8	6.8 6.8	6.8	8.5	37.6 50.5	44.1	43.2
				Middle	3	18.4 18.4	18.4	8.1 8.1	8.1	30.3 30.3	30.3	98.0 98.2	98.1	7.7 7.7	7.7		8.3 8.3	8.3		37.6 41.5	39.6	
				Bottom	5	17.9 17.8	17.9	8.2 8.2	8.2	31.9 31.7	31.8	97.7 97.9	97.8	7.7 7.7	7.7	7.7	10.5 10.5	10.5		45.0 46.7	45.9	
15-Feb-17	Cloudy	Rough	15:40	Surface	1	20.9 20.9	20.9	8.1 8.1	8.1	31.5 31.3	31.4	98.8 98.2	98.5	7.3 7.3	7.3	7.3	3.4 3.2	3.3	3.9	15.9 15.1	15.5	15.1
				Middle	3.5	20.8 20.8	20.8	8.1 8.1	8.1	31.4 31.5	31.5	98.3 97.1	97.7	7.3 7.2	7.3		3.5 3.5	3.5		15.4 14.0	14.7	
				Bottom	6	20.9 20.8	20.9	8.1 8.1	8.1	31.2 31.6	31.4	97.9 98.2	98.1	7.3 7.3	7.3	7.3	4.7 5.1	4.9		14.7 15.4	15.1	
17-Feb-17	Cloudy	Rough	17:04	Surface	1	20.2 20.4	20.3	8.1 8.1	8.1	31.3 31.5	31.4	97.7 96.9	97.3	7.4 7.3	7.4	7.4	2.9 3.1	3.0	3.9	10.9 9.5	10.2	11.2
				Middle	3.5	20.3 20.5	20.4	8.1 8.1	8.1	31.3 31.4	31.4	97.1 96.6	96.9	7.3 7.2	7.3		3.5 3.5	3.5		13.8 9.1	11.5	
				Bottom	6	20.4 20.5	20.5	8.1 8.1	8.1	31.4 31.5	31.5	97.3 98.1	97.7	7.3 7.3	7.3	7.3	5.2 5.3	5.3		10.8 13.2	12.0	
20-Feb-17	Sunny	Moderate	20:56	Surface	1	18.7 18.6	18.7	8.0 8.1	8.1	25.3 25.2	25.3	97.8 97.8	97.8	7.9 7.9	7.9	7.9	6.6 6.6	6.6	8.5	4.6 5.0	4.8	5.4
				Middle	3	18.0 18.1	18.1	8.1 8.1	8.1	26.6 26.6	26.6	96.6 96.3	96.5	7.8 7.8	7.8		8.7 8.7	8.7		4.5 4.2	4.4	
				Bottom	5	17.8 17.8	17.8	8.2 8.2	8.2	27.4 27.5	27.5	95.6 95.5	95.6	7.7 7.7	7.7	7.7	10.2 10.2	10.2		6.9 6.9	6.9	
22-Feb-17	Cloudy	Moderate	10:39	Surface	1	18.7 18.7	18.7	7.8 7.8	7.8	29.3 29.2	29.3	99.4 99.7	99.6	7.8 7.8	7.8	7.8	5.1 5.1	5.1	6.6	8.2 6.2	7.2	8.7
				Middle	3	18.1 18.1	18.1	7.8 7.8	7.8	30.4 30.4	30.4	98.5 98.7	98.6	7.8 7.8	7.8		6.5 6.5	6.5		9.3 11.7	10.5	
				Bottom	5	18.0 17.9	18.0	7.8 7.8	7.8	31.1 31.1	31.1	97.3 97.5	97.4	7.7 7.7	7.7	7.7	8.3 8.3	8.3		9.4 7.6	8.5	
24-Feb-17	Rainy	Rough	12:49	Surface	1	19.1 19.0	19.1	8.1 8.0	8.1	18.5 18.8	18.7	83.5 83.8	83.7	6.9 7.0	7.0	7.0	9.0 8.3	8.7	10.1	16.9 15.6	16.3	16.5
				Middle	3	19.0 18.9	19.0	8.0 7.9	8.0	20.5 20.6	20.6	82.7 83.8	83.3	6.8 6.9	6.9		10.2 10.2	10.2		13.1 13.9	13.5	
				Bottom	5	18.9 18.8	18.9	8.0 7.9	8.0	23.4 23.3	23.4	81.1 80.4	80.8	6.6 6.5	6.6	6.6	11.3 11.4	11.4		21.9 17.4	19.7	
27-Feb-17	Cloudy	Moderate	13:35	Surface	1	17.5 17.4	17.5	8.1 8.1	8.1	30.5 30.6	30.6	96.6 96.5	96.6	7.7 7.7	7.7	7.7	4.3 4.3	4.3	6.5	16.9 17.8	17.4	16.0
				Middle	3	17.4 17.4	17.4	8.1 8.1	8.1	31.4 31.4	31.4	96.8 96.8	96.8	7.7 7.7	7.7		6.1 6.1	6.1		17.0 12.4	14.7	
				Bottom	5	17.1 17.1	17.1	8.1 8.1	8.1	31.6 31.6	31.6	96.8 96.8	96.8	7.7 7.7	7.7	7.7	9.1 9.1	9.1		17.3 14.6	16.0	

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

Water Quality Monitoring Results at IS4 - 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*
1-Feb-17	Sunny	Moderate	09:57	Surface	1	19.0 19.0	19.0	8.2 8.2	8.2	29.2 29.2	29.2	92.5 92.4	92.5	7.2 7.2	7.2	7.2	4.2 4.1	4.2	7.2	29.0 28.7	28.9	32.6
				Middle	3	18.9 19.0	19.0	8.1 8.1	8.1	28.9 28.9	28.9	91.1 91.3	91.2	7.1 7.1	7.1		7.5 7.5	7.5		37.0 32.0	34.5	
				Bottom	5	18.9 18.9	18.9	8.2 8.2	8.2	29.3 29.4	29.4	90.4 90.4	90.4	7.1 7.1	7.1	7.1	9.8 9.9	9.9		35.0 34.0	34.5	
3-Feb-17	Cloudy	Moderate	11:22	Surface	1	19.2 19.1	19.2	8.1 8.1	8.1	30.5 30.5	30.5	93.4 93.6	93.5	7.2 7.2	7.2	7.2	4.3 4.2	4.3	6.6	21.3 19.6	20.5	20.0
				Middle	3	19.0 19.0	19.0	8.1 8.1	8.1	30.5 30.4	30.5	92.5 92.3	92.4	7.2 7.1	7.2		7.2 7.2	7.2		20.3 19.3	19.8	
				Bottom	5	18.9 18.9	18.9	8.1 8.1	8.1	29.9 30.1	30.0	91.3 91.4	91.4	7.1 7.1	7.1	7.1	8.3 8.5	8.4		20.4 18.8	19.6	
6-Feb-17	Cloudy	Moderate	14:45	Surface	1	19.9 19.9	19.9	8.1 8.1	8.1	31.3 31.3	31.3	94.0 94.0	94.0	7.1 7.1	7.1	7.1	3.8 3.8	3.8	4.5	11.2 10.3	10.8	11.8
				Middle	3.5	19.2 19.2	19.2	8.1 8.1	8.1	31.4 31.4	31.4	91.6 91.5	91.6	7.0 7.0	7.0		4.2 4.2	4.2		11.6 11.4	11.5	
				Bottom	6	19.1 19.1	19.1	8.1 8.1	8.1	31.4 31.4	31.4	87.9 87.5	87.7	6.8 6.7	6.8	6.8	5.5 5.6	5.6		12.3 13.9	13.1	
8-Feb-17	Cloudy	Moderate	16:19	Surface	1	18.6 18.6	18.6	8.1 8.1	8.1	30.6 30.6	30.6	97.1 97.2	97.2	7.6 7.6	7.6	7.6	5.1 5.1	5.1	6.5	15.4 16.2	15.8	17.5
				Middle	3	18.2 18.3	18.3	8.1 8.1	8.1	30.6 30.6	30.6	96.5 96.5	96.5	7.6 7.6	7.6		6.4 6.4	6.4		17.1 15.5	16.3	
				Bottom	5	18.0 17.9	18.0	8.2 8.1	8.2	31.3 31.4	31.4	96.0 96.0	96.0	7.5 7.6	7.6	7.6	7.9 7.9	7.9		24.4 16.1	20.3	
10-Feb-17	Cloudy	Rough	12:59	Surface	1	18.2 18.2	18.2	8.1 8.1	8.1	29.6 29.6	29.6	97.0 97.1	97.1	7.7 7.7	7.7	7.7	7.5 7.5	7.5	8.7	11.4 11.5	11.5	12.3
				Middle	3	17.9 17.6	17.8	8.1 8.1	8.1	30.1 30.1	30.1	96.6 96.8	96.7	7.7 7.7	7.7		8.4 8.4	8.4		15.4 13.0	14.2	
				Bottom	5	17.5 17.5	17.5	8.2 8.2	8.2	30.8 30.9	30.9	95.3 95.4	95.4	7.6 7.6	7.6	7.6	10.3 10.3	10.3		11.4 11.0	11.2	
13-Feb-17	Sunny	Rough	08:52	Surface	1	18.4 18.3	18.4	8.1 8.1	8.1	29.2 29.3	29.3	98.6 98.6	98.6	7.8 7.8	7.8	7.8	5.4 5.4	5.4	8.0	50.3 56.0	53.2	50.6
				Middle	3	18.3 18.2	18.3	8.1 8.1	8.1	30.2 30.3	30.3	98.4 98.4	98.4	7.7 7.7	7.7		8.1 8.1	8.1		51.7 48.7	50.2	
				Bottom	5	17.9 17.7	17.8	8.1 8.2	8.2	31.2 31.8	31.5	97.9 98.0	98.0	7.7 7.7	7.7	7.7	10.5 10.5	10.5		48.3 48.3	48.3	
15-Feb-17	Cloudy	Rough	10:08	Surface	1	21.1 21.2	21.2	8.1 8.1	8.1	31.4 31.5	31.5	99.4 99.3	99.4	7.4 7.3	7.4	7.4	3.9 3.9	3.9	4.3	18.5 20.2	19.4	16.4
				Middle	3	21.2 21.1	21.2	8.1 8.1	8.1	31.3 31.3	31.3	98.1 97.5	97.8	7.3 7.2	7.3		4.1 3.7	3.9		17.3 12.7	15.0	
				Bottom	5	21.1 21.0	21.1	8.1 8.1	8.1	31.5 31.3	31.4	98.4 98.1	98.3	7.3 7.3	7.3	7.3	5.1 4.8	5.0		15.0 14.8	14.9	
17-Feb-17	Cloudy	Rough	11:02	Surface	1	20.6 20.6	20.6	8.1 8.2	8.2	31.6 31.4	31.5	98.5 97.6	98.1	7.4 7.3	7.4	7.4	3.6 4.0	3.8	4.3	10.9 9.1	10.0	11.1
				Middle	3	20.6 20.6	20.6	8.1 8.1	8.1	31.4 31.5	31.5	97.2 97.0	97.1	7.3 7.3	7.3		3.8 3.9	3.9		9.5 10.9	10.2	
				Bottom	5	20.6 20.5	20.6	8.1 8.1	8.1	31.3 31.4	31.4	97.2 97.7	97.5	7.3 7.3	7.3	7.3	5.2 5.1	5.2		12.4 13.6	13.0	
20-Feb-17	Sunny	Moderate	12:49	Surface	1	18.7 18.7	18.7	8.1 8.1	8.1	24.2 24.4	24.3	97.7 97.9	97.8	7.9 7.9	7.9	7.9	6.4 6.4	6.4	8.6	5.7 5.1	5.4	6.3
				Middle	3	18.4 18.4	18.4	8.1 8.1	8.1	26.2 25.7	26.0	96.4 96.2	96.3	7.8 7.8	7.8		8.8 8.9	8.9		5.5 6.4	6.0	
				Bottom	5	18.0 18.1	18.1	8.2 8.2	8.2	27.2 27.9	27.6	96.2 96.0	96.1	7.7 7.7	7.7	7.7	10.6 10.6	10.6		8.8 6.1	7.5	
22-Feb-17	Cloudy	Moderate	15:27	Surface	1	18.6 18.5	18.6	7.8 7.8	7.8	29.3 29.3	29.3	99.6 99.9	99.8	7.8 7.9	7.9	7.9	5.2 5.2	5.2	6.6	7.6 7.8	7.7	8.8
				Middle	3	18.1 18.1	18.1	7.8 7.8	7.8	30.2 30.2	30.2	98.4 98.7	98.6	7.8 7.8	7.8		6.3 6.3	6.3		9.1 9.2	9.2	
				Bottom	5	17.9 18.0	18.0	7.8 7.8	7.8	31.5 31.5	31.5	97.5 97.7	97.6	7.7 7.7	7.7	7.7	8.4 8.4	8.4		10.9 7.9	9.4	
24-Feb-17	Rainy	Rough	17:07	Surface	1	18.6 18.5	18.6	8.1 8.1	8.1	24.2 24.0	24.1	82.2 82.8	82.5	6.7 6.7	6.7	6.6	7.4 7.7	7.6	9.2	7.0 6.3	6.7	7.9
				Middle	3.5	18.5 18.5	18.5	8.1 8.1	8.1	25.5 25.3	25.4	79.4 82.3	80.9	6.4 6.6	6.5		8.6 9.3	9.0		9.1 9.5	9.3	
				Bottom	6	18.3 18.4	18.4	8.1 8.1	8.1	27.2 27.1	27.2	78.2 79.4	78.8	6.3 6.3	6.3	6.3	10.7 11.2	11.0		7.5 7.6	7.6	
27-Feb-17	Cloudy	Moderate	19:21	Surface	1	17.4 17.5	17.5	8.1 8.1	8.1	31.4 31.4	31.4	97.5 97.2	97.4	7.7 7.7	7.7	7.7	5.5 5.5	5.5	7.3	9.9 10.3	10.1	10.9
				Middle	3	17.3 17.2	17.3	8.1 8.1	8.1	31.5 31.5	31.5	96.8 96.6	96.7	7.7 7.7	7.7		7.1 7.1	7.1		11.3 9.1	10.2	
				Bottom	5	17.0 17.9	17.5	8.2 8.2	8.2	31.6 31.6	31.6	96.7 96.5	96.6	7.7 7.6	7.7	7.7	9.3 9.2	9.3		12.4 12.5	12.5	

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

Water Quality Monitoring Results at SR1 - 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*
1-Feb-17	Sunny	Moderate	14:36	Surface	-	-	-	-	-	-	-	-	-	-	-	7.1	-	-	4.2	-	-	11.0
						-		-		-		-		-			-			-		
				Middle	1.1	19.3	19.3	8.3	8.3	28.0	28.0	90.7	90.7	7.1	7.1		4.3	4.2		10.7	11.0	
						19.2		8.3		28.0		90.7		7.1			4.1			11.2		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
3-Feb-17	Cloudy	Moderate	17:09	Surface	-	-	-	-	-	-	-	-	-	-	-	7.2	-	-	5.2	-	-	12.5
						-		-		-		-		-			-			-		
				Middle	1.2	19.7	19.7	8.2	8.2	29.9	30.2	93.4	93.5	7.2	7.2		5.2	5.2		13.2	12.5	
						19.7		8.1		30.4		93.5		7.1			5.1			11.7		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
6-Feb-17	Cloudy	Moderate	08:51	Surface	-	-	-	-	-	-	-	-	-	-	-	7.1	-	-	8.5	-	-	10.5
						-		-		-		-		-			-			-		
				Middle	1.4	19.5	19.5	8.1	8.1	32.0	32.0	92.7	92.9	7.0	7.1		9.0	8.5		10.8	10.5	
						19.5		8.1		32.0		93.0		7.1			8.0			10.2		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
8-Feb-17	Cloudy	Moderate	11:02	Surface	-	-	-	-	-	-	-	-	-	-	-	6.9	-	-	3.8	-	-	15.9
						-		-		-		-		-			-			-		
				Middle	1.1	18.6	18.6	8.2	8.2	29.1	29.2	87.5	87.3	6.9	6.9		3.7	3.8		15.8	15.9	
						18.6		8.2		29.2		87.0		6.8			3.8			16.0		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
10-Feb-17	Cloudy	Rough	16:59	Surface	-	-	-	-	-	-	-	-	-	-	-	7.5	-	-	7.8	-	-	12.6
						-		-		-		-		-			-			-		
				Middle	1.1	18.2	18.2	8.0	8.0	27.8	27.8	92.8	93.3	7.4	7.5		7.8	7.8		13.1	12.6	
						18.2		8.0		27.8		93.7		7.5			7.7			12.0		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
13-Feb-17	Sunny	Rough	13:19	Surface	-	-	-	-	-	-	-	-	-	-	-	7.6	-	-	7.9	-	-	8.1
						-		-		-		-		-			-			-		
				Middle	1.1	18.8	18.8	8.0	8.0	27.8	27.8	95.8	96.2	7.6	7.6		7.9	7.9		7.8	8.1	
						18.8		8.0		27.8		96.6		7.6			7.8			8.4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
15-Feb-17	Cloudy	Rough	14:41	Surface	-	-	-	-	-	-	-	-	-	-	-	7.2	-	-	3.8	-	-	19.7
						-		-		-		-		-			-			-		
				Middle	0.9	21.0	21.0	8.3	8.3	29.0	29.1	95.5	95.5	7.2	7.2		3.9	3.8		17.9	19.7	
						21.0		8.3		29.1		95.5		7.2			3.7			21.5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
17-Feb-17	Cloudy	Rough	15:55	Surface	-	-	-	-	-	-	-	-	-	-	-	6.8	-	-	4.1	-	-	15.1
						-		-		-		-		-			-			-		
				Middle	1.1	20.7	20.7	8.2	8.2	29.4	29.5	90.0	90.0	6.8	6.8		4.2	4.1		16.0	15.1	
						20.7		8.2		29.5		90.0		6.8			4.0			14.2		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
20-Feb-17	Sunny	Moderate	19:31	Surface	-	-	-	-	-	-	-	-	-	-	-	7.4	-	-	1.8	-	-	7.5
						-		-		-		-		-			-			-		
				Middle	1	19.4	19.4	8.2	8.2	26.0	26.0	93.4	93.4	7.4	7.4		1.9	1.8		7.4	7.5	
						19.4		8.2		26.0		93.4		7.4			1.7			7.6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
22-Feb-17	Cloudy	Moderate	09:58	Surface	-	-	-	-	-	-	-	-	-	-	-	7.7	-	-	8.4	-	-	8.2
						-		-		-		-		-			-			-		
				Middle	1.2	18.5	18.5	7.7	7.7	30.1	30.1	98.2	98.1	7.7	7.7		8.2	8.4		8.6	8.2	
						18.4		7.7		30.1		97.9		7.7			8.5			7.7		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
24-Feb-17	Rainy	Rough	12:58	Surface	-	-	-	-	-	-	-	-	-	-	-	7.3	-	-	4.2	-	-	9.7
						-		-		-		-		-			-			-		
				Middle	1.1	19.4	19.4	7.9	7.9	23.8	23.8	91.7	91.0	7.3	7.3		4.2	4.2		10.5	9.7	
						19.3		7.9		23.7		90.3		7.2			4.1			8.8		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
27-Feb-17	Cloudy	Moderate	13:42	Surface	-	-	-	-	-	-	-	-	-	-	-	7.5	-	-	8.5	-	-	12.8
						-		-		-		-		-			-			-		
				Middle	1.4	17.5	17.5	8.1	8.1	31.2	31.2	94.0	94.2	7.5	7.5		9.0	8.5		13.5	12.8	
						17.5		8.1		31.2		94.3		7.5			8.0			12.0		
				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 SR1 - 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*
1-Feb-17	Sunny	Moderate	10:06	Surface	-	-	-	-	-	-	-	-	-	-	-	7.4	-	-	5.5	-	-	16.0
						-		-		-		-		-			-			-		
				Middle	1.1	18.7	18.7	8.1	8.1	28.7	28.7	94.5	93.8	7.4	7.4		5.5	5.5		14.5	16.0	
						18.7		8.1		28.6		93.1		7.3			5.4			17.5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
3-Feb-17	Cloudy	Moderate	10:50	Surface	-	-	-	-	-	-	-	-	-	-	-	7.2	-	-	5.2	-	-	14.2
						-		-		-		-		-			-			-		
				Middle	1.1	19.8	19.8	8.1	8.1	29.9	30.1	93.3	93.6	7.1	7.2		5.0	5.2		14.6	14.2	
						19.8		8.1		30.2		93.9		7.2			5.3			13.7		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
6-Feb-17	Cloudy	Moderate	13:02	Surface	-	-	-	-	-	-	-	-	-	-	-	6.9	-	-	7.8	-	-	10.0
						-		-		-		-		-			-			-		
				Middle	1.3	19.5	19.5	8.0	8.0	31.1	31.1	89.6	90.2	6.9	6.9		7.8	7.8		8.3	10.0	
						19.5		8.0		31.1		90.8		6.9			7.7			11.7		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
8-Feb-17	Cloudy	Moderate	14:56	Surface	-	-	-	-	-	-	-	-	-	-	-	7.5	-	-	5.0	-	-	16.8
						-		-		-		-		-			-			-		
				Middle	1.1	18.7	18.7	8.1	8.1	28.2	28.2	94.5	94.9	7.5	7.5		4.8	5.0		16.5	16.8	
						18.7		8.1		28.1		95.3		7.5			5.1			17.1		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
10-Feb-17	Cloudy	Rough	12:43	Surface	-	-	-	-	-	-	-	-	-	-	-	7.4	-	-	8.4	-	-	13.6
						-		-		-		-		-			-			-		
				Middle	1.1	18.2	18.2	8.1	8.1	28.7	28.8	93.5	93.3	7.4	7.4		8.3	8.4		12.2	13.6	
						18.2		8.1		28.9		93.0		7.4			8.4			14.9		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
13-Feb-17	Sunny	Rough	08:44	Surface	-	-	-	-	-	-	-	-	-	-	-	7.0	-	-	8.5	-	-	9.3
						-		-		-		-		-			-			-		
				Middle	1	18.8	18.8	8.1	8.1	28.7	28.8	88.9	88.6	7.0	7.0		8.4	8.5		10.7	9.3	
						18.8		8.1		28.9		88.3		6.9			8.5			7.8		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
15-Feb-17	Cloudy	Rough	10:07	Surface	-	-	-	-	-	-	-	-	-	-	-	7.8	-	-	5.1	-	-	13.9
						-		-		-		-		-			-			-		
				Middle	0.9	20.4	20.4	8.1	8.1	29.8	29.8	103.4	102.7	7.8	7.8		5.1	5.1		13.9	13.9	
						20.4		8.1		29.7		102.0		7.7			5.0			13.8		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
17-Feb-17	Cloudy	Rough	11:02	Surface	-	-	-	-	-	-	-	-	-	-	-	7.1	-	-	5.4	-	-	15.3
						-		-		-		-		-			-			-		
				Middle	1.1	20.2	20.2	8.1	8.1	30.2	30.2	94.0	93.3	7.1	7.1		5.4	5.4		15.2	15.3	
						20.2		8.1		30.1		92.6		7.0			5.3			15.3		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
20-Feb-17	Sunny	Moderate	12:46	Surface	-	-	-	-	-	-	-	-	-	-	-	7.1	-	-	3.1	-	-	4.7
						-		-		-		-		-			-			-		
				Middle	1	18.9	18.9	8.1	8.1	26.7	26.7	89.8	89.2	7.1	7.1		3.1	3.1		5.0	4.7	
						18.8		8.1		26.6		88.5		7.0			3.0			4.3		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
22-Feb-17	Cloudy	Moderate	14:44	Surface	-	-	-	-	-	-	-	-	-	-	-	7.7	-	-	7.0	-	-	8.1
						-		-		-		-		-			-			-		
				Middle	1	18.2	18.2	7.8	7.8	30.6	30.7	98.6	98.5	7.7	7.7		6.5	7.0		8.8	8.1	
						18.1		7.8		30.7		98.3		7.7			7.5			7.3		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
24-Feb-17	Rainy	Rough	16:06	Surface	-	-	-	-	-	-	-	-	-	-	-	6.5	-	-	2.9	-	-	15.7
						-		-		-		-		-			-			-		
				Middle	1.1	19.9	19.9	8.0	8.0	23.1	23.1	82.1	82.1	6.5	6.5		3.0	2.9		17.7	15.7	
						19.9		8.0		23.1		82.1		6.5			2.8			13.7		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
27-Feb-17	Cloudy	Moderate	18:06	Surface	-	-	-	-	-	-	-	-	-	-	-	7.4	-	-	7.8	-	-	9.4
						-		-		-		-		-			-			-		
				Middle	1.2	17.4	17.4	8.1	8.1	30.3	30.3	91.0	91.6	7.3	7.4		7.8	7.8		10.0	9.4	
						17.4		8.1		30.2		92.1		7.4			7.7			8.7		
				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 SR2 - 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*
1-Feb-17	Sunny	Moderate	15:41	Surface	-	-	-	-	-	-	-	-	-	-	-	7.2	-	-	6.6	-	-	9.4
						-		-		-		-		-			-			-		
				Middle	1.2	19.5	19.6	8.2	8.2	27.3	27.1	92.0	92.2	7.2	7.2		6.8	6.6		9.1	9.4	
						19.6		8.2		26.9		92.4		7.2			6.4			9.7		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
3-Feb-17	Cloudy	Moderate	16:27	Surface	-	-	-	-	-	-	-	-	-	-	-	7.3	-	-	6.3	-	-	11.6
						-		-		-		-		-			-			-		
				Middle	1	19.2	19.2	8.1	8.1	30.0	30.1	94.6	94.7	7.3	7.3		6.5	6.3		10.5	11.6	
						19.1		8.1		30.1		94.8		7.3			6.1			12.7		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
6-Feb-17	Cloudy	Moderate	07:55	Surface	-	-	-	-	-	-	-	-	-	-	-	6.9	-	-	5.6	-	-	9.5
						-		-		-		-		-			-			-		
				Middle	0.9	19.6	19.6	8.0	8.0	31.1	31.2	90.3	90.6	6.9	6.9		5.5	5.6		9.3	9.5	
						19.6		8.0		31.2		90.8		6.9			5.7			9.7		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
8-Feb-17	Cloudy	Moderate	10:06	Surface	-	-	-	-	-	-	-	-	-	-	-	7.4	-	-	4.9	-	-	16.9
						-		-		-		-		-			-			-		
				Middle	0.9	18.5	18.5	8.2	8.2	31.1	31.1	95.4	95.1	7.4	7.4		5.1	4.9		16.4	16.9	
						18.5		8.1		31.1		94.7		7.4			4.7			17.3		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
10-Feb-17	Cloudy	Rough	17:56	Surface	-	-	-	-	-	-	-	-	-	-	-	7.4	-	-	5.6	-	-	11.7
						-		-		-		-		-			-			-		
				Middle	1	18.2	18.2	8.1	8.1	30.7	30.8	94.7	94.2	7.4	7.4		5.4	5.6		12.8	11.7	
						18.2		8.0		30.8		93.7		7.4			5.7			10.5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
13-Feb-17	Sunny	Rough	14:17	Surface	-	-	-	-	-	-	-	-	-	-	-	7.6	-	-	5.7	-	-	10.0
						-		-		-		-		-			-			-		
				Middle	1	18.8	18.8	8.1	8.1	30.7	30.8	97.7	97.2	7.6	7.6		5.5	5.7		10.0	10.0	
						18.8		8.0		30.8		96.7		7.5			5.8			10.0		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
15-Feb-17	Cloudy	Rough	15:46	Surface	-	-	-	-	-	-	-	-	-	-	-	7.3	-	-	6.2	-	-	18.8
						-		-		-		-		-			-			-		
				Middle	1	21.2	21.3	8.2	8.2	28.4	28.2	96.8	97.1	7.3	7.3		6.4	6.2		18.9	18.8	
						21.3		8.2		27.9		97.3		7.3			6.0			18.7		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
17-Feb-17	Cloudy	Rough	16:59	Surface	-	-	-	-	-	-	-	-	-	-	-	6.9	-	-	6.5	-	-	16.4
						-		-		-		-		-			-			-		
				Middle	1.1	20.9	21.0	8.1	8.2	28.8	28.6	91.3	91.6	6.9	6.9		6.7	6.5		17.0	16.4	
						21.1		8.2		28.4		91.8		6.9			6.3			15.7		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
20-Feb-17	Sunny	Moderate	20:36	Surface	-	-	-	-	-	-	-	-	-	-	-	6.9	-	-	4.2	-	-	9.2
						-		-		-		-		-			-			-		
				Middle	1.1	19.6	19.7	8.1	8.2	25.3	25.1	87.3	87.5	6.9	6.9		4.4	4.2		9.7	9.2	
						19.8		8.2		24.9		87.7		6.9			4.0			8.6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
22-Feb-17	Cloudy	Moderate	09:30	Surface	-	-	-	-	-	-	-	-	-	-	-	7.7	-	-	5.5	-	-	7.3
						-		-		-		-		-			-			-		
				Middle	1	18.5	18.5	7.8	7.8	30.2	30.2	97.9	97.8	7.7	7.7		5.3	5.5		7.3	7.3	
						18.4		7.8		30.2		97.6		7.7			5.6			7.2		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
24-Feb-17	Rainy	Rough	11:53	Surface	-	-	-	-	-	-	-	-	-	-	-	6.9	-	-	5.1	-	-	7.1
						-		-		-		-		-			-			-		
				Middle	1.2	20.4	20.4	7.9	7.9	23.6	23.7	86.8	87.1	6.8	6.9		5.0	5.1		8.2	7.1	
						20.4		7.9		23.7		87.4		6.9			5.2			5.9		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
27-Feb-17	Cloudy	Moderate	12:46	Surface	-	-	-	-	-	-	-	-	-	-	-	7.4	-	-	10.6	-	-	14.1
						-		-		-		-		-			-			-		
				Middle	0.8	17.5	17.5	8.1	8.1	30.3	30.3	91.8	92.0	7.3	7.4		10.5	10.6		12.7	14.1	
						17.5		8.1		30.3		92.2		7.4			10.7			15.4		
				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 SR2 - 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*
1-Feb-17	Sunny	Moderate	09:01	Surface	-	-	-	-	-	-	-	-	-	-	-	7.0	-	-	6.4	-	-	13.3
						-		-		-		-		-			-			-		
				Middle	1.1	19.7	19.7	8.2	8.2	28.5	28.6	89.6	89.9	6.9	7.0		6.3	6.4		13.4	13.3	
						19.7		8.2		28.6		90.2		7.0			6.5			13.2		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
3-Feb-17	Cloudy	Moderate	10:04	Surface	-	-	-	-	-	-	-	-	-	-	-	7.2	-	-	7.5	-	-	12.4
						-		-		-		-		-			-			-		
				Middle	1.2	19.1	19.2	8.1	8.1	30.2	30.2	93.0	92.6	7.2	7.2		7.4	7.5		12.6	12.4	
						19.2		8.1		30.2		92.1		7.1			7.5			12.1		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
6-Feb-17	Cloudy	Moderate	13:57	Surface	-	-	-	-	-	-	-	-	-	-	-	6.8	-	-	7.5	-	-	10.1
						-		-		-		-		-			-			-		
				Middle	1.2	19.4	19.5	8.0	8.0	31.2	31.2	88.7	88.8	6.8	6.8		7.5	7.5		10.9	10.1	
						19.5		8.0		31.2		88.9		6.8			7.5			9.2		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
8-Feb-17	Cloudy	Moderate	15:54	Surface	-	-	-	-	-	-	-	-	-	-	-	7.5	-	-	6.2	-	-	16.2
						-		-		-		-		-			-			-		
				Middle	1.1	18.6	18.6	8.1	8.1	31.1	31.1	96.3	95.8	7.5	7.5		6.0	6.2		15.4	16.2	
						18.6		8.1		31.1		95.3		7.4			6.3			16.9		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
10-Feb-17	Cloudy	Rough	11:48	Surface	-	-	-	-	-	-	-	-	-	-	-	7.4	-	-	8.1	-	-	14.5
						-		-		-		-		-			-			-		
				Middle	0.8	18.0	18.0	8.1	8.1	30.7	30.7	94.4	94.1	7.4	7.4		8.3	8.1		13.4	14.5	
						18.0		8.1		30.7		93.7		7.4			7.9			15.5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
13-Feb-17	Sunny	Rough	07:49	Surface	-	-	-	-	-	-	-	-	-	-	-	7.5	-	-	8.2	-	-	8.0
						-		-		-		-		-			-			-		
				Middle	0.8	18.6	18.6	8.1	8.1	30.7	30.7	96.7	96.4	7.5	7.5		8.4	8.2		8.6	8.0	
						18.6		8.1		30.7		96.1		7.5			8.0			7.4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
15-Feb-17	Cloudy	Rough	09:02	Surface	-	-	-	-	-	-	-	-	-	-	-	7.4	-	-	6.0	-	-	15.1
						-		-		-		-		-			-			-		
				Middle	1	21.4	21.4	8.2	8.2	29.6	29.6	98.4	98.8	7.3	7.4		5.9	6.0		15.3	15.1	
						21.4		8.2		29.6		99.1		7.4			6.1			14.9		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
17-Feb-17	Cloudy	Rough	09:57	Surface	-	-	-	-	-	-	-	-	-	-	-	7.5	-	-	6.3	-	-	14.0
						-		-		-		-		-			-			-		
				Middle	1.1	21.2	21.2	8.1	8.1	30.0	30.1	99.6	99.9	7.4	7.5		6.2	6.3		14.9	14.0	
						21.2		8.1		30.1		100.2		7.5			6.4			13.1		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
20-Feb-17	Sunny	Moderate	11:41	Surface	-	-	-	-	-	-	-	-	-	-	-	7.6	-	-	4.0	-	-	6.3
						-		-		-		-		-			-			-		
				Middle	1	19.9	19.9	8.1	8.1	26.5	26.6	97.0	97.3	7.6	7.6		3.9	4.0		7.6	6.3	
						19.8		8.1		26.6		97.6		7.6			4.1			4.9		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
22-Feb-17	Cloudy	Moderate	14:18	Surface	-	-	-	-	-	-	-	-	-	-	-	7.7	-	-	5.5	-	-	8.5
						-		-		-		-		-			-			-		
				Middle	1.1	18.2	18.2	7.9	7.9	30.0	30.1	97.4	97.5	7.7	7.7		5.2	5.5		8.6	8.5	
						18.2		7.9		30.1		97.6		7.7			5.7			8.4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
24-Feb-17	Rainy	Rough	17:11	Surface	-	-	-	-	-	-	-	-	-	-	-	6.7	-	-	5.3	-	-	13.6
						-		-		-		-		-			-			-		
				Middle	1.2	20.1	20.2	8.0	8.0	22.4	22.2	83.4	83.6	6.6	6.7		5.5	5.3		13.8	13.6	
						20.3		8.0		22.0		83.8		6.7			5.1			13.3		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
27-Feb-17	Cloudy	Moderate	19:01	Surface	-	-	-	-	-	-	-	-	-	-	-	7.2	-	-	7.5	-	-	10.0
						-		-		-		-		-			-			-		
				Middle	1.2	17.4	17.4	8.1	8.1	30.4	30.4	90.2	90.3	7.2	7.2		7.5	7.5		10.9	10.0	
						17.4		8.1		30.4		90.3		7.2			7.5			9.0		
				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 SR3 - 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*
1-Feb-17	Sunny	Moderate	16:01	Surface	-	-	-	-	-	-	-	-	-	-	-	7.8	-	-	5.5	-	-	9.6
						-		-		-		-		-			-			-		
				Middle	0.9	20.2	20.2	8.3	8.3	28.0	28.0	100.9	101.5	7.8	7.8		5.6	5.5		9.2	9.6	
						20.2		8.3		28.0		102.0		7.8			5.3			9.9		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
3-Feb-17	Cloudy	Moderate	16:10	Surface	-	-	-	-	-	-	-	-	-	-	-	7.8	-	-	6.5	-	-	13.6
						-		-		-		-		-			-			-		
				Middle	1.1	19.7	19.8	8.1	8.2	30.3	30.6	100.4	101.6	7.7	7.8		6.6	6.5		13.7	13.6	
						19.9		8.2		30.8		102.7		7.8			6.4			13.5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
6-Feb-17	Cloudy	Moderate	07:27	Surface	-	-	-	-	-	-	-	-	-	-	-	7.0	-	-	5.7	-	-	11.4
						-		-		-		-		-			-			-		
				Middle	1.1	19.4	19.5	7.9	7.9	30.8	30.8	90.9	90.6	7.0	7.0		5.7	5.7		11.3	11.4	
						19.5		7.9		30.8		90.2		6.9			5.7			11.4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
8-Feb-17	Cloudy	Moderate	09:37	Surface	-	-	-	-	-	-	-	-	-	-	-	7.3	-	-	5.5	-	-	17.4
						-		-		-		-		-			-			-		
				Middle	1.1	18.7	18.7	8.1	8.1	30.4	30.4	93.3	92.9	7.3	7.3		5.5	5.5		18.3	17.4	
						18.7		8.1		30.4		92.5		7.2			5.5			16.4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
10-Feb-17	Cloudy	Rough	18:23	Surface	-	-	-	-	-	-	-	-	-	-	-	7.3	-	-	6.8	-	-	12.3
						-		-		-		-		-			-			-		
				Middle	0.9	18.4	18.4	8.0	8.0	30.7	30.7	93.7	93.2	7.3	7.3		6.8	6.8		13.0	12.3	
						18.4		8.0		30.7		92.7		7.3			6.7			11.6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
13-Feb-17	Sunny	Rough	14:44	Surface	-	-	-	-	-	-	-	-	-	-	-	7.5	-	-	6.9	-	-	8.5
						-		-		-		-		-			-			-		
				Middle	0.9	19.0	19.0	8.0	8.0	30.7	30.7	95.7	96.2	7.4	7.5		6.8	6.9		8.6	8.5	
						19.0		8.0		30.7		96.7		7.5			6.9			8.4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
15-Feb-17	Cloudy	Rough	16:06	Surface	-	-	-	-	-	-	-	-	-	-	-	8.5	-	-	5.1	-	-	20.3
						-		-		-		-		-			-			-		
				Middle	0.7	21.9	21.9	8.3	8.3	29.0	29.1	114.2	114.8	8.5	8.5		5.2	5.1		17.6	20.3	
						21.9		8.3		29.1		115.3		8.5			4.9			22.9		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
17-Feb-17	Cloudy	Rough	17:20	Surface	-	-	-	-	-	-	-	-	-	-	-	8.1	-	-	5.4	-	-	23.4
						-		-		-		-		-			-			-		
				Middle	0.9	20.2	20.2	8.3	8.3	29.5	29.5	105.8	106.3	8.1	8.1		5.5	5.4		22.2	23.4	
						20.2		8.3		29.5		106.8		8.1			5.2			24.6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
20-Feb-17	Sunny	Moderate	20:56	Surface	-	-	-	-	-	-	-	-	-	-	-	7.6	-	-	3.1	-	-	7.0
						-		-		-		-		-			-			-		
				Middle	0.8	18.4	18.4	8.3	8.3	26.0	26.0	94.2	93.8	7.6	7.6		3.2	3.1		7.6	7.0	
						18.4		8.3		26.0		93.3		7.5			2.9			6.4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
22-Feb-17	Cloudy	Moderate	09:05	Surface	-	-	-	-	-	-	-	-	-	-	-	7.6	-	-	3.5	-	-	8.9
						-		-		-		-		-			-			-		
				Middle	1	18.6	18.6	7.9	7.9	28.5	28.4	96.7	96.7	7.6	7.6		3.5	3.5		8.5	8.9	
						18.5		7.9		28.3		96.6		7.6			3.5			9.3		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
24-Feb-17	Rainy	Rough	11:33	Surface	-	-	-	-	-	-	-	-	-	-	-	6.4	-	-	8.6	-	-	7.8
						-		-		-		-		-			-			-		
				Middle	1.2	19.2	19.2	7.8	7.8	24.6	24.8	79.7	79.6	6.4	6.4		8.6	8.6		7.2	7.8	
						19.1		7.8		24.9		79.5		6.4			8.6			8.4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
27-Feb-17	Cloudy	Moderate	12:17	Surface	-	-	-	-	-	-	-	-	-	-	-	7.4	-	-	5.7	-	-	13.9
						-		-		-		-		-			-			-		
				Middle	1	17.4	17.4	8.0	8.0	30.0	30.0	92.3	92.0	7.4	7.4		5.7	5.7		13.2	13.9	
						17.4		8.0		30.0		91.6		7.3			5.7			14.5		
				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 SR3 - 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*
1-Feb-17	Sunny	Moderate	08:41	Surface	-	-	-	-	-	-	-	-	-	-	-	7.3	-	-	9.9	-	-	13.8
						-		-		-		-		-			-			-		
				Middle	1.2	18.5	18.5	8.0	8.1	29.5	29.7	92.5	92.4	7.3	7.3		9.9	9.9		15.2	13.8	
						18.4		8.1		29.9		92.3		7.3			9.9			12.3		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
3-Feb-17	Cloudy	Moderate	09:44	Surface	-	-	-	-	-	-	-	-	-	-	-	7.8	-	-	5.3	-	-	14.4
						-		-		-		-		-			-			-		
				Middle	1.1	19.5	19.6	8.2	8.2	30.4	30.4	101.1	101.3	7.8	7.8		4.9	5.3		15.2	14.4	
						19.7		8.2		30.3		101.4		7.8			5.6			13.5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
6-Feb-17	Cloudy	Moderate	14:16	Surface	-	-	-	-	-	-	-	-	-	-	-	6.3	-	-	5.9	-	-	10.7
						-		-		-		-		-			-			-		
				Middle	1.1	19.6	19.6	8.0	8.0	30.8	30.8	81.5	81.8	6.2	6.3		5.9	5.9		11.3	10.7	
						19.6		8.0		30.8		82.0		6.3			5.9			10.0		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
8-Feb-17	Cloudy	Moderate	16:21	Surface	-	-	-	-	-	-	-	-	-	-	-	7.4	-	-	7.4	-	-	17.7
						-		-		-		-		-			-			-		
				Middle	0.9	18.8	18.8	8.1	8.1	31.1	31.1	95.3	94.9	7.4	7.4		7.4	7.4		18.9	17.7	
						18.8		8.1		31.1		94.4		7.3			7.3			16.5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
10-Feb-17	Cloudy	Rough	11:18	Surface	-	-	-	-	-	-	-	-	-	-	-	7.3	-	-	8.7	-	-	13.2
						-		-		-		-		-			-			-		
				Middle	1.1	18.2	18.2	8.0	8.0	30.1	30.1	92.3	91.9	7.3	7.3		8.7	8.7		13.7	13.2	
						18.2		8.0		30.1		91.5		7.2			8.7			12.6		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
13-Feb-17	Sunny	Rough	07:19	Surface	-	-	-	-	-	-	-	-	-	-	-	7.4	-	-	8.8	-	-	9.4
						-		-		-		-		-			-			-		
				Middle	1.1	18.8	18.8	8.0	8.0	30.1	30.1	94.6	94.3	7.4	7.4		8.8	8.8		10.3	9.4	
						18.8		8.0		30.0		93.9		7.3			8.8			8.4		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
15-Feb-17	Cloudy	Rough	08:42	Surface	-	-	-	-	-	-	-	-	-	-	-	6.9	-	-	9.5	-	-	12.7
						-		-		-		-		-			-			-		
				Middle	1	20.2	20.2	8.0	8.1	30.5	30.7	90.8	90.7	6.9	6.9		9.5	9.5		13.6	12.7	
						20.1		8.1		30.9		90.6		6.9			9.5			11.7		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
17-Feb-17	Cloudy	Rough	09:37	Surface	-	-	-	-	-	-	-	-	-	-	-	7.0	-	-	7.5	-	-	15.5
						-		-		-		-		-			-			-		
				Middle	1.1	20.0	20.0	8.0	8.0	30.1	30.3	91.5	91.4	7.0	7.0		7.5	7.5		17.3	15.5	
						19.9		8.0		30.4		91.2		7.0			7.5			13.7		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
20-Feb-17	Sunny	Moderate	11:21	Surface	-	-	-	-	-	-	-	-	-	-	-	7.1	-	-	7.5	-	-	8.3
						-		-		-		-		-			-			-		
				Middle	1.1	18.6	18.6	8.0	8.0	26.6	26.8	89.1	89.0	7.1	7.1		7.5	7.5		7.6	8.3	
						18.5		8.0		27.0		88.9		7.1			7.5			9.0		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
22-Feb-17	Cloudy	Moderate	13:52	Surface	-	-	-	-	-	-	-	-	-	-	-	7.7	-	-	4.0	-	-	9.0
						-		-		-		-		-			-			-		
				Middle	1	18.7	18.6	7.9	7.9	29.0	29.2	97.4	97.3	7.7	7.7		4.0	4.0		9.3	9.0	
						18.4		7.9		29.4		97.1		7.7			4.0			8.7		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
24-Feb-17	Rainy	Rough	17:31	Surface	-	-	-	-	-	-	-	-	-	-	-	7.9	-	-	4.2	-	-	9.3
						-		-		-		-		-			-			-		
				Middle	0.9	20.9	20.9	8.1	8.1	23.1	23.1	99.7	100.3	7.8	7.9		4.3	4.2		10.0	9.3	
						20.9		8.1		23.1		100.8		7.9			4.0			8.5		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
27-Feb-17	Cloudy	Moderate	19:20	Surface	-	-	-	-	-	-	-	-	-	-	-	6.7	-	-	5.9	-	-	12.8
						-		-		-		-		-			-			-		
				Middle	1	17.5	17.6	8.1	8.1	30.0	30.0	83.3	83.6	6.7	6.7		5.9	5.9		15.2	12.8	
						17.6		8.1		29.9		83.8		6.7			5.9			10.3		
				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 SR6 - 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*
1-Feb-17	Sunny	Moderate	14:48	Surface	1	19.2 19.1	19.2	8.1 8.1	8.1	30.4 30.3	30.4	97.4 97.4	97.4	7.5 7.5	7.5	7.5	3.3 3.3	3.3	4.5	29.7 33.3	31.5	31.7
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.1	18.7 18.7	18.7	8.2 8.2	8.2	31.5 31.0	31.3	96.6 96.8	96.7	7.5 7.5	7.5	7.5	5.6 5.7	5.7		28.7 35.0	31.9	
3-Feb-17	Cloudy	Moderate	16:37	Surface	1	19.2 19.2	19.2	8.1 8.1	8.1	30.5 30.5	30.5	96.8 96.7	96.8	7.5 7.5	7.5	7.5	3.7 3.3	3.5	4.1	24.8 25.9	25.4	27.3
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4	19.1 19.1	19.1	8.2 8.2	8.2	30.7 30.7	30.7	96.4 96.4	96.4	7.4 7.4	7.4	7.4	4.6 4.7	4.7		27.8 30.5	29.2	
6-Feb-17	Cloudy	Moderate	07:41	Surface	1	19.5 19.5	19.5	8.1 8.1	8.1	31.4 31.4	31.4	92.2 92.2	92.2	7.0 7.0	7.0	7.0	4.7 4.8	4.8	5.3	11.3 9.7	10.5	10.6
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.1	19.3 19.2	19.3	8.1 8.1	8.1	31.5 31.5	31.5	92.0 92.2	92.1	7.0 7.1	7.1	7.1	5.8 5.8	5.8		9.7 11.5	10.6	
8-Feb-17	Cloudy	Moderate	09:51	Surface	1	18.8 18.9	18.9	8.1 8.1	8.1	29.1 29.9	29.5	98.4 98.3	98.4	7.7 7.7	7.7	7.7	4.5 4.3	4.4	5.6	21.4 15.8	18.6	17.7
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.1	18.7 18.6	18.7	8.1 8.1	8.1	30.7 31.0	30.9	96.2 96.1	96.2	7.5 7.5	7.5	7.5	6.9 6.4	6.7		16.0 17.4	16.7	
10-Feb-17	Cloudy	Rough	17:10	Surface	1	18.7 18.8	18.8	8.0 8.0	8.0	30.5 30.1	30.3	97.4 97.2	97.3	7.6 7.6	7.6	7.6	7.1 7.1	7.1	7.9	12.2 10.4	11.3	11.5
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.1	18.3 18.2	18.3	8.1 8.1	8.1	29.7 30.0	29.9	96.3 96.3	96.3	7.6 7.6	7.6	7.6	8.6 8.6	8.6		11.0 12.4	11.7	
13-Feb-17	Sunny	Rough	13:35	Surface	1	18.3 18.3	18.3	8.1 8.1	8.1	29.2 29.3	29.3	98.0 98.1	98.1	7.8 7.7	7.8	7.8	5.6 5.6	5.6	7.2	53.0 47.3	50.2	51.6
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.1	18.1 18.1	18.1	8.1 8.1	8.1	30.9 30.8	30.9	96.9 96.9	96.9	7.6 7.6	7.6	7.6	8.8 8.8	8.8		56.0 49.7	52.9	
15-Feb-17	Cloudy	Rough	14:38	Surface	1	20.7 20.9	20.8	8.1 8.1	8.1	31.4 31.3	31.4	99.9 99.4	99.7	7.5 7.4	7.5	7.5	2.1 1.9	2.0	2.5	9.1 11.1	10.1	11.3
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.2	20.8 20.7	20.8	8.1 8.1	8.1	31.8 31.8	31.8	99.3 97.6	98.5	7.4 7.3	7.4	7.4	2.9 2.8	2.9		12.8 12.2	12.5	
17-Feb-17	Cloudy	Rough	16:02	Surface	1	20.3 20.1	20.2	8.0 8.1	8.1	31.2 31.4	31.3	99.0 98.4	98.7	7.5 7.4	7.5	7.5	2.0 1.9	2.0	2.5	11.7 10.3	11.0	11.6
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.2	20.1 20.2	20.2	8.1 8.1	8.1	31.7 31.6	31.7	97.5 96.5	97.0	7.3 7.3	7.3	7.3	3.1 2.9	3.0		12.9 11.4	12.2	
20-Feb-17	Sunny	Moderate	19:44	Surface	1	18.7 18.7	18.7	8.0 8.0	8.0	25.9 26.2	26.1	96.5 96.6	96.6	7.7 7.7	7.7	7.7	5.3 5.3	5.3	6.4	13.5 12.5	13.0	13.3
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.1	18.2 18.3	18.3	8.1 8.1	8.1	26.7 27.0	26.9	96.0 95.9	96.0	7.7 7.7	7.7	7.7	7.4 7.5	7.5		15.1 12.0	13.6	
22-Feb-17	Cloudy	Moderate	09:21	Surface	1	18.7 18.8	18.8	7.8 7.8	7.8	29.9 29.8	29.9	99.7 99.9	99.8	7.8 7.8	7.8	7.8	2.2 2.3	2.3	4.0	13.9 9.0	11.5	9.3
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.1	18.2 18.3	18.3	7.8 7.8	7.8	30.5 30.4	30.5	98.6 98.3	98.5	7.8 7.7	7.8	7.8	5.7 5.7	5.7		7.6 6.5	7.1	
24-Feb-17	Rainy	Rough	11:46	Surface	1	19.1 19.1	19.1	7.9 8.0	8.0	22.4 22.2	22.3	85.1 85.4	85.3	6.9 6.9	6.9	6.9	7.7 8.6	8.2	9.2	21.3 13.9	17.6	16.1
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.3	19.0 19.0	19.0	7.8 7.8	7.8	24.5 24.4	24.5	83.4 83.9	83.7	6.7 6.7	6.7	6.7	9.9 10.4	10.2		13.8 15.2	14.5	
27-Feb-17	Cloudy	Moderate	12:29	Surface	1	17.7 17.7	17.7	8.1 8.1	8.1	30.6 30.6	30.6	97.5 97.7	97.6	7.7 7.8	7.8	7.8	4.9 5.0	5.0	5.9	11.7 10.7	11.2	11.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.1	17.5 17.4	17.5	8.1 8.1	8.1	31.8 31.8	31.8	96.7 96.6	96.7	7.7 7.7	7.7	7.7	6.8 6.8	6.8		10.5 11.0	10.8	

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

Water Quality Monitoring Results at SR6 - 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*
1-Feb-17	Sunny	Moderate	08:51	Surface	1	18.9 18.9	18.9	8.1 8.1	8.1	28.7 28.8	28.8	96.3 96.9	96.6	7.6 7.6	7.6	7.6	3.7 3.7	3.7	5.5	55.0 67.7	61.4	62.2
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.1	18.7 18.7	18.7	8.2 8.2	8.2	29.4 29.4	29.4	96.2 96.2	96.2	7.5 7.5	7.5	7.5	7.2 7.2	7.2		59.3 66.7	63.0	
3-Feb-17	Cloudy	Moderate	10:08	Surface	1	18.9 18.9	18.9	8.1 8.1	8.1	28.8 28.9	28.9	97.2 97.3	97.3	7.6 7.6	7.6	7.6	3.3 3.2	3.3	4.8	20.3 19.2	19.8	20.4
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	3.9	18.8 18.9	18.9	8.1 8.1	8.1	29.1 29.3	29.2	96.2 96.4	96.3	7.5 7.5	7.5	7.5	6.4 6.2	6.3		20.8 21.2	21.0	
6-Feb-17	Cloudy	Moderate	13:26	Surface	1	19.6 19.6	19.6	8.1 8.1	8.1	31.4 31.4	31.4	97.2 96.9	97.1	7.4 7.4	7.4	7.4	2.7 2.7	2.7	3.2	10.5 13.4	12.0	11.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.4	19.0 19.0	19.0	8.1 8.1	8.1	31.6 31.6	31.6	93.9 93.8	93.9	7.2 7.2	7.2	7.2	3.6 3.6	3.6		10.4 9.4	9.9	
8-Feb-17	Cloudy	Moderate	15:15	Surface	1	18.5 18.4	18.5	8.1 8.1	8.1	30.1 30.1	30.1	97.2 97.2	97.2	7.6 7.6	7.6	7.6	4.5 4.5	4.5	5.6	20.9 20.7	20.8	20.7
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.1	18.1 18.1	18.1	8.1 8.1	8.1	31.3 31.3	31.3	96.3 96.4	96.4	7.6 7.6	7.6	7.6	6.7 6.7	6.7		22.3 18.6	20.5	
10-Feb-17	Cloudy	Rough	11:33	Surface	1	18.4 18.4	18.4	8.0 8.1	8.1	29.7 29.7	29.7	96.1 96.3	96.2	7.6 7.6	7.6	7.6	7.3 7.3	7.3	7.9	11.9 12.5	12.2	11.7
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4	18.1 18.2	18.2	8.0 8.0	8.0	30.0 29.9	30.0	95.7 96.0	95.9	7.6 7.6	7.6	7.6	8.4 8.4	8.4		11.2 10.9	11.1	
13-Feb-17	Sunny	Rough	07:33	Surface	1	18.3 18.4	18.4	8.1 8.1	8.1	30.0 30.1	30.1	98.1 98.0	98.1	7.7 7.7	7.7	7.7	5.3 5.3	5.3	6.3	54.0 56.0	55.0	56.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4	18.0 18.0	18.0	8.1 8.1	8.1	30.6 30.7	30.7	97.3 97.3	97.3	7.7 7.7	7.7	7.7	7.3 7.3	7.3		58.0 55.7	56.9	
15-Feb-17	Cloudy	Rough	08:55	Surface	1	21.0 21.1	21.1	8.1 8.1	8.1	31.4 31.6	31.5	98.7 97.7	98.2	7.3 7.2	7.3	7.3	3.8 4.0	3.9	4.6	20.6 22.4	21.5	21.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.1	21.0 20.8	20.9	8.1 8.1	8.1	31.5 31.6	31.6	96.8 95.9	96.4	7.2 7.1	7.2	7.2	5.1 5.4	5.3		21.0 20.0	20.5	
17-Feb-17	Cloudy	Rough	09:50	Surface	1	20.4 20.3	20.4	8.1 8.1	8.1	31.6 31.4	31.5	97.6 96.2	96.9	7.3 7.2	7.3	7.3	4.2 4.5	4.4	4.7	12.8 14.4	13.6	12.9
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.1	20.5 20.5	20.5	8.1 8.1	8.1	31.5 31.4	31.5	95.7 94.9	95.3	7.2 7.1	7.2	7.2	4.8 5.0	4.9		10.8 13.3	12.1	
20-Feb-17	Sunny	Moderate	11:36	Surface	1	18.9 18.7	18.8	8.0 8.0	8.0	25.4 25.4	25.4	98.7 98.6	98.7	7.9 7.9	7.9	7.9	5.2 5.2	5.2	6.8	7.8 7.4	7.6	8.6
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.1	18.5 18.4	18.5	8.1 8.1	8.1	26.6 26.8	26.7	96.3 96.5	96.4	7.7 7.7	7.7	7.7	8.4 8.4	8.4		9.3 9.7	9.5	
22-Feb-17	Cloudy	Moderate	14:13	Surface	1	18.8 18.8	18.8	7.8 7.8	7.8	29.6 29.6	29.6	99.5 99.4	99.5	7.8 7.8	7.8	7.8	3.3 3.3	3.3	4.2	10.6 7.8	9.2	8.6
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.1	18.2 18.1	18.2	7.8 7.8	7.8	30.4 30.3	30.4	98.3 98.4	98.4	7.7 7.8	7.8	7.8	5.1 5.1	5.1		9.6 6.2	7.9	
24-Feb-17	Rainy	Rough	16:08	Surface	1	18.6 18.5	18.6	8.0 7.9	8.0	24.3 24.2	24.3	84.3 82.8	83.6	6.8 6.7	6.8	6.8	7.4 7.3	7.4	8.6	23.1 22.4	22.8	18.9
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.5	18.4 18.5	18.5	8.0 8.0	8.0	26.2 26.3	26.3	82.3 82.3	82.3	6.6 6.6	6.6	6.6	9.7 9.7	9.7		13.5 16.3	14.9	
27-Feb-17	Cloudy	Moderate	18:15	Surface	1	17.5 17.5	17.5	8.1 8.1	8.1	30.5 30.5	30.5	97.3 97.1	97.2	7.8 7.7	7.8	7.8	3.7 3.7	3.7	5.0	14.8 16.0	15.4	15.6
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-		- -	-		- -	-	
				Bottom	4.1	17.1 17.2	17.2	8.1 8.1	8.1	31.4 31.5	31.5	96.7 96.4	96.6	7.7 7.7	7.7	7.7	6.2 6.2	6.2		14.0 17.3	15.7	

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

Water Quality Monitoring Results at SRA - 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*
1-Feb-17	Sunny	Moderate	15:51	Surface	1	19.6 19.5	19.6	8.2 8.2	8.2	27.5 27.5	27.5	93.6 93.7	93.7	7.3 7.3	7.3	7.3	6.5 6.3	6.4	8.1	12.6 10.3	11.5	11.5
				Middle	4	18.8 18.9	18.9	8.2 8.2	8.2	29.2 29.0	29.1	91.0 91.5	91.3	7.1 7.2	7.2		7.8 7.9	7.9		14.7 10.3	12.5	
				Bottom	7	18.6 18.6	18.6	8.2 8.2	8.2	30.1 30.1	30.1	89.4 89.2	89.3	7.0 7.0	7.0	7.0	10.2 10.0	10.1		11.3 9.9	10.6	
3-Feb-17	Cloudy	Moderate	16:17	Surface	1	19.2 19.5	19.4	8.2 8.1	8.2	30.3 30.3	30.3	100.1 102.4	101.3	7.7 7.9	7.8	7.6	6.9 6.7	6.8	7.8	12.1 7.8	10.0	12.5
				Middle	3	19.5 18.8	19.2	8.1 8.1	8.1	30.7 30.6	30.7	93.9 94.1	94.0	7.2 7.3	7.3		7.4 7.2	7.3		11.6 12.0	11.8	
				Bottom	5	18.3 18.6	18.5	8.1 8.1	8.1	30.9 30.6	30.8	87.5 87.9	87.7	6.9 6.9	6.9	6.9	9.1 9.3	9.2		16.6 14.8	15.7	
6-Feb-17	Cloudy	Moderate	07:33	Surface	1	19.4 19.4	19.4	7.9 7.9	7.9	30.8 30.8	30.8	89.9 89.6	89.8	6.9 6.9	6.9	6.9	5.4 5.6	5.5	5.6	10.5 11.7	11.1	10.9
				Middle	3.5	19.3 19.3	19.3	7.9 7.9	7.9	30.9 30.9	30.9	88.1 87.5	87.8	6.8 6.7	6.8		5.5 5.5	5.5		12.3 10.4	11.4	
				Bottom	6	19.3 19.3	19.3	7.9 7.9	7.9	30.9 30.9	30.9	85.7 84.6	85.2	6.6 6.5	6.6	6.6	5.7 5.7	5.7		10.6 10.0	10.3	
8-Feb-17	Cloudy	Moderate	09:51	Surface	1	18.7 18.7	18.7	8.1 8.1	8.1	30.4 30.4	30.4	97.8 96.3	97.1	7.6 7.5	7.6	7.5	4.3 4.6	4.5	5.3	16.9 15.3	16.1	16.6
				Middle	3.5	18.7 18.7	18.7	8.1 8.1	8.1	30.4 30.4	30.4	94.5 94.8	94.7	7.4 7.4	7.4		5.6 5.7	5.7		16.8 16.1	16.5	
				Bottom	6	18.7 18.7	18.7	8.1 8.1	8.1	30.4 30.5	30.5	93.3 93.6	93.5	7.3 7.3	7.3	7.3	5.6 5.6	5.6		17.4 17.0	17.2	
10-Feb-17	Cloudy	Rough	18:09	Surface	1	18.3 18.3	18.3	8.0 8.0	8.0	30.6 30.6	30.6	92.8 91.7	92.3	7.3 7.2	7.3	7.2	7.2 6.5	6.9	7.0	14.8 11.5	13.2	12.3
				Middle	4	18.2 18.3	18.3	8.0 8.0	8.0	30.6 30.6	30.6	90.5 90.1	90.3	7.1 7.1	7.1		7.1 7.0	7.1		13.3 12.5	12.9	
				Bottom	7	18.2 18.2	18.2	8.0 8.0	8.0	30.6 30.6	30.6	88.7 88.7	88.7	7.0 7.0	7.0	7.0	6.7 7.1	6.9		11.2 10.5	10.9	
13-Feb-17	Sunny	Rough	14:29	Surface	1	18.9 18.9	18.9	8.0 8.0	8.0	30.6 30.6	30.6	95.8 94.7	95.3	7.4 7.3	7.4	7.4	7.3 6.6	7.0	7.1	8.2 8.5	8.4	8.3
				Middle	4	18.8 18.9	18.9	8.0 8.0	8.0	30.6 30.6	30.6	93.4 93.1	93.3	7.3 7.2	7.3		7.2 7.1	7.2		8.4 8.3	8.4	
				Bottom	7	18.8 18.8	18.8	8.0 8.0	8.0	30.6 30.6	30.6	91.6 91.6	91.6	7.1 7.1	7.1	7.1	6.8 7.2	7.0		8.6 7.6	8.1	
15-Feb-17	Cloudy	Rough	15:56	Surface	1	21.3 21.2	21.3	8.2 8.2	8.2	28.5 28.6	28.6	98.6 98.7	98.7	7.4 7.4	7.4	7.4	6.1 5.9	6.0	7.7	15.5 14.0	14.8	13.9
				Middle	4	20.5 20.6	20.6	8.2 8.2	8.2	30.3 30.1	30.2	95.9 96.4	96.2	7.2 7.3	7.3		7.4 7.5	7.5		8.7 11.3	10.0	
				Bottom	7	20.3 20.3	20.3	8.2 8.2	8.2	31.2 31.1	31.2	94.2 94.0	94.1	7.1 7.1	7.1	7.1	9.8 9.6	9.7		17.0 16.9	17.0	
17-Feb-17	Cloudy	Rough	17:09	Surface	1	21.0 21.0	21.0	8.1 8.1	8.1	28.9 29.0	29.0	93.0 93.2	93.1	7.0 7.0	7.0	7.0	6.4 6.2	6.3	8.0	23.5 19.9	21.7	17.2
				Middle	4	20.3 20.4	20.4	8.1 8.1	8.1	30.7 30.5	30.6	90.4 90.9	90.7	6.8 6.9	6.9		7.7 7.8	7.8		13.3 13.0	13.2	
				Bottom	7	20.0 20.0	20.0	8.1 8.1	8.1	31.6 31.6	31.6	88.7 88.6	88.7	6.7 6.7	6.7	6.7	10.1 9.9	10.0		19.6 13.5	16.6	
20-Feb-17	Sunny	Moderate	20:46	Surface	1	19.7 19.7	19.7	8.1 8.1	8.1	25.4 25.5	25.5	88.9 89.0	89.0	7.0 7.0	7.0	7.0	4.1 3.9	4.0	5.7	6.4 5.6	6.0	7.5
				Middle	4	19.0 19.0	19.0	8.1 8.1	8.1	27.2 27.0	27.1	86.3 86.9	86.6	6.8 6.9	6.9		5.4 5.5	5.5		6.4 7.1	6.8	
				Bottom	7	18.7 18.7	18.7	8.1 8.1	8.1	28.1 28.1	28.1	84.7 84.6	84.7	6.7 6.7	6.7	6.7	7.8 7.6	7.7		9.4 9.7	9.6	
22-Feb-17	Cloudy	Moderate	09:14	Surface	1	18.4 18.4	18.4	7.9 7.9	7.9	29.2 29.2	29.2	97.3 97.4	97.4	7.7 7.7	7.7	7.7	3.0 3.0	3.0	4.2	8.5 8.3	8.4	8.4
				Middle	4.5	18.3 18.3	18.3	7.8 7.8	7.8	29.6 29.7	29.7	97.9 97.8	97.9	7.7 7.7	7.7		4.1 4.1	4.1		8.7 8.9	8.8	
				Bottom	8	18.2 18.2	18.2	7.8 7.8	7.8	30.0 30.0	30.0	98.1 98.0	98.1	7.7 7.7	7.7	7.7	5.5 5.6	5.6		8.4 7.8	8.1	
24-Feb-17	Rainy	Rough	11:43	Surface	1	19.8 19.8	19.8	7.8 7.8	7.8	23.2 23.2	23.2	82.9 83.1	83.0	6.6 6.6	6.6	6.6	5.3 4.7	5.0	6.1	8.2 7.1	7.7	7.5
				Middle	3.5	19.4 19.4	19.4	7.8 7.8	7.8	23.8 23.9	23.9	82.6 82.4	82.5	6.6 6.6	6.6		5.8 6.0	5.9		7.5 7.6	7.6	
				Bottom	6	18.8 18.8	18.8	7.8 7.8	7.8	25.6 25.5	25.6	81.2 80.2	80.7	6.5 6.4	6.5	6.5	7.3 7.5	7.4		6.8 7.3	7.1	
27-Feb-17	Cloudy	Moderate	12:24	Surface	1	17.4 17.3	17.4	8.0 8.0	8.0	30.0 30.0	30.0	91.3 91.0	91.2	7.3 7.3	7.3	7.3	5.4 5.6	5.5	5.6	14.2 13.8	14.0	13.7
				Middle	3.5	17.3 17.3	17.3	8.0 8.0	8.0	30.1 30.1	30.1	89.5 89.0	89.3	7.2 7.1	7.2		5.5 5.5	5.5		12.8 10.4	11.6	
				Bottom	6	17.2 17.2	17.2	8.0 8.0	8.0	30.1 30.1	30.1	87.3 86.3	86.8	7.0 6.9	7.0	7.0	5.7 5.7	5.7		16.2 14.8	15.5	

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

Water Quality Monitoring Results at SRA - 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*
1-Feb-17	Sunny	Moderate	08:51	Surface	1	19.1 19.1	19.1	8.1 8.1	8.1	28.1 28.2	28.2	95.8 96.0	95.9	7.5 7.5	7.5	7.5	6.6 6.0	6.3	7.4	14.9 17.3	16.1	14.0
				Middle	3.5	18.7 18.8	18.8	8.1 8.1	8.1	28.9 28.8	28.9	95.2 95.5	95.4	7.5 7.5	7.5		7.3 7.1	7.2		13.7 13.4	13.6	
				Bottom	6	18.1 18.1	18.1	8.1 8.1	8.1	30.5 30.5	30.5	94.1 93.0	93.6	7.4 7.3	7.4	7.4	8.6 8.8	8.7		12.2 12.5	12.4	
3-Feb-17	Cloudy	Moderate	09:52	Surface	1	19.6 19.3	19.5	8.2 8.2	8.2	30.2 30.3	30.3	98.3 97.7	98.0	7.5 7.5	7.5	7.4	6.3 5.9	6.1	7.7	12.9 15.3	14.1	14.2
				Middle	3	18.7 19.3	19.0	8.1 8.1	8.1	30.2 30.2	30.2	93.1 95.0	94.1	7.3 7.3	7.3		8.0 8.3	8.2		14.8 13.3	14.1	
				Bottom	5	18.5 18.8	18.7	8.1 8.1	8.1	30.5 30.4	30.5	87.2 86.7	87.0	6.8 6.8	6.8	6.8	8.9 8.8	8.9		14.9 14.1	14.5	
6-Feb-17	Cloudy	Moderate	14:05	Surface	1	19.5 19.5	19.5	8.0 8.0	8.0	31.1 31.1	31.1	85.1 85.4	85.3	6.5 6.5	6.5	6.6	6.2 6.1	6.2	6.7	10.0 10.0	10.0	10.7
				Middle	4	19.4 19.4	19.4	8.0 8.0	8.0	31.2 31.2	31.2	87.2 87.6	87.4	6.7 6.7	6.7		6.4 6.5	6.5		10.0 10.1	10.1	
				Bottom	7	19.4 19.4	19.4	8.0 8.0	8.0	31.2 31.2	31.2	88.1 88.2	88.2	6.7 6.8	6.8	6.8	7.4 7.5	7.5		12.7 11.3	12.0	
8-Feb-17	Cloudy	Moderate	16:06	Surface	1	18.7 18.7	18.7	8.1 8.1	8.1	30.9 30.9	30.9	94.4 93.3	93.9	7.3 7.2	7.3	7.3	7.8 7.1	7.5	7.6	15.5 18.0	16.8	15.9
				Middle	4	18.7 18.7	18.7	8.1 8.1	8.1	30.9 30.9	30.9	92.1 91.7	91.9	7.2 7.1	7.2		7.7 7.6	7.7		15.4 15.1	15.3	
				Bottom	7	18.7 18.7	18.7	8.1 8.1	8.1	30.9 30.9	30.9	90.2 90.2	90.2	7.0 7.0	7.0	7.0	7.3 7.7	7.5		16.9 14.4	15.7	
10-Feb-17	Cloudy	Rough	11:33	Surface	1	18.2 18.2	18.2	8.0 8.0	8.0	30.1 30.1	30.1	96.8 95.3	96.1	7.6 7.5	7.6	7.5	7.5 7.8	7.7	8.5	12.7 14.2	13.5	12.6
				Middle	3.5	18.2 18.2	18.2	8.0 8.0	8.0	30.1 30.1	30.1	93.5 93.9	93.7	7.4 7.4	7.4		8.8 8.9	8.9		10.9 11.4	11.2	
				Bottom	6	18.2 18.2	18.2	8.0 8.0	8.0	30.1 30.1	30.1	92.4 92.6	92.5	7.3 7.3	7.3	7.3	8.8 8.8	8.8		12.9 13.1	13.0	
13-Feb-17	Sunny	Rough	07:34	Surface	1	18.8 18.8	18.8	8.0 8.0	8.0	30.1 30.1	30.1	99.1 97.6	98.4	7.7 7.6	7.7	7.6	7.6 7.9	7.8	8.6	9.1 7.8	8.5	8.0
				Middle	3.5	18.8 18.8	18.8	8.0 8.0	8.0	30.1 30.1	30.1	95.8 96.2	96.0	7.5 7.5	7.5		8.9 9.0	9.0		7.1 8.0	7.6	
				Bottom	6	18.8 18.8	18.8	8.0 8.0	8.0	30.1 30.1	30.1	94.7 94.9	94.8	7.4 7.4	7.4	7.4	8.9 8.9	8.9		9.3 6.6	8.0	
15-Feb-17	Cloudy	Rough	08:52	Surface	1	20.9 20.8	20.9	8.1 8.1	8.1	29.2 29.2	29.2	94.2 94.4	94.3	7.1 7.1	7.1	7.1	6.2 5.6	5.9	7.0	12.3 12.3	12.3	13.9
				Middle	3.5	20.5 20.4	20.5	8.1 8.1	8.1	29.8 29.9	29.9	93.9 93.6	93.8	7.1 7.1	7.1		6.7 6.9	6.8		12.5 16.9	14.7	
				Bottom	6	19.9 19.8	19.9	8.1 8.1	8.1	31.5 31.5	31.5	92.5 91.4	92.0	7.0 6.9	7.0	7.0	8.2 8.4	8.3		16.8 12.3	14.6	
17-Feb-17	Cloudy	Rough	09:47	Surface	1	20.6 20.6	20.6	8.0 8.0	8.0	29.6 29.6	29.6	95.4 95.6	95.5	7.2 7.2	7.2	7.2	6.5 5.9	6.2	7.3	14.2 15.0	14.6	14.3
				Middle	3.5	20.3 20.2	20.3	8.0 8.0	8.0	30.2 30.3	30.3	95.1 94.8	95.0	7.2 7.2	7.2		7.0 7.2	7.1		13.0 12.0	12.5	
				Bottom	6	19.6 19.6	19.6	8.0 8.0	8.0	32.0 31.9	32.0	93.6 92.5	93.1	7.1 7.0	7.1	7.1	8.5 8.7	8.6		18.0 13.5	15.8	
20-Feb-17	Sunny	Moderate	11:31	Surface	1	19.3 19.2	19.3	8.0 8.0	8.0	26.1 26.1	26.1	92.9 93.1	93.0	7.3 7.4	7.4	7.4	4.2 3.6	3.9	5.0	7.0 7.5	7.3	8.3
				Middle	3.5	18.9 18.9	18.9	8.0 8.0	8.0	26.8 26.9	26.9	92.6 92.3	92.5	7.3 7.3	7.3		4.7 4.9	4.8		7.8 9.4	8.6	
				Bottom	6	18.3 18.3	18.3	8.0 8.0	8.0	28.5 28.4	28.5	91.2 90.1	90.7	7.2 7.2	7.2	7.2	6.2 6.4	6.3		9.7 8.0	8.9	
22-Feb-17	Cloudy	Moderate	14:01	Surface	1	18.7 18.8	18.8	8.0 8.0	8.0	29.1 29.1	29.1	97.3 97.4	97.4	7.6 7.6	7.6	7.7	3.8 4.0	3.9	5.4	9.0 9.0	9.0	8.9
				Middle	5	18.3 18.3	18.3	8.0 8.0	8.0	29.8 29.6	29.7	97.2 97.1	97.2	7.7 7.7	7.7		5.7 5.4	5.6		9.4 9.1	9.3	
				Bottom	9	18.1 18.1	18.1	7.9 7.9	7.9	30.3 30.2	30.3	97.1 97.0	97.1	7.7 7.7	7.7	7.7	6.8 6.6	6.7		9.1 7.5	8.3	
24-Feb-17	Rainy	Rough	17:21	Surface	1	20.2 20.2	20.2	8.0 8.0	8.0	22.5 22.6	22.6	85.0 85.1	85.1	6.7 6.8	6.8	6.7	5.2 5.0	5.1	6.8	9.8 8.3	9.1	7.1
				Middle	4	19.5 19.6	19.6	8.0 8.0	8.0	24.3 24.1	24.2	82.4 83.0	82.7	6.6 6.6	6.6		6.5 6.6	6.6		6.6 6.0	6.3	
				Bottom	7	19.2 19.2	19.2	7.9 7.9	7.9	25.2 25.2	25.2	80.8 80.7	80.8	6.4 6.4	6.4	6.4	8.9 8.7	8.8		6.6 5.3	6.0	
27-Feb-17	Cloudy	Moderate	19:09	Surface	1	17.4 17.4	17.4	8.1 8.1	8.1	30.2 30.3	30.3	86.8 87.0	86.9	6.9 7.0	7.0	7.1	6.2 6.1	6.2	6.7	11.8 9.7	10.8	10.3
				Middle	4	17.4 17.4	17.4	8.1 8.1	8.1	30.3 30.4	30.4	88.7 89.1	88.9	7.1 7.1	7.1		6.4 6.5	6.5		9.0 9.5	9.3	
				Bottom	7	17.3 17.3	17.3	8.1 8.1	8.1	30.4 30.4	30.4	89.6 89.7	89.7	7.2 7.2	7.2	7.2	7.4 7.5	7.5		10.0 11.8	10.9	

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

Water Quality Monitoring Results at ST1 - 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*
1-Feb-17	Sunny	Moderate	15:12	Surface	1	19.0 19.0	19.0	8.1 8.1	8.1	31.7 31.6	31.7	97.3 97.1	97.2	7.5 7.5	7.5	7.5	4.4 4.4	4.4	6.2	37.3 35.0	36.2	32.6
				Middle	5	18.6 18.6	18.6	8.3 8.3	8.3	31.7 31.8	31.8	96.0 96.2	96.1	7.4 7.5	7.5		5.6 5.6	5.6		31.0 34.3	32.7	
				Bottom	9	18.7 18.8	18.8	8.3 8.3	8.3	32.0 31.9	32.0	94.3 94.3	94.3	7.3 7.3	7.3	7.3	8.7 8.6	8.7		30.3 27.7	29.0	
3-Feb-17	Cloudy	Moderate	17:05	Surface	1	19.1 19.1	19.1	8.1 8.1	8.1	30.5 30.4	30.5	97.1 97.4	97.3	7.5 7.5	7.5	7.5	3.7 3.6	3.7	5.4	21.4 18.1	19.8	22.4
				Middle	5	19.1 19.1	19.1	8.2 8.2	8.2	30.7 30.6	30.7	96.6 96.3	96.5	7.5 7.4	7.5		5.6 5.5	5.6		20.8 21.1	21.0	
				Bottom	9	19.0 19.0	19.0	8.2 8.2	8.2	30.9 30.8	30.9	95.1 94.9	95.0	7.3 7.3	7.3	7.3	6.9 6.9	6.9		25.6 27.2	26.4	
6-Feb-17	Cloudy	Moderate	08:13	Surface	1	19.4 19.4	19.4	8.1 8.1	8.1	31.5 31.5	31.5	90.8 90.6	90.7	6.9 6.9	6.9	6.9	3.1 3.1	3.1	4.9	12.6 10.8	11.7	10.9
				Middle	5	19.3 19.2	19.3	8.1 8.1	8.1	31.5 31.5	31.5	90.4 90.5	90.5	6.9 6.9	6.9		5.2 5.1	5.2		9.6 10.8	10.2	
				Bottom	9	19.2 19.2	19.2	8.1 8.1	8.1	31.6 31.6	31.6	89.2 88.8	89.0	6.8 6.8	6.8	6.8	6.5 6.5	6.5		10.9 10.7	10.8	
8-Feb-17	Cloudy	Moderate	10:24	Surface	1	19.0 18.8	18.9	8.1 8.0	8.1	29.2 29.2	29.2	97.6 97.2	97.4	7.6 7.6	7.6	7.6	6.3 6.2	6.3	8.2	18.3 21.1	19.7	17.0
				Middle	5	18.3 18.3	18.3	8.1 8.1	8.1	29.9 30.3	30.1	96.2 96.3	96.3	7.6 7.6	7.6		8.1 8.2	8.2		15.2 15.6	15.4	
				Bottom	9	18.0 17.9	18.0	8.2 8.2	8.2	31.9 32.0	32.0	95.9 95.4	95.7	7.5 7.5	7.5	7.5	10.2 10.1	10.2		15.6 15.9	15.8	
10-Feb-17	Cloudy	Rough	17:42	Surface	1	18.8 18.8	18.8	8.1 8.1	8.1	29.3 29.4	29.4	98.1 98.2	98.2	7.7 7.7	7.7	7.7	6.1 6.1	6.1	8.2	12.5 11.2	11.9	14.6
				Middle	5	18.6 18.6	18.6	8.1 8.1	8.1	29.7 29.7	29.7	97.3 97.2	97.3	7.6 7.6	7.6		8.3 8.3	8.3		14.6 17.4	16.0	
				Bottom	9	18.0 17.9	18.0	8.1 8.1	8.1	30.2 30.1	30.2	95.5 95.5	95.5	7.6 7.6	7.6	7.6	10.1 10.2	10.2		16.3 15.6	16.0	
13-Feb-17	Sunny	Rough	14:00	Surface	1	18.3 18.2	18.3	8.1 8.1	8.1	29.3 29.4	29.4	99.1 99.4	99.3	7.8 7.9	7.9	7.9	5.2 5.2	5.2	8.1	62.7 48.7	55.7	51.6
				Middle	5	17.9 17.9	17.9	8.1 8.1	8.1	30.5 30.5	30.5	98.3 98.1	98.2	7.8 7.8	7.8		8.2 8.2	8.2		49.0 50.0	49.5	
				Bottom	9	17.4 17.3	17.4	8.2 8.2	8.2	31.3 31.5	31.4	96.9 96.9	96.9	7.7 7.7	7.7	7.7	10.8 10.8	10.8		50.7 48.3	49.5	
15-Feb-17	Cloudy	Rough	15:04	Surface	1	20.6 20.7	20.7	8.0 8.1	8.1	31.4 31.3	31.4	101.2 100.8	101.0	7.6 7.5	7.6	7.5	2.0 1.9	2.0	2.8	15.9 10.6	13.3	12.9
				Middle	5	20.6 20.7	20.7	8.1 8.1	8.1	31.5 31.3	31.4	98.5 99.3	98.9	7.4 7.4	7.4		2.7 3.0	2.9		11.7 11.5	11.6	
				Bottom	9	20.6 20.8	20.7	8.1 8.2	8.2	31.5 31.3	31.4	94.8 95.4	95.1	7.1 7.1	7.1	7.1	3.5 3.7	3.6		15.6 12.0	13.8	
17-Feb-17	Cloudy	Rough	16:28	Surface	1	20.3 20.1	20.2	8.0 8.1	8.1	31.4 31.4	31.4	100.4 100.5	100.5	7.6 7.6	7.6	7.5	1.8 1.9	1.9	2.8	10.8 10.2	10.5	10.1
				Middle	5	20.3 20.1	20.2	8.1 8.1	8.1	31.1 31.2	31.2	97.6 98.0	97.8	7.4 7.4	7.4		2.7 2.9	2.8		10.8 9.3	10.1	
				Bottom	9	20.1 20.2	20.2	8.1 8.1	8.1	31.7 31.3	31.5	94.0 94.6	94.3	7.1 7.1	7.1	7.1	3.8 3.7	3.8		11.3 8.0	9.7	
20-Feb-17	Sunny	Moderate	20:13	Surface	1	18.5 18.5	18.5	8.0 8.0	8.0	26.2 26.4	26.3	97.3 97.4	97.4	7.8 7.8	7.8	7.8	6.1 6.2	6.2	7.8	5.0 7.0	6.0	6.4
				Middle	5	18.2 18.1	18.2	8.1 8.1	8.1	27.4 27.6	27.5	96.2 96.3	96.3	7.7 7.7	7.7		7.8 7.8	7.8		5.8 5.4	5.6	
				Bottom	9	17.7 17.7	17.7	8.2 8.2	8.2	28.7 28.7	28.7	95.6 95.6	95.6	7.7 7.7	7.7	7.7	9.4 9.5	9.5		8.7 6.2	7.5	
22-Feb-17	Cloudy	Moderate	09:55	Surface	1	18.8 18.7	18.8	7.8 7.8	7.8	29.8 29.8	29.8	99.4 99.7	99.6	7.8 7.8	7.8	7.8	3.6 3.7	3.7	6.2	9.4 10.6	10.0	9.7
				Middle	5	18.3 18.2	18.3	7.8 7.9	7.9	30.1 30.2	30.2	98.5 98.8	98.7	7.8 7.8	7.8		6.5 6.5	6.5		11.5 8.9	10.2	
				Bottom	9	17.9 17.9	17.9	7.9 7.9	7.9	30.7 30.6	30.7	97.2 97.3	97.3	7.7 7.7	7.7	7.7	8.3 8.3	8.3		9.4 8.3	8.9	
24-Feb-17	Rainy	Rough	12:15	Surface	1	19.1 19.1	19.1	8.0 8.0	8.0	21.5 21.4	21.5	85.8 84.3	85.1	7.0 6.9	7.0	6.9	9.2 9.3	9.3	10.4	10.1 12.6	11.4	12.9
				Middle	5	18.9 19.0	19.0	7.9 7.9	7.9	22.1 22.8	22.5	83.4 83.2	83.3	6.8 6.7	6.8		10.4 10.6	10.5		13.4 13.7	13.6	
				Bottom	9	18.9 18.9	18.9	7.8 7.9	7.9	24.3 25.5	24.9	81.3 84.2	82.8	6.5 6.7	6.6	6.6	11.1 11.9	11.5		13.7 13.7	13.7	
27-Feb-17	Cloudy	Moderate	12:54	Surface	1	17.7 17.8	17.8	8.1 8.1	8.1	30.7 30.7	30.7	97.4 97.5	97.5	7.7 7.7	7.7	7.7	3.3 3.3	3.3	5.5	10.0 12.4	11.2	11.5
				Middle	5	17.4 17.5	17.5	8.1 8.1	8.1	31.6 31.6	31.6	96.3 96.3	96.3	7.6 7.6	7.6		5.5 5.5	5.5		12.8 11.8	12.3	
				Bottom	9	17.1 17.1	17.1	8.1 8.2	8.2	31.6 31.8	31.7	96.0 96.1	96.1	7.7 7.7	7.7	7.7	7.8 7.7	7.8		10.0 12.0	11.0	

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

Water Quality Monitoring Results at ST1 - 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*
1-Feb-17	Sunny	Moderate	09:20	Surface	1	18.9 19.0	19.0	8.1 8.1	8.1	29.9 30.0	30.0	94.4 94.6	94.5	7.3 7.4	7.4	7.4	3.0 3.0	3.0	6.1	32.7 34.7	33.7	31.8
				Middle	5	18.5 18.6	18.6	8.3 8.3	8.3	30.1 30.2	30.2	93.8 93.6	93.7	7.3 7.3	7.3		6.1 6.0	6.1		29.0 30.0	29.5	
				Bottom	9	18.7 18.7	18.7	8.3 8.3	8.3	30.3 30.3	30.3	93.5 93.1	93.3	7.3 7.3	7.3	7.3	9.0 9.1	9.1		30.0 34.3	32.2	
3-Feb-17	Cloudy	Moderate	10:42	Surface	1	19.1 19.1	19.1	8.1 8.1	8.1	29.7 29.6	29.7	95.7 95.6	95.7	7.4 7.4	7.4	7.4	3.0 3.1	3.1	5.8	17.6 19.6	18.6	18.9
				Middle	5	19.0 19.0	19.0	8.2 8.2	8.2	30.0 30.2	30.1	94.8 94.7	94.8	7.4 7.4	7.4		5.8 6.0	5.9		20.7 17.3	19.0	
				Bottom	9	18.9 18.9	18.9	8.2 8.2	8.2	30.8 30.9	30.9	93.5 93.3	93.4	7.2 7.2	7.2	7.2	8.4 8.6	8.5		20.5 17.7	19.1	
6-Feb-17	Cloudy	Moderate	13:59	Surface	1	19.7 19.7	19.7	8.1 8.1	8.1	31.3 31.3	31.3	95.4 95.4	95.4	7.3 7.3	7.3	7.3	2.7 2.7	2.7	3.6	10.4 11.1	10.8	11.1
				Middle	5	19.5 19.4	19.5	8.1 8.1	8.1	31.3 31.4	31.4	94.7 94.7	94.7	7.2 7.2	7.2		3.7 3.8	3.8		11.0 9.5	10.3	
				Bottom	9	19.0 19.0	19.0	8.1 8.1	8.1	31.4 31.4	31.4	92.5 92.5	92.5	7.1 7.1	7.1	7.1	4.4 4.4	4.4		12.9 11.4	12.2	
8-Feb-17	Cloudy	Moderate	15:40	Surface	1	19.0 18.8	18.9	8.1 8.1	8.1	30.7 30.7	30.7	98.0 97.9	98.0	7.6 7.6	7.6	7.6	4.1 4.2	4.2	7.2	19.0 21.1	20.1	18.4
				Middle	5	18.3 18.3	18.3	8.1 8.1	8.1	30.8 30.8	30.8	96.6 96.6	96.6	7.6 7.6	7.6		7.4 7.5	7.5		20.2 14.6	17.4	
				Bottom	9	18.0 17.9	18.0	8.2 8.2	8.2	31.4 31.4	31.4	95.4 95.4	95.4	7.5 7.5	7.5	7.5	9.8 9.7	9.8		22.4 12.9	17.7	
10-Feb-17	Cloudy	Rough	12:08	Surface	1	18.3 18.3	18.3	8.1 8.1	8.1	29.6 29.4	29.5	97.9 97.6	97.8	7.7 7.7	7.7	7.7	5.2 5.2	5.2	7.4	10.4 11.7	11.1	11.3
				Middle	5	17.9 18.0	18.0	8.1 8.2	8.2	29.3 29.8	29.6	96.9 96.9	96.9	7.7 7.7	7.7		7.7 7.8	7.8		12.6 10.3	11.5	
				Bottom	9	17.6 17.5	17.6	8.2 8.2	8.2	29.7 30.4	30.1	94.5 94.7	94.6	7.6 7.5	7.6	7.6	9.3 9.3	9.3		11.0 11.6	11.3	
13-Feb-17	Sunny	Rough	08:11	Surface	1	18.6 18.6	18.6	8.1 8.1	8.1	29.2 29.2	29.2	98.8 98.8	98.8	7.8 7.8	7.8	7.8	6.7 6.6	6.7	8.5	41.7 46.0	43.9	46.0
				Middle	5	18.1 18.0	18.1	8.2 8.2	8.2	30.1 30.3	30.2	98.2 98.2	98.2	7.8 7.8	7.8		8.1 8.1	8.1		46.3 45.0	45.7	
				Bottom	9	17.6 17.7	17.7	8.2 8.2	8.2	30.5 30.6	30.6	96.6 96.6	96.6	7.7 7.7	7.7	7.7	10.8 10.8	10.8		51.0 45.7	48.4	
15-Feb-17	Cloudy	Rough	09:26	Surface	1	21.0 21.1	21.1	8.0 8.1	8.1	31.6 31.6	31.6	102.5 101.6	102.1	7.6 7.5	7.6	7.5	2.5 2.4	2.5	4.3	19.4 20.9	20.2	18.8
				Middle	5	21.0 21.1	21.1	8.1 8.1	8.1	31.6 31.4	31.5	98.9 97.8	98.4	7.3 7.2	7.3		4.7 4.1	4.4		20.4 16.9	18.7	
				Bottom	9	20.9 21.0	21.0	8.1 8.1	8.1	31.6 31.7	31.7	96.4 97.0	96.7	7.2 7.2	7.2	7.2	6.2 5.8	6.0		20.0 14.7	17.4	
17-Feb-17	Cloudy	Rough	10:21	Surface	1	20.4 20.4	20.4	8.0 8.1	8.1	31.5 31.5	31.5	101.3 100.6	101.0	7.6 7.5	7.6	7.5	2.5 2.2	2.4	4.2	10.3 8.8	9.6	10.1
				Middle	5	20.4 20.5	20.5	8.1 8.1	8.1	31.4 31.5	31.5	97.8 96.8	97.3	7.3 7.2	7.3		4.6 4.1	4.4		9.7 11.2	10.5	
				Bottom	9	20.5 20.4	20.5	8.1 8.1	8.1	31.5 31.6	31.6	95.5 95.4	95.5	7.2 7.2	7.2	7.2	5.6 5.7	5.7		8.9 11.4	10.2	
20-Feb-17	Sunny	Moderate	12:09	Surface	1	18.7 18.7	18.7	8.1 8.0	8.1	26.9 26.9	26.9	97.1 97.2	97.2	7.7 7.7	7.7	7.7	6.7 6.6	6.7	8.3	8.5 6.9	7.7	7.2
				Middle	5	18.3 18.5	18.4	8.2 8.1	8.2	27.0 27.1	27.1	96.5 96.5	96.5	7.7 7.7	7.7		7.6 7.6	7.6		8.0 5.9	7.0	
				Bottom	9	17.7 17.6	17.7	8.2 8.2	8.2	27.7 27.7	27.7	95.2 95.6	95.4	7.7 7.7	7.7	7.7	10.5 10.5	10.5		8.4 5.6	7.0	
22-Feb-17	Cloudy	Moderate	14:45	Surface	1	18.8 18.8	18.8	7.8 7.8	7.8	29.9 29.8	29.9	99.6 99.7	99.7	7.8 7.8	7.8	7.8	3.8 3.8	3.8	6.5	9.1 8.8	9.0	8.7
				Middle	5	18.3 18.4	18.4	7.8 7.8	7.8	30.3 30.3	30.3	98.6 98.6	98.6	7.7 7.7	7.7		6.8 6.8	6.8		9.1 7.9	8.5	
				Bottom	9	18.0 17.9	18.0	7.9 7.9	7.9	31.0 31.0	31.0	97.1 97.0	97.1	7.6 7.6	7.6	7.6	9.0 9.0	9.0		8.0 9.1	8.6	
24-Feb-17	Rainy	Rough	16:34	Surface	1	18.6 18.5	18.6	7.9 8.0	8.0	19.8 20.4	20.1	80.9 81.1	81.0	6.7 6.7	6.7	6.7	7.3 7.8	7.6	8.7	16.6 10.9	13.8	11.3
				Middle	5	18.5 18.5	18.5	8.0 8.0	8.0	23.2 23.0	23.1	81.0 81.3	81.2	6.6 6.6	6.6		7.9 8.6	8.3		10.2 9.4	9.8	
				Bottom	9	18.4 18.3	18.4	8.1 8.1	8.1	24.3 24.2	24.3	79.7 79.8	79.8	6.5 6.5	6.5	6.5	10.2 10.4	10.3		9.4 10.9	10.2	
27-Feb-17	Cloudy	Moderate	18:41	Surface	1	17.5 17.6	17.6	8.1 8.1	8.1	30.5 30.5	30.5	97.8 97.5	97.7	7.8 7.8	7.8	7.8	4.7 4.7	4.7	5.9	13.4 10.2	11.8	12.5
				Middle	5	17.2 17.2	17.2	8.1 8.1	8.1	31.5 31.5	31.5	97.1 97.2	97.2	7.7 7.7	7.7		5.4 5.4	5.4		12.2 10.3	11.3	
				Bottom	9	16.9 16.9	16.9	8.2 8.2	8.2	31.7 31.8	31.8	96.4 96.6	96.5	7.7 7.7	7.7	7.7	7.6 7.6	7.6		13.9 14.8	14.4	

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

Water Quality Monitoring Results at ST2 - 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*
1-Feb-17	Sunny	Moderate	14:59	Surface	1	18.9 18.9	18.9	8.1 8.1	8.1	30.9 30.9	30.9	96.1 96.2	96.2	7.4 7.4	7.4	7.4	3.9 3.9	3.9	6.1	25.3 19.7	22.5	24.3
				Middle	3.5	18.8 18.8	18.8	8.1 8.1	8.1	31.3 31.3	31.3	95.3 95.5	95.4	7.4 7.4	7.4		6.1 6.1	6.1		24.3 26.3	25.3	
				Bottom	6	18.6 18.6	18.6	8.2 8.2	8.2	30.9 30.9	30.9	95.7 95.6	95.7	7.4 7.4	7.4	7.4	8.4 8.4	8.4		26.7 23.7	25.2	
3-Feb-17	Cloudy	Moderate	16:50	Surface	1	19.2 19.2	19.2	8.1 8.1	8.1	29.0 28.9	29.0	96.7 96.5	96.6	7.5 7.5	7.5	7.5	3.9 3.9	3.9	4.8	23.5 22.4	23.0	20.8
				Middle	3.5	19.1 19.1	19.1	8.1 8.1	8.1	30.1 30.3	30.2	95.8 95.5	95.7	7.4 7.4	7.4		4.1 4.1	4.1		18.8 20.4	19.6	
				Bottom	6	19.1 19.1	19.1	8.2 8.2	8.2	30.7 30.6	30.7	95.3 90.2	92.8	7.4 7.0	7.2	7.2	6.5 6.5	6.5		20.7 18.6	19.7	
6-Feb-17	Cloudy	Moderate	08:00	Surface	1	19.3 19.3	19.3	8.1 8.1	8.1	31.4 31.4	31.4	92.1 92.2	92.2	7.1 7.1	7.1	7.1	4.6 4.6	4.6	5.1	13.4 12.1	12.8	11.7
				Middle	4	19.1 19.1	19.1	8.1 8.1	8.1	31.5 31.5	31.5	92.6 92.7	92.7	7.1 7.1	7.1		4.8 4.8	4.8		11.4 11.2	11.3	
				Bottom	7	19.1 19.1	19.1	8.1 8.1	8.1	31.6 31.6	31.6	92.2 92.3	92.3	7.1 7.1	7.1	7.1	6.3 5.7	6.0		10.2 11.6	10.9	
8-Feb-17	Cloudy	Moderate	10:07	Surface	1	18.9 18.5	18.7	8.0 8.0	8.0	29.7 29.4	29.6	96.7 96.8	96.8	7.5 7.6	7.6	7.6	4.2 4.2	4.2	7.1	16.0 15.1	15.6	15.2
				Middle	3.5	18.1 18.5	18.3	8.1 8.1	8.1	30.6 30.7	30.7	95.7 95.8	95.8	7.5 7.5	7.5		7.8 7.8	7.8		16.7 13.4	15.1	
				Bottom	6	17.9 17.7	17.8	8.1 8.1	8.1	31.8 31.3	31.6	95.0 94.9	95.0	7.5 7.5	7.5	7.5	9.3 9.3	9.3		13.8 15.7	14.8	
10-Feb-17	Cloudy	Rough	17:24	Surface	1	18.4 18.4	18.4	8.1 8.1	8.1	29.6 29.6	29.6	97.4 97.6	97.5	7.7 7.7	7.7	7.7	6.8 6.8	6.8	8.3	14.7 13.4	14.1	13.4
				Middle	3.5	18.2 18.2	18.2	8.1 8.1	8.1	30.0 29.7	29.9	96.8 96.3	96.6	7.6 7.6	7.6		8.0 8.0	8.0		11.2 14.5	12.9	
				Bottom	6	17.7 17.7	17.7	8.1 8.2	8.2	30.1 30.2	30.2	95.1 95.4	95.3	7.6 7.6	7.6	7.6	10.1 10.1	10.1		13.9 12.2	13.1	
13-Feb-17	Sunny	Rough	13:46	Surface	1	18.3 18.2	18.3	8.1 8.1	8.1	29.5 29.6	29.6	98.5 98.5	98.5	7.8 7.8	7.8	7.8	5.1 5.1	5.1	8.0	57.3 54.7	56.0	53.7
				Middle	3.5	17.9 17.9	17.9	8.2 8.2	8.2	30.0 30.2	30.1	98.2 98.1	98.2	7.8 7.8	7.8		8.6 8.6	8.6		53.3 53.0	53.2	
				Bottom	6	17.6 17.7	17.7	8.2 8.2	8.2	30.7 30.9	30.8	97.0 96.9	97.0	7.7 7.7	7.7	7.7	10.3 10.3	10.3		53.0 50.7	51.9	
15-Feb-17	Cloudy	Rough	14:52	Surface	1	20.7 20.7	20.7	8.1 8.1	8.1	31.2 31.2	31.2	95.6 96.1	95.9	7.1 7.2	7.2	7.2	2.0 2.0	2.0	2.7	15.7 12.0	13.9	13.2
				Middle	4	20.8 20.7	20.8	8.2 8.2	8.2	31.1 31.2	31.2	94.5 94.3	94.4	7.1 7.0	7.1		2.4 2.3	2.4		13.6 12.1	12.9	
				Bottom	7	20.9 20.7	20.8	8.1 8.1	8.1	31.2 31.2	31.2	96.0 97.6	96.8	7.2 7.3	7.3	7.3	3.6 3.9	3.8		12.0 13.6	12.8	
17-Feb-17	Cloudy	Rough	16:16	Surface	1	20.2 20.1	20.2	8.1 8.1	8.1	31.4 31.2	31.3	95.1 95.1	95.1	7.2 7.2	7.2	7.2	1.9 2.1	2.0	2.8	10.7 10.4	10.6	11.1
				Middle	4	20.2 20.2	20.2	8.2 8.2	8.2	31.3 31.3	31.3	93.7 93.8	93.8	7.1 7.1	7.1		2.2 1.9	2.1		12.4 9.6	11.0	
				Bottom	7	20.1 20.3	20.2	8.1 8.1	8.1	31.4 31.5	31.5	95.4 97.0	96.2	7.2 7.3	7.3	7.3	4.1 4.3	4.2		13.3 10.1	11.7	
20-Feb-17	Sunny	Moderate	19:55	Surface	1	18.7 18.7	18.7	8.1 8.0	8.1	25.9 25.8	25.9	95.8 95.3	95.6	7.7 7.6	7.7	7.7	4.4 4.4	4.4	6.8	6.9 5.6	6.3	7.6
				Middle	3.5	18.2 18.1	18.2	8.1 8.1	8.1	26.1 26.3	26.2	94.7 94.6	94.7	7.6 7.6	7.6		6.9 7.0	7.0		5.8 5.9	5.9	
				Bottom	6	18.0 18.0	18.0	8.2 8.2	8.2	27.7 27.4	27.6	93.9 93.6	93.8	7.5 7.5	7.5	7.5	8.8 8.9	8.9		10.3 10.6	10.5	
22-Feb-17	Cloudy	Moderate	09:38	Surface	1	18.8 18.8	18.8	7.8 7.8	7.8	28.2 28.9	28.6	100.2 99.9	100.1	7.9 7.8	7.9	7.9	3.1 3.2	3.2	7.0	8.0 8.2	8.1	8.1
				Middle	3.5	18.1 18.0	18.1	7.8 7.9	7.9	29.4 29.2	29.3	98.7 98.3	98.5	7.8 7.8	7.8		7.4 7.4	7.4		9.8 7.3	8.6	
				Bottom	6	17.9 17.9	17.9	7.9 7.9	7.9	30.7 30.8	30.8	97.9 97.7	97.8	7.7 7.7	7.7	7.7	10.4 10.4	10.4		8.2 7.0	7.6	
24-Feb-17	Rainy	Rough	12:00	Surface	1	19.1 19.1	19.1	7.9 7.9	7.9	21.3 21.1	21.2	85.4 84.7	85.1	7.0 6.9	7.0	7.0	9.5 8.8	9.2	10.5	16.3 13.0	14.7	15.5
				Middle	4	19.0 19.0	19.0	7.8 7.8	7.8	23.1 22.9	23.0	84.9 84.1	84.5	6.9 6.8	6.9		10.5 10.7	10.6		17.7 16.2	17.0	
				Bottom	7	18.9 18.9	18.9	7.9 7.8	7.9	25.5 25.3	25.4	80.4 80.4	80.4	6.4 6.4	6.4	6.4	11.8 11.6	11.7		13.1 16.5	14.8	
27-Feb-17	Cloudy	Moderate	12:41	Surface	1	17.8 17.8	17.8	8.1 8.1	8.1	30.1 30.2	30.2	97.2 97.3	97.3	7.7 7.7	7.7	7.7	3.7 3.7	3.7	5.0	15.5 16.9	16.2	15.5
				Middle	3.5	17.5 17.6	17.6	8.1 8.1	8.1	31.6 31.6	31.6	96.7 96.7	96.7	7.7 7.6	7.7		4.6 4.5	4.6		15.9 16.8	16.4	
				Bottom	6	17.2 17.1	17.2	8.2 8.2	8.2	31.9 31.8	31.9	96.6 96.5	96.6	7.7 7.7	7.7	7.7	6.8 6.8	6.8		14.4 13.5	14.0	

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

Water Quality Monitoring Results at ST2 - 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*
1-Feb-17	Sunny	Moderate	09:06	Surface	1	18.7 18.7	18.7	8.0 8.1	8.1	29.8 29.3	29.6	94.6 94.6	94.6	7.4 7.4	7.4	7.4	3.1 3.2	3.2	5.7	28.7 36.3	32.5	34.7
				Middle	3.5	18.8 18.9	18.9	8.1 8.1	8.1	29.3 29.3	29.3	93.1 93.1	93.1	7.3 7.3	7.3		5.3 5.4	5.4		38.3 33.3	35.8	
				Bottom	6	18.7 18.7	18.7	8.2 8.2	8.2	30.1 30.2	30.2	92.8 92.7	92.8	7.2 7.2	7.2	7.2	8.5 8.5	8.5		31.7 40.0	35.9	
3-Feb-17	Cloudy	Moderate	10:25	Surface	1	18.9 18.9	18.9	8.1 8.1	8.1	28.9 28.8	28.9	95.6 95.4	95.5	7.5 7.5	7.5	7.4	2.9 3.0	3.0	5.9	20.7 19.3	20.0	20.3
				Middle	3.5	18.8 18.8	18.8	8.1 8.1	8.1	29.6 29.4	29.5	93.5 93.3	93.4	7.3 7.3	7.3		6.2 6.3	6.3		23.7 18.1	20.9	
				Bottom	6	18.8 18.8	18.8	8.2 8.2	8.2	29.9 30.0	30.0	92.6 92.8	92.7	7.2 7.2	7.2	7.2	8.3 8.3	8.3		21.7 18.5	20.1	
6-Feb-17	Cloudy	Moderate	13:45	Surface	1	20.1 20.1	20.1	8.1 8.1	8.1	31.2 31.2	31.2	96.9 97.0	97.0	7.3 7.3	7.3	7.3	2.7 2.7	2.7	3.4	9.5 13.1	11.3	12.0
				Middle	4	19.6 19.6	19.6	8.1 8.1	8.1	31.3 31.3	31.3	95.7 95.7	95.7	7.3 7.3	7.3		2.9 2.9	2.9		11.2 10.1	10.7	
				Bottom	7	19.1 19.1	19.1	8.1 8.1	8.1	31.4 31.4	31.4	91.0 90.6	90.8	7.0 7.0	7.0	7.0	4.6 4.6	4.6		14.7 13.3	14.0	
8-Feb-17	Cloudy	Moderate	15:26	Surface	1	18.9 18.8	18.9	8.0 8.0	8.0	29.5 29.5	29.5	97.8 97.9	97.9	7.6 7.7	7.7	7.7	4.1 4.2	4.2	6.9	18.0 17.8	17.9	20.0
				Middle	3.5	18.4 18.4	18.4	8.1 8.1	8.1	30.3 30.3	30.3	96.8 96.8	96.8	7.6 7.6	7.6		7.4 7.4	7.4		17.0 18.9	18.0	
				Bottom	6	17.8 17.8	17.8	8.2 8.2	8.2	30.7 30.8	30.8	96.7 96.3	96.5	7.6 7.6	7.6	7.6	9.1 9.1	9.1		27.4 20.6	24.0	
10-Feb-17	Cloudy	Rough	11:52	Surface	1	18.4 18.5	18.5	8.1 8.1	8.1	29.8 29.9	29.9	97.4 97.3	97.4	7.7 7.6	7.7	7.7	6.0 6.1	6.1	7.6	11.2 11.7	11.5	11.9
				Middle	3.5	18.2 18.2	18.2	8.1 8.1	8.1	29.3 29.4	29.4	96.8 96.9	96.9	7.7 7.7	7.7		7.2 7.2	7.2		12.1 11.0	11.6	
				Bottom	6	17.5 17.6	17.6	8.1 8.1	8.1	30.6 30.5	30.6	94.6 94.4	94.5	7.5 7.5	7.5	7.5	9.4 9.4	9.4		11.1 13.9	12.5	
13-Feb-17	Sunny	Rough	07:46	Surface	1	18.6 18.7	18.7	8.1 8.1	8.1	29.3 29.3	29.3	98.8 98.8	98.8	7.8 7.8	7.8	7.8	4.6 4.6	4.6	6.8	46.3 49.3	47.8	52.2
				Middle	3.5	18.3 18.3	18.3	8.1 8.1	8.1	29.9 30.0	30.0	98.2 98.3	98.3	7.7 7.7	7.7		7.1 7.0	7.1		52.0 49.7	50.9	
				Bottom	6	17.6 17.6	17.6	8.2 8.2	8.2	30.9 30.9	30.9	96.9 96.9	96.9	7.7 7.7	7.7	7.7	8.7 8.7	8.7		58.7 57.3	58.0	
15-Feb-17	Cloudy	Rough	09:12	Surface	1	20.9 20.8	20.9	8.0 8.0	8.0	31.4 31.5	31.5	100.2 99.4	99.8	7.4 7.4	7.4	7.4	3.9 4.3	4.1	4.4	20.1 21.2	20.7	20.7
				Middle	4	20.9 20.7	20.8	8.0 8.1	8.1	31.5 31.4	31.5	98.9 97.4	98.2	7.4 7.3	7.4		4.1 3.9	4.0		20.3 19.4	19.9	
				Bottom	7	20.8 20.8	20.8	8.1 8.1	8.1	31.7 31.7	31.7	95.5 95.3	95.4	7.1 7.1	7.1	7.1	5.2 4.8	5.0		21.5 21.2	21.4	
17-Feb-17	Cloudy	Rough	10:06	Surface	1	20.5 20.4	20.5	8.0 8.0	8.0	31.4 31.4	31.4	99.8 98.5	99.2	7.5 7.4	7.5	7.5	3.8 3.8	3.8	4.4	11.5 11.8	11.7	12.1
				Middle	4	20.3 20.4	20.4	8.0 8.0	8.0	31.4 31.7	31.6	97.8 97.2	97.5	7.4 7.3	7.4		4.1 3.7	3.9		12.6 11.9	12.3	
				Bottom	7	20.3 20.4	20.4	8.1 8.1	8.1	31.5 31.5	31.5	94.4 94.7	94.6	7.1 7.1	7.1	7.1	5.7 5.2	5.5		13.0 11.5	12.3	
20-Feb-17	Sunny	Moderate	11:52	Surface	1	18.9 18.9	18.9	8.0 8.0	8.0	25.4 26.4	25.9	96.5 96.3	96.4	7.7 7.7	7.7	7.7	4.4 4.4	4.4	7.1	7.0 6.7	6.9	7.6
				Middle	3.5	18.6 18.6	18.6	8.1 8.1	8.1	26.6 26.9	26.8	96.0 95.3	95.7	7.7 7.6	7.7		7.7 7.7	7.7		6.3 6.8	6.6	
				Bottom	6	18.3 18.4	18.4	8.2 8.2	8.2	27.9 27.2	27.6	94.0 94.0	94.0	7.5 7.5	7.5	7.5	9.3 9.3	9.3		9.2 9.3	9.3	
22-Feb-17	Cloudy	Moderate	14:30	Surface	1	18.7 17.8	18.3	7.8 7.8	7.8	28.4 28.3	28.4	99.8 99.2	99.5	7.9 8.0	8.0	7.9	3.3 3.3	3.3	6.5	7.6 10.9	9.3	8.5
				Middle	3.5	18.1 18.1	18.1	7.8 7.8	7.8	29.2 29.2	29.2	98.7 98.7	98.7	7.8 7.8	7.8		7.0 7.0	7.0		10.3 7.2	8.8	
				Bottom	6	17.9 17.8	17.9	7.9 7.9	7.9	30.7 30.7	30.7	97.5 97.8	97.7	7.7 7.7	7.7	7.7	9.1 9.1	9.1		9.3 5.7	7.5	
24-Feb-17	Rainy	Rough	16:20	Surface	1	18.7 18.6	18.7	8.0 8.0	8.0	20.8 20.6	20.7	82.4 80.7	81.6	6.8 6.7	6.8	6.8	6.8 7.6	7.2	8.5	10.9 12.5	11.7	10.4
				Middle	4	18.5 18.5	18.5	8.1 8.1	8.1	22.3 22.2	22.3	81.3 81.8	81.6	6.7 6.7	6.7		7.9 7.6	7.8		13.0 7.7	10.4	
				Bottom	7	18.4 18.4	18.4	8.0 8.1	8.1	24.7 24.8	24.8	80.0 78.8	79.4	6.5 6.4	6.5	6.5	10.2 10.6	10.4		9.1 8.8	9.0	
27-Feb-17	Cloudy	Moderate	18:27	Surface	1	17.7 17.6	17.7	8.1 8.1	8.1	30.3 30.3	30.3	97.1 97.2	97.2	7.7 7.7	7.7	7.7	4.8 4.8	4.8	5.7	14.5 15.1	14.8	13.1
				Middle	3.5	17.2 17.2	17.2	8.1 8.1	8.1	31.6 31.6	31.6	96.6 96.6	96.6	7.7 7.7	7.7		5.6 5.7	5.7		10.7 12.7	11.7	
				Bottom	6	16.9 16.9	16.9	8.2 8.2	8.2	31.7 31.8	31.8	96.5 96.5	96.5	7.7 7.7	7.7	7.7	6.6 6.6	6.6		13.0 12.8	12.9	

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

Water Quality Monitoring Results at ST3 - 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*
1-Feb-17	Sunny	Moderate	14:51	Surface	1	19.3 19.3	19.3	8.3 8.3	8.3	27.9 27.9	27.9	95.9 95.6	95.8	7.5 7.5	7.5	7.5	4.5 4.8	4.7	5.2	10.8 10.2	10.5	10.8
				Middle	6	18.7 18.7	18.7	8.3 8.3	8.3	30.1 30.1	30.1	95.3 94.8	95.1	7.4 7.4	7.4		5.5 5.5	5.5		13.4 11.3	12.4	
				Bottom	11	18.3 18.3	18.3	8.3 8.3	8.3	32.1 32.2	32.2	90.6 91.8	91.2	7.0 7.1	7.1	7.1	5.5 5.5	5.5		9.7 9.3	9.5	
3-Feb-17	Cloudy	Moderate	16:55	Surface	1	19.7 20.2	20.0	8.1 8.1	8.1	30.5 30.9	30.7	103.6 103.9	103.8	7.9 7.8	7.9	7.7	5.4 5.8	5.6	8.0	15.1 11.8	13.5	13.5
				Middle	6	18.7 18.4	18.6	8.1 8.1	8.1	30.5 30.6	30.6	96.0 96.1	96.1	7.5 7.5	7.5		8.5 8.5	8.5		13.4 12.2	12.8	
				Bottom	11	17.9 17.7	17.8	8.2 8.2	8.2	30.5 30.5	30.5	89.1 89.9	89.5	7.0 7.1	7.1	7.1	9.7 9.8	9.8		16.6 12.0	14.3	
6-Feb-17	Cloudy	Moderate	08:40	Surface	1	19.5 19.5	19.5	8.1 8.1	8.1	32.0 32.0	32.0	93.6 94.3	94.0	7.1 7.2	7.2	7.2	7.1 7.0	7.1	8.1	13.1 14.2	13.7	13.6
				Middle	5	19.5 19.5	19.5	8.1 8.1	8.1	32.3 32.4	32.4	95.2 95.5	95.4	7.2 7.2	7.2		7.4 7.5	7.5		12.8 11.6	12.2	
				Bottom	9	19.4 19.4	19.4	8.0 8.0	8.0	32.6 32.6	32.6	92.6 92.2	92.4	7.0 7.0	7.0	7.0	9.5 9.7	9.6		15.4 14.5	15.0	
8-Feb-17	Cloudy	Moderate	10:51	Surface	1	18.7 18.7	18.7	8.1 8.1	8.1	27.0 27.0	27.0	89.1 89.5	89.3	7.1 7.1	7.1	7.0	3.4 3.6	3.5	4.3	18.8 18.5	18.7	17.4
				Middle	5.5	18.5 18.5	18.5	8.2 8.2	8.2	30.4 30.7	30.6	88.6 88.4	88.5	6.9 6.9	6.9		4.1 4.1	4.1		18.0 16.8	17.4	
				Bottom	10	18.1 18.1	18.1	8.3 8.3	8.3	33.4 33.4	33.4	89.6 89.6	89.6	6.9 6.9	6.9	6.9	5.0 5.8	5.4		16.0 16.1	16.1	
10-Feb-17	Cloudy	Rough	17:09	Surface	1	18.3 18.3	18.3	8.0 8.0	8.0	26.5 26.6	26.6	94.0 93.8	93.9	7.6 7.5	7.6	7.5	8.0 8.2	8.1	8.7	13.1 11.5	12.3	13.4
				Middle	6.5	18.0 18.0	18.0	8.1 8.1	8.1	31.0 30.6	30.8	93.4 93.2	93.3	7.4 7.4	7.4		8.3 8.1	8.2		15.0 12.9	14.0	
				Bottom	12	17.7 17.6	17.7	8.1 8.1	8.1	33.1 33.4	33.3	94.1 94.3	94.2	7.4 7.4	7.4	7.4	10.1 9.7	9.9		14.9 12.8	13.9	
13-Feb-17	Sunny	Rough	13:29	Surface	1	18.9 18.9	18.9	8.0 8.0	8.0	26.5 26.6	26.6	96.9 96.8	96.9	7.7 7.7	7.7	7.6	8.1 8.3	8.2	8.8	9.9 8.3	9.1	9.6
				Middle	6.5	18.6 18.6	18.6	8.1 8.1	8.1	31.0 30.6	30.8	96.4 96.2	96.3	7.5 7.5	7.5		8.4 8.2	8.3		12.4 8.3	10.4	
				Bottom	12	18.3 18.2	18.3	8.1 8.1	8.1	33.1 33.4	33.3	97.1 97.3	97.2	7.5 7.5	7.5	7.5	10.2 9.8	10.0		10.0 8.8	9.4	
15-Feb-17	Cloudy	Rough	14:56	Surface	1	21.0 21.0	21.0	8.3 8.3	8.3	28.9 28.9	28.9	101.0 100.6	100.8	7.6 7.6	7.6	7.6	4.1 4.4	4.3	4.8	14.9 14.3	14.6	15.9
				Middle	6	20.4 20.4	20.4	8.3 8.3	8.3	31.2 31.2	31.2	100.3 99.8	100.1	7.5 7.5	7.5		5.1 5.1	5.1		20.2 13.0	16.6	
				Bottom	11	20.0 20.0	20.0	8.3 8.3	8.3	33.2 33.2	33.2	95.5 96.7	96.1	7.1 7.2	7.2	7.2	5.1 5.1	5.1		18.8 13.9	16.4	
17-Feb-17	Cloudy	Rough	16:10	Surface	1	20.8 20.8	20.8	8.2 8.2	8.2	29.3 29.4	29.4	95.5 95.1	95.3	7.2 7.2	7.2	7.2	4.4 4.7	4.6	5.1	15.8 13.3	14.6	15.3
				Middle	6	20.1 20.1	20.1	8.2 8.2	8.2	31.6 31.6	31.6	94.8 94.3	94.6	7.1 7.1	7.1		5.4 5.4	5.4		18.7 12.7	15.7	
				Bottom	11	19.7 19.7	19.7	8.2 8.2	8.2	33.6 33.6	33.6	89.9 91.1	90.5	6.7 6.8	6.8	6.8	5.4 5.4	5.4		17.5 13.9	15.7	
20-Feb-17	Sunny	Moderate	19:46	Surface	1	19.4 19.4	19.4	8.2 8.2	8.2	25.9 25.9	25.9	91.2 90.9	91.1	7.2 7.2	7.2	7.2	2.1 2.4	2.3	2.8	7.6 7.6	7.6	7.5
				Middle	6	18.8 18.8	18.8	8.2 8.2	8.2	28.1 28.1	28.1	90.6 90.1	90.4	7.1 7.1	7.1		3.1 3.1	3.1		5.7 5.7	5.7	
				Bottom	11	18.4 18.4	18.4	8.2 8.2	8.2	30.1 30.2	30.2	85.9 87.1	86.5	6.7 6.8	6.8	6.8	3.1 3.1	3.1		11.2 7.1	9.2	
22-Feb-17	Cloudy	Moderate	10:22	Surface	1	18.5 18.5	18.5	7.8 7.8	7.8	29.9 29.8	29.9	98.0 98.1	98.1	7.7 7.7	7.7	7.7	3.5 3.7	3.6	6.4	11.1 13.4	12.3	11.4
				Middle	5.5	18.2 18.3	18.3	7.8 7.8	7.8	30.1 30.1	30.1	97.9 98.0	98.0	7.7 7.7	7.7		6.8 6.5	6.7		12.0 14.3	13.2	
				Bottom	10	18.0 17.9	18.0	7.7 7.8	7.8	30.2 30.2	30.2	97.7 97.5	97.6	7.7 7.7	7.7	7.7	8.8 9.1	9.0		10.5 6.6	8.6	
24-Feb-17	Rainy	Rough	12:42	Surface	1	19.5 19.5	19.5	7.9 7.9	7.9	23.4 23.4	23.4	84.9 85.2	85.1	6.8 6.8	6.8	6.9	3.0 3.3	3.2	4.3	9.9 9.1	9.5	9.7
				Middle	5.5	18.8 18.8	18.8	7.9 7.9	7.9	26.1 26.0	26.1	85.9 86.4	86.2	6.9 6.9	6.9		5.1 4.4	4.8		13.9 9.2	11.6	
				Bottom	10	18.3 18.3	18.3	7.9 7.9	7.9	28.1 28.1	28.1	82.7 81.0	81.9	6.6 6.4	6.5	6.5	4.4 5.1	4.8		8.8 7.1	8.0	
27-Feb-17	Cloudy	Moderate	13:31	Surface	1	17.5 17.5	17.5	8.1 8.1	8.1	31.2 31.2	31.2	94.9 95.6	95.3	7.5 7.6	7.6	7.7	7.1 7.0	7.1	8.1	15.6 12.7	14.2	12.4
				Middle	6	17.5 17.5	17.5	8.1 8.1	8.1	31.5 31.6	31.6	96.4 96.7	96.6	7.6 7.7	7.7		7.4 7.5	7.5		13.5 9.0	11.3	
				Bottom	11	17.3 17.3	17.3	8.1 8.1	8.1	31.8 31.8	31.8	94.0 93.6	93.8	7.5 7.4	7.5	7.5	9.5 9.7	9.6		11.8 11.6	11.7	

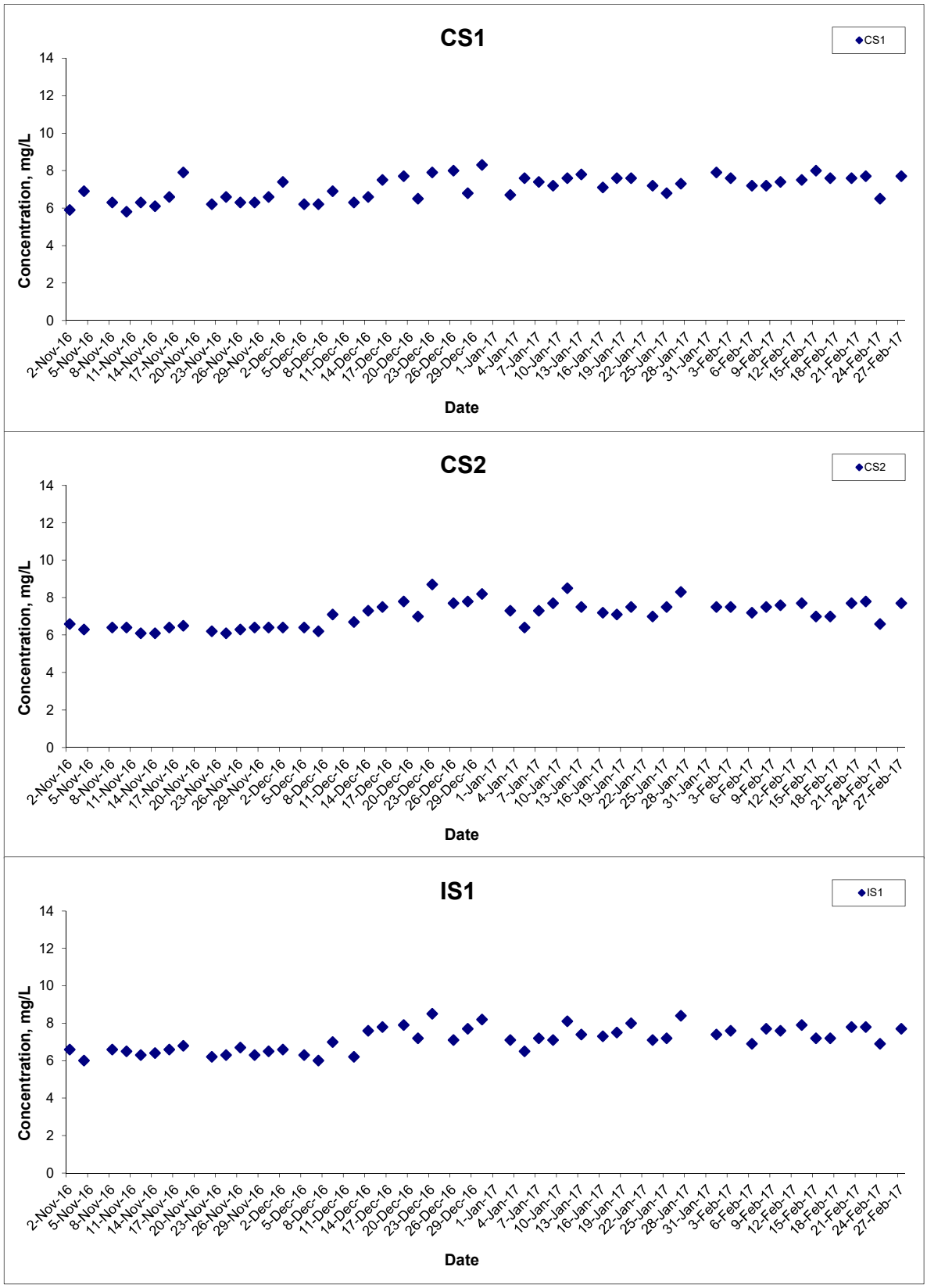
Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Water Quality Monitoring Results at ST3 - 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*
1-Feb-17	Sunny	Moderate	09:50	Surface	1	18.9 18.9	18.9	8.2 8.2	8.2	28.3 28.3	28.3	97.8 98.1	98.0	7.7 7.7	7.7	7.8	4.3 4.6	4.5	5.6	13.0 13.5	13.3	13.8
				Middle	5.5	18.1 18.2	18.2	8.2 8.2	8.2	31.0 30.9	31.0	98.9 99.3	99.1	7.8 7.8	7.8		6.4 5.7	6.1		19.0 11.6	15.3	
				Bottom	10	17.7 17.7	17.7	8.2 8.1	8.2	33.1 33.1	33.1	95.6 93.9	94.8	7.5 7.3	7.4	7.4	5.7 6.4	6.1		11.9 13.9	12.9	
3-Feb-17	Cloudy	Moderate	10:36	Surface	1	19.7 19.8	19.8	8.1 8.1	8.1	30.6 30.4	30.5	100.5 99.1	99.8	7.7 7.6	7.7	7.5	4.7 5.1	4.9	7.6	12.4 11.3	11.9	12.1
				Middle	6	18.5 18.4	18.5	8.1 8.1	8.1	30.2 30.3	30.3	94.0 92.2	93.1	7.4 7.2	7.3		8.5 8.4	8.5		11.3 11.7	11.5	
				Bottom	11	17.9 18.0	18.0	8.1 8.1	8.1	30.4 30.3	30.4	86.0 86.4	86.2	6.8 6.8	6.8	6.8	9.4 9.4	9.4		12.5 13.2	12.9	
6-Feb-17	Cloudy	Moderate	13:09	Surface	1	19.4 19.5	19.5	8.0 8.0	8.0	31.1 31.1	31.1	92.0 92.4	92.2	7.0 7.1	7.1	7.2	8.3 7.8	8.1	8.4	9.8 10.0	9.9	11.1
				Middle	5.5	19.5 19.5	19.5	8.0 8.0	8.0	29.7 31.3	30.5	94.0 94.0	94.0	7.2 7.2	7.2		9.0 8.6	8.8		15.5 10.9	13.2	
				Bottom	10	19.5 19.5	19.5	8.0 8.0	8.0	31.5 31.5	31.5	93.5 93.2	93.4	7.1 7.1	7.1	7.1	8.4 8.4	8.4		10.8 9.8	10.3	
8-Feb-17	Cloudy	Moderate	15:06	Surface	1	18.7 18.7	18.7	8.1 8.1	8.1	26.9 26.9	26.9	95.6 95.5	95.6	7.6 7.6	7.6	7.5	5.1 5.0	5.1	5.5	15.4 16.4	15.9	17.0
				Middle	6	18.4 18.4	18.4	8.2 8.1	8.2	31.4 30.9	31.2	95.0 94.8	94.9	7.4 7.4	7.4		4.5 4.6	4.6		18.2 17.2	17.7	
				Bottom	11	18.1 18.1	18.1	8.2 8.2	8.2	33.5 33.7	33.6	95.7 95.9	95.8	7.4 7.4	7.4	7.4	6.9 6.5	6.7		16.6 18.0	17.3	
10-Feb-17	Cloudy	Rough	12:33	Surface	1	18.3 18.3	18.3	8.1 8.1	8.1	26.6 26.6	26.6	95.0 95.4	95.2	7.6 7.7	7.7	7.6	8.3 8.5	8.4	8.8	10.6 13.0	11.8	12.8
				Middle	6	18.1 18.1	18.1	8.1 8.1	8.1	30.1 30.4	30.3	94.6 94.5	94.6	7.5 7.5	7.5		9.3 9.7	9.5		13.7 13.1	13.4	
				Bottom	11	17.7 17.6	17.7	8.2 8.2	8.2	33.1 33.1	33.1	95.7 95.7	95.7	7.5 7.5	7.5	7.5	8.2 9.0	8.6		12.9 13.6	13.3	
13-Feb-17	Sunny	Rough	08:34	Surface	1	18.9 18.9	18.9	8.1 8.1	8.1	26.6 26.6	26.6	90.4 90.8	90.6	7.2 7.2	7.2	7.1	8.4 8.6	8.5	8.9	8.6 8.2	8.4	9.3
				Middle	6	18.7 18.7	18.7	8.1 8.1	8.1	30.1 30.4	30.3	89.9 89.8	89.9	7.0 7.0	7.0		9.4 9.8	9.6		9.5 7.2	8.4	
				Bottom	11	18.3 18.2	18.3	8.2 8.2	8.2	33.1 33.1	33.1	91.0 90.9	91.0	7.0 7.0	7.0	7.0	8.3 9.1	8.7		10.3 11.9	11.1	
15-Feb-17	Cloudy	Rough	09:51	Surface	1	20.6 20.6	20.6	8.2 8.2	8.2	29.4 29.4	29.4	96.3 96.6	96.5	7.3 7.3	7.3	7.4	3.9 4.2	4.1	5.2	11.5 13.6	12.6	14.8
				Middle	6	19.8 19.9	19.9	8.2 8.2	8.2	32.0 32.0	32.0	97.4 97.9	97.7	7.4 7.4	7.4		6.0 5.3	5.7		18.6 13.8	16.2	
				Bottom	11	19.4 19.4	19.4	8.2 8.1	8.2	34.1 34.1	34.1	94.0 92.3	93.2	7.1 6.9	7.0	7.0	5.3 6.0	5.7		15.4 15.6	15.5	
17-Feb-17	Cloudy	Rough	10:46	Surface	1	20.3 20.3	20.3	8.1 8.1	8.1	29.8 29.8	29.8	97.5 97.7	97.6	7.4 7.4	7.4	7.5	4.2 4.5	4.4	5.5	12.8 13.1	13.0	16.0
				Middle	5.5	19.6 19.6	19.6	8.1 8.1	8.1	32.5 32.4	32.5	98.6 99.0	98.8	7.5 7.5	7.5		6.3 5.6	6.0		22.7 16.9	19.8	
				Bottom	10	19.2 19.2	19.2	8.1 8.1	8.1	34.5 34.5	34.5	95.2 93.4	94.3	7.2 7.0	7.1	7.1	5.6 6.3	6.0		17.0 13.3	15.2	
20-Feb-17	Sunny	Moderate	12:31	Surface	1	19.0 19.0	19.0	8.1 8.1	8.1	26.3 26.3	26.3	94.9 95.1	95.0	7.5 7.6	7.6	7.6	1.9 2.2	2.1	3.2	6.9 6.6	6.8	7.0
				Middle	5.5	18.2 18.3	18.3	8.1 8.1	8.1	29.0 28.9	29.0	95.9 96.4	96.2	7.6 7.6	7.6		4.0 3.3	3.7		7.9 6.2	7.1	
				Bottom	10	17.8 17.8	17.8	8.1 8.1	8.1	31.0 31.1	31.1	92.7 91.0	91.9	7.3 7.2	7.3	7.3	3.3 4.0	3.7		6.5 7.7	7.1	
22-Feb-17	Cloudy	Moderate	15:08	Surface	1	18.4 18.4	18.4	7.8 7.8	7.8	29.8 30.0	29.9	97.9 97.8	97.9	7.7 7.7	7.7	7.7	5.7 5.8	5.8	7.2	8.1 7.2	7.7	6.5
				Middle	5.5	18.2 18.3	18.3	7.8 7.8	7.8	30.3 30.3	30.3	98.0 98.3	98.2	7.7 7.7	7.7		7.3 7.1	7.2		6.0 6.0	6.0	
				Bottom	10	18.1 18.0	18.1	7.7 7.7	7.7	30.9 30.9	30.9	98.4 98.3	98.4	7.7 7.7	7.7	7.7	8.7 8.5	8.6		6.4 5.4	5.9	
24-Feb-17	Rainy	Rough	16:21	Surface	1	20.0 19.9	20.0	8.0 8.0	8.0	22.9 23.0	23.0	87.3 86.9	87.1	6.9 6.9	6.9	6.9	3.2 3.5	3.4	3.9	15.5 14.8	15.2	16.4
				Middle	5.5	19.3 19.3	19.3	8.0 8.0	8.0	25.2 25.2	25.2	86.6 86.1	86.4	6.9 6.8	6.9		4.2 4.2	4.2		17.7 16.3	17.0	
				Bottom	10	18.9 18.9	18.9	8.0 8.0	8.0	27.2 27.2	27.2	82.0 83.1	82.6	6.5 6.6	6.6	6.6	4.2 4.2	4.2		15.5 18.6	17.1	
27-Feb-17	Cloudy	Moderate	18:13	Surface	1	17.4 17.4	17.4	8.1 8.1	8.1	30.3 30.2	30.3	93.4 93.8	93.6	7.5 7.5	7.5	7.6	8.3 7.8	8.1	8.4	9.2 9.6	9.4	9.9
				Middle	6.5	17.5 17.5	17.5	8.1 8.1	8.1	28.9 30.5	29.7	95.2 95.3	95.3	7.7 7.6	7.7		9.0 8.6	8.8		10.9 8.0	9.5	
				Bottom	12	17.4 17.4	17.4	8.1 8.1	8.1	30.7 30.6	30.7	94.8 94.5	94.7	7.6 7.5	7.6	7.6	8.4 8.4	8.4		12.9 8.6	10.8	

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

Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA12014	CINOTECH
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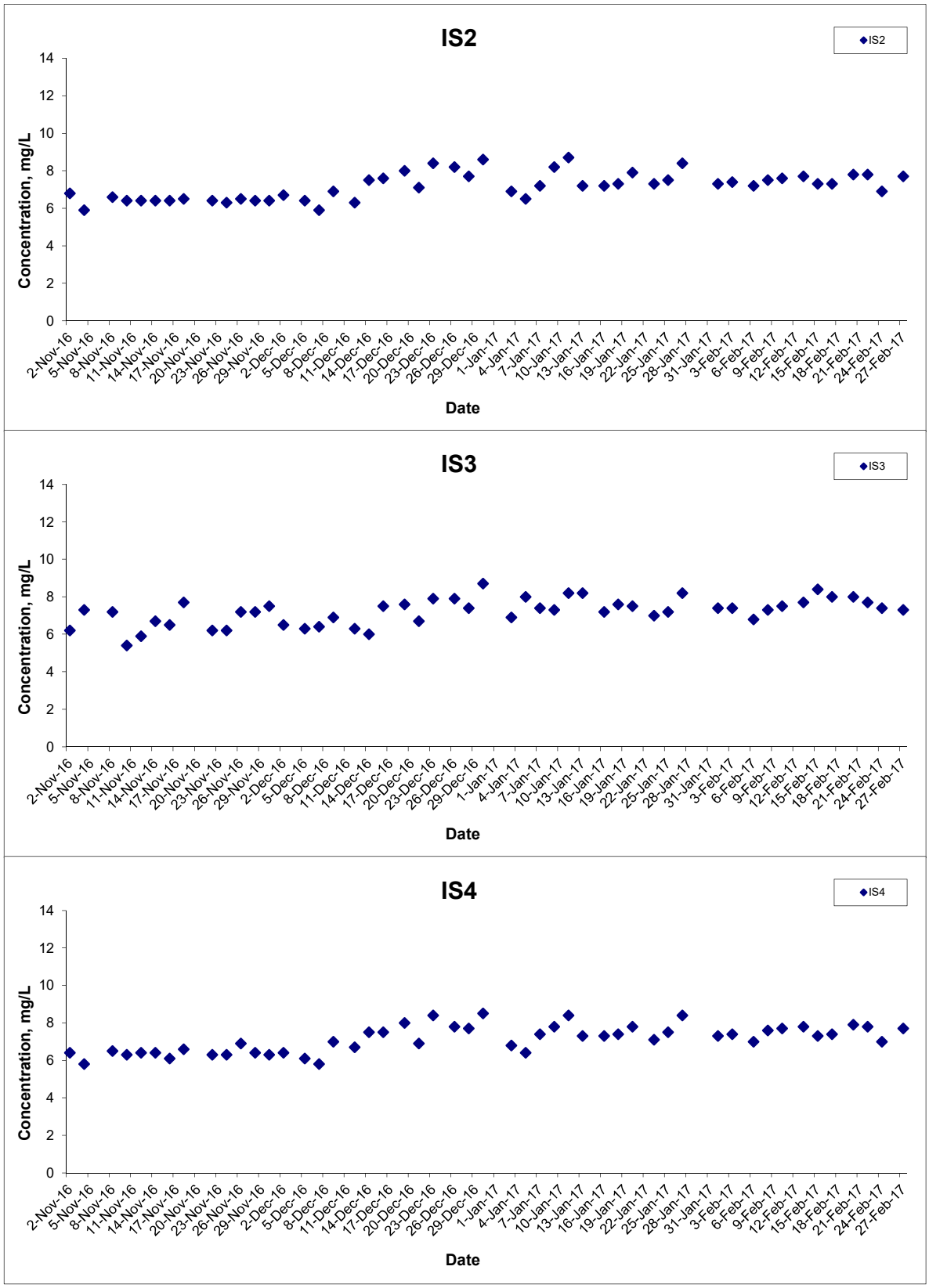
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



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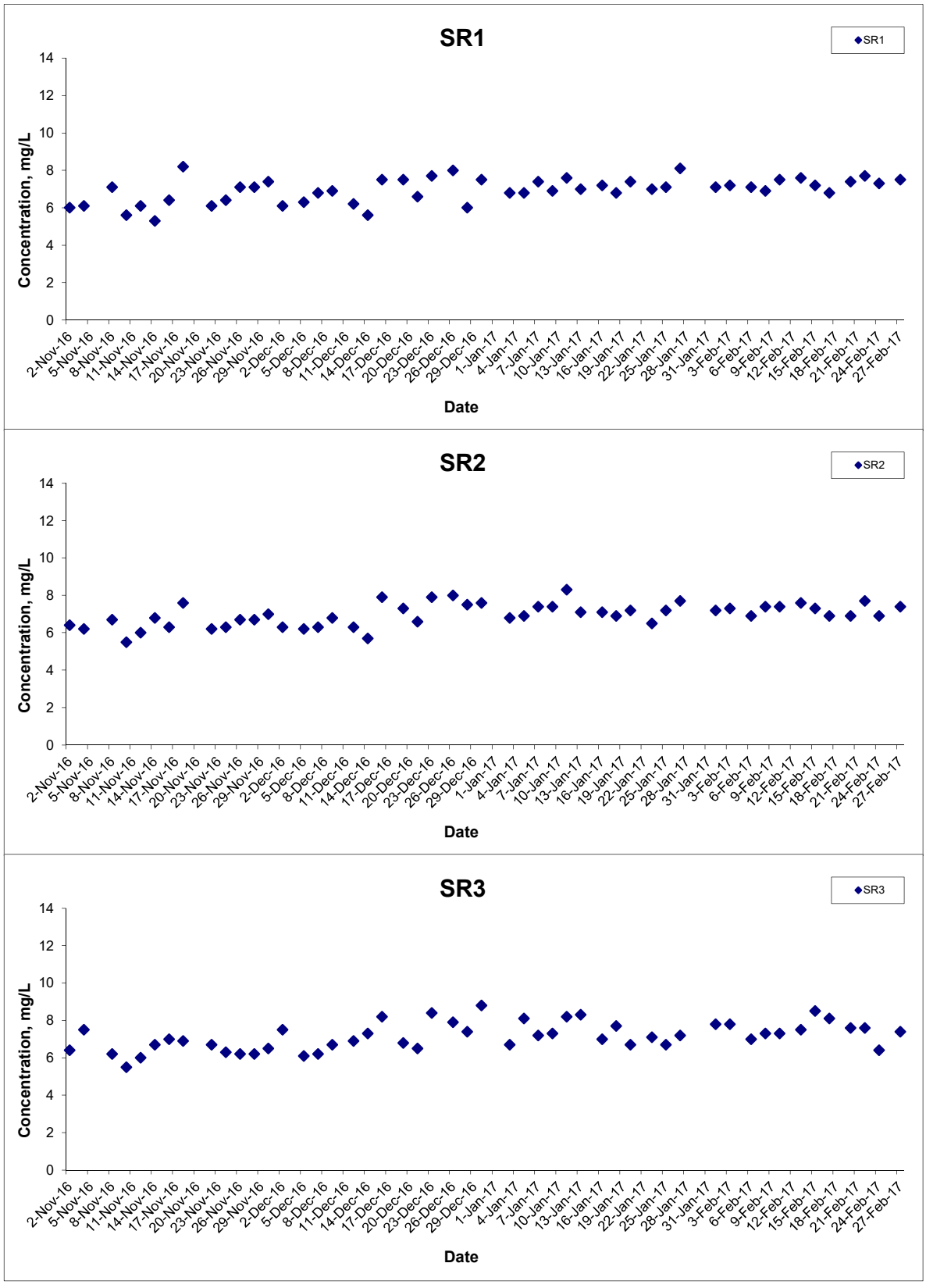
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



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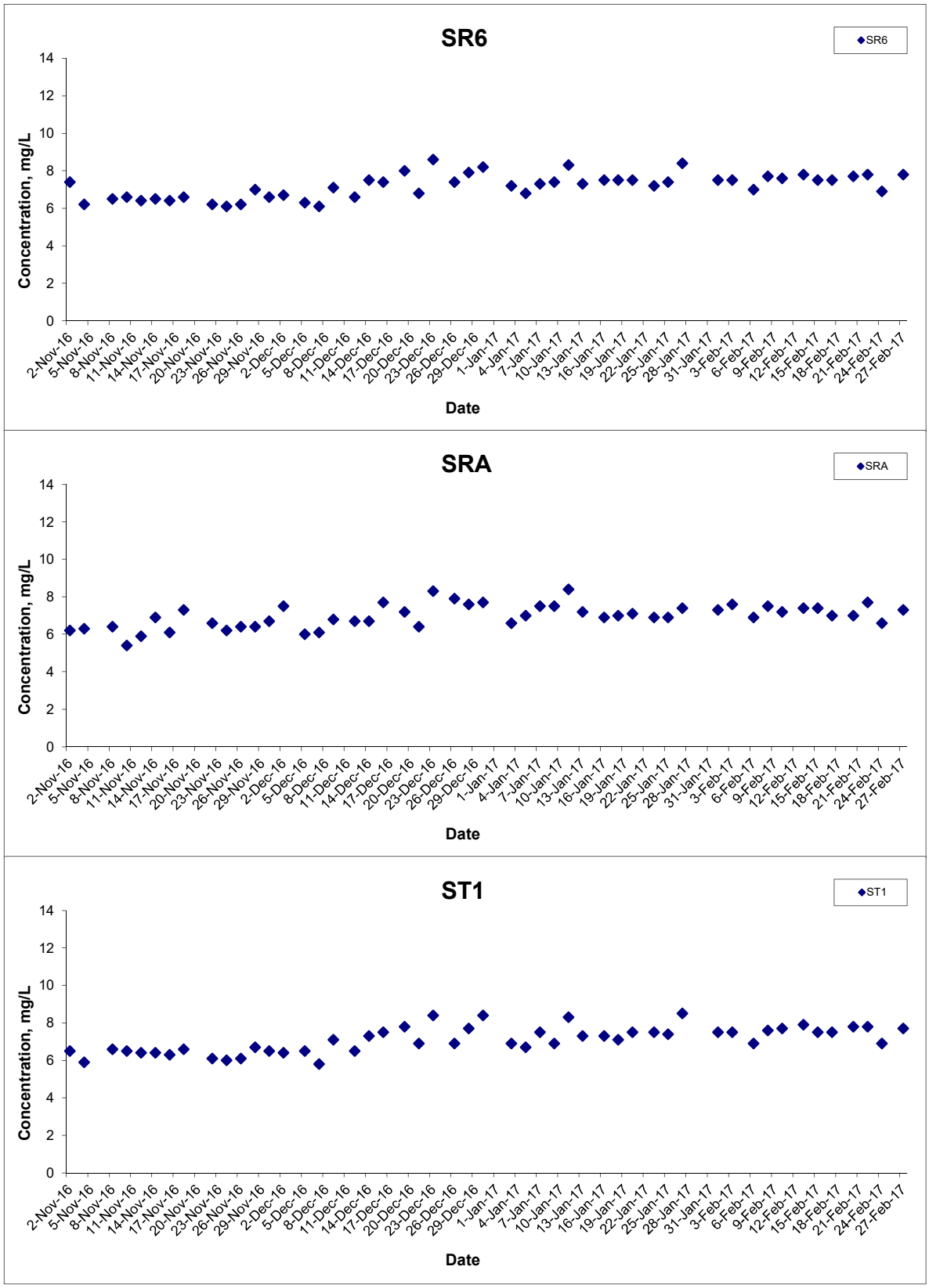
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA12014	CINOTECH
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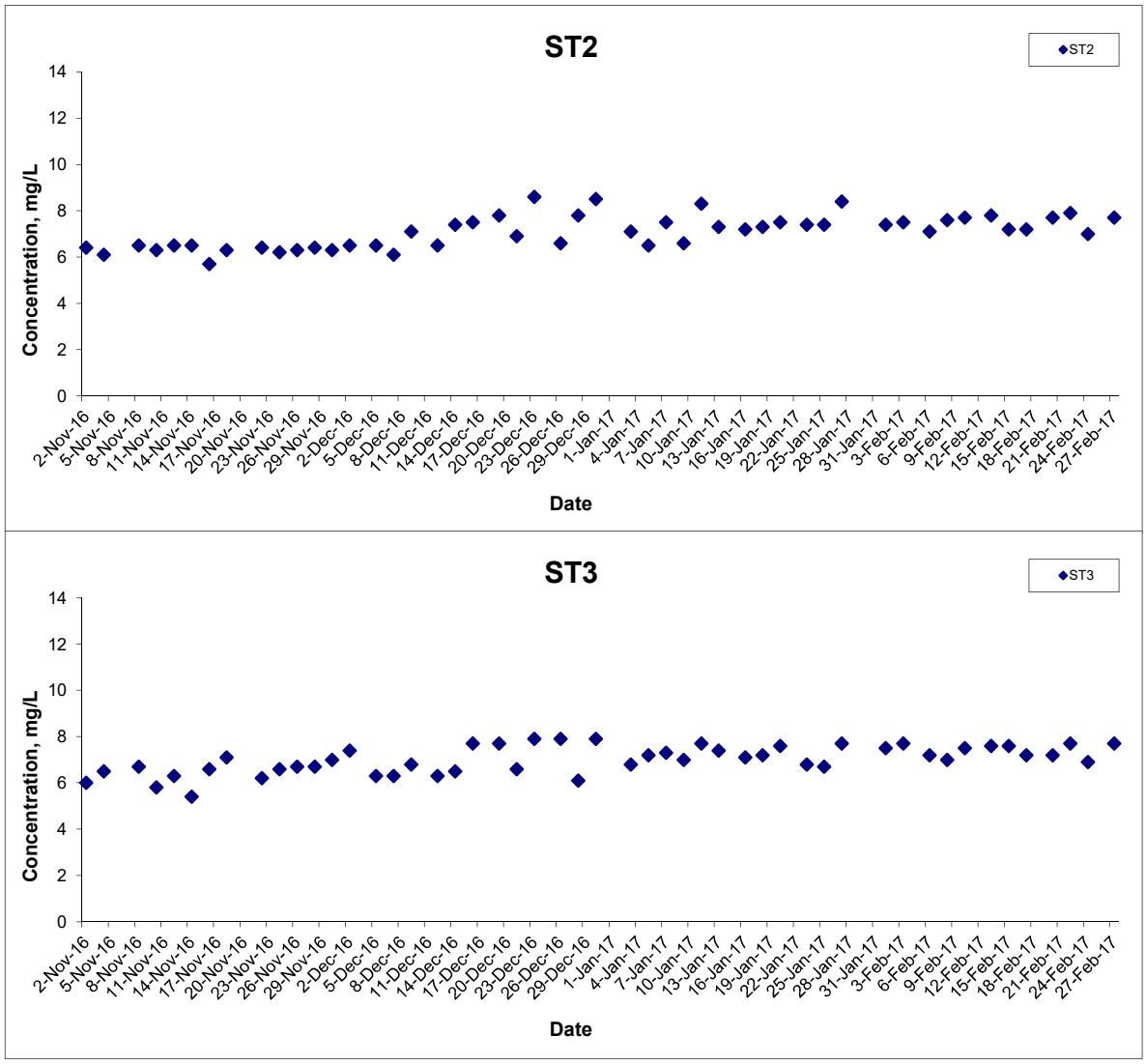
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



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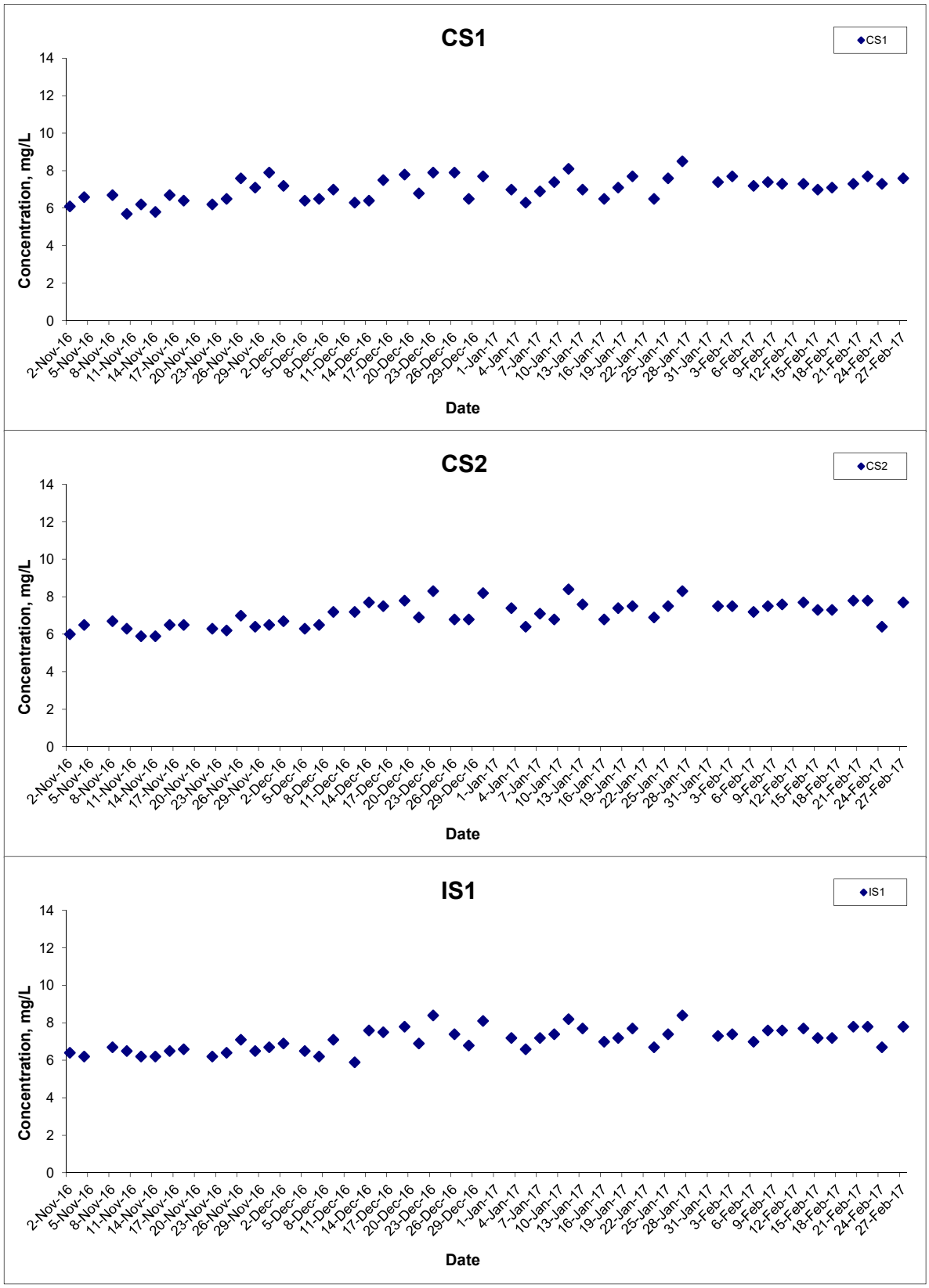
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA12014	CINOTECH
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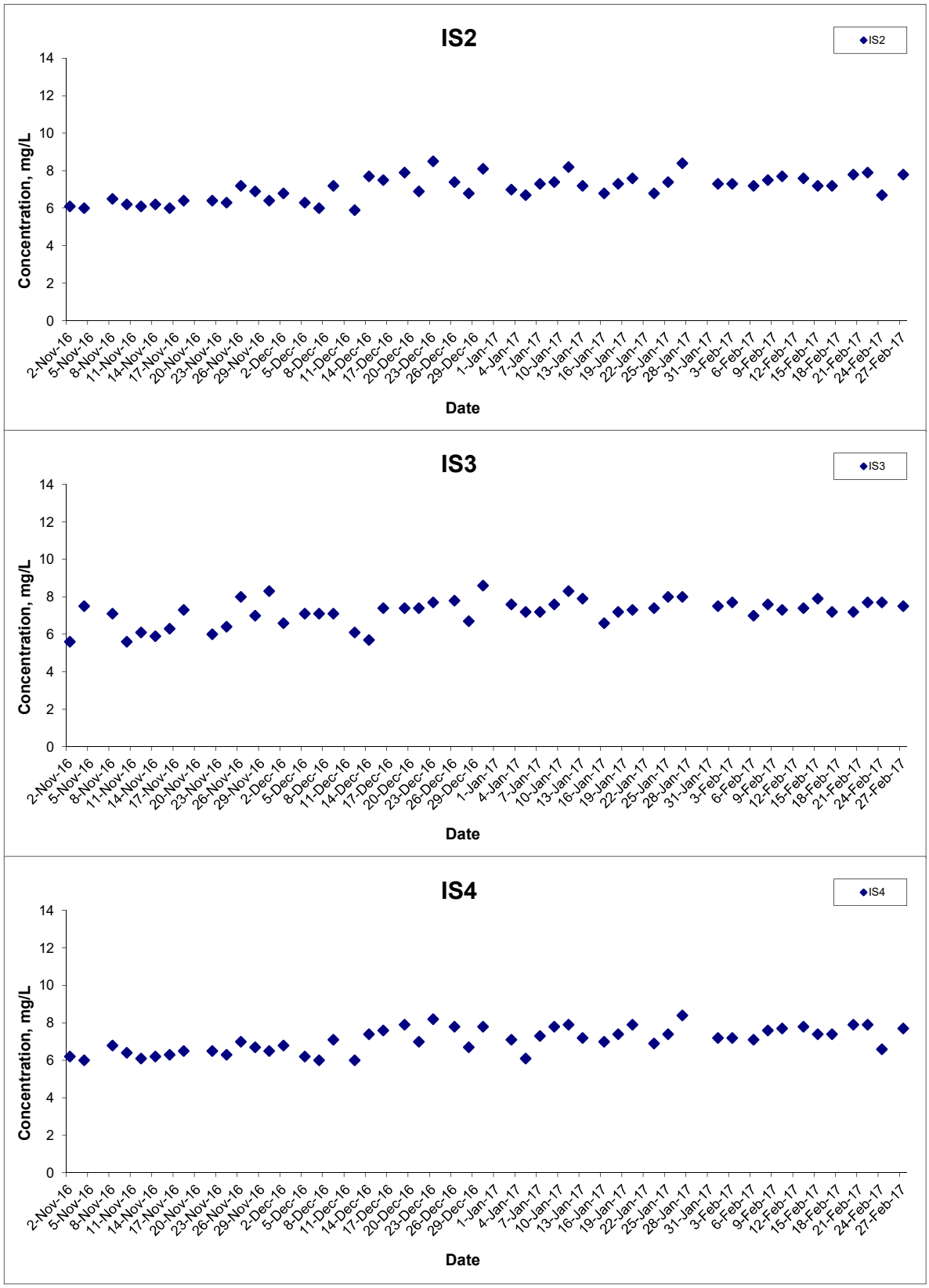
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



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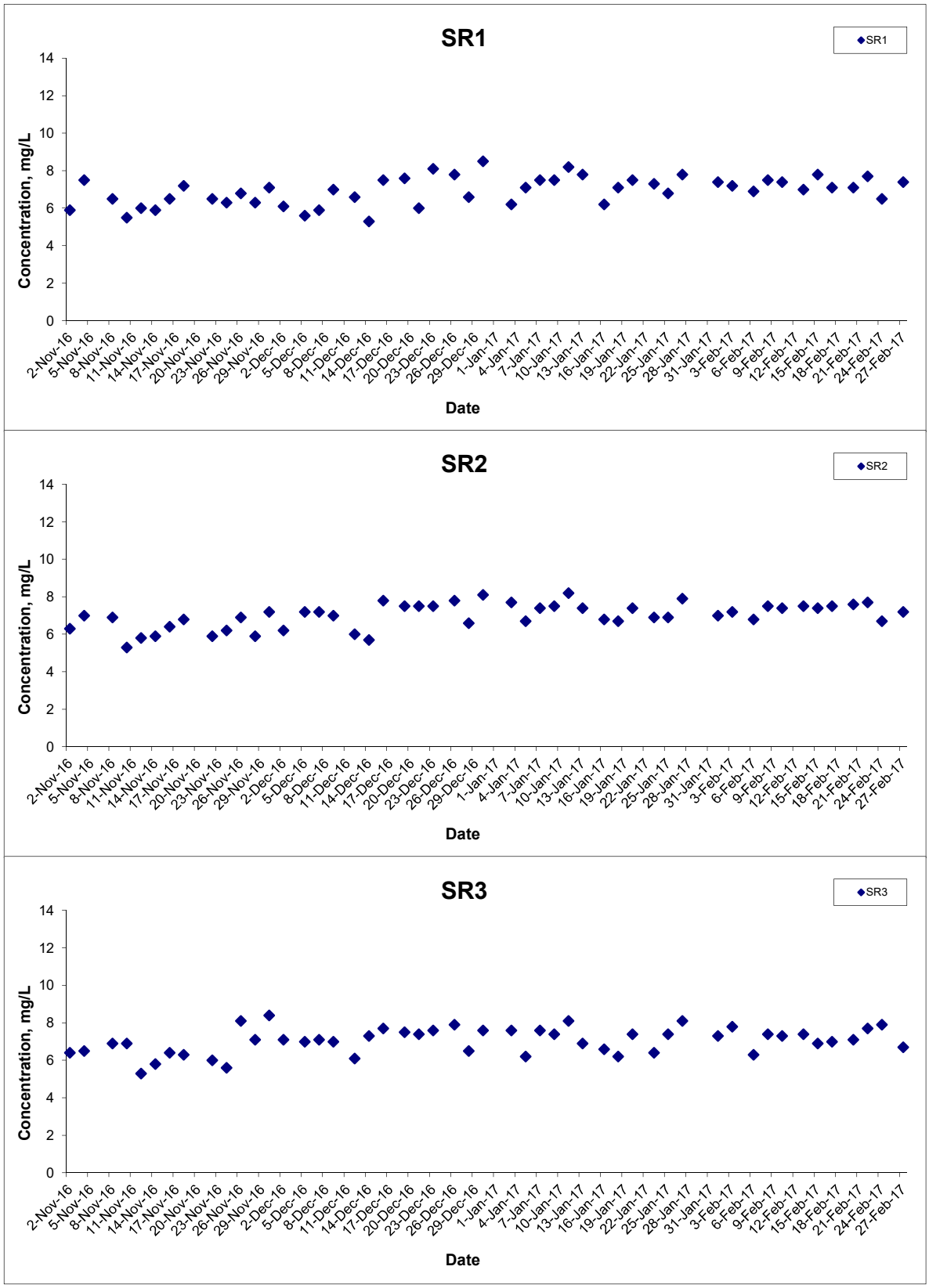
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



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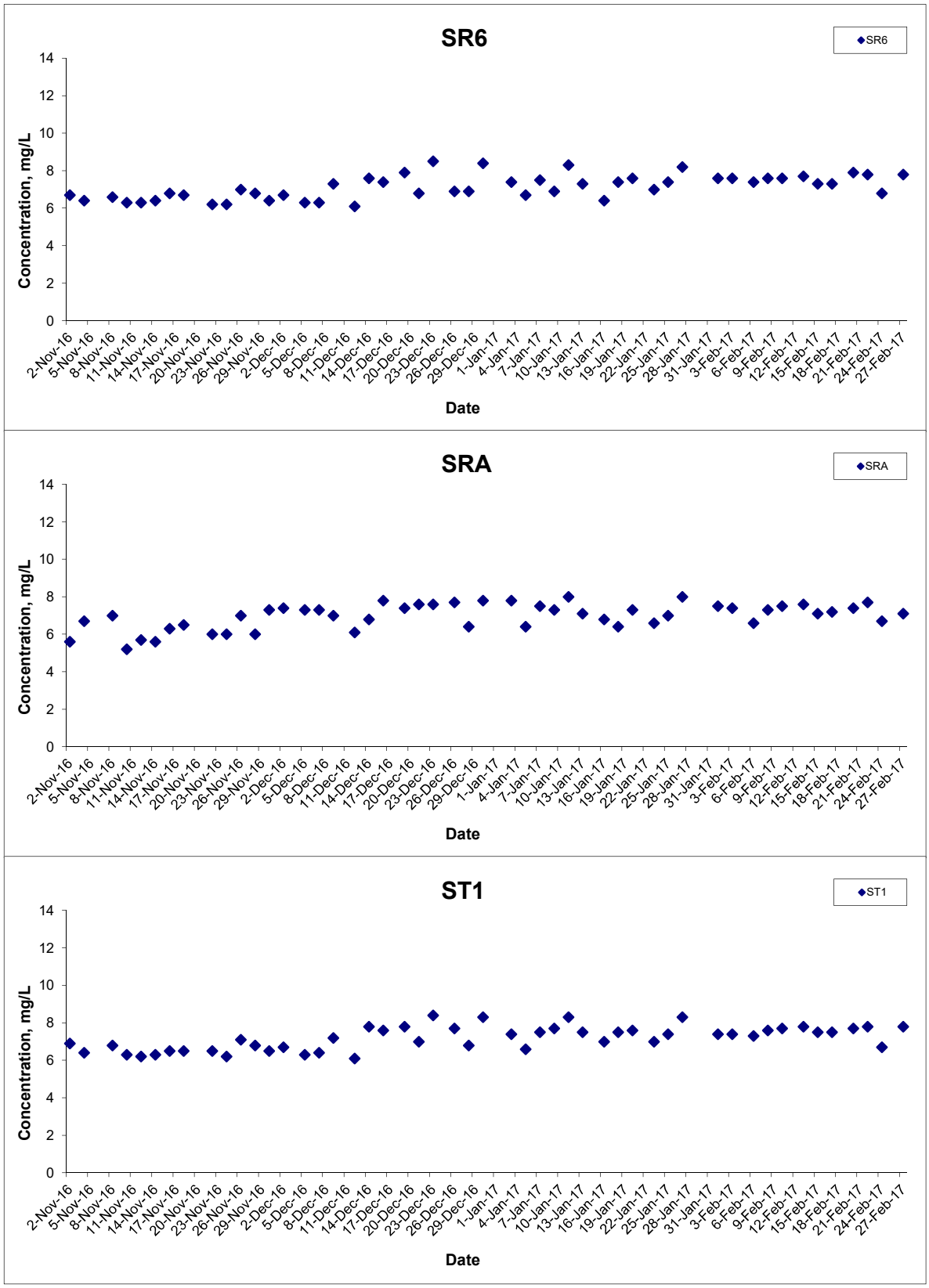
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



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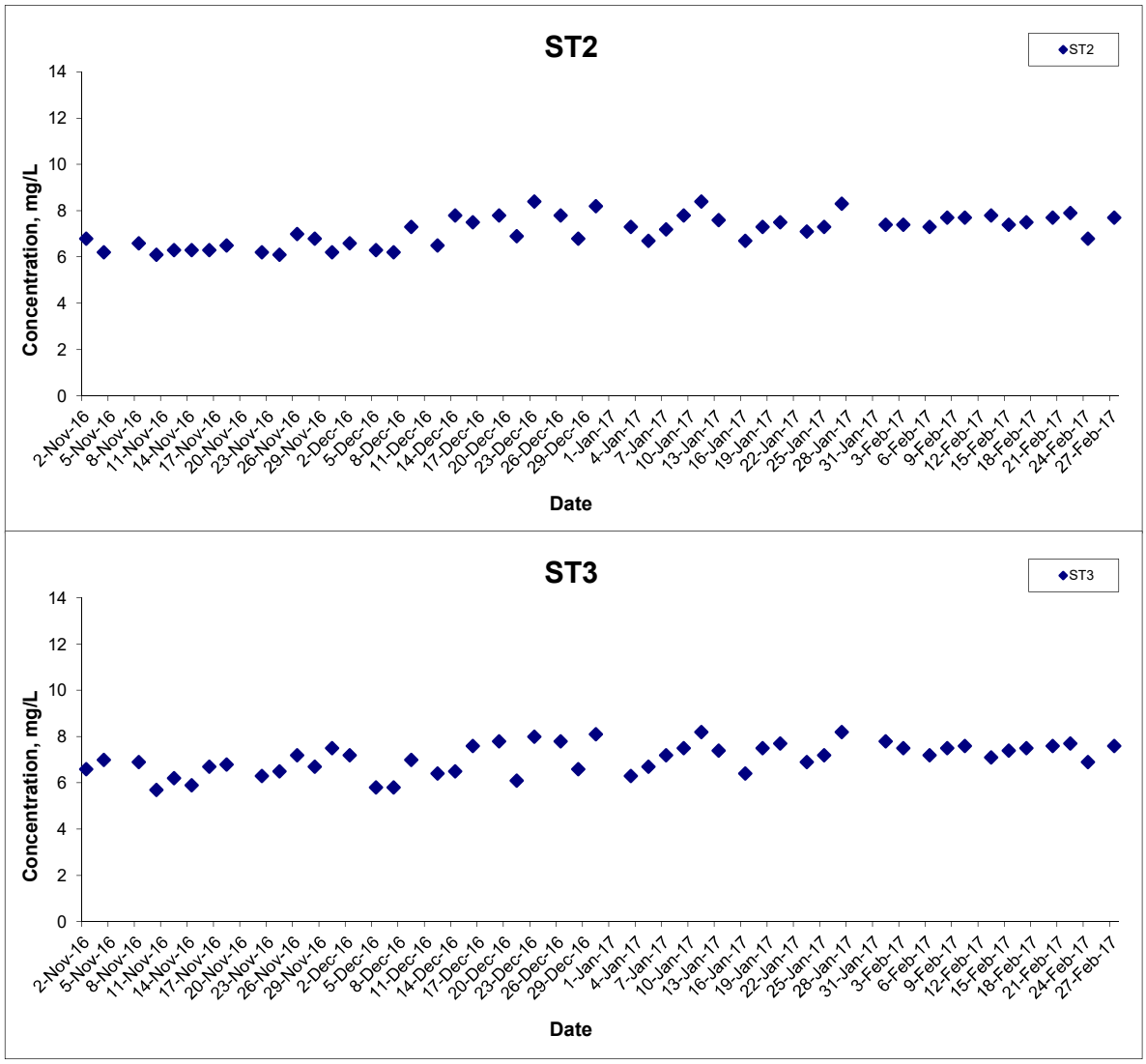
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



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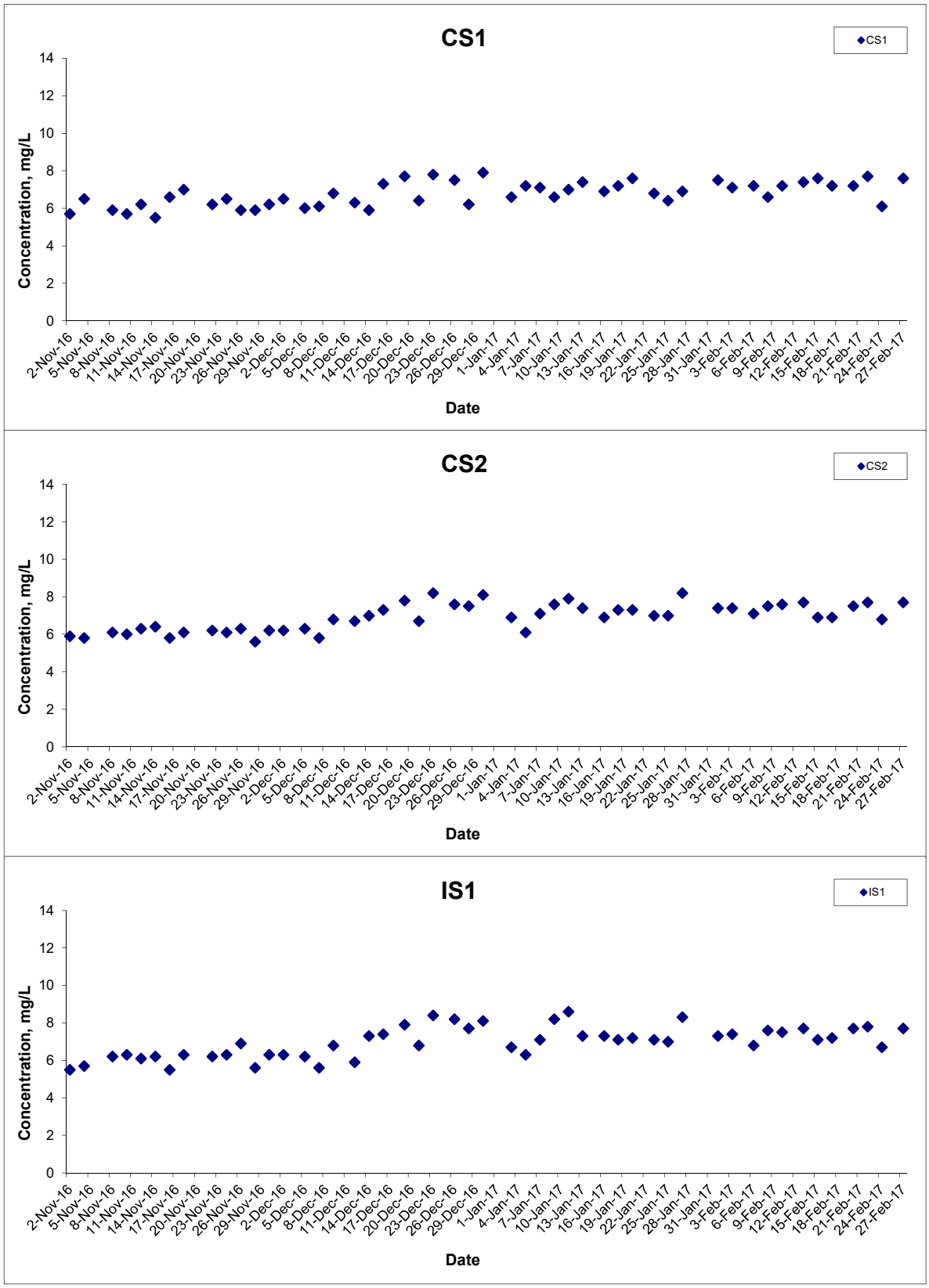
Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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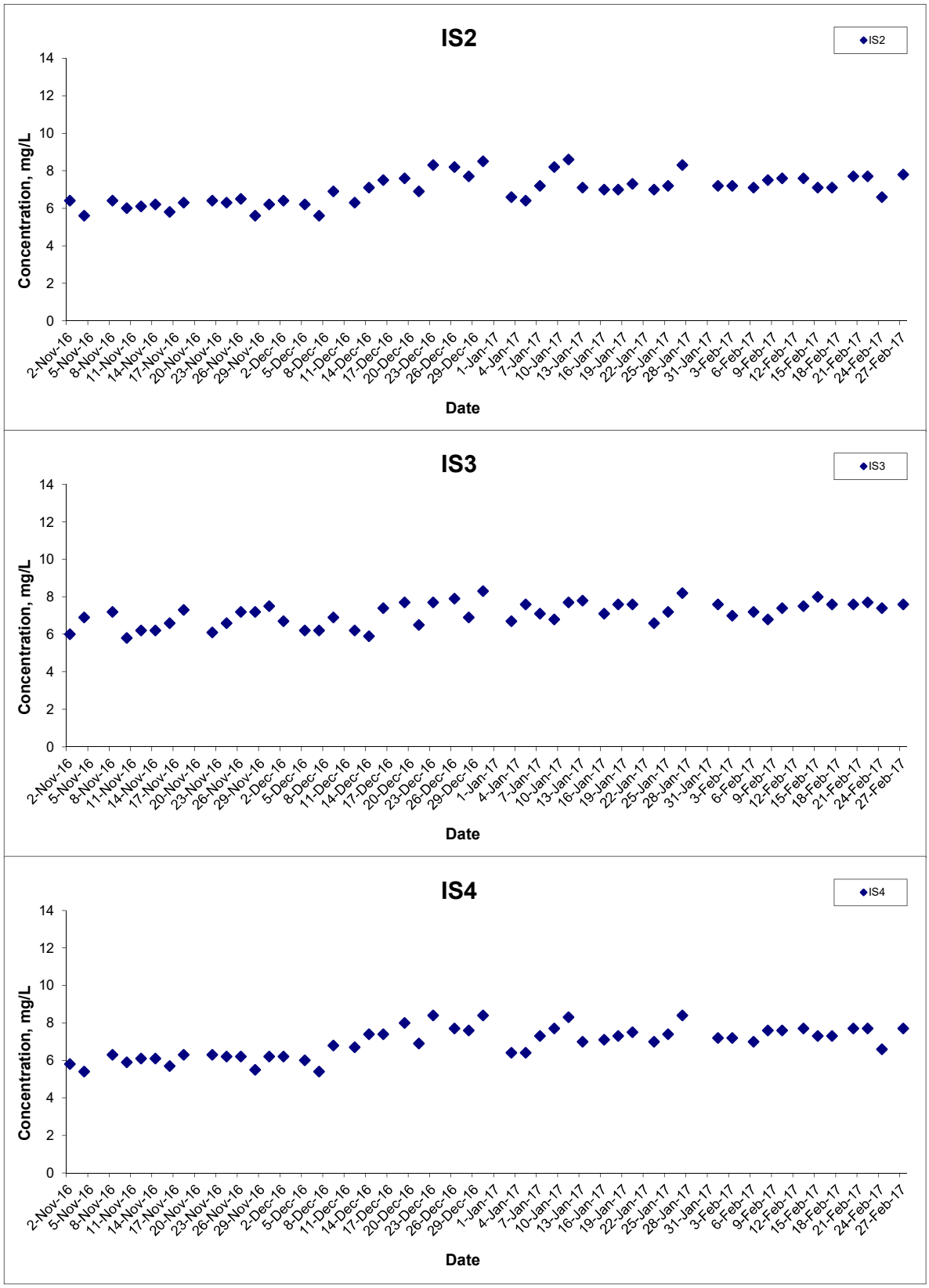
Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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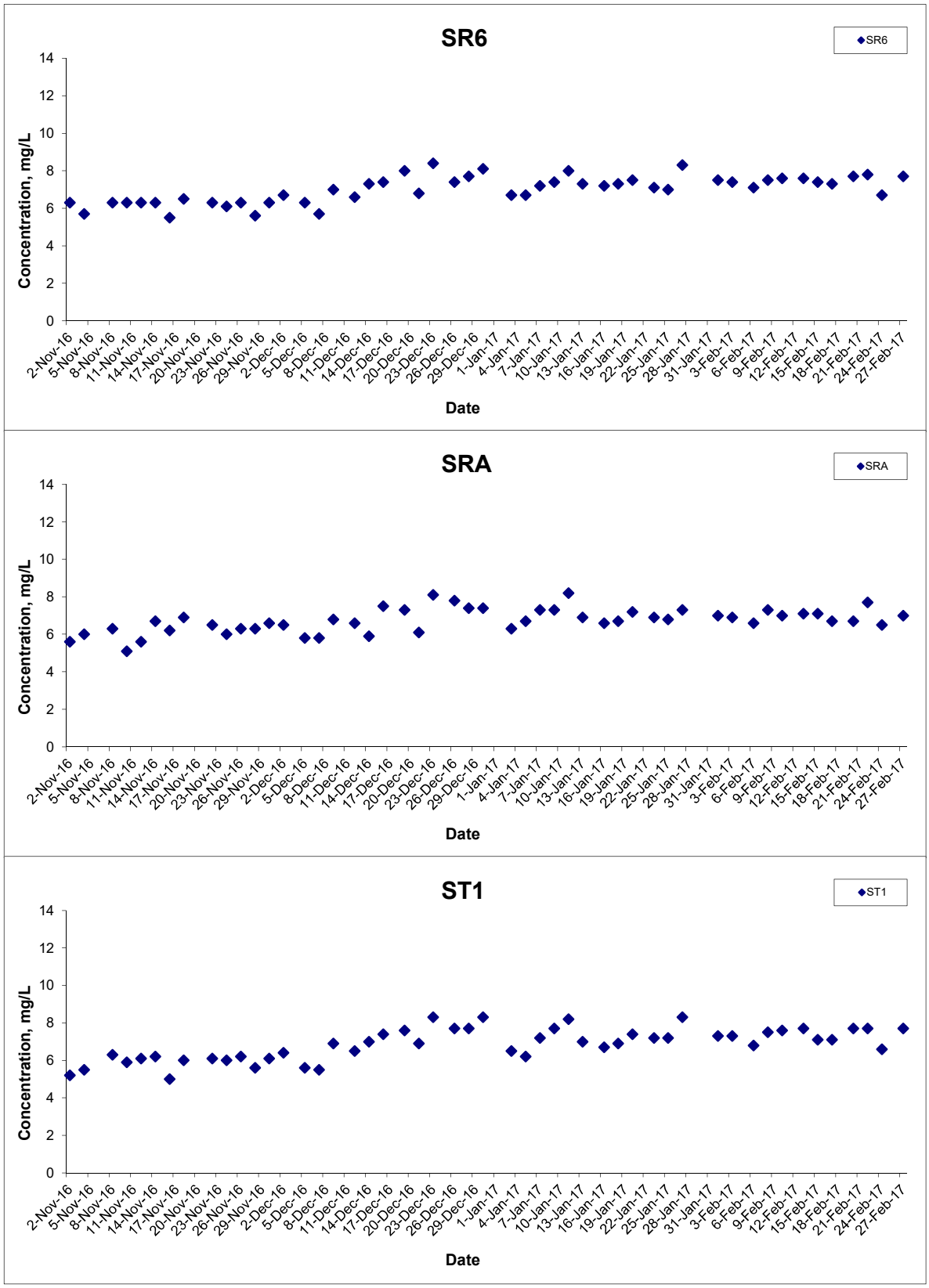
Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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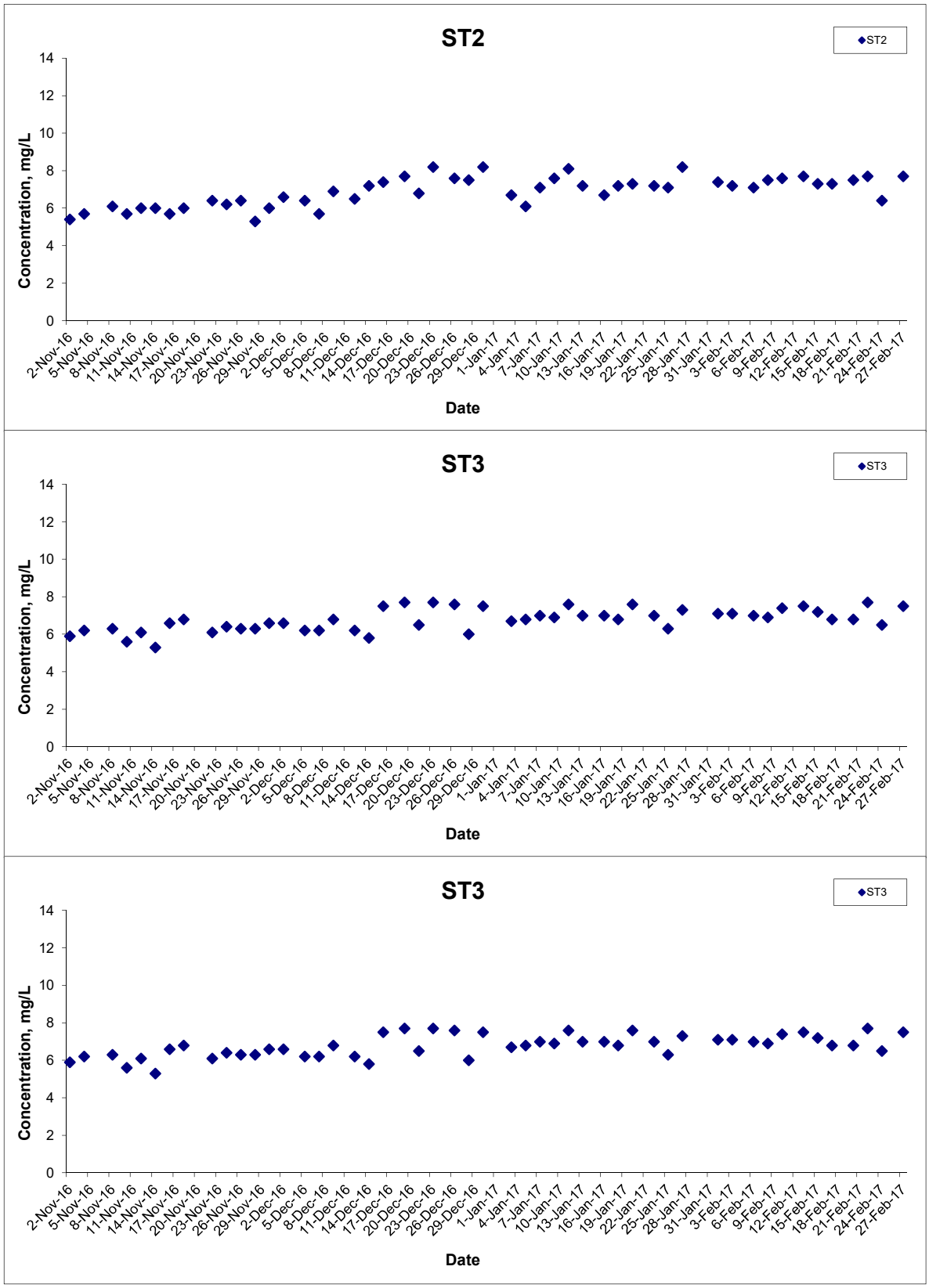
Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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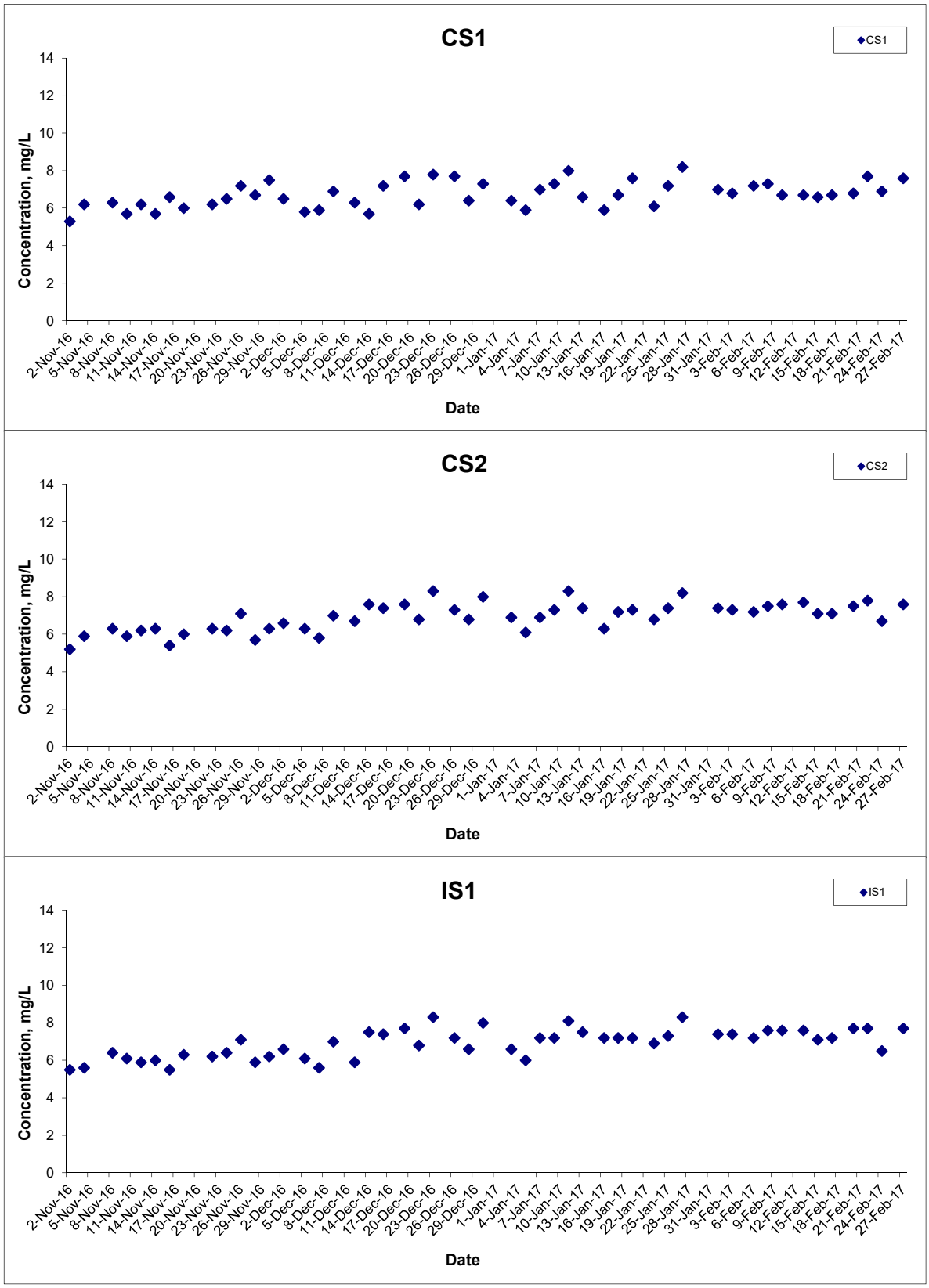
Dissolved Oxygen (Bottom) at Mid-Flood Tide



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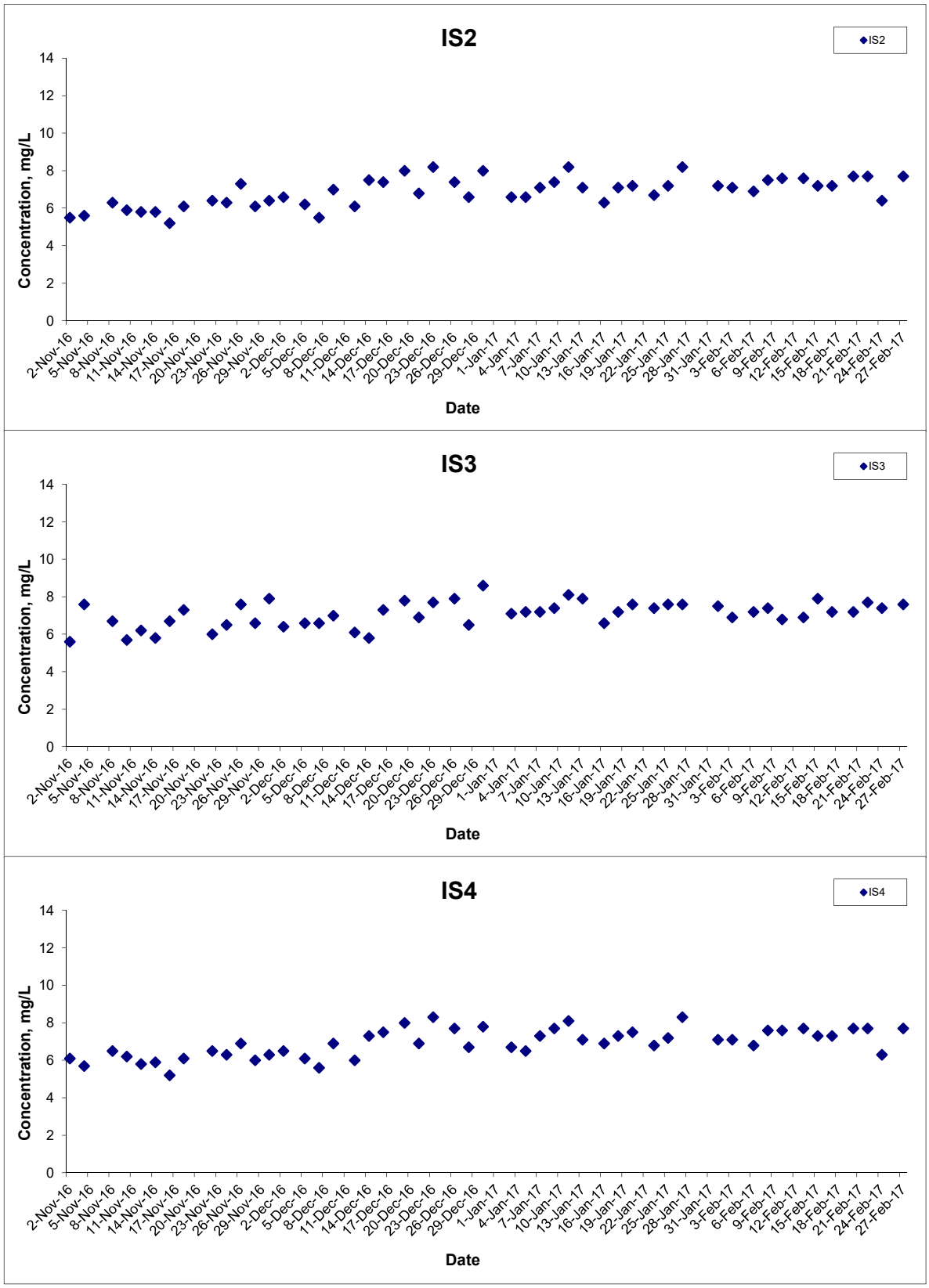
Dissolved Oxygen (Bottom) at Mid-Flood Tide



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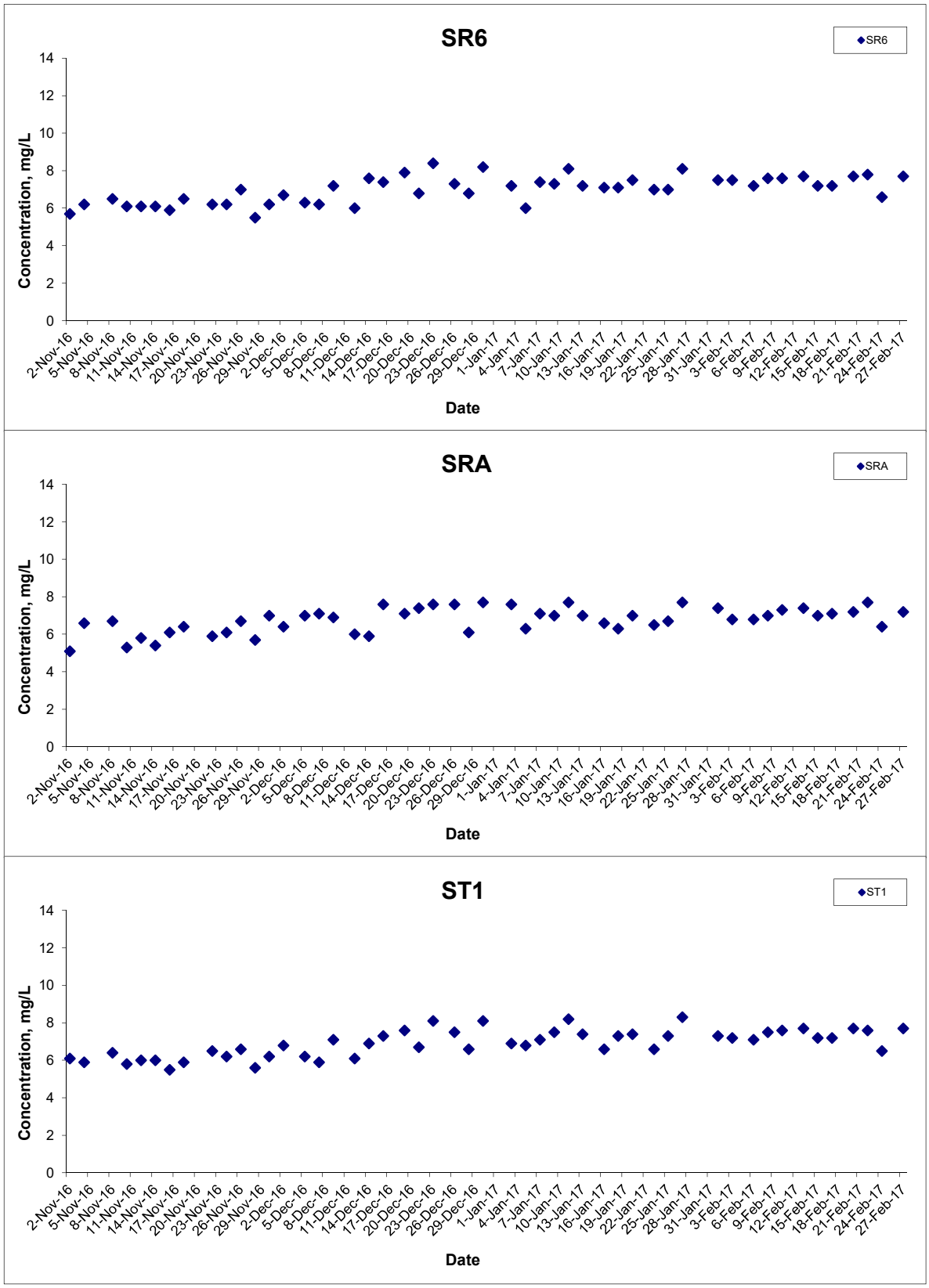
Dissolved Oxygen (Bottom) at Mid-Flood Tide



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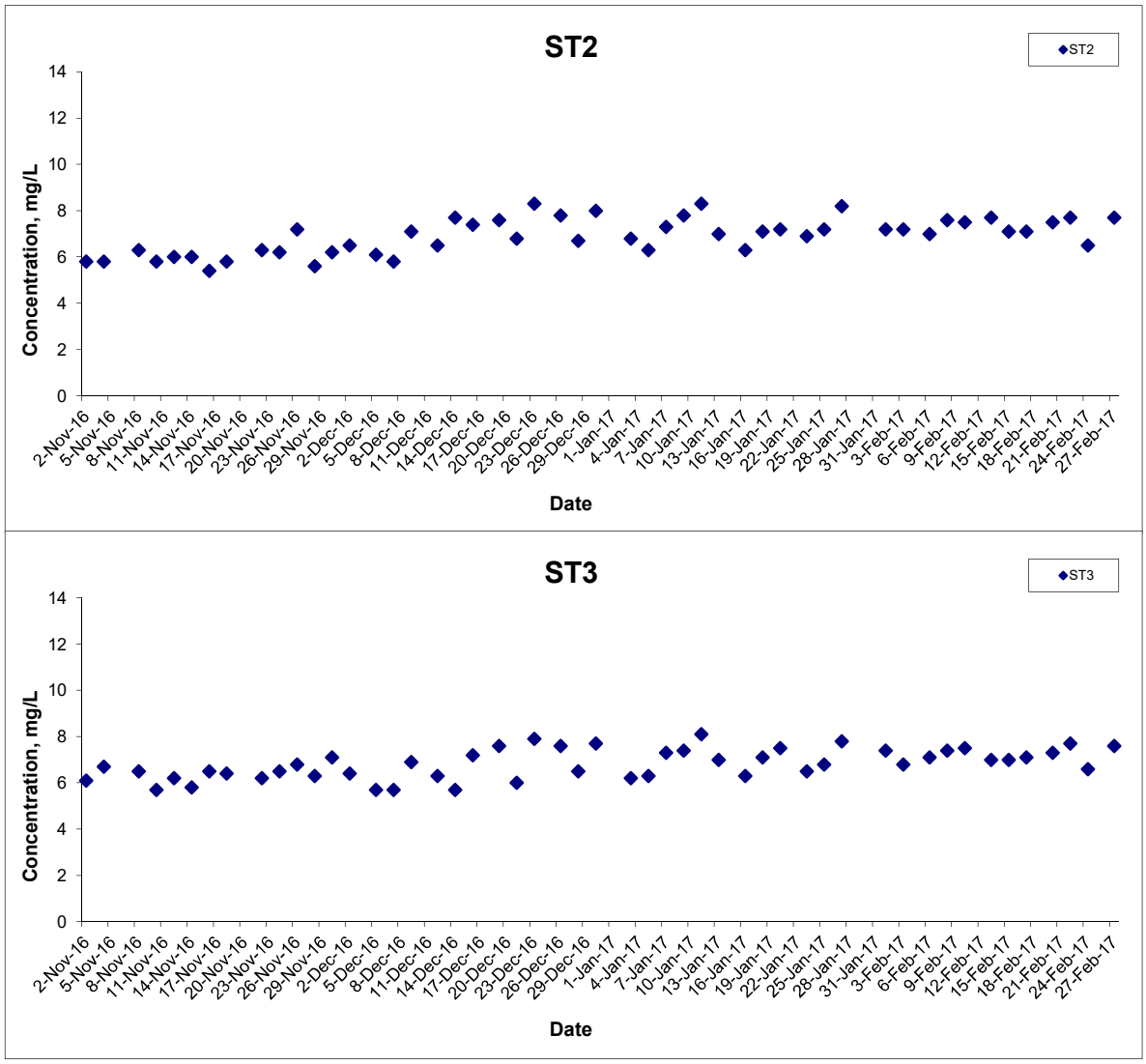
Dissolved Oxygen (Bottom) at Mid-Flood Tide



Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA12014	CINOTECH
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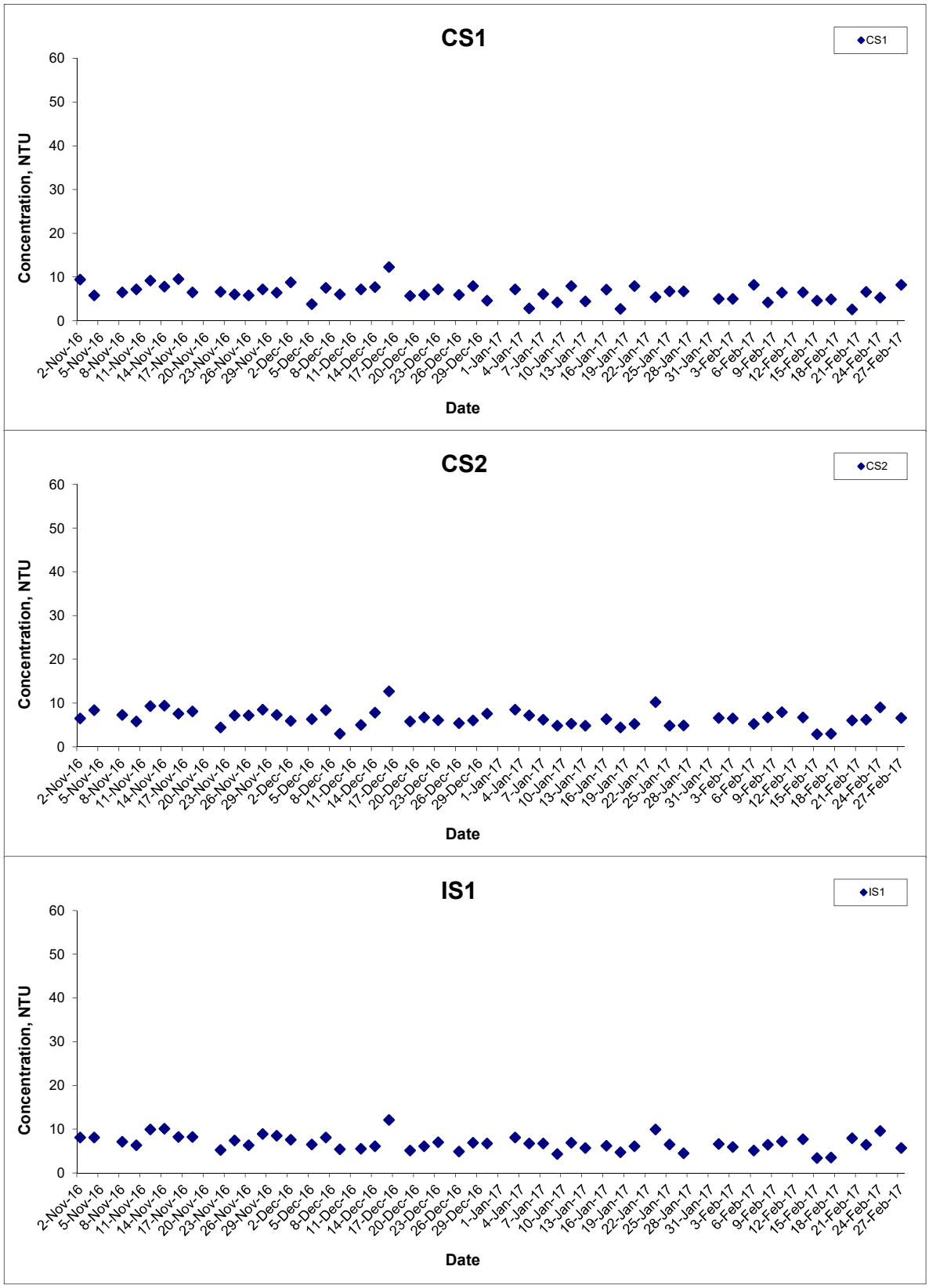
Turbidity (Depth-averaged) at Mid-Ebb Tide



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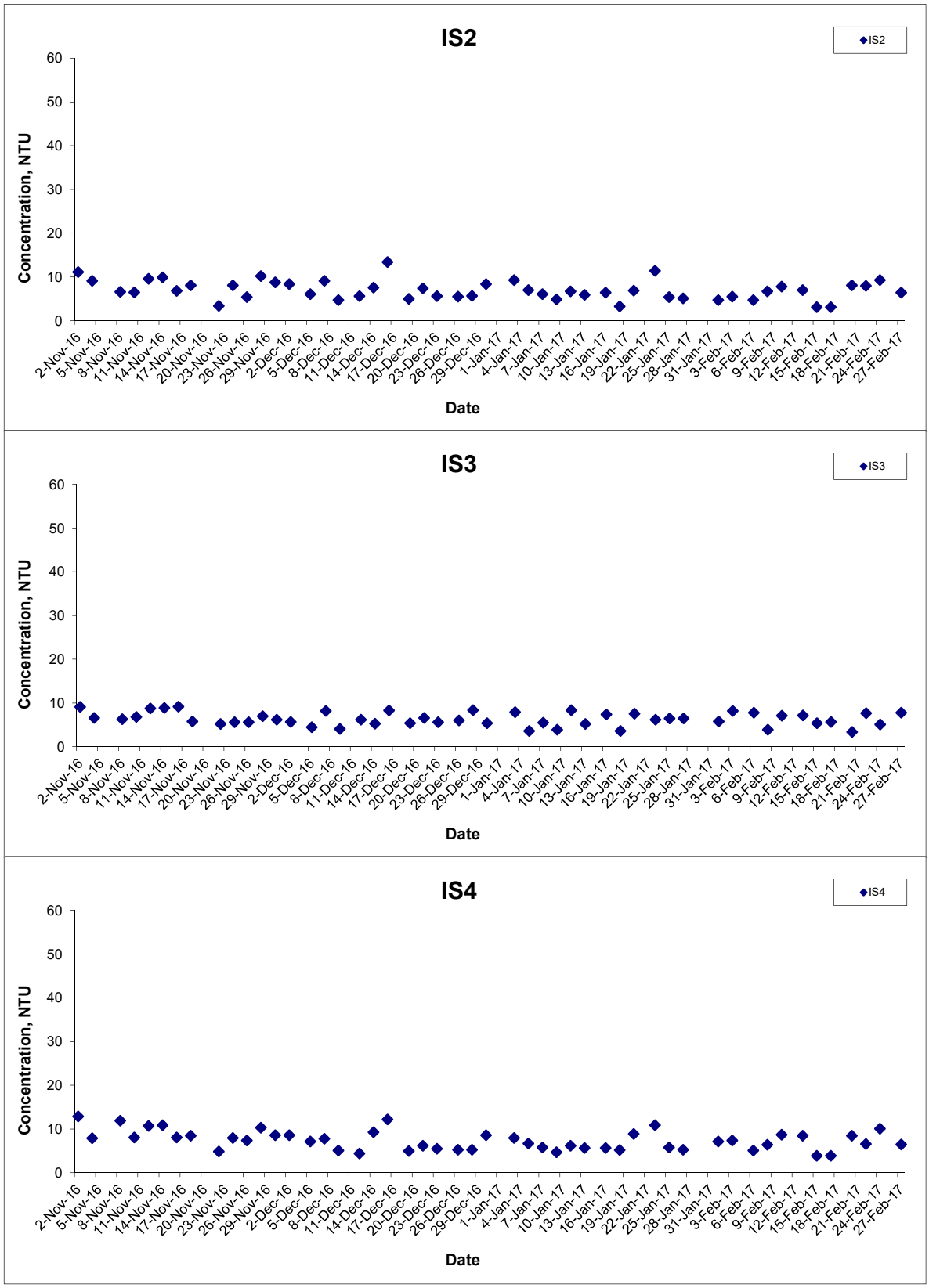
Turbidity (Depth-averaged) at Mid-Ebb Tide



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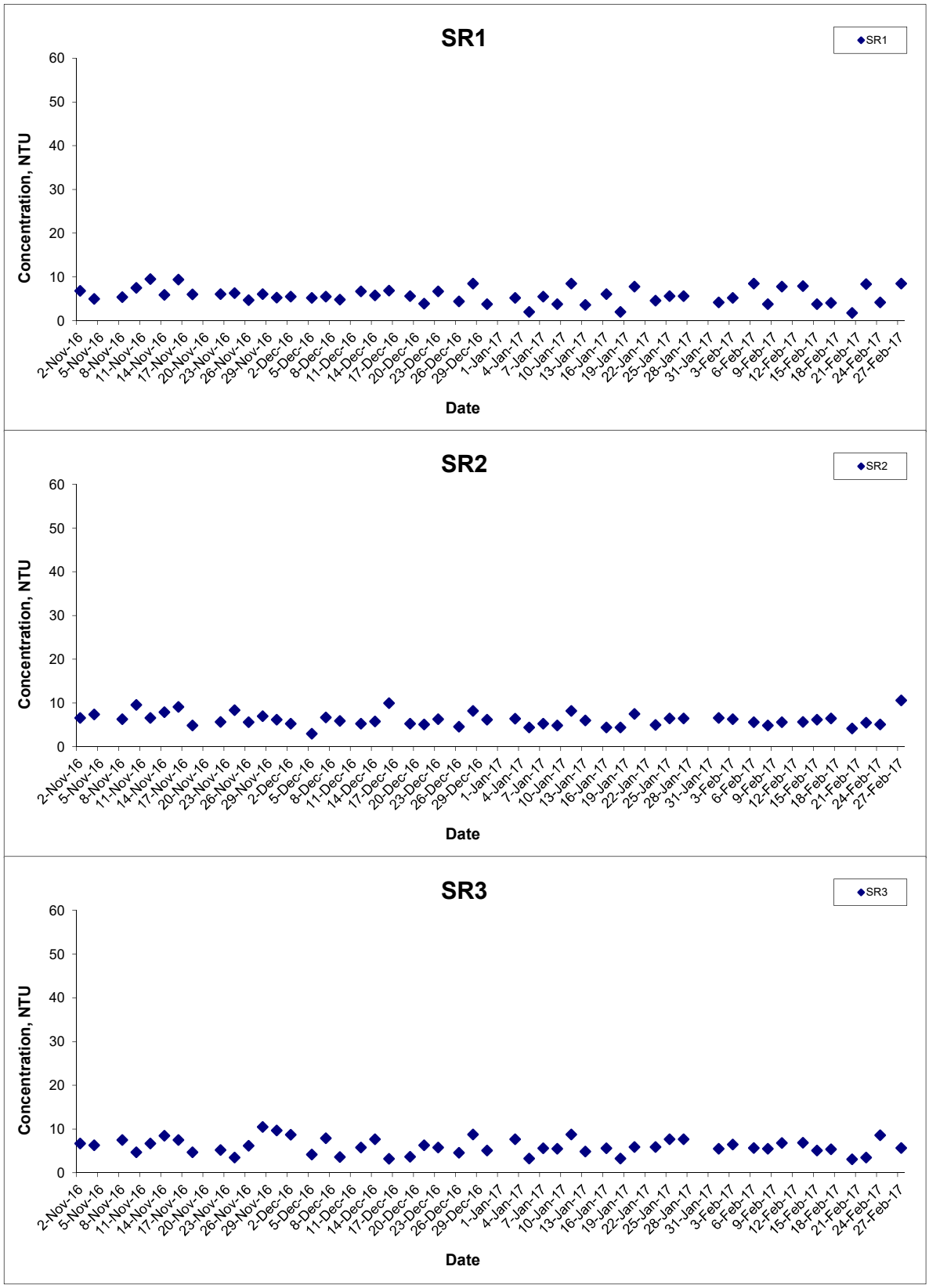
Turbidity (Depth-averaged) at Mid-Ebb Tide



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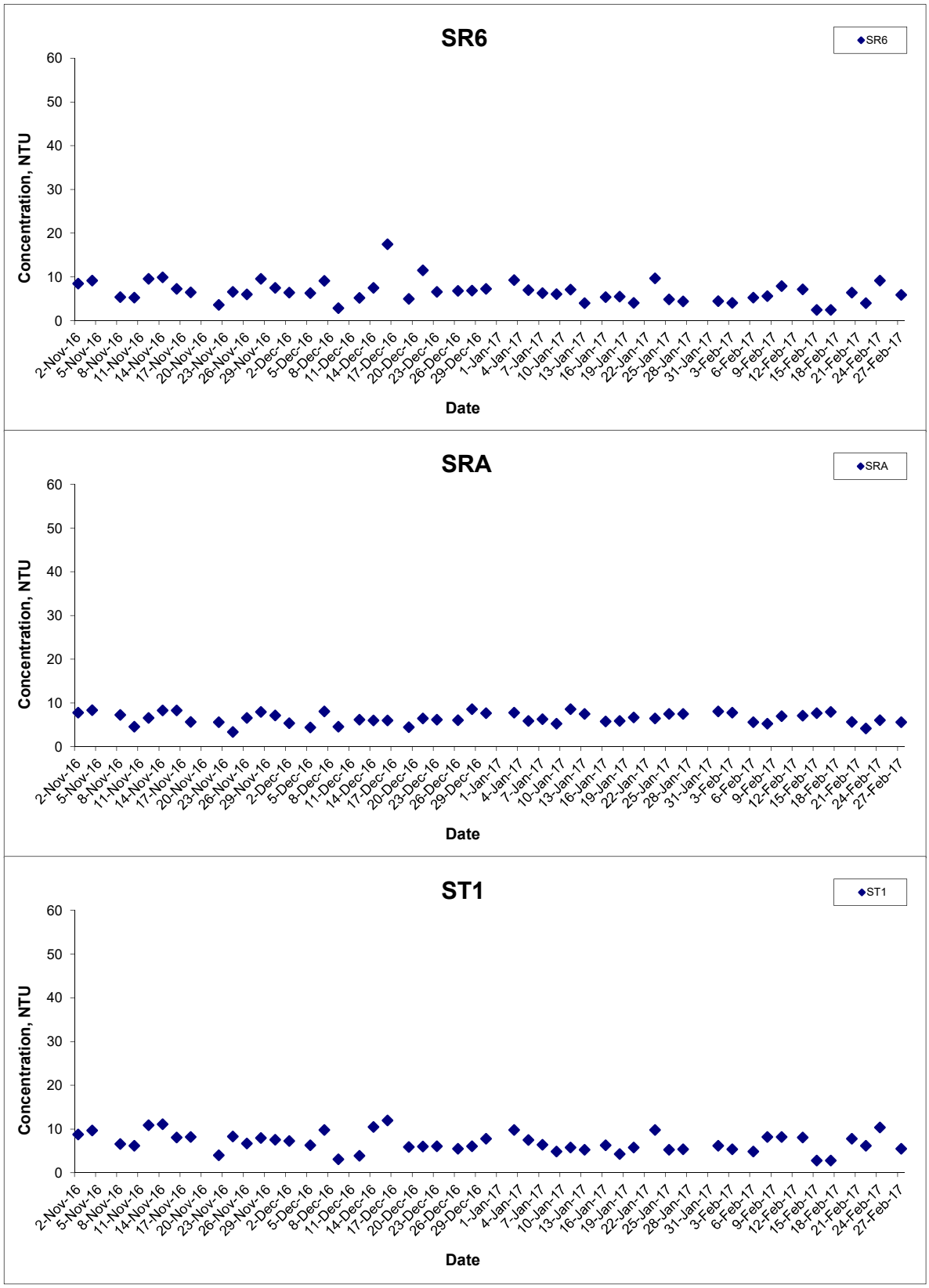
Turbidity (Depth-averaged) at Mid-Ebb Tide



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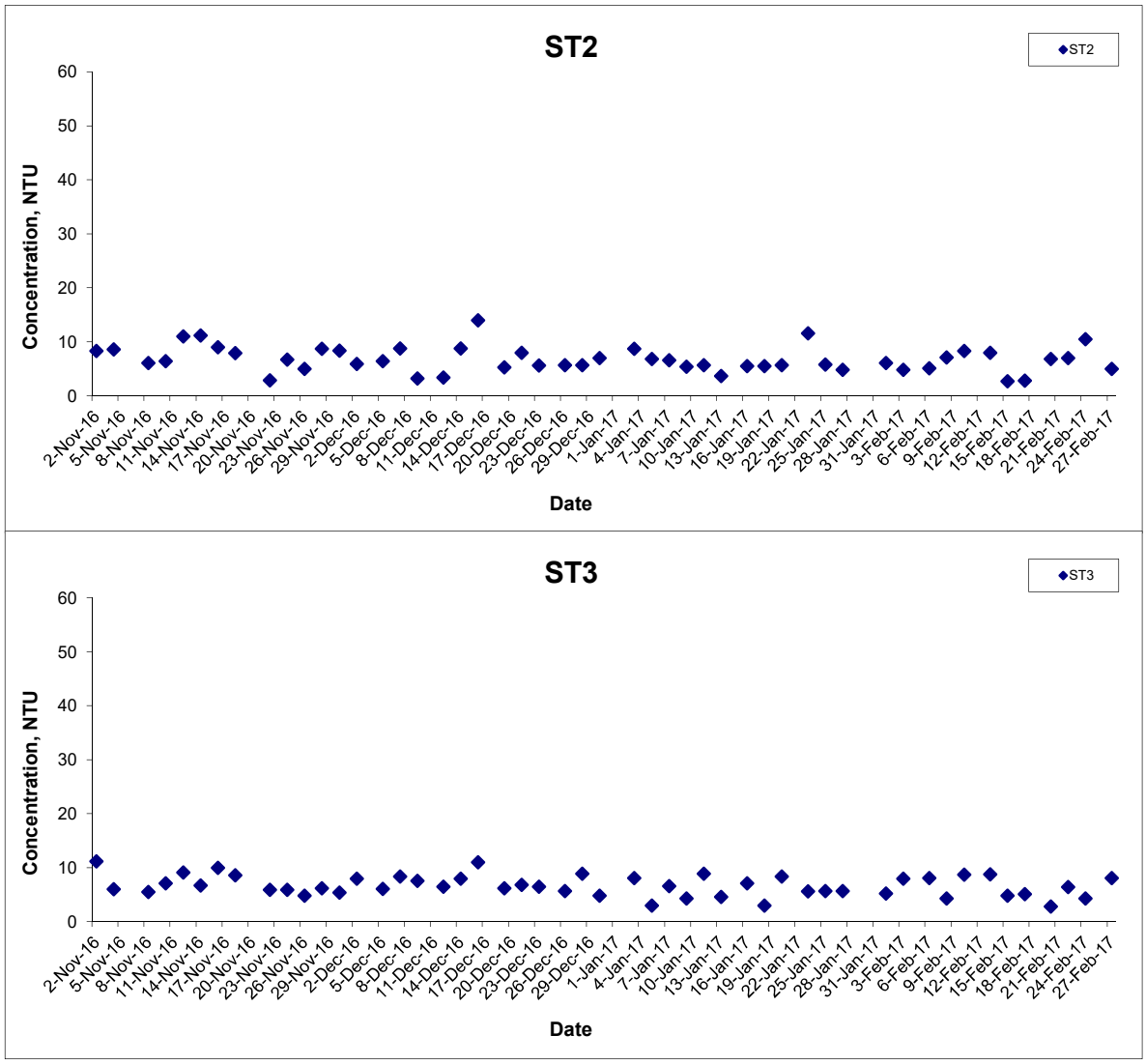
Turbidity (Depth-averaged) at Mid-Ebb Tide



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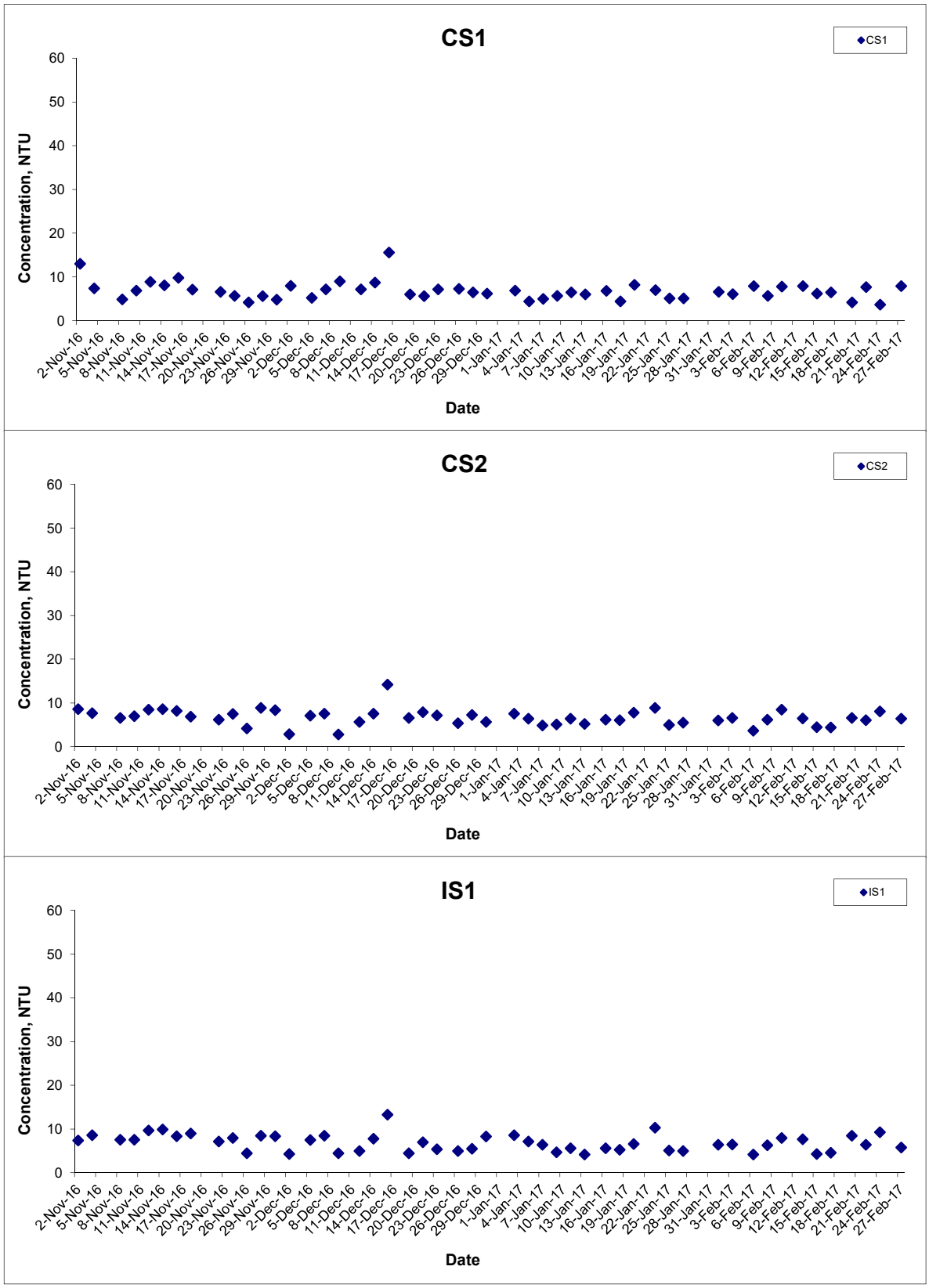
Turbidity (Depth-averaged) at Mid-Flood Tide



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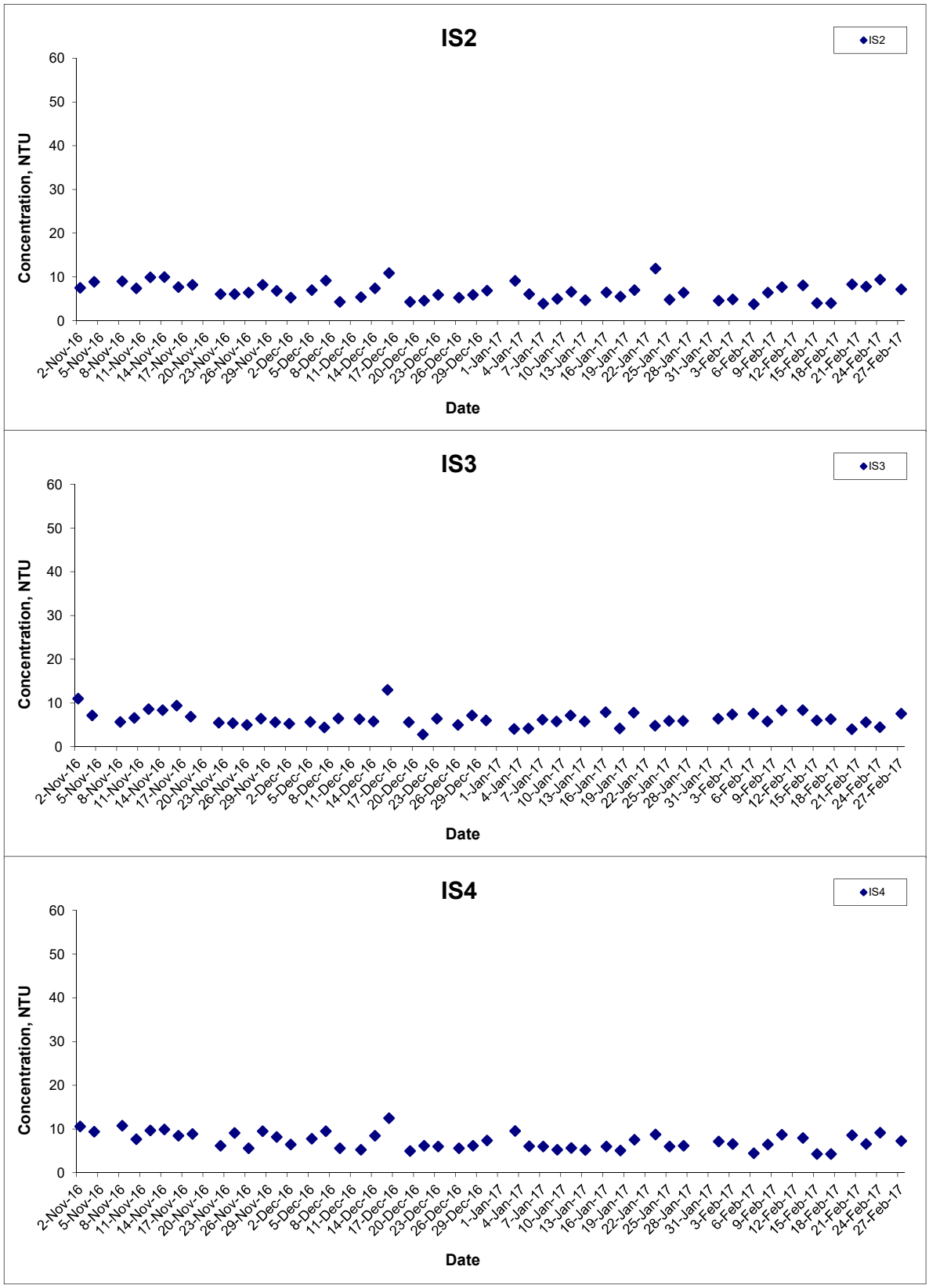
Turbidity (Depth-averaged) at Mid-Flood Tide



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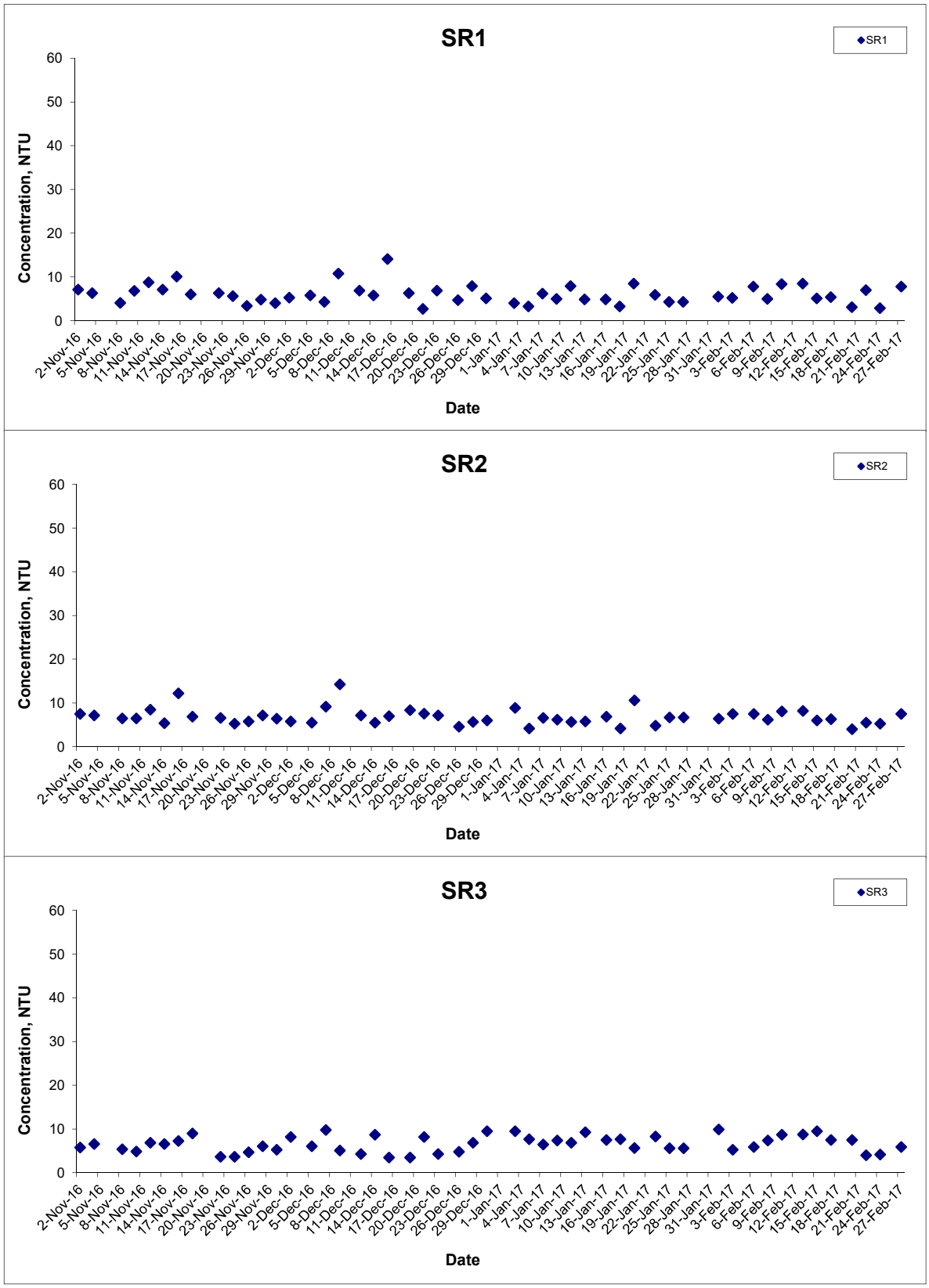
Turbidity (Depth-averaged) at Mid-Flood Tide



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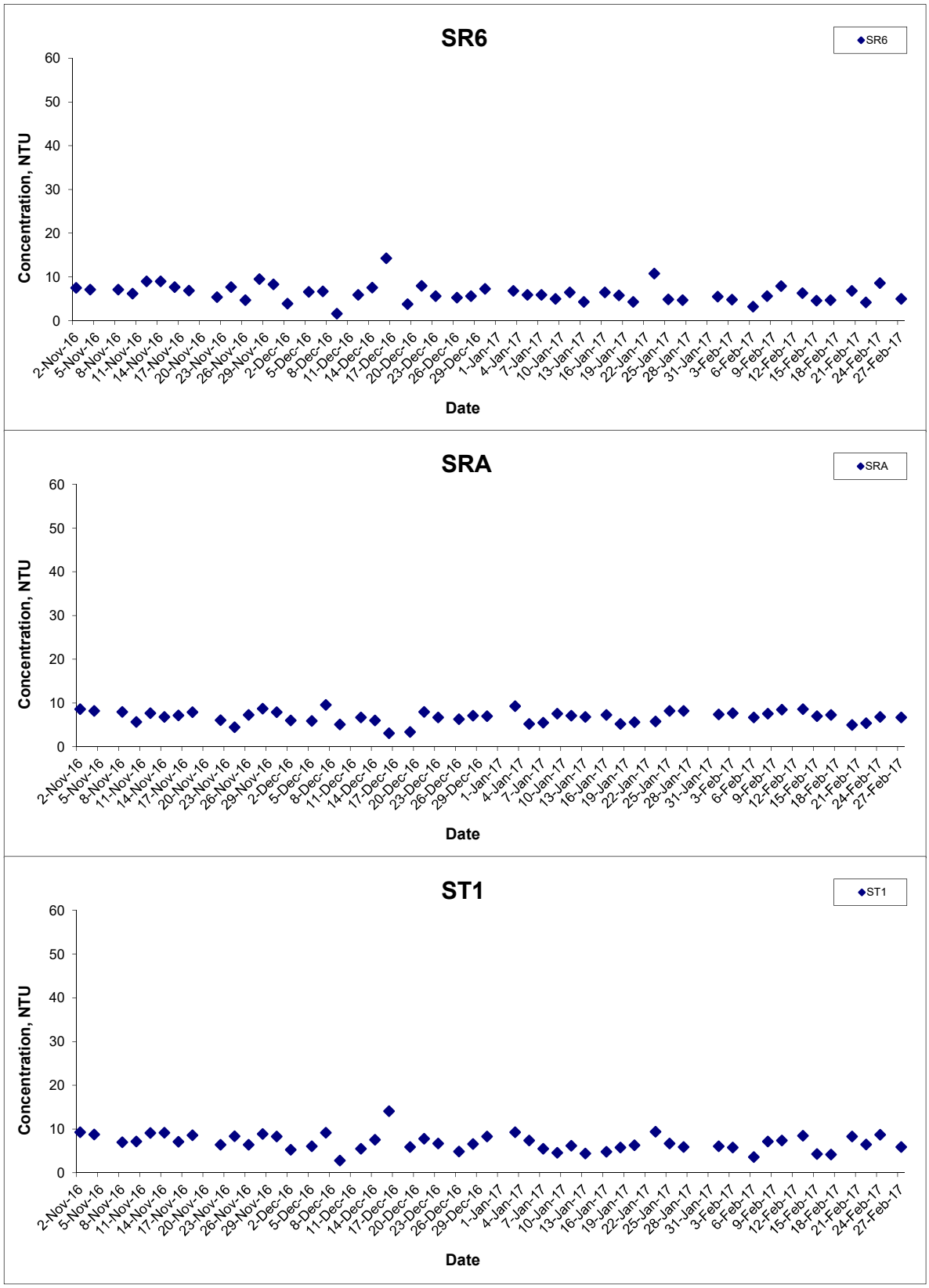
Turbidity (Depth-averaged) at Mid-Flood Tide



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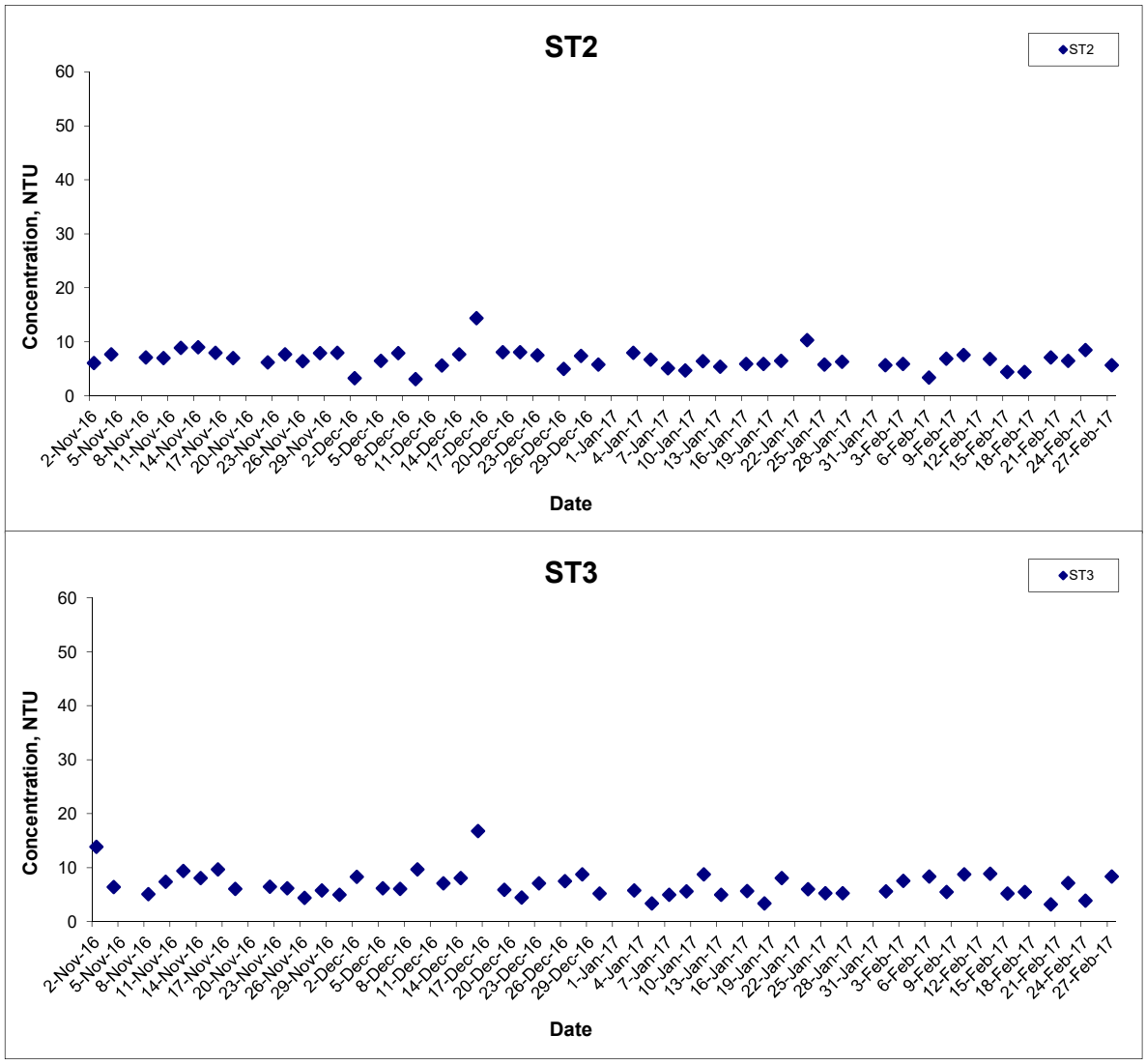
Turbidity (Depth-averaged) at Mid-Flood Tide



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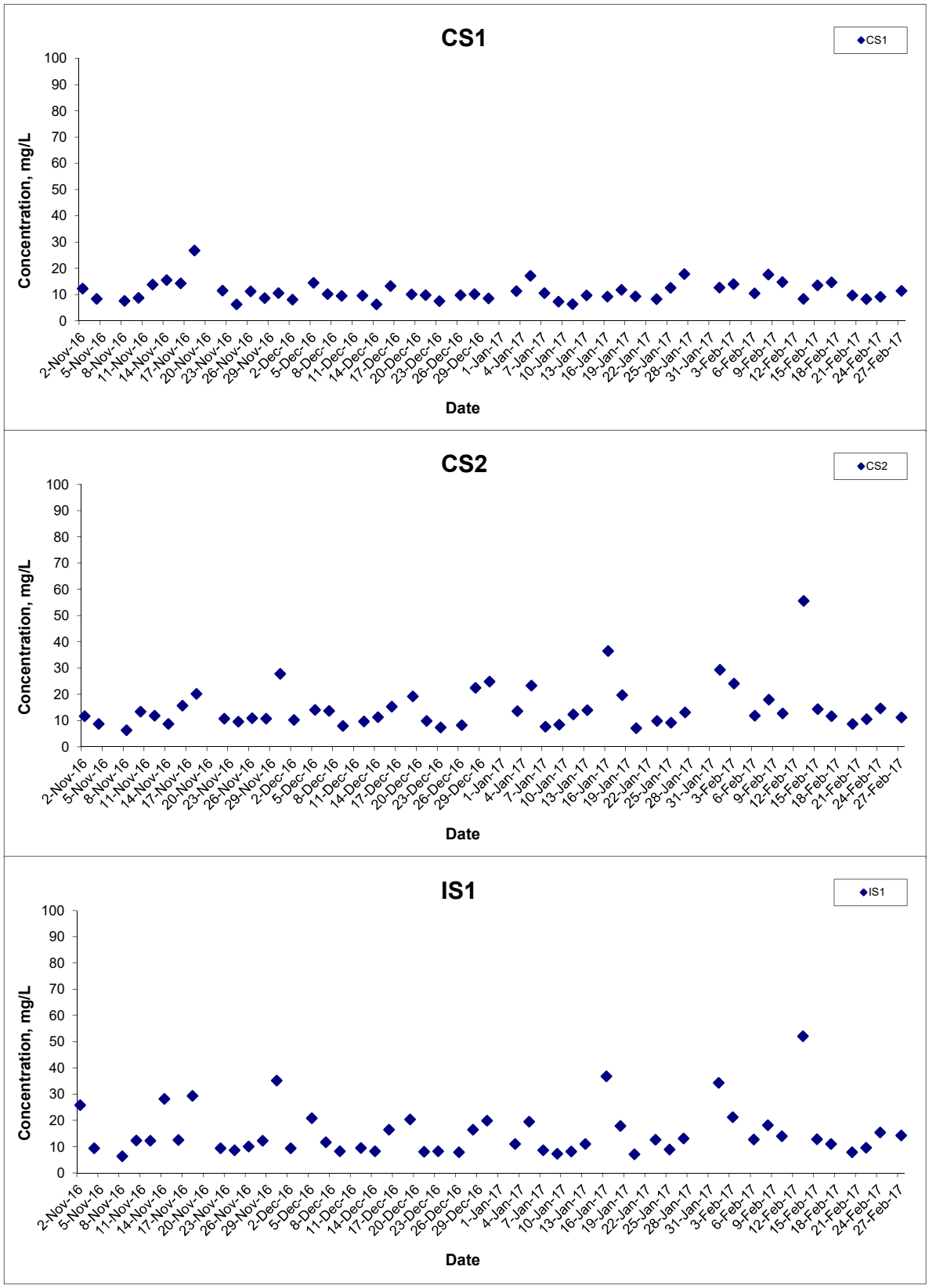
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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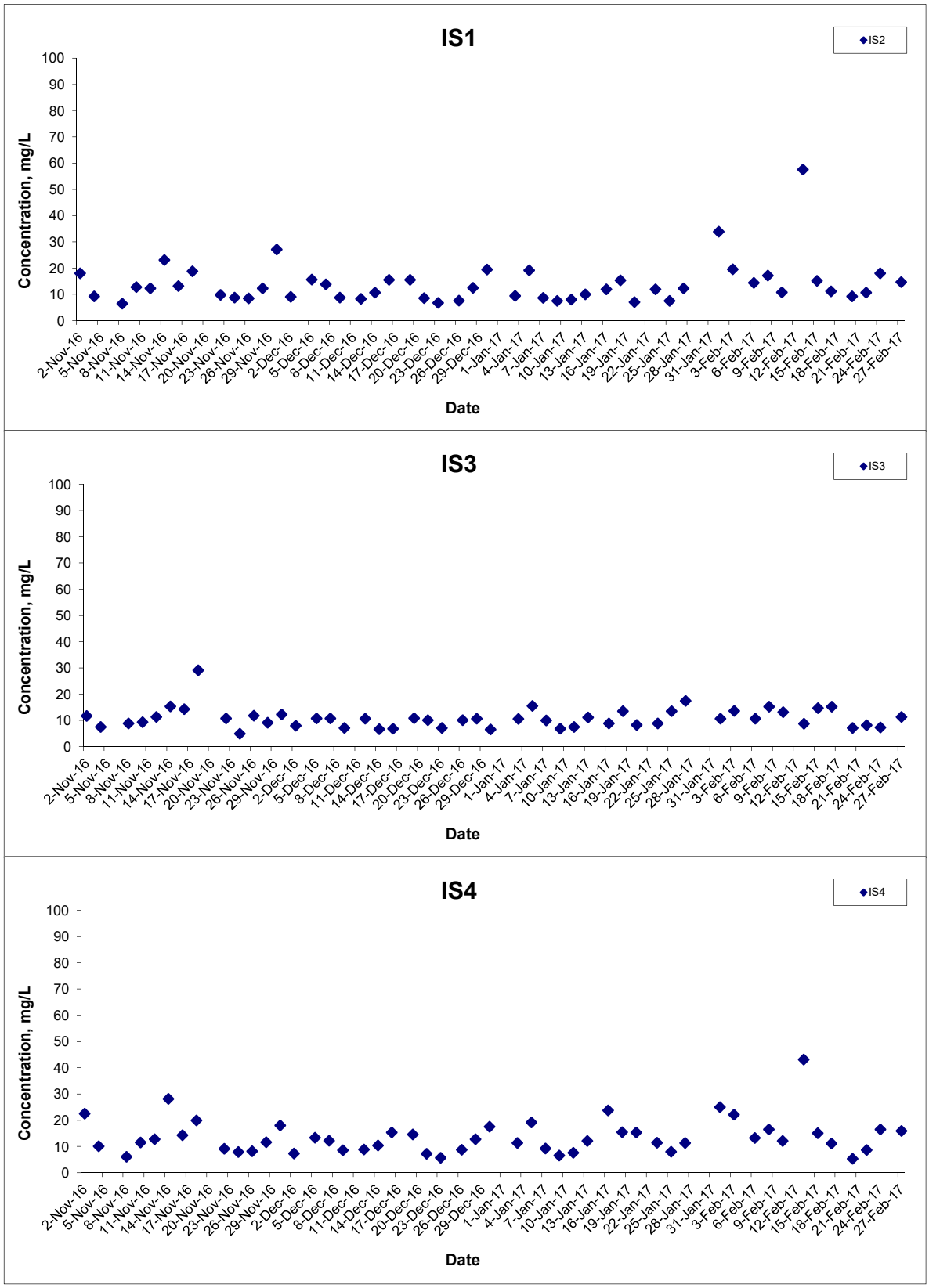
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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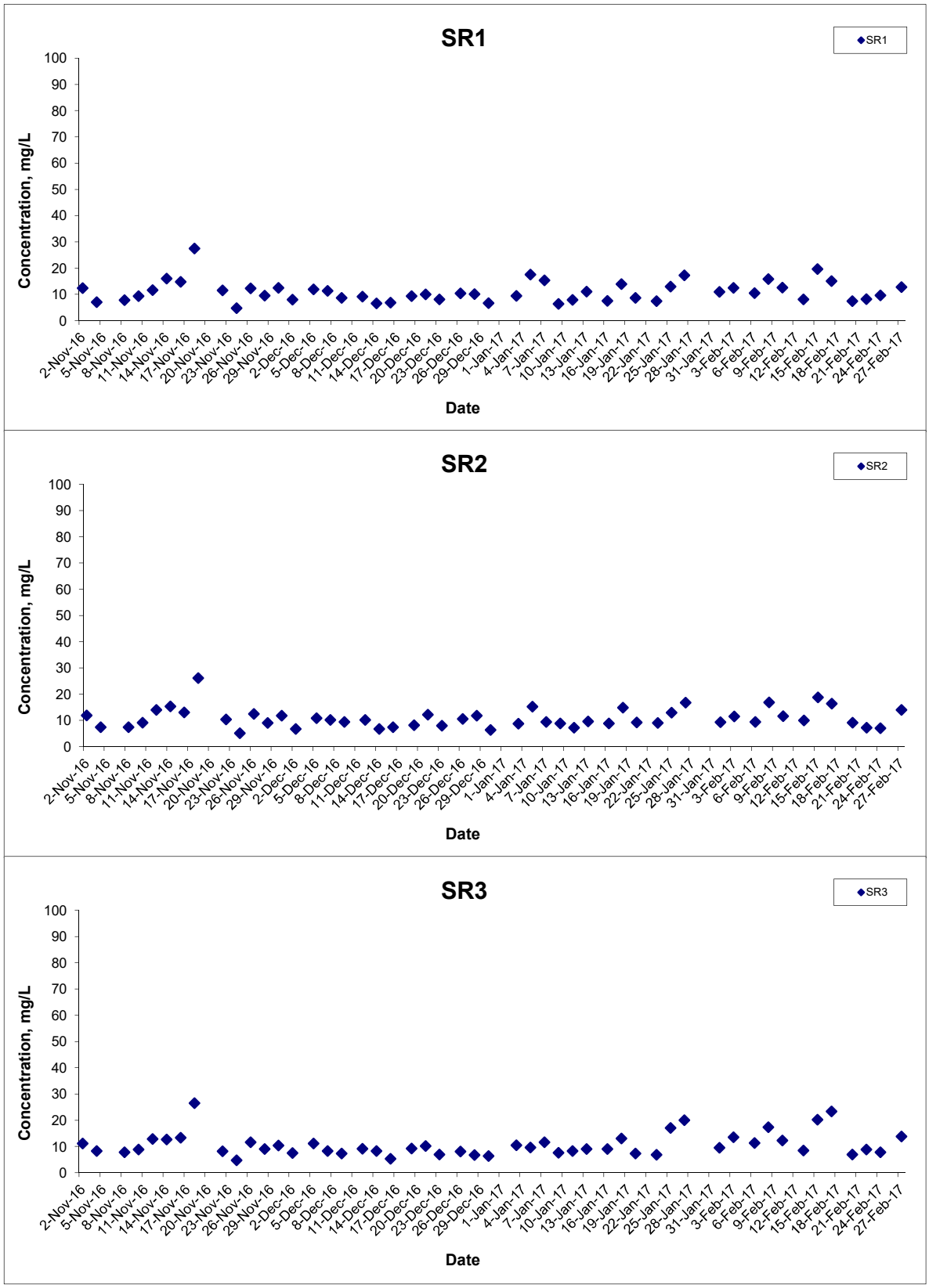
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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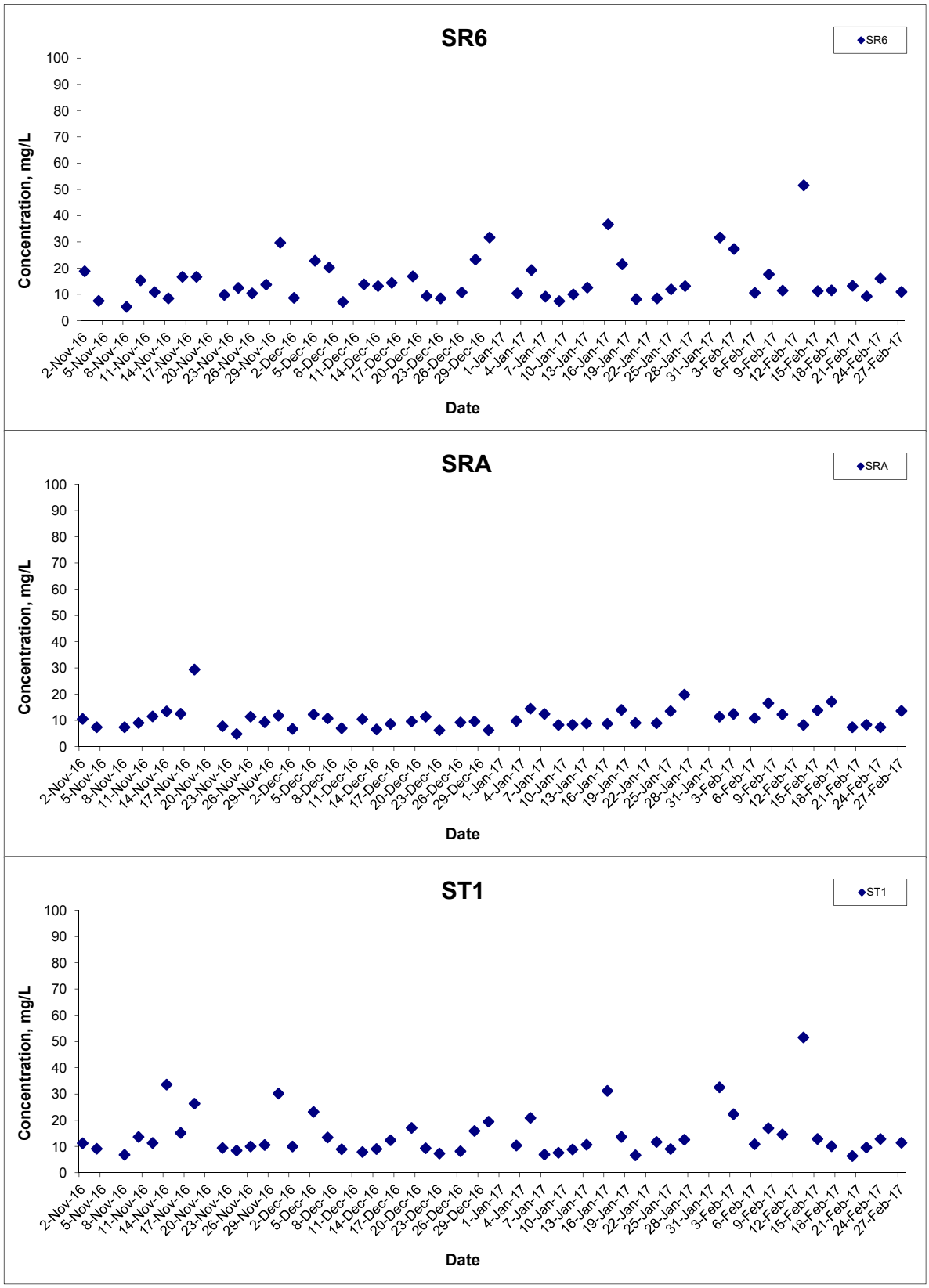

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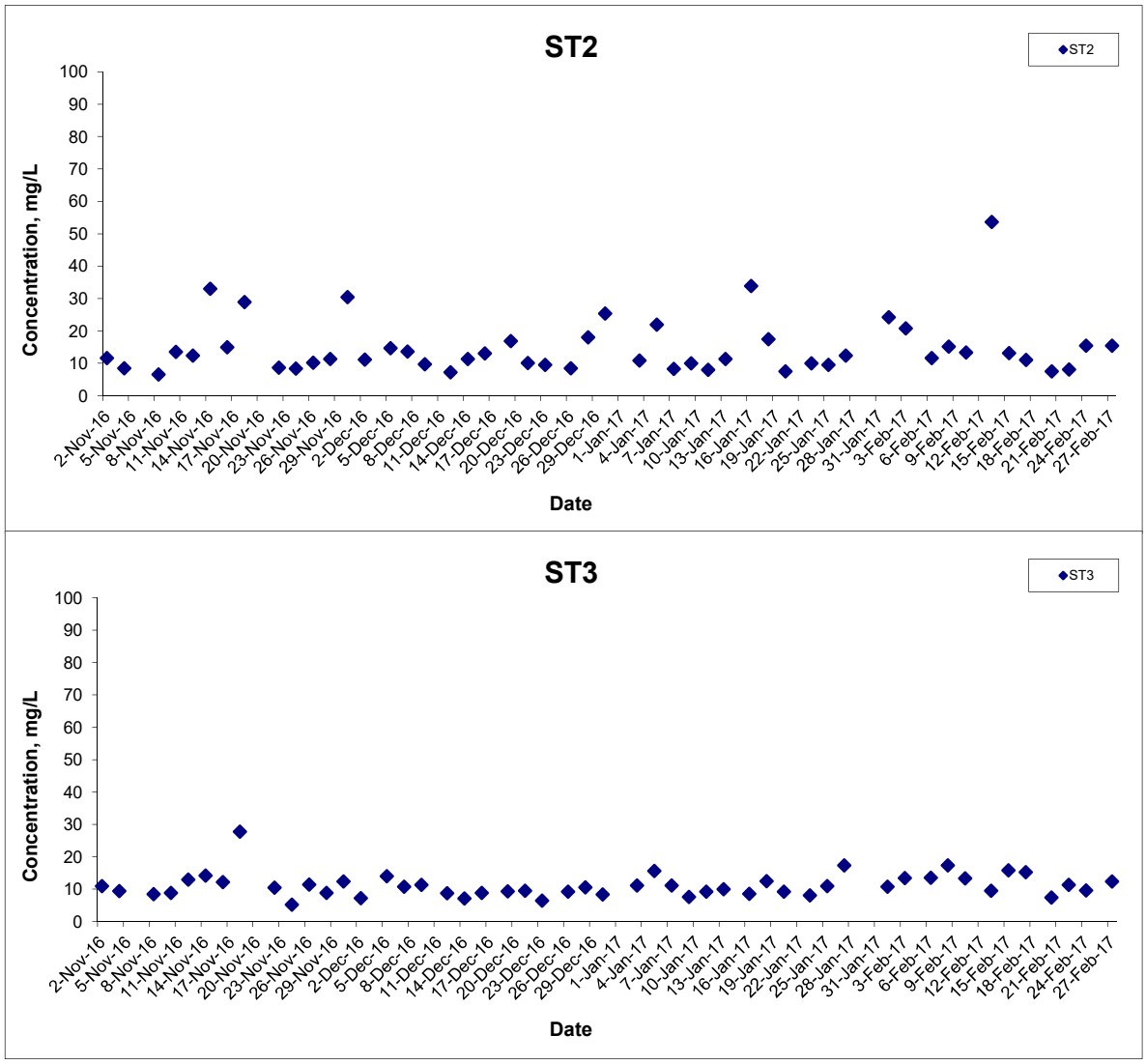
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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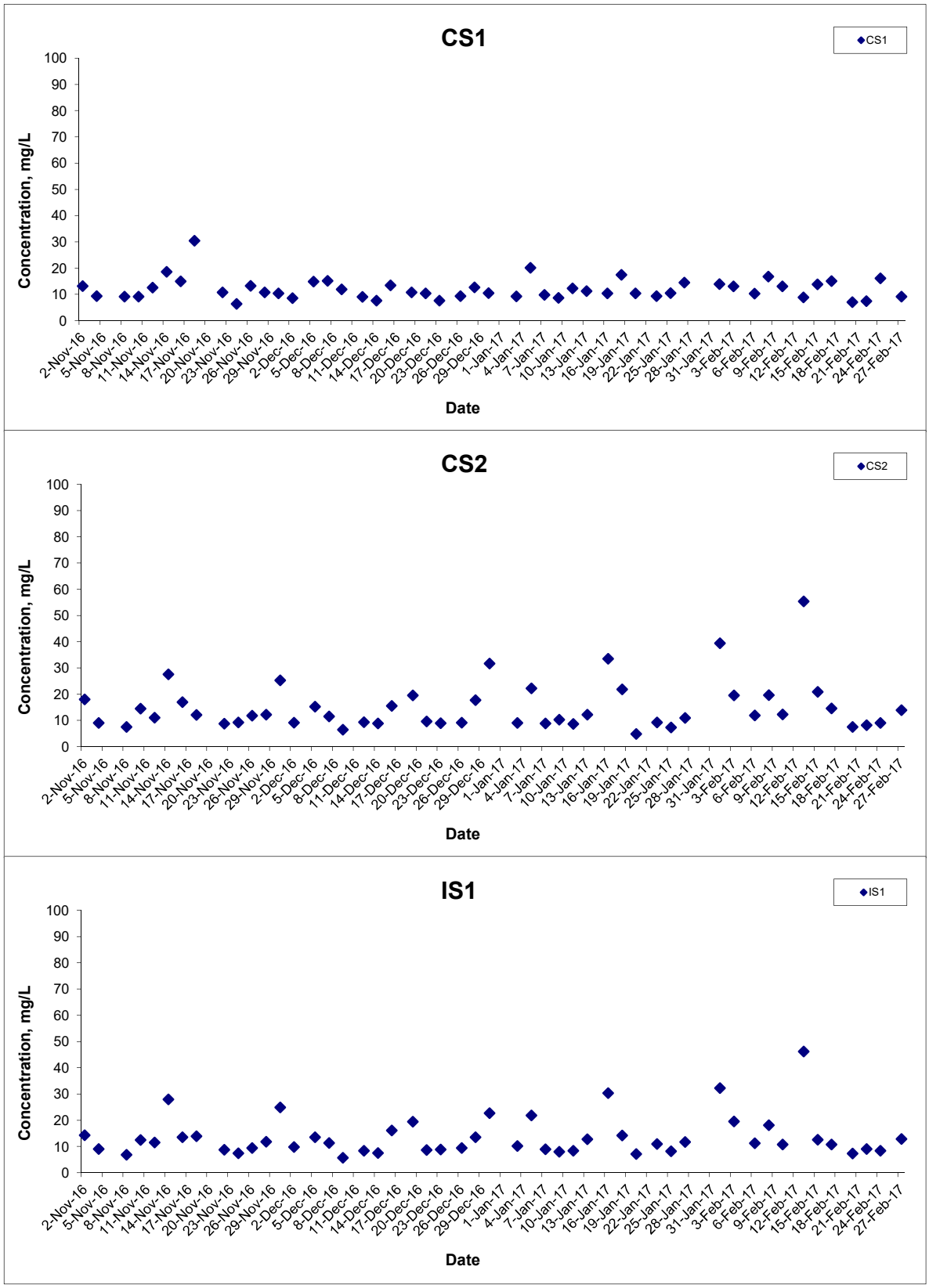
Suspended Solids (Depth-averaged) at Mid-Flood Tide



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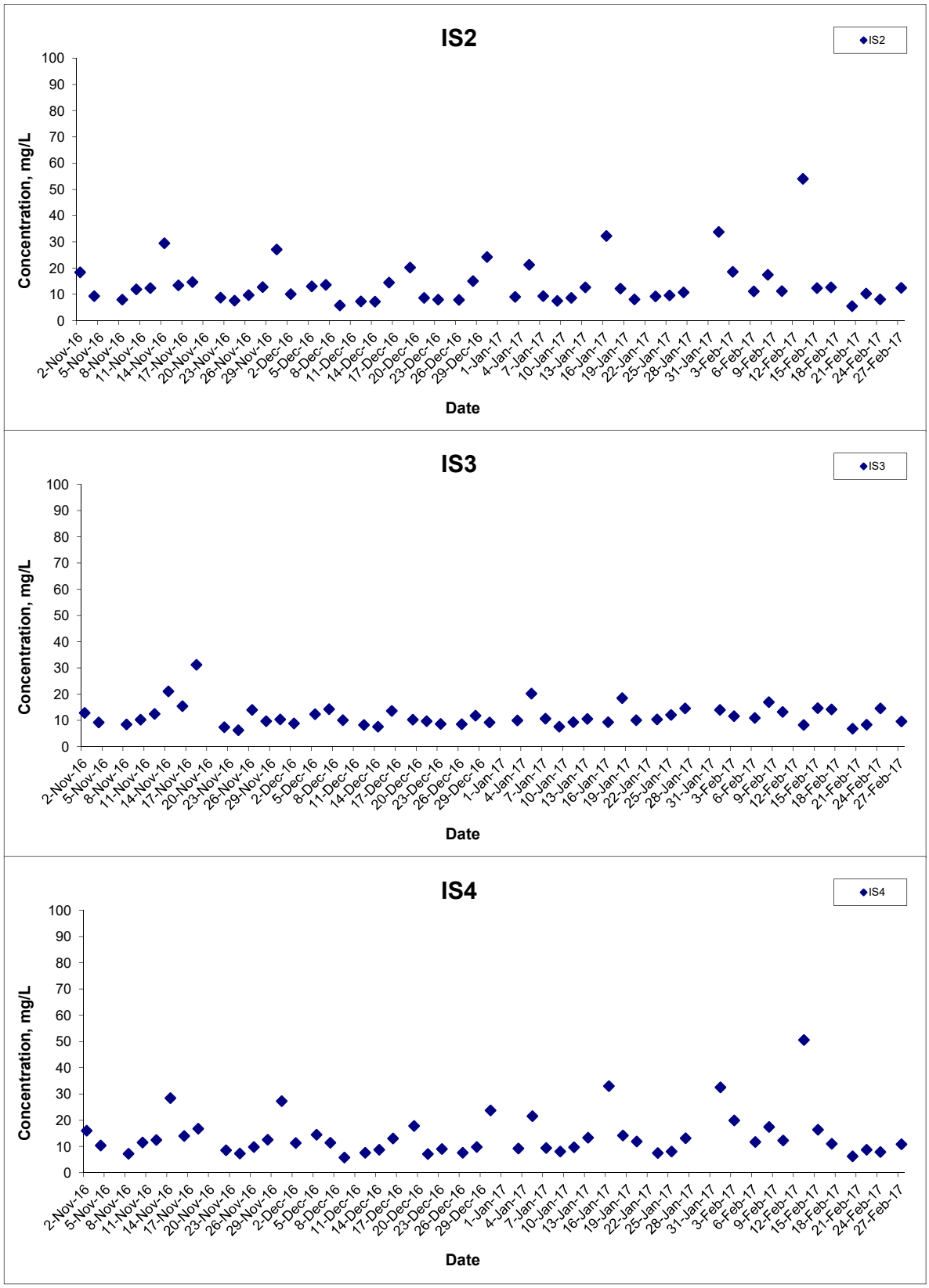
Suspended Solids (Depth-averaged) at Mid-Flood Tide



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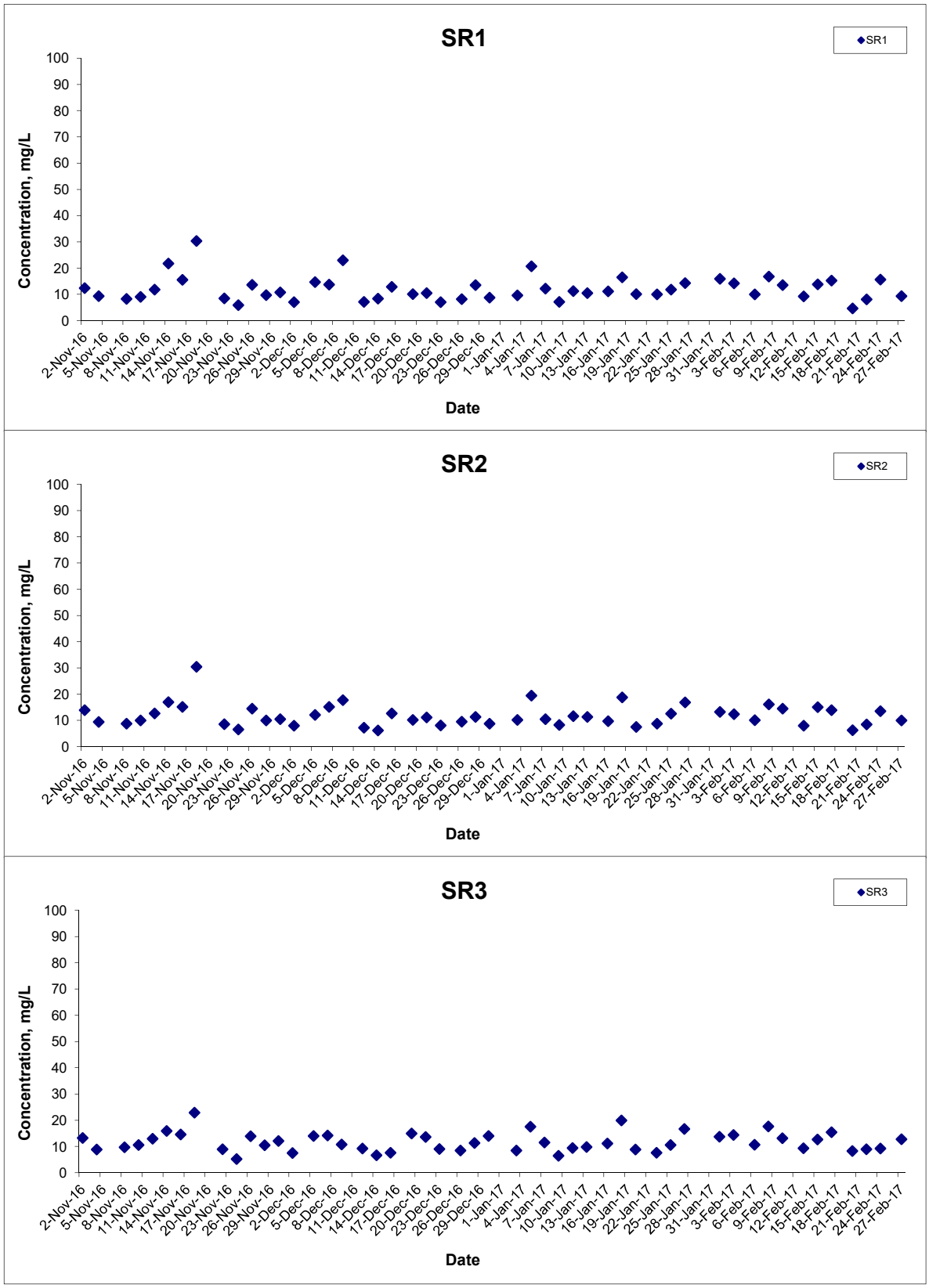
Suspended Solids (Depth-averaged) at Mid-Flood Tide



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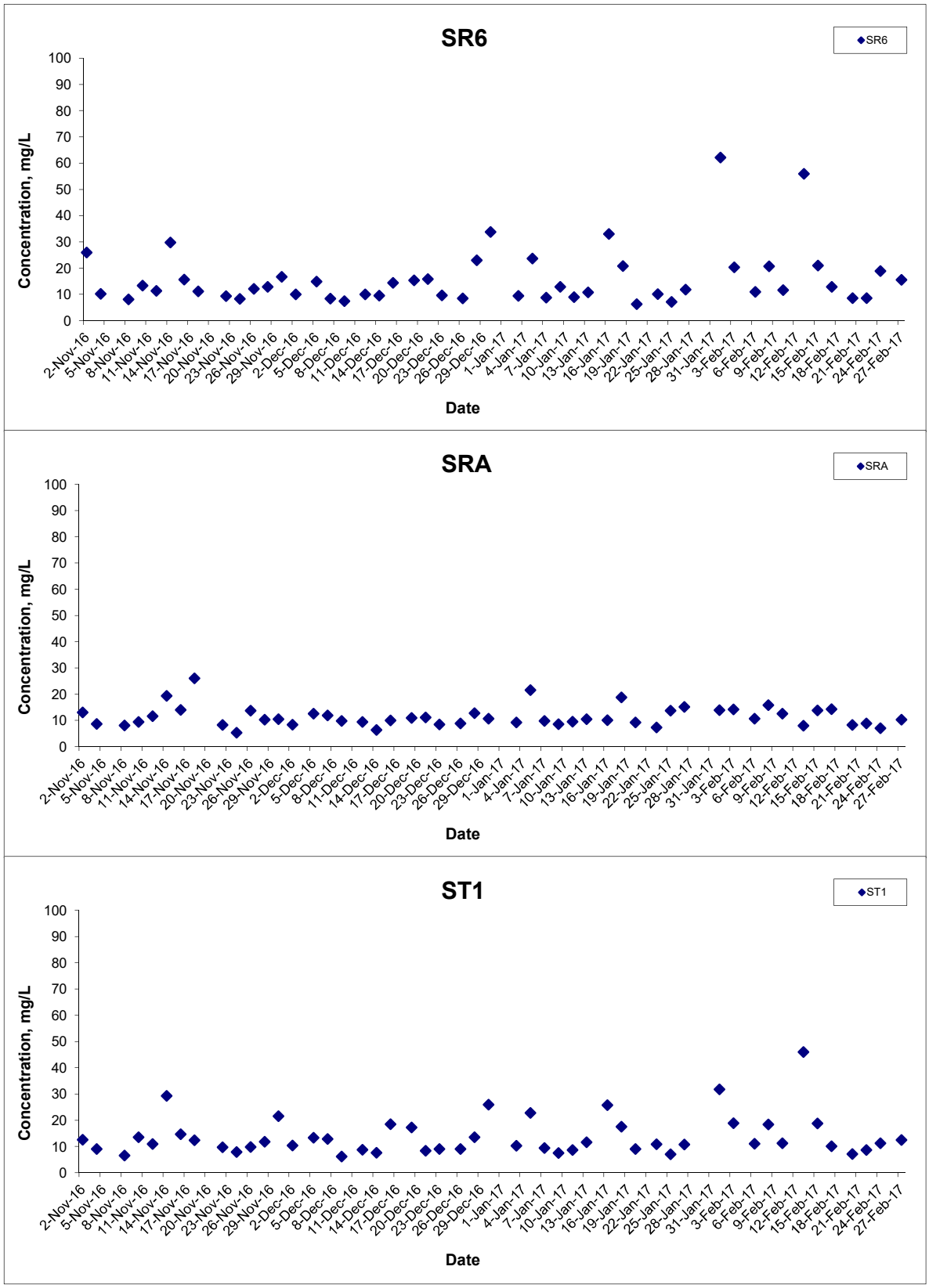

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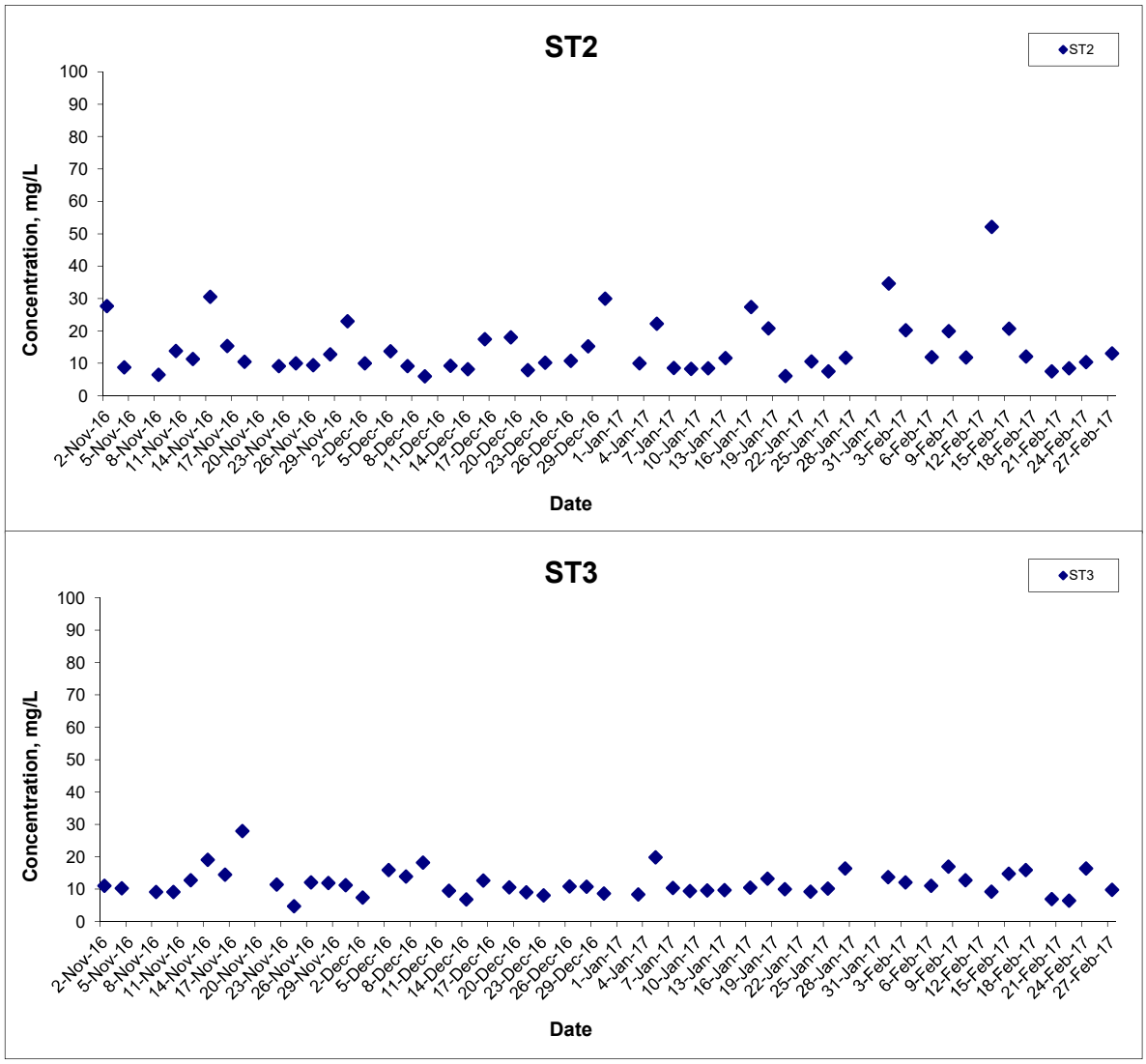

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APPENDIX I
DOLPHIN MONITORING REPORT
(LINE TRANSECT)

Contract No. HY/2011/09
Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Dolphin Monthly Monitoring

49th Monthly Progress Report (February 2017)

Submitted by
Samuel K.Y. Hung, Ph.D., Hong Kong Cetacean Research Project

3 March 2017

1. Introduction

1.1. The Hong Kong Link Road (HKLR) serves to connect the Hong Kong-Zhuhai-Macao Bridge (HZMB) Main Bridge at the Hong Kong Special Administrative Region (HKSAR) Boundary and the HZMB Hong Kong Boundary Crossing Facilities (HKBCF) located at the northeastern waters of the Hong Kong International Airport.

1.2. According to the updated Environmental Monitoring and Audit (EM&A) Manual (for HKLR), monthly line-transect vessel surveys for Chinese White Dolphin should be conducted to cover the West Lantau survey area as in AFCD annual marine mammal monitoring programme.

1.3. Since November 2012, Hong Kong Cetacean Research Project (HKCRP) has been commissioned by Dragages – China Harbour – VSL JV to conduct this 34-month dolphin monitoring study in order to collect data on Chinese White Dolphins during the construction phase (i.e. impact period) of the HKLR09 project in West Lantau (WL) survey area, and to analyze the collected survey data to monitor distribution, encounter rate, abundance, activities and occurrence of dolphin calves. Photo-identification will also be collected from individual Chinese White Dolphins to examine their individual range patterns and core area use.

1.4. From the monitoring results, any changes in dolphin occurrence within the study area will be examined for possible causes, and appropriate actions and additional

mitigation measures will be recommended as necessary.

1.5. This report is the 49th monthly progress report under the HKLR09 construction phase dolphin monitoring programme, summarizing the results of the survey findings during the month of February 2017.

2. Monitoring Methodology

2.1. Vessel-based Line-transect Survey

2.1.1. According to the requirement of the updated EM&A manual, dolphin monitoring programme should cover all transect lines in WL survey area (see Figure 1) twice per month throughout the entire construction period. The co-ordinates of all transect lines are shown in Table 1.

Table 1. Co-ordinates of transect lines in WL survey area

Line No.		Easting	Northing		Line No.		Easting	Northing
1	Start Point	803750	818500		7	Start Point	800200	810450
1	End Point	803750	815500		7	End Point	801400	810450
2	Start Point	803750	815500		8	Start Point	801300	809450
2	End Point	802940	815500		8	End Point	799750	809450
3	Start Point	802550	814500		9	Start Point	799400	808450
3	End Point	803700	814500		9	End Point	801430	808450
4	Start Point	803120	813600		10	Start Point	801500	807450
4	End Point	801640	813600		10	End Point	799600	807450
5	Start Point	801100	812450		11	Start Point	800300	806500
5	End Point	802900	812450		11	End Point	801750	806500
6	Start Point	802400	811500		12	Start Point	801760	805450
6	End Point	800660	811500		12	End Point	800700	805450

2.1.2. The survey team used standard line-transect methods (Buckland et al. 2001) to conduct the systematic vessel surveys, and followed the same technique of data collection that has been adopted over the last 19 years of marine

mammal monitoring surveys in Hong Kong developed by HKCRP (see Hung 2014, 2015). For each monitoring vessel survey, a 15-m inboard vessel with an open upper deck (about 4.5 m above water surface) was used to make observations from the flying bridge area.

2.1.3. Two experienced observers (a data recorder and a primary observer) made up the on-effort survey team, and the survey vessel transited different transect lines at a constant speed of 13-15 km per hour. The data recorder searched with unaided eyes and filled out the datasheets, while the primary observer searched for dolphins and porpoises continuously through 7 x 50 *Fujinon* marine binoculars. Both observers searched the sea ahead of the vessel, between 270^{o} and 90^{o} (in relation to the bow, which is defined as 0^{o}). One to two additional experienced observers were available on the boat to work in shift (i.e. rotate every 30 minutes) in order to minimize fatigue of the survey team members. All observers were experienced in small cetacean survey techniques and identifying local cetacean species.

2.1.4. During on-effort survey periods, the survey team recorded effort data including time, position (latitude and longitude), weather conditions (Beaufort sea state and visibility), and distance traveled in each series (a continuous period of search effort) with the assistance of a handheld GPS.

2.1.5. Data including time, position and vessel speed were also automatically and continuously logged by handheld GPS throughout the entire survey for subsequent review.

2.1.6. When dolphins were sighted, the survey team would end the survey effort, and immediately record the initial sighting distance and angle of the dolphin group from the survey vessel, as well as the sighting time and position. Then the research vessel was diverted from its course to approach the animals for species identification, group size estimation, assessment of group composition, and behavioural observations. The perpendicular distance (PSD) of the dolphin group to the transect line was later calculated from the initial sighting distance and angle.

2.1.7. Survey effort being conducted along the parallel transect lines that were perpendicular to the coastlines (as indicated in Figure 1) was labeled as “primary” survey effort, while the survey effort being conducted along the

connecting lines between parallel lines was labeled as “secondary” survey effort. According to HKCRP long-term dolphin monitoring data, encounter rates of Chinese white dolphins deduced from effort and sighting data collected along primary and secondary lines were similar in survey areas around Lantau Island. Therefore, primary and secondary survey effort were both presented as on-effort survey effort in this report.

2.1.8. Encounter rates of Chinese white dolphins (number of on-effort sightings per 100 km of survey effort) were calculated in WL survey area in relation to the amount of survey effort conducted during each month of monitoring survey. Only data collected under Beaufort 3 or below condition would be used for encounter rate analysis. Dolphin encounter rates were calculated using primary survey effort alone, as well as the combined survey effort from both primary and secondary lines.

2.2. Photo-identification Work

2.2.1. When a group of Chinese White Dolphins were sighted during the line-transect survey, the survey team would end effort and approach the group slowly from the side and behind to take photographs of them. Every attempt was made to photograph every dolphin in the group, and even photograph both sides of the dolphins, since the colouration and markings on both sides may not be symmetrical.

2.2.2. A professional digital camera (*Canon* EOS 7D or 60D model) equipped with long telephoto lenses (100-400 mm zoom) were available on board for researchers to take sharp, close-up photographs of dolphins as they surfaced. The images were shot at the highest available resolution and stored on Compact Flash memory cards for downloading onto a computer.

2.2.3. All digital images taken in the field were first examined, and those containing potentially identifiable individuals were sorted out. These photographs would then be examined in greater detail, and were carefully compared to the existing Chinese White Dolphin photo-identification catalogue maintained by HKCRP since 1995.

2.2.4. Chinese White Dolphins can be identified by their natural markings, such as nicks, cuts, scars and deformities on their dorsal fin and body, and their unique spotting patterns were also used as secondary identifying features

(Jefferson 2000).

2.2.5. All photographs of each individual were then compiled and arranged in chronological order, with data including the date and location first identified (initial sighting), re-sightings, associated dolphins, distinctive features, and age classes entered into a computer database.

3. Monitoring Results

3.1. Vessel-based Line-transect Survey

3.1.1. During the monitoring month of February 2017, two complete sets of systematic line-transect vessel surveys were conducted on the 6th and 13th, to cover all transect lines in WL survey area twice. The survey routes of each survey day are presented in Figures 2-3.

3.1.2. From these surveys, a total of 65.67 km of survey effort was collected, with 82.2% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility) (Appendix I). The total survey effort conducted on primary lines (the horizontal lines perpendicular to the coastlines) was 43.63 km, while the effort on secondary lines (the lines connecting the primary lines) was 22.04 km.

3.1.3. During the monitoring surveys conducted in February 2017, 10 groups of 36 Chinese White Dolphins were sighted. All dolphin sightings were made during on-effort search, and seven of the 10 on-effort sightings were made on primary lines (Appendix II).

3.1.4. Notably, two of the 10 dolphin groups were associated with operating fishing vessel, one with a single trawler and another one with a purse-seiner (Appendix II).

3.1.5. Distribution of the dolphin sightings made during February's surveys is shown in Figure 4. These sightings were evenly spread in the middle portion of WL survey area, with slightly higher concentration to the west of Tai O Peninsula and to the southwest of Peaked Hill (Figure 4). Only one dolphin group was sighted in the vicinity of the HKLR09 alignment (Figure 4).

3.1.6. During the February's surveys, encounter rates of Chinese White Dolphins deduced from the survey effort and on-effort sighting data made under

favourable conditions (Beaufort 3 or below) are shown in Tables 2 & 3.

Table 2. Dolphin encounter rates (sightings per 100 km of survey effort) per set during February's surveys in West Lantau (WL)

		Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)	**Encounter rate (ANI)** (no. of dolphins from all on-effort sightings per 100 km of survey effort)
		Primary Lines Only	**Primary Lines Only**
West Lantau	Set 1: February 6th	21.8	116.4
	Set 2: February 13th	18.6	69.6

Table 3. Overall dolphin encounter rates (sightings per 100 km of survey effort) in February's surveys on primary lines only as well as both primary lines and secondary lines in West Lantau (WL)

	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)		**Encounter rate (ANI)** (no. of dolphins from all on-effort sightings per 100 km of survey effort)	
	Primary Lines Only	**Both Primary and Secondary Lines**	**Primary Lines Only**	**Both Primary and Secondary Lines**
West Lantau	19.8	18.5	87.8	66.7

3.1.7. The average group size of Chinese White Dolphins was 3.6 individuals per group during February's surveys, which was slightly higher than the averages in previous months of monitoring surveys.

3.1.8. Half of the 10 dolphin groups were small in size with only 1-3 animals per group, while the other five groups were medium-sized with 5-7 animals per group (Appendix II).

3.2. Photo-identification Work

3.2.1. Twenty-two different individual Chinese White Dolphins were identified 37 times during February's surveys (Appendices III and IV). Thirteen individuals were re-sighted only once during the monitoring month, while the rest were re-sighted 2-5 times from the two monitoring surveys.

3.2.2. Notably, none of these individuals was accompanied by any young calf during their re-sightings in this month's monitoring surveys.

3.3. Conclusion

3.3.1. During this month of dolphin monitoring, marine construction activities have continued under this contract. However, no adverse impact on Chinese white dolphins was noticeable from general observations.

3.3.2. Due to the monthly variation in dolphin occurrence within the study area, it would be more appropriate to draw conclusion on whether any impacts on dolphins have been detected related to the construction activities of this project in the quarterly EM&A report, where comparison on distribution, group size and encounter rates of dolphins between the quarterly impact monitoring period (i.e. December 2016 – February 2017) and baseline monitoring period will be made.

4. References

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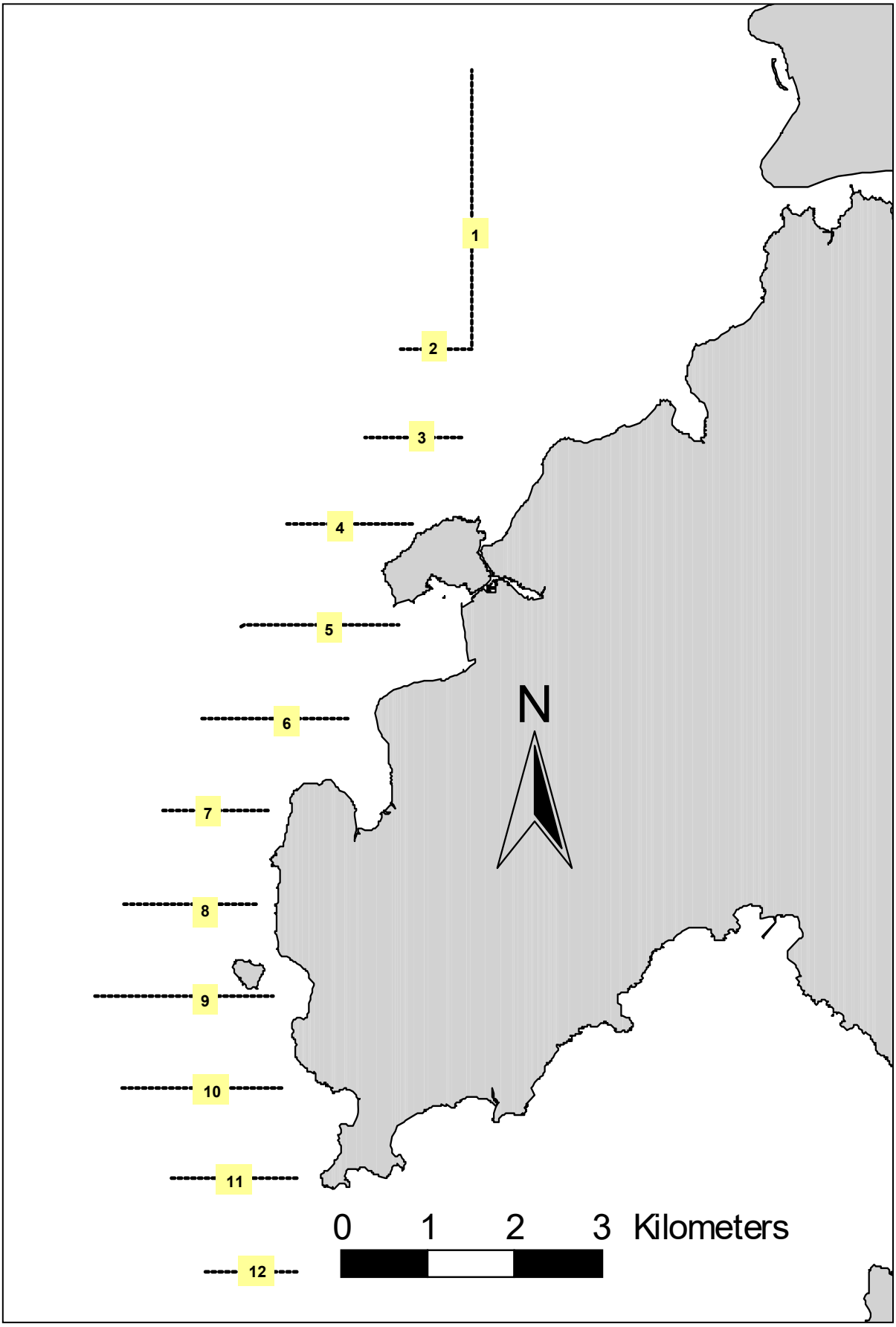


Figure 1. Transect Line Layout in West Lantau Survey Areas

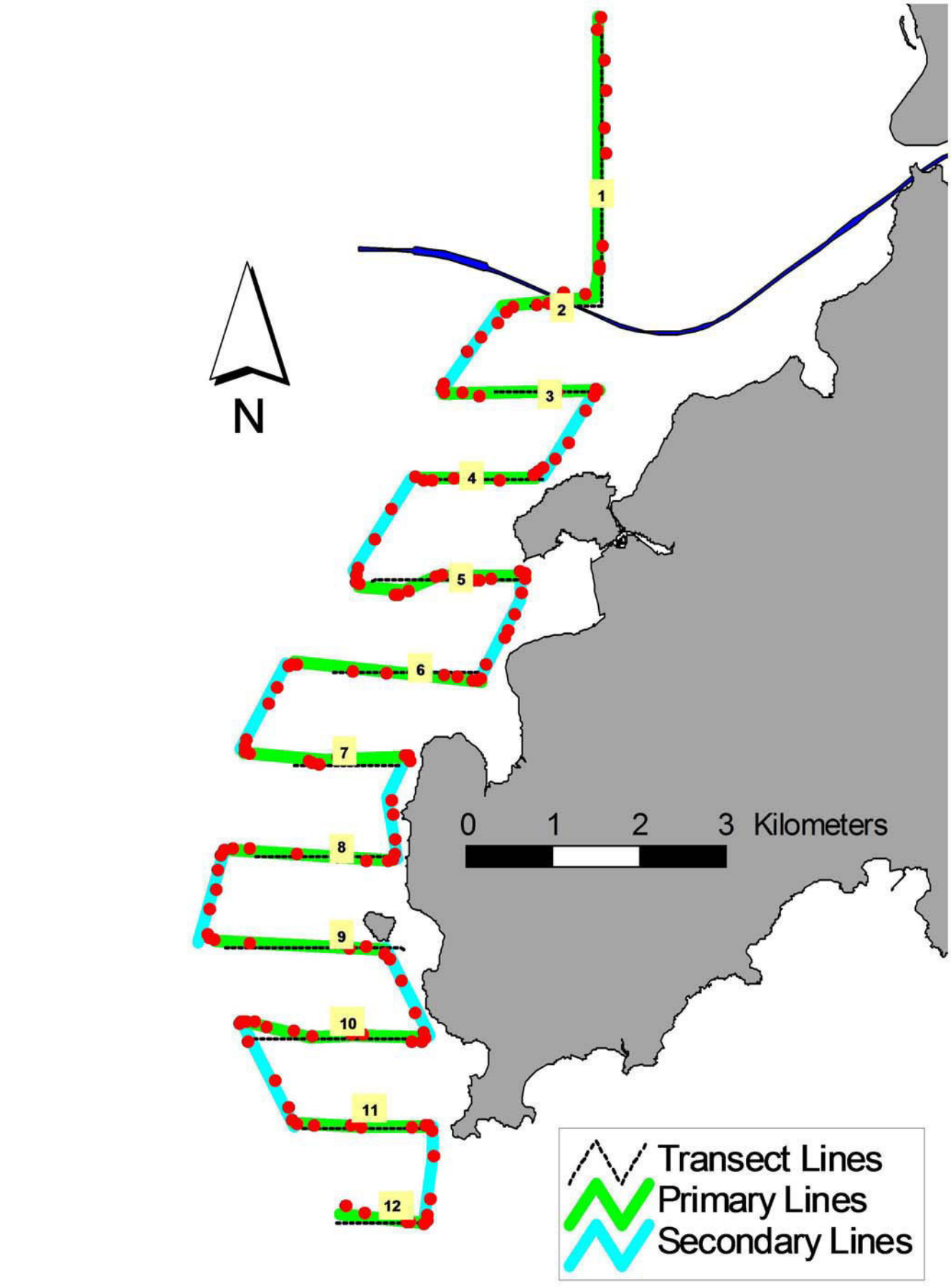


Figure 2. Survey Route on February 6th, 2017 (note: red dots represent the tracked positions of survey boat logged continuously by GPS throughout the course of the survey)

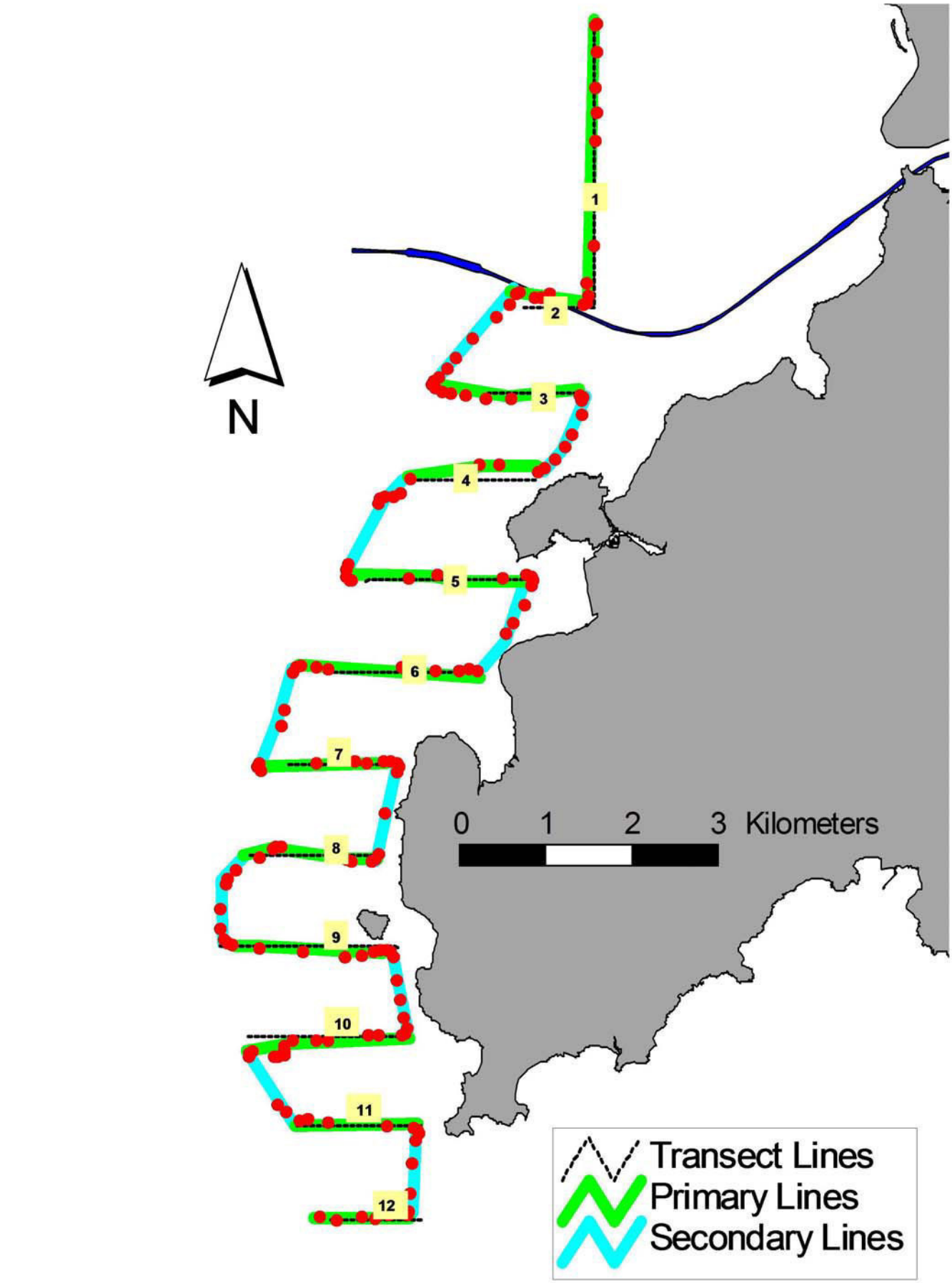


Figure 3. Survey Route on February 13th, 2017 (note: red dots represent the tracked positions of survey boat logged continuously by GPS throughout the course of the survey)

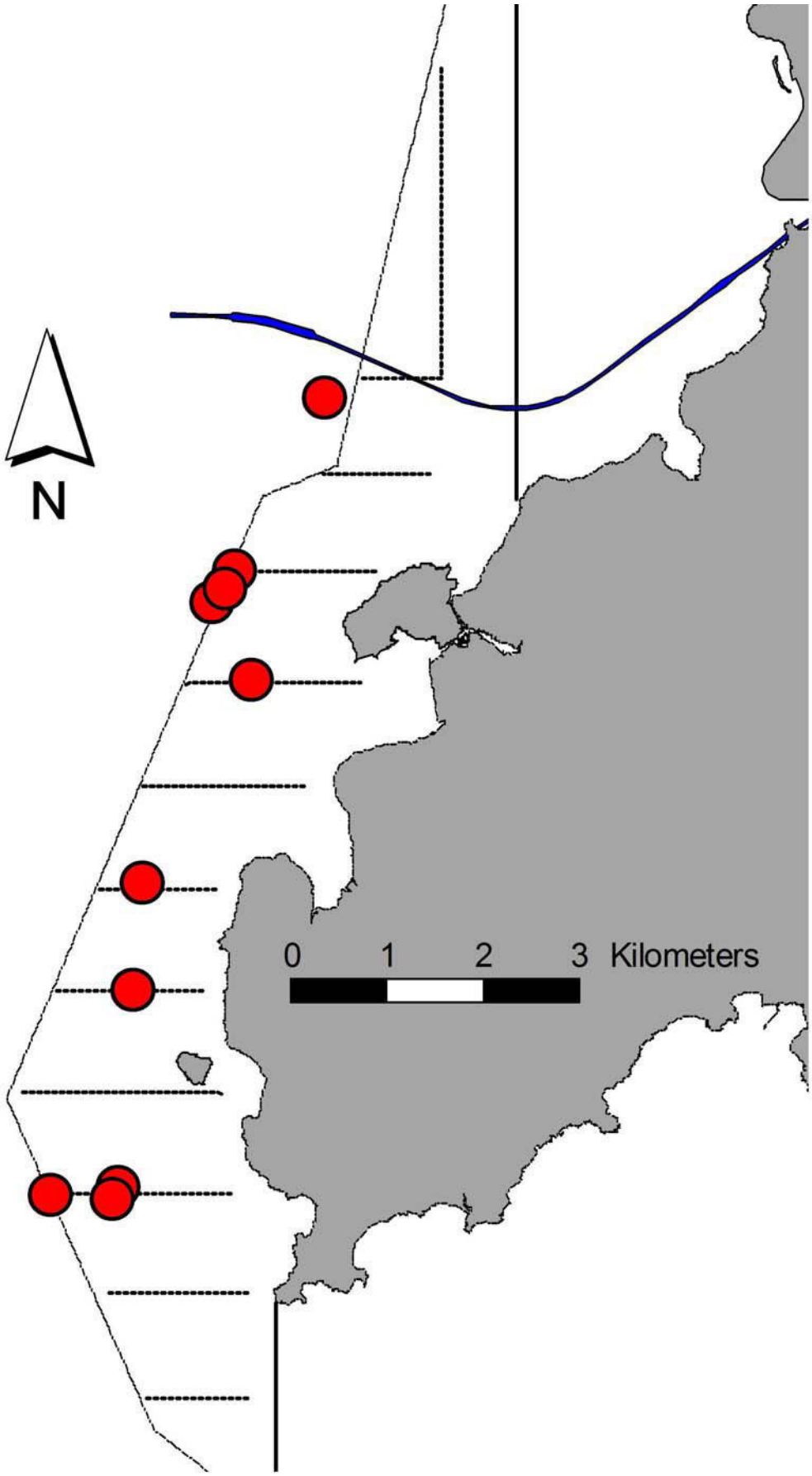


Figure 4. Distribution of Chinese White Dolphin Sighting during February 2017 HKLR09 Monitoring Surveys

Appendix I. HKLR09 Survey Effort Database (February 2017)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
6-Feb-17	W LANTAU	2	9.37	WINTER	STANDARD36826	HKLR	P
6-Feb-17	W LANTAU	3	4.38	WINTER	STANDARD36826	HKLR	P
6-Feb-17	W LANTAU	4	6.73	WINTER	STANDARD36826	HKLR	P
6-Feb-17	W LANTAU	5	1.61	WINTER	STANDARD36826	HKLR	P
6-Feb-17	W LANTAU	2	5.72	WINTER	STANDARD36826	HKLR	S
6-Feb-17	W LANTAU	3	1.57	WINTER	STANDARD36826	HKLR	S
6-Feb-17	W LANTAU	4	3.34	WINTER	STANDARD36826	HKLR	S
13-Feb-17	W LANTAU	2	11.99	WINTER	STANDARD36826	HKLR	P
13-Feb-17	W LANTAU	3	9.55	WINTER	STANDARD36826	HKLR	P
13-Feb-17	W LANTAU	2	6.33	WINTER	STANDARD36826	HKLR	S
13-Feb-17	W LANTAU	3	5.08	WINTER	STANDARD36826	HKLR	S

Appendix II. HKLR09 Chinese White Dolphin Sighting Database (February 2017)

(Abberviations: STG# = Sighting Number; HRD SZ = Dolphin Herd Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance; ND = Not Determined; BOAT ASSOC. = Fishing Boat Association; P/S: Sighting Made on Primary/Secondary Lines)

DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	TYPE	NORTHING	EASTING	SEASON	BOAT ASSOC.	P/S
6-Feb-17	1	1137	1	W LANTAU	3	97	ON	HKLR	807430	799685	WINTER	NONE	S
6-Feb-17	2	1146	5	W LANTAU	3	211	ON	HKLR	807506	800397	WINTER	NONE	P
6-Feb-17	3	1242	5	W LANTAU	2	572	ON	HKLR	809432	800535	WINTER	NONE	P
6-Feb-17	4	1310	6	W LANTAU	2	142	ON	HKLR	810484	800641	WINTER	NONE	P
6-Feb-17	5	1357	3	W LANTAU	2	243	ON	HKLR	813251	801358	WINTER	SINGLE	S
13-Feb-17	2	1042	1	W LANTAU	2	717	ON	HKLR	815264	802538	WINTER	NONE	S
13-Feb-17	3	1107	5	W LANTAU	3	164	ON	HKLR	813549	801596	WINTER	NONE	P
13-Feb-17	4	1122	1	W LANTAU	3	95	ON	HKLR	813383	801503	WINTER	NONE	P
13-Feb-17	5	1133	7	W LANTAU	3	156	ON	HKLR	812475	801769	WINTER	PURSE-SEINE	P
13-Feb-17	6	1310	2	W LANTAU	2	55	ON	HKLR	807384	800334	WINTER	NONE	P

Appendix III. Individual dolphins identified during HKLR09 monitoring surveys in February 2017

ID#	DATE	STG#	AREA
CH38	06/02/17	2	W LANTAU
	13/02/17	5	W LANTAU
CH108	06/02/17	2	W LANTAU
	06/02/17	3	W LANTAU
	06/02/17	5	W LANTAU
	13/02/17	3	W LANTAU
	13/02/17	5	W LANTAU
NL98	06/02/17	3	W LANTAU
	06/02/17	5	W LANTAU
NL120	06/02/17	3	W LANTAU
	06/02/17	5	W LANTAU
NL123	06/02/17	3	W LANTAU
NL212	06/02/17	2	W LANTAU
NL226	06/02/17	3	W LANTAU
SL40	06/02/17	4	W LANTAU
SL58	06/02/17	2	W LANTAU
WL42	06/02/17	4	W LANTAU
	13/02/17	3	W LANTAU
	13/02/17	5	W LANTAU
WL68	13/02/17	3	W LANTAU
	13/02/17	5	W LANTAU
WL74	13/02/17	4	W LANTAU
WL79	06/02/17	2	W LANTAU
WL109	13/02/17	6	W LANTAU
WL123	06/02/17	4	W LANTAU
WL128	06/02/17	4	W LANTAU
WL131	06/02/17	2	W LANTAU
	13/02/17	3	W LANTAU
	13/02/17	5	W LANTAU
WL137	06/02/17	1	W LANTAU
	13/02/17	5	W LANTAU
WL173	06/02/17	4	W LANTAU
WL211	13/02/17	5	W LANTAU
WL220	06/02/17	4	W LANTAU
WL229	06/02/17	5	W LANTAU
	13/02/17	3	W LANTAU
	13/02/17	5	W LANTAU

Appendix IV. Photographs of Identified Individual Dolphins in February 2017 (HKLR09)

Appendix IV (cont'd).

Appendix IV (cont'd).

Appendix IV (cont'd).

Appendix IV (cont'd).

APPENDIX J
WIND DATA

Appendix J - Wind Data

Date	Time	Wind Speed m/s	Direction
1-Feb-2017	0:00	2	W
1-Feb-2017	1:00	2	SW
1-Feb-2017	2:00	2.1	S
1-Feb-2017	3:00	2.4	WSW
1-Feb-2017	4:00	2.1	SSW
1-Feb-2017	5:00	2.3	SW
1-Feb-2017	6:00	2.2	SW
1-Feb-2017	7:00	2.4	SW
1-Feb-2017	8:00	2.7	N
1-Feb-2017	9:00	2.9	NE
1-Feb-2017	10:00	3.2	ENE
1-Feb-2017	11:00	3.3	NNE
1-Feb-2017	12:00	3.4	NNE
1-Feb-2017	13:00	3.6	N
1-Feb-2017	14:00	3.3	NNE
1-Feb-2017	15:00	3.1	N
1-Feb-2017	16:00	3.1	N
1-Feb-2017	17:00	2.8	N
1-Feb-2017	18:00	2.6	N
1-Feb-2017	19:00	2.1	NNE
1-Feb-2017	20:00	2.1	NNE
1-Feb-2017	21:00	2.5	N
1-Feb-2017	22:00	2.4	NNE
1-Feb-2017	23:00	2.4	NNE
2-Feb-2017	0:00	2.5	NNE
2-Feb-2017	1:00	2.4	N
2-Feb-2017	2:00	2.6	NNE
2-Feb-2017	3:00	2.4	NNE
2-Feb-2017	4:00	2.3	NNE
2-Feb-2017	5:00	2.4	NE
2-Feb-2017	6:00	2.4	N
2-Feb-2017	7:00	2.5	N
2-Feb-2017	8:00	2.7	NE
2-Feb-2017	9:00	2.7	NNE
2-Feb-2017	10:00	2.9	NE
2-Feb-2017	11:00	3.2	NNE
2-Feb-2017	12:00	3.2	NE
2-Feb-2017	13:00	2.9	ENE
2-Feb-2017	14:00	2.9	NNE
2-Feb-2017	15:00	2.7	NE
2-Feb-2017	16:00	2.5	NE
2-Feb-2017	17:00	2.5	NNE
2-Feb-2017	18:00	2.3	NNE
2-Feb-2017	19:00	2.2	N
2-Feb-2017	20:00	2	N
2-Feb-2017	21:00	2.2	N
2-Feb-2017	22:00	2.2	N
2-Feb-2017	23:00	2.3	NNE
3-Feb-2017	0:00	2.1	NNE
3-Feb-2017	1:00	2.2	NNE
3-Feb-2017	2:00	2.3	N
3-Feb-2017	3:00	2.2	WNW
3-Feb-2017	4:00	2.2	NNE
3-Feb-2017	5:00	2	W

Appendix J - Wind Data

Date	Time	Wind Speed m/s	Direction
3-Feb-2017	6:00	1.9	NNE
3-Feb-2017	7:00	2	NNE
3-Feb-2017	8:00	2	NE
3-Feb-2017	9:00	1.4	W
3-Feb-2017	10:00	1.5	W
3-Feb-2017	11:00	1.9	SW
3-Feb-2017	12:00	2.3	WSW
3-Feb-2017	13:00	2.8	WSW
3-Feb-2017	14:00	2.5	SSW
3-Feb-2017	15:00	2.2	WSW
3-Feb-2017	16:00	2.3	SSW
3-Feb-2017	17:00	2.3	WSW
3-Feb-2017	18:00	2	WSW
3-Feb-2017	19:00	1.8	SSW
3-Feb-2017	20:00	1.2	W
3-Feb-2017	21:00	1.1	W
3-Feb-2017	22:00	1.1	NNE
3-Feb-2017	23:00	1.1	N
4-Feb-2017	0:00	0.9	N
4-Feb-2017	1:00	1.2	NNE
4-Feb-2017	2:00	1.3	NNE
4-Feb-2017	3:00	1.7	NNE
4-Feb-2017	4:00	1.4	N
4-Feb-2017	5:00	1.6	NNE
4-Feb-2017	6:00	1.5	NNE
4-Feb-2017	7:00	1.5	NE
4-Feb-2017	8:00	1.9	NE
4-Feb-2017	9:00	2.2	NNE
4-Feb-2017	10:00	2.7	N
4-Feb-2017	11:00	2.5	N
4-Feb-2017	12:00	2.7	NNE
4-Feb-2017	13:00	2.9	NE
4-Feb-2017	14:00	2.7	NNE
4-Feb-2017	15:00	2.9	N
4-Feb-2017	16:00	2.7	NE
4-Feb-2017	17:00	2.5	NE
4-Feb-2017	18:00	2.6	NNE
4-Feb-2017	19:00	2.3	N
4-Feb-2017	20:00	2	N
4-Feb-2017	21:00	2.1	N
4-Feb-2017	22:00	2.2	NE
4-Feb-2017	23:00	2.1	NNE
5-Feb-2017	0:00	2.1	NNE
5-Feb-2017	1:00	2	N
5-Feb-2017	2:00	1.9	NNE
5-Feb-2017	3:00	2.1	N
5-Feb-2017	4:00	2.2	W
5-Feb-2017	5:00	2	W
5-Feb-2017	6:00	1.9	WNW
5-Feb-2017	7:00	1.6	WNW
5-Feb-2017	8:00	1.8	W
5-Feb-2017	9:00	2.3	W
5-Feb-2017	10:00	2.6	W
5-Feb-2017	11:00	2.4	WNW

Appendix J - Wind Data

Date	Time	Wind Speed m/s	Direction
5-Feb-2017	12:00	2.8	WSW
5-Feb-2017	13:00	2.9	SW
5-Feb-2017	14:00	2.8	WSW
5-Feb-2017	15:00	2.8	W
5-Feb-2017	16:00	2.6	SSW
5-Feb-2017	17:00	2.5	W
5-Feb-2017	18:00	2.2	W
5-Feb-2017	19:00	2	W
5-Feb-2017	20:00	2.2	WNW
5-Feb-2017	21:00	2	W
5-Feb-2017	22:00	2.1	SSW
5-Feb-2017	23:00	2.1	WNW
6-Feb-2017	0:00	1.9	SSW
6-Feb-2017	1:00	1.9	W
6-Feb-2017	2:00	2	ENE
6-Feb-2017	3:00	1.8	E
6-Feb-2017	4:00	1.8	WNW
6-Feb-2017	5:00	2	NW
6-Feb-2017	6:00	1.9	NE
6-Feb-2017	7:00	1.8	NE
6-Feb-2017	8:00	1.8	E
6-Feb-2017	9:00	2.1	E
6-Feb-2017	10:00	2.1	E
6-Feb-2017	11:00	2.3	N
6-Feb-2017	12:00	2.6	N
6-Feb-2017	13:00	2.7	SSW
6-Feb-2017	14:00	2.5	SW
6-Feb-2017	15:00	2.4	SW
6-Feb-2017	16:00	2.4	SSW
6-Feb-2017	17:00	2	SW
6-Feb-2017	18:00	1.7	SW
6-Feb-2017	19:00	1.7	WSW
6-Feb-2017	20:00	1.7	W
6-Feb-2017	21:00	1.7	SSW
6-Feb-2017	22:00	1.8	SSW
6-Feb-2017	23:00	1.6	SSW
7-Feb-2017	0:00	1.8	WNW
7-Feb-2017	1:00	1.9	WNW
7-Feb-2017	2:00	1.6	WNW
7-Feb-2017	3:00	1.5	WNW
7-Feb-2017	4:00	1.4	NNE
7-Feb-2017	5:00	1.5	WNW
7-Feb-2017	6:00	1.6	WNW
7-Feb-2017	7:00	1.8	WNW
7-Feb-2017	8:00	1.9	SW
7-Feb-2017	9:00	2.2	SSW
7-Feb-2017	10:00	2.2	W
7-Feb-2017	11:00	2.3	W
7-Feb-2017	12:00	2.5	SW
7-Feb-2017	13:00	2.3	SW
7-Feb-2017	14:00	2.4	WSW
7-Feb-2017	15:00	2.5	W
7-Feb-2017	16:00	2.3	SW
7-Feb-2017	17:00	2	WNW

Appendix J - Wind Data

Date	Time	Wind Speed m/s	Direction
7-Feb-2017	18:00	2.2	SW
7-Feb-2017	19:00	1.8	WSW
7-Feb-2017	20:00	1.5	WSW
7-Feb-2017	21:00	1.5	SW
7-Feb-2017	22:00	2	WSW
7-Feb-2017	23:00	1.9	W
8-Feb-2017	0:00	1.9	W
8-Feb-2017	1:00	2	W
8-Feb-2017	2:00	2.2	W
8-Feb-2017	3:00	1.8	W
8-Feb-2017	4:00	2.1	WSW
8-Feb-2017	5:00	2.2	W
8-Feb-2017	6:00	2	WNW
8-Feb-2017	7:00	1.9	W
8-Feb-2017	8:00	2.1	WNW
8-Feb-2017	9:00	2.2	W
8-Feb-2017	10:00	2.8	SSW
8-Feb-2017	11:00	3	WNW
8-Feb-2017	12:00	2.9	NE
8-Feb-2017	13:00	2.9	WNW
8-Feb-2017	14:00	3	NE
8-Feb-2017	15:00	3	NNE
8-Feb-2017	16:00	3.1	SSW
8-Feb-2017	17:00	2.6	W
8-Feb-2017	18:00	2.1	W
8-Feb-2017	19:00	1.9	N
8-Feb-2017	20:00	1.5	NE
8-Feb-2017	21:00	1.7	SSW
8-Feb-2017	22:00	1.5	SSW
8-Feb-2017	23:00	1.3	SW
9-Feb-2017	0:00	1.2	WSW
9-Feb-2017	1:00	1.3	WSW
9-Feb-2017	2:00	1.3	WNW
9-Feb-2017	3:00	1.4	W
9-Feb-2017	4:00	1.6	SSW
9-Feb-2017	5:00	1.5	W
9-Feb-2017	6:00	1.5	WSW
9-Feb-2017	7:00	1.1	WSW
9-Feb-2017	8:00	1.3	SE
9-Feb-2017	9:00	1.6	SW
9-Feb-2017	10:00	2.3	NE
9-Feb-2017	11:00	2.3	ENE
9-Feb-2017	12:00	2.2	N
9-Feb-2017	13:00	2.7	NNE
9-Feb-2017	14:00	2.4	SW
9-Feb-2017	15:00	2.5	SW
9-Feb-2017	16:00	2.6	ENE
9-Feb-2017	17:00	2.6	E
9-Feb-2017	18:00	2	SSW
9-Feb-2017	19:00	1.5	NNW
9-Feb-2017	20:00	1.3	NNE
9-Feb-2017	21:00	1.3	WNW
9-Feb-2017	22:00	1.2	NNE
9-Feb-2017	23:00	1.2	ENE

Appendix J - Wind Data

Date	Time	Wind Speed m/s	Direction
10-Feb-2017	0:00	1.6	ENE
10-Feb-2017	1:00	1.8	SSE
10-Feb-2017	2:00	1.6	ESE
10-Feb-2017	3:00	1.6	NNE
10-Feb-2017	4:00	1.4	WNW
10-Feb-2017	5:00	1.4	N
10-Feb-2017	6:00	1.2	NE
10-Feb-2017	7:00	1.2	ENE
10-Feb-2017	8:00	1.5	S
10-Feb-2017	9:00	1.9	W
10-Feb-2017	10:00	2.2	W
10-Feb-2017	11:00	2.7	W
10-Feb-2017	12:00	2.7	W
10-Feb-2017	13:00	2.8	NE
10-Feb-2017	14:00	2.6	ESE
10-Feb-2017	15:00	2.4	SSW
10-Feb-2017	16:00	2.5	ENE
10-Feb-2017	17:00	2.4	ESE
10-Feb-2017	18:00	2.2	NE
10-Feb-2017	19:00	1.6	ENE
10-Feb-2017	20:00	1.7	SSE
10-Feb-2017	21:00	1.6	SW
10-Feb-2017	22:00	1.6	SSE
10-Feb-2017	23:00	1.8	SW
11-Feb-2017	0:00	2.1	SW
11-Feb-2017	1:00	2.2	N
11-Feb-2017	2:00	2.3	S
11-Feb-2017	3:00	2	WNW
11-Feb-2017	4:00	1.8	W
11-Feb-2017	5:00	1.2	W
11-Feb-2017	6:00	1.2	WNW
11-Feb-2017	7:00	1	WSW
11-Feb-2017	8:00	1.2	W
11-Feb-2017	9:00	1.7	WNW
11-Feb-2017	10:00	1.8	NE
11-Feb-2017	11:00	2.1	N
11-Feb-2017	12:00	2.2	NE
11-Feb-2017	13:00	2.4	NE
11-Feb-2017	14:00	2.2	NE
11-Feb-2017	15:00	2.2	SW
11-Feb-2017	16:00	2	SSW
11-Feb-2017	17:00	1.8	SSW
11-Feb-2017	18:00	1.4	SW
11-Feb-2017	19:00	1.1	SW
11-Feb-2017	20:00	1.1	SW
11-Feb-2017	21:00	1.2	SW
11-Feb-2017	22:00	1.2	WSW
11-Feb-2017	23:00	1.2	SW
12-Feb-2017	0:00	1.3	WSW
12-Feb-2017	1:00	1.1	W
12-Feb-2017	2:00	1	W
12-Feb-2017	3:00	0.9	WNW
12-Feb-2017	4:00	0.8	WNW
12-Feb-2017	5:00	0.5	WNW

Appendix J - Wind Data

Date	Time	Wind Speed m/s	Direction
12-Feb-2017	6:00	0.4	W
12-Feb-2017	7:00	0.6	W
12-Feb-2017	8:00	0.7	WNW
12-Feb-2017	9:00	0.9	SSW
12-Feb-2017	10:00	1.5	WNW
12-Feb-2017	11:00	1.8	WSW
12-Feb-2017	12:00	2.1	WNW
12-Feb-2017	13:00	2.2	SW
12-Feb-2017	14:00	2	WNW
12-Feb-2017	15:00	2.1	W
12-Feb-2017	16:00	2	WNW
12-Feb-2017	17:00	1.8	WNW
12-Feb-2017	18:00	1.5	W
12-Feb-2017	19:00	1.2	SW
12-Feb-2017	20:00	1.1	SW
12-Feb-2017	21:00	0.8	WNW
12-Feb-2017	22:00	0.9	SW
12-Feb-2017	23:00	0.9	SW
13-Feb-2017	0:00	0.7	SW
13-Feb-2017	1:00	0.6	WSW
13-Feb-2017	2:00	0.6	SW
13-Feb-2017	3:00	0.7	SW
13-Feb-2017	4:00	0.7	SSW
13-Feb-2017	5:00	0.5	SSW
13-Feb-2017	6:00	0.4	SSW
13-Feb-2017	7:00	0.6	SSW
13-Feb-2017	8:00	0.6	WNW
13-Feb-2017	9:00	1.2	WNW
13-Feb-2017	10:00	1.4	ESE
13-Feb-2017	11:00	1.7	W
13-Feb-2017	12:00	1.7	W
13-Feb-2017	13:00	1.7	WSW
13-Feb-2017	14:00	1.8	WSW
13-Feb-2017	15:00	1.9	W
13-Feb-2017	16:00	1.8	N
13-Feb-2017	17:00	1.5	SW
13-Feb-2017	18:00	1.3	W
13-Feb-2017	19:00	1.2	WSW
13-Feb-2017	20:00	0.9	SSW
13-Feb-2017	21:00	0.9	SW
13-Feb-2017	22:00	1	N
13-Feb-2017	23:00	1.3	W
14-Feb-2017	0:00	1.2	W
14-Feb-2017	1:00	1.1	W
14-Feb-2017	2:00	1	W
14-Feb-2017	3:00	1.3	SW
14-Feb-2017	4:00	1.2	WSW
14-Feb-2017	5:00	1	SSW
14-Feb-2017	6:00	1.1	W
14-Feb-2017	7:00	1	WSW
14-Feb-2017	8:00	1.4	ENE
14-Feb-2017	9:00	1.6	NW
14-Feb-2017	10:00	1.9	W
14-Feb-2017	11:00	2.3	W

Appendix J - Wind Data

Date	Time	Wind Speed m/s	Direction
14-Feb-2017	12:00	2.5	SW
14-Feb-2017	13:00	2.4	W
14-Feb-2017	14:00	2.2	E
14-Feb-2017	15:00	1.9	SW
14-Feb-2017	16:00	2	SSE
14-Feb-2017	17:00	2.1	N
14-Feb-2017	18:00	1.9	WNW
14-Feb-2017	19:00	1.3	SSW
14-Feb-2017	20:00	1.4	SSW
14-Feb-2017	21:00	1.4	N
14-Feb-2017	22:00	1.7	W
14-Feb-2017	23:00	1.4	SSE
15-Feb-2017	0:00	1.5	E
15-Feb-2017	1:00	1.2	N
15-Feb-2017	2:00	1.2	N
15-Feb-2017	3:00	1	NNW
15-Feb-2017	4:00	1.2	SE
15-Feb-2017	5:00	0.9	SW
15-Feb-2017	6:00	1.5	SSW
15-Feb-2017	7:00	1.1	ENE
15-Feb-2017	8:00	1.2	NE
15-Feb-2017	9:00	1.5	S
15-Feb-2017	10:00	1.9	NNE
15-Feb-2017	11:00	1.9	ENE
15-Feb-2017	12:00	2	ENE
15-Feb-2017	13:00	2.3	ENE
15-Feb-2017	14:00	2.2	ENE
15-Feb-2017	15:00	2	N
15-Feb-2017	16:00	2.1	WSW
15-Feb-2017	17:00	1.9	WSW
15-Feb-2017	18:00	1.9	WNW
15-Feb-2017	19:00	1.4	WNW
15-Feb-2017	20:00	1.3	NE
15-Feb-2017	21:00	1.2	ENE
15-Feb-2017	22:00	1.1	WNW
15-Feb-2017	23:00	1	WSW
16-Feb-2017	0:00	0.8	WNW
16-Feb-2017	1:00	0.9	W
16-Feb-2017	2:00	0.7	ENE
16-Feb-2017	3:00	1.2	NNE
16-Feb-2017	4:00	1.1	ESE
16-Feb-2017	5:00	1	ESE
16-Feb-2017	6:00	0.8	WNW
16-Feb-2017	7:00	1	WNW
16-Feb-2017	8:00	0.7	SE
16-Feb-2017	9:00	1	NNE
16-Feb-2017	10:00	1.4	SSE
16-Feb-2017	11:00	1.4	NNE
16-Feb-2017	12:00	1.8	NNE
16-Feb-2017	13:00	1.9	NNE
16-Feb-2017	14:00	2.1	ENE
16-Feb-2017	15:00	2.2	SE
16-Feb-2017	16:00	1.9	NE
16-Feb-2017	17:00	1.6	NE

Appendix J - Wind Data

Date	Time	Wind Speed m/s	Direction
16-Feb-2017	18:00	1.2	NNE
16-Feb-2017	19:00	1	ESE
16-Feb-2017	20:00	0.9	ESE
16-Feb-2017	21:00	1	ENE
16-Feb-2017	22:00	0.8	NE
16-Feb-2017	23:00	1	ENE
17-Feb-2017	0:00	1.1	ESE
17-Feb-2017	1:00	1	ESE
17-Feb-2017	2:00	1	E
17-Feb-2017	3:00	0.9	E
17-Feb-2017	4:00	0.9	ESE
17-Feb-2017	5:00	0.9	NE
17-Feb-2017	6:00	0.9	W
17-Feb-2017	7:00	1	SE
17-Feb-2017	8:00	1	SSE
17-Feb-2017	9:00	1.2	ESE
17-Feb-2017	10:00	1.3	ESE
17-Feb-2017	11:00	1.7	ENE
17-Feb-2017	12:00	2.1	ENE
17-Feb-2017	13:00	2.2	ENE
17-Feb-2017	14:00	2.3	E
17-Feb-2017	15:00	2.4	SSE
17-Feb-2017	16:00	2.2	E
17-Feb-2017	17:00	2	S
17-Feb-2017	18:00	1.7	ESE
17-Feb-2017	19:00	1.4	ENE
17-Feb-2017	20:00	1.3	NE
17-Feb-2017	21:00	1	NNE
17-Feb-2017	22:00	1	NE
17-Feb-2017	23:00	0.8	ENE
18-Feb-2017	0:00	1	ENE
18-Feb-2017	1:00	1.2	SSE
18-Feb-2017	2:00	1.2	SE
18-Feb-2017	3:00	1.3	ENE
18-Feb-2017	4:00	1.3	ENE
18-Feb-2017	5:00	1.1	SE
18-Feb-2017	6:00	0.9	SE
18-Feb-2017	7:00	1.2	E
18-Feb-2017	8:00	1.4	NNE
18-Feb-2017	9:00	1.7	NE
18-Feb-2017	10:00	2.7	NNE
18-Feb-2017	11:00	2.8	ENE
18-Feb-2017	12:00	2.9	ENE
18-Feb-2017	13:00	3.1	SW
18-Feb-2017	14:00	3	W
18-Feb-2017	15:00	3	W
18-Feb-2017	16:00	2.9	ENE
18-Feb-2017	17:00	2.6	ENE
18-Feb-2017	18:00	2.4	S
18-Feb-2017	19:00	2.4	S
18-Feb-2017	20:00	1.7	W
18-Feb-2017	21:00	2	S
18-Feb-2017	22:00	2	NE
18-Feb-2017	23:00	2.4	E

Appendix J - Wind Data

Date	Time	Wind Speed m/s	Direction
19-Feb-2017	0:00	2.2	NE
19-Feb-2017	1:00	2.3	ENE
19-Feb-2017	2:00	2.2	ESE
19-Feb-2017	3:00	2.2	NE
19-Feb-2017	4:00	2.3	NNE
19-Feb-2017	5:00	2.1	ENE
19-Feb-2017	6:00	2.1	SSE
19-Feb-2017	7:00	1.9	ESE
19-Feb-2017	8:00	2.2	NNE
19-Feb-2017	9:00	2.4	SSE
19-Feb-2017	10:00	2.4	NNE
19-Feb-2017	11:00	2.7	SE
19-Feb-2017	12:00	3.1	SE
19-Feb-2017	13:00	3	NE
19-Feb-2017	14:00	2.8	SE
19-Feb-2017	15:00	2.6	ESE
19-Feb-2017	16:00	2.3	ESE
19-Feb-2017	17:00	3	SSE
19-Feb-2017	18:00	2.9	ESE
19-Feb-2017	19:00	2.6	ESE
19-Feb-2017	20:00	2.1	ESE
19-Feb-2017	21:00	1.9	SE
19-Feb-2017	22:00	1.8	SSE
19-Feb-2017	23:00	2	NE
20-Feb-2017	0:00	1.9	NE
20-Feb-2017	1:00	2.1	NNE
20-Feb-2017	2:00	2.1	NNE
20-Feb-2017	3:00	1.9	SSE
20-Feb-2017	4:00	1.9	NNE
20-Feb-2017	5:00	2	SE
20-Feb-2017	6:00	1.9	ESE
20-Feb-2017	7:00	2	SSE
20-Feb-2017	8:00	2	SSE
20-Feb-2017	9:00	2.4	ESE
20-Feb-2017	10:00	2.6	SE
20-Feb-2017	11:00	2.7	SSE
20-Feb-2017	12:00	2.6	SE
20-Feb-2017	13:00	3.1	SSE
20-Feb-2017	14:00	3.1	ESE
20-Feb-2017	15:00	3.2	SSE
20-Feb-2017	16:00	3.1	SE
20-Feb-2017	17:00	2.9	SE
20-Feb-2017	18:00	2.5	SSE
20-Feb-2017	19:00	2.4	SSE
20-Feb-2017	20:00	2.1	ESE
20-Feb-2017	21:00	2.4	SSE
20-Feb-2017	22:00	2.1	SSE
20-Feb-2017	23:00	2.4	SSE
21-Feb-2017	0:00	2.1	SSE
21-Feb-2017	1:00	2.2	SE
21-Feb-2017	2:00	2.1	SSE
21-Feb-2017	3:00	2	NE
21-Feb-2017	4:00	1.6	SSE
21-Feb-2017	5:00	1.4	WNW

Appendix J - Wind Data

Date	Time	Wind Speed m/s	Direction
21-Feb-2017	6:00	2	ENE
21-Feb-2017	7:00	2.2	ENE
21-Feb-2017	8:00	2	ENE
21-Feb-2017	9:00	2	NE
21-Feb-2017	10:00	2.5	N
21-Feb-2017	11:00	3.2	N
21-Feb-2017	12:00	3.2	E
21-Feb-2017	13:00	3.4	W
21-Feb-2017	14:00	3.3	WNW
21-Feb-2017	15:00	3.4	WNW
21-Feb-2017	16:00	3.7	W
21-Feb-2017	17:00	3.2	NW
21-Feb-2017	18:00	3.9	W
21-Feb-2017	19:00	3.1	WNW
21-Feb-2017	20:00	2.8	WNW
21-Feb-2017	21:00	2.5	NW
21-Feb-2017	22:00	2.5	ENE
21-Feb-2017	23:00	1.8	NNE
22-Feb-2017	0:00	2	NE
22-Feb-2017	1:00	2	WNW
22-Feb-2017	2:00	1.8	WNW
22-Feb-2017	3:00	1.9	WNW
22-Feb-2017	4:00	2.1	SW
22-Feb-2017	5:00	1.8	W
22-Feb-2017	6:00	1.6	E
22-Feb-2017	7:00	1.8	SW
22-Feb-2017	8:00	1.9	SW
22-Feb-2017	9:00	2.2	SW
22-Feb-2017	10:00	2.3	SW
22-Feb-2017	11:00	2.6	W
22-Feb-2017	12:00	2.7	SW
22-Feb-2017	13:00	2.8	ENE
22-Feb-2017	14:00	2.7	ESE
22-Feb-2017	15:00	2.7	N
22-Feb-2017	16:00	2.9	ENE
22-Feb-2017	17:00	2.9	NE
22-Feb-2017	18:00	2.6	WNW
22-Feb-2017	19:00	2.3	E
22-Feb-2017	20:00	2.1	SW
22-Feb-2017	21:00	2.3	N
22-Feb-2017	22:00	2.2	N
22-Feb-2017	23:00	2.1	N
23-Feb-2017	0:00	2.2	NE
23-Feb-2017	1:00	2.4	NNW
23-Feb-2017	2:00	2.5	WNW
23-Feb-2017	3:00	2.4	NE
23-Feb-2017	4:00	2.4	SSW
23-Feb-2017	5:00	2.3	SSW
23-Feb-2017	6:00	2	SW
23-Feb-2017	7:00	1.4	SW
23-Feb-2017	8:00	1.8	SW
23-Feb-2017	9:00	2.1	WNW
23-Feb-2017	10:00	2.2	WSW
23-Feb-2017	11:00	2.3	SSE

Appendix J - Wind Data

Date	Time	Wind Speed m/s	Direction
23-Feb-2017	12:00	2.2	SW
23-Feb-2017	13:00	2.2	W
23-Feb-2017	14:00	2.4	NNE
23-Feb-2017	15:00	2.2	W
23-Feb-2017	16:00	2.1	WNW
23-Feb-2017	17:00	2	ESE
23-Feb-2017	18:00	1.7	NNE
23-Feb-2017	19:00	1.3	NE
23-Feb-2017	20:00	1.3	ESE
23-Feb-2017	21:00	1.5	ENE
23-Feb-2017	22:00	1.9	W
23-Feb-2017	23:00	1.9	WSW
24-Feb-2017	0:00	1.8	W
24-Feb-2017	1:00	1.6	N
24-Feb-2017	2:00	1.7	ESE
24-Feb-2017	3:00	1.7	E
24-Feb-2017	4:00	1.5	ENE
24-Feb-2017	5:00	1.4	NE
24-Feb-2017	6:00	1.4	NNE
24-Feb-2017	7:00	1.5	N
24-Feb-2017	8:00	1.8	NNE
24-Feb-2017	9:00	2.1	NE
24-Feb-2017	10:00	2.4	SSE
24-Feb-2017	11:00	2.5	ESE
24-Feb-2017	12:00	2.4	SE
24-Feb-2017	13:00	2.4	SSW
24-Feb-2017	14:00	2.4	SW
24-Feb-2017	15:00	2.8	SW
24-Feb-2017	16:00	2.7	WNW
24-Feb-2017	17:00	2.5	E
24-Feb-2017	18:00	2.1	SSW
24-Feb-2017	19:00	2.1	E
24-Feb-2017	20:00	1.9	ENE
24-Feb-2017	21:00	1.8	NE
24-Feb-2017	22:00	1.6	SE
24-Feb-2017	23:00	1.7	SE
25-Feb-2017	0:00	1.8	SSE
25-Feb-2017	1:00	1.7	SSE
25-Feb-2017	2:00	1.7	ENE
25-Feb-2017	3:00	1.5	NE
25-Feb-2017	4:00	1.5	ENE
25-Feb-2017	5:00	1.4	ENE
25-Feb-2017	6:00	1.4	E
25-Feb-2017	7:00	1.2	ENE
25-Feb-2017	8:00	1.4	NNE
25-Feb-2017	9:00	1.8	WSW
25-Feb-2017	10:00	2	W
25-Feb-2017	11:00	2.2	NNW
25-Feb-2017	12:00	2.4	SSW
25-Feb-2017	13:00	2.3	N
25-Feb-2017	14:00	2.3	ESE
25-Feb-2017	15:00	2.2	NE
25-Feb-2017	16:00	2.1	NNE
25-Feb-2017	17:00	1.7	ESE

Appendix J - Wind Data

Date	Time	Wind Speed m/s	Direction
25-Feb-2017	18:00	1.3	ESE
25-Feb-2017	19:00	0.9	ESE
25-Feb-2017	20:00	1	ENE
25-Feb-2017	21:00	0.8	SE
25-Feb-2017	22:00	0.9	SE
25-Feb-2017	23:00	1.2	SSE
26-Feb-2017	0:00	1.4	ESE
26-Feb-2017	1:00	1.1	SE
26-Feb-2017	2:00	1.4	SSE
26-Feb-2017	3:00	0.9	SE
26-Feb-2017	4:00	1	NE
26-Feb-2017	5:00	1.2	SE
26-Feb-2017	6:00	0.9	E
26-Feb-2017	7:00	1	E
26-Feb-2017	8:00	1.3	ESE
26-Feb-2017	9:00	1.6	E
26-Feb-2017	10:00	2.1	WNW
26-Feb-2017	11:00	2.2	NW
26-Feb-2017	12:00	2.9	NE
26-Feb-2017	13:00	2.8	SE
26-Feb-2017	14:00	2.5	ENE
26-Feb-2017	15:00	2.1	NE
26-Feb-2017	16:00	1.9	SE
26-Feb-2017	17:00	1.4	NE
26-Feb-2017	18:00	1.2	SE
26-Feb-2017	19:00	1.2	SE
26-Feb-2017	20:00	0.8	W
26-Feb-2017	21:00	1.3	WNW
26-Feb-2017	22:00	1.2	ESE
26-Feb-2017	23:00	1.2	NE
27-Feb-2017	0:00	1.3	ENE
27-Feb-2017	1:00	1.2	ESE
27-Feb-2017	2:00	1.1	SE
27-Feb-2017	3:00	1.1	SE
27-Feb-2017	4:00	1.1	NE
27-Feb-2017	5:00	1.2	NNE
27-Feb-2017	6:00	1.1	NE
27-Feb-2017	7:00	1	W
27-Feb-2017	8:00	1.5	W
27-Feb-2017	9:00	1.9	WNW
27-Feb-2017	10:00	1.9	WNW
27-Feb-2017	11:00	2.3	N
27-Feb-2017	12:00	2.6	ENE
27-Feb-2017	13:00	2.7	WNW
27-Feb-2017	14:00	2.5	W
27-Feb-2017	15:00	2.5	SSW
27-Feb-2017	16:00	2.4	E
27-Feb-2017	17:00	2	SSE
27-Feb-2017	18:00	1.9	N
27-Feb-2017	19:00	1.7	W
27-Feb-2017	20:00	1.5	NNE
27-Feb-2017	21:00	1.6	W
27-Feb-2017	22:00	1.3	SW
27-Feb-2017	23:00	1.4	SSE

Appendix J - Wind Data

Date	Time	Wind Speed m/s	Direction
28-Feb-2017	0:00	1.1	WSW
28-Feb-2017	1:00	1.2	W
28-Feb-2017	2:00	1	W
28-Feb-2017	3:00	1.2	NNE
28-Feb-2017	4:00	1.2	SSW
28-Feb-2017	5:00	1.1	NE
28-Feb-2017	6:00	1	ENE
28-Feb-2017	7:00	1.5	ENE
28-Feb-2017	8:00	1.5	ENE
28-Feb-2017	9:00	1.5	ESE
28-Feb-2017	10:00	1.8	WNW
28-Feb-2017	11:00	1.9	N
28-Feb-2017	12:00	2	SE
28-Feb-2017	13:00	2.1	NNE
28-Feb-2017	14:00	2	WNW
28-Feb-2017	15:00	1.7	ENE
28-Feb-2017	16:00	2	SW
28-Feb-2017	17:00	1.9	ENE
28-Feb-2017	18:00	1.4	ENE
28-Feb-2017	19:00	1.2	ESE
28-Feb-2017	20:00	1.2	NNE
28-Feb-2017	21:00	1.2	NE
28-Feb-2017	22:00	1.2	NE
28-Feb-2017	23:00	1.2	SSE

APPENDIX K
EVENT ACTION PLANS

Event / Action Plan for Air Quality

EVENT	ACTION			
	ET	IEC	SO	CONTRACTOR
ACTION LEVEL				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and SO; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2.Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and SO; 3. Advise the SO on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and SO; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor;	1. Submit proposals for remedial to SO within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

LIMIT LEVEL				
1.Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform SO, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and SO informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the SO on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
2.Exceedance for two or more consecutive samples	1. Notify IEC, SO, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and SO to discuss the remedial actions to	1. Discuss amongst SO, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the SO accordingly; 3. Supervise the implementation of remedial	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented;	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the SO until the exceedance is

	be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and SO informed of the results; 8. If exceedance stops, cease additional monitoring.	measures.	5. 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.	abated.

Abbreviations: ET – Environmental Team, IEC – Independent Environmental Checker, SO – Supervising Office

Event / Action Plan for Construction Noise

EVENT	ACTION			
	ET	**IEC**	**SO**	**CONTRACTOR**
Action Level	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Notify IEC and Contractor; 3. Report the results of investigation to the IEC, SO and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the SO accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented	1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals.
Limit Level	1. Identify source; 2. Inform IEC, SO, EPD and Contractor; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IEC, SO and EPD	1. Discuss amongst SO, ET, and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the SO accordingly; 3. Supervise the implementation of	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control;

EVENT	ACTION			
	ET	IEC	SO	CONTRACTOR
	the causes and actions taken for the exceedances; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and SO informed of the results; 8. If exceedance stops, cease additional monitoring.	remedial measures.	problem; 4. Ensure remedial measures properly implemented; 5. 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.	5. Stop the relevant portion of works as determined by the SO until the exceedance is abated.

Event and Action Plan for Water Quality

Event	ET Leader	IEC	SO	Contractor
Action level being exceeded by one sampling day	Repeat *in situ* measurement on next day of exceedance to confirm findings; Identify source(s) of impact; Inform IEC, contractor and SO; Check monitoring data, all plant, equipment and Contractor's working methods.	Check monitoring data submitted by ET and Contractor's working methods.	Confirm receipt of notification of non-compliance in writing; Notify Contractor.	Inform the SO and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Amend working methods if appropriate.
Action level being exceeded by two or more consecutive sampling days	Repeat measurement on next day of exceedance to confirm findings; Identify source(s) of impact; Inform IEC, contractor, SO and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Ensure mitigation measures are implemented; Increase the monitoring frequency to daily until no exceedance of Action level;	Check monitoring data submitted by ET and Contractor's working method; Discuss with ET and Contractor on possible remedial actions; Review the proposed mitigation measures submitted by Contractor and advise the SO accordingly; Supervise the implementation of mitigation measures.	Discuss with IEC on the proposed mitigation measures; Ensure mitigation measures are properly implemented; Assess the effectiveness of the implemented mitigation measures.	Inform the Supervising Officer and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment and consider changes of working methods; Submit proposal of additional mitigation measures to SO within 3 working days of notification and discuss with ET, IEC and SO; Implement the agreed mitigation measures.
Limit level being exceeded by one sampling day	Repeat measurement on next day of exceedance to confirm findings; Identify source(s) of impact; Inform IEC, contractor, SO and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, SO and Contractor;	Check monitoring data submitted by ET and Contractor's working method; Discuss with ET and Contractor on possible remedial actions; Review the proposed mitigation measures submitted by Contractor and advise the SO accordingly.	Confirm receipt of notification of failure in writing; Discuss with IEC, ET and Contractor on the proposed mitigation measures; Request Contractor to review the working methods.	Inform the SO and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment and consider changes of working methods; Submit proposal of mitigation measures to SO within 3 working days of notification and discuss with ET, IEC and SO.

Event	ET Leader	IEC	SO	Contractor
Limit level being exceeded by two or more consecutive sampling days	Repeat measurement on next day of exceedance to confirm findings; Identify source(s) of impact; Inform IEC, contractor, SO and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, SO and Contractor; Ensure mitigation measures are implemented;	Check monitoring data submitted by ET and Contractor's working method; Discuss with ET and Contractor on possible remedial actions; Review the Contractor's mitigation measures whenever necessary to assure their effectiveness and advise the SO accordingly; Supervise the implementation of mitigation measures.	Discuss with IEC, ET and Contractor on the proposed mitigation measures; Request Contractor to critically review the working methods; Make agreement on the mitigation measures to be implemented; Ensure mitigation measures are properly implemented; Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit level.	Take immediate action to avoid further exceedance; Submit proposal of mitigation measures to SO within 3 working days of notification and discuss with ET, IEC and SO; Implement the agreed mitigation measures; Resubmit proposals of mitigation measures if problem still not under control; As directed by the Supervising Officer, to slow down or to stop all or part of the construction activities until no exceedance of Limit level.

APPENDIX L
SUMMARY OF EXCEEDANCE

Contract No. HY/2011/09
Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road –
Section between HKSAR Boundary and Scenic Hill

Exceedance Report

(A) Exceedance Report for Air Quality

Environmental Monitoring	Parameter	No. of Exceedance		No. of Exceedance related to the Construction Activities of this Contract	
		Action Level	Limit Level	Action Level	Limit Level
Air Quality	1-hr TSP	0	0	0	0
	24-hr TSP	0	0	0	0

(B) Exceedance Report for Construction Noise (NIL in the reporting period)

(C) Exceedance Report for Water Quality

Environmental Monitoring	Parameter	No. of Exceedance		No. of Exceedance related to the Construction Activities of this Contract	
		Action Level	Limit Level	Action Level	Limit Level
Water Quality	Dissolved Oxygen (DO) (Surface & Middle)	0	0	0	0
	Dissolved Oxygen (DO) (Bottom)	0	0	0	0
	Turbidity	0	0	0	0
	Suspended Solids (SS)	4	8	0	0

Contract No. HY/2011/09

Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill - Notification of Environmental Quality Limit Exceedances

Date of Water Quality Monitoring: 1 February 2017

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB)~~ / Suspended Solids (SS)

Station(s)	Tide	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	Control Station(s)	Depth-average Value at Control Stations (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Depth-average Measured Value (mg/L)	Justification*	Validity (Yes/No)
IS1	Mid-flood	23.5	34.4	CS1	14.0	16.8	18.2	***32.3***	(2), (6)	No
IS2								***33.8***	(2), (6)	No
IS4								***32.6***	(2), (6)	No
SR6								***62.2***	(2), (6)	No
ST1								***31.8***	(2), (6)	No
ST2								***34.7***	(2), (6)	No

Note: ***Bold Italic*** means Action Level exceedance
Bold Italic with underline means Limit Level exceedance

*Remarks (1) – No major marine construction activity was conducted.
(2) – No pollution discharge from construction activity was observed.
(3) – Control Station value already exceeded either the Baseline Action or Limit Levels.
(4) – The exceeded results were similar or within the ranges baseline monitoring results.
(5) – Monitoring station is situated at the upstream of the construction sites.
(6) – Other(s): Please specify – Adverse water quality outside the site boundary was observed while no construction vessel for this Contract was travelling nearby

Part B – Conclusion: No direct evidence that the exceedances were due to the Contract, therefore the exceedances are considered due to the other external factors rather than the contract works.

Part C – Recommendation: As the exeedances were not related to the contract works, no further action to be required.

Contract No. HY/2011/09

Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill - Notification of Environmental Quality Limit Exceedances

Location Plan:

Reviewed by: Dr. Priscilla Choy

Title: Environmental Team Leader

Date: 7 March 2017

Contract No. HY/2011/09

Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill - Notification of Environmental Quality Limit Exceedances

Date of Water Quality Monitoring: 13 February 2017

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB)~~ / Suspended Solids (SS)

Station(s)	Tide	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	Control Station(s)	Depth-average Value at Control Stations (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Depth-average Measured Value (mg/L)	Justification*	Validity (Yes/No)
IS1	Mid-flood	23.5	34.4	CS1	8.9	10.7	11.6	***46.2***	(2), (6a), (6b)	No
IS2								***54.1***	(2), (6a), (6b)	No
IS4								***50.6***	(2), (6a), (6b)	No
SR6								***56.0***	(2), (6a), (6b)	No
ST1								***46.0***	(2), (6a), (6b)	No
ST2								***52.2***	(2), (6a), (6b)	No

Note: ***Bold Italic*** means Action Level exceedance
Bold Italic with underline means Limit Level exceedance

*Remarks (1) – No major marine construction activity was conducted.
(2) – No pollution discharge from construction activity was observed.
(3) – Control Station value already exceeded either the Baseline Action or Limit Levels.
(4) – The exceeded results were similar or within the ranges baseline monitoring results.
(5) – Monitoring station is situated at the upstream of the construction sites.
(6) – Other(s): Please specify – (a) Localized sediment plume due to the rough water condition was observed.
(b) Adverse water quality outside the site boundary was observed while no construction vessel for this Contract was travelling nearby

Part B – Conclusion: No direct evidence that the exceedances were due to the Contract, therefore the exceedances are considered due to the other external factors rather than the contract works.

Part C – Recommendation: As the exeedances were not related to the contract works, no further action to be required.

Contract No. HY/2011/09

Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill - Notification of Environmental Quality Limit Exceedances

Location Plan:

Reviewed by: Dr. Priscilla Choy

Title: Environmental Team Leader

Date: 7 March 2017

APPENDIX M
SITE AUDIT SUMMARY

Contract HY/2011/09

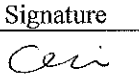
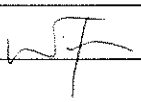
Hong Kong-Zhuhai-Macao Bridge

Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary

Checklist Reference Number	170202
Date	2 February 2017 (Thursday)
Time	9:15-11:30; 13:30-16:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	B. Water Quality	
	• No environmental deficiency was identified during site inspection.	
	C. Ecology	
	• No environmental deficiency was identified during site inspection.	
	D. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	E. Noise	
	• No environmental deficiency was identified during site inspection.	
	F. Waste / Chemical Management	
170202-R01	• Oil stain should be cleared at P11 and Portion C.	F8
170202-R02	• Accumulated waste at P10 should be cleared.	F1i
170202-R03	• Drip tray should be provided to the chemical containers at P11 and the plant at Portion C.	F8,9
170202-R04	• Chemical container at P57 should be provided with chemical label.	F2iii
	G. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	H. Others	
	• Follow-up on previous audit section (Ref. No.:170124), item 170124-R02 was found outstanding and remarked as 170202-R04. Review will be needed during next audit section.	

	Name	Signature	Date
Recorded by	Cecilia Yang		2 February 2017
Checked by	Dr. Priscilla Choy		2 February 2017

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge

Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Environmental Observations Identified during the Environmental Site Inspection (2 February 2017)

Ref No: 170202-R01

Impact:

Waste / Chemical Management (F8)

Details:
Oil stain should be cleared at P11 and Portion C.

Ref No: 170202-R02

Impact:

Waste / Chemical Management (F1i)

Details:
Accumulated waste at P10 should be cleared.

Ref No: 170202-R03

Impact:

Water Quality (F8,9)

Details:

Drip tray should be provided to the chemical containers at P11 and the plant at Portion C.

Ref No: 170202-R05

Impact:

Waste / Chemical Management (F2iii)

Details:

Chemical container at P57 should be provided with chemical label.

Rectification Actions taken by the Contractor for Environmental Deficiencies Identified during Previous Audit Session

Ref No: 170124-R01

Impact:

Waste / Chemical Management (F1i)

Details:
Accumulated waste and concrete at P57, 58, Portion A(P84) should be cleared.

Follow-up:
Accumulated waste and concrete at P57, 58, Portion A(P84) was cleared.

	**Ref No:** 170124-R02 **Impact:** Waste / Chemical Management (F2iii) **Details:** Chemical container at P57 should be provided with chemical label. **Follow-up:** Chemical container at P57 should be provided with chemical label. This item was remarked as 170202-R04.
	**Ref No:** 170124-R03 **Impact:** Water Quality (B24) **Details:** Silt curtain should be provided at P82. **Follow-up:** Silt curtain was provided at P82.
	**Ref No:** 170124-R04 **Impact:** Waste / Chemical Management (F2i) **Details:** Chemical waste storage area should be improved to fulfill the requirement of EPD. **Follow-up:** Chemical waste storage area improved with vent holes and with both English and Chinese label outside.

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge

Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Environmental Observations Identified during the Environmental Site Inspection (7 February 2017)

Ref No: 170207-R01

Impact:

Waste / Chemical Management (F8,9)

Details:
Chemical containers at P69 should be provided with drip trays.

	**Ref No:** 170207-R02 **Impact:** Water Quality (B15) **Details:** Sand and debris near the site boundary of P69 should be cleared.

Ref No: 170207-R03

Impact:

Waste / Chemical Management (F1i)

Details:

Oil stain at P69, 75, 76 should be cleared.

	**Ref No:** 170207-R04 **Impact:** Noise (D26) **Details:** NRMM label should be provided to the plant at P76.
	**Ref No:** 170207-R05 **Impact:** Waste / Chemical Management (F8,9) **Details:** Power plant at Portion C should be provided with drip tray and oil stain should be removed.

Rectification Actions taken by the Contractor for Environmental Deficiencies Identified during Previous Audit Session

Ref No: 170202-R01

Impact:

Waste / Chemical Management (F8)

Details:
Oil stain should be cleared at P11 and Portion C.

Follow-up:
Oil stain at P11 was cleared but was still found at Portion C. This item was remarked as 170207-R05.

Ref No: 170202-R02

Impact:

Waste / Chemical Management (F1i)

Details:
Accumulated waste at P10 should be cleared.

Follow-up:
Accumulated waste at P10 was cleared.

Ref No: 170202-R03

Impact:
Water Quality (F8,9)

Details:
Drip tray should be provided to the chemical containers at P11 and the plant at Portion C.

Follow-up:
Chemical containers at P11 were removed but drip tray should still be provided to the plant at Portion C. This item was remarked as 170207-R05.

Ref No: 170202-R04

Impact:
Waste / Chemical Management (F2iii)

Details:
Chemical containers at P57 should be provided with chemical label.

Follow-up:
Chemical containers at P57 were removed.

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge

Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary

Checklist Reference Number	170214
Date	14 February 2017 (Tuesday)
Time	9:15-11:30; 13:30-16:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	B. Water Quality	
	• No environmental deficiency was identified during site inspection.	
	C. Ecology	
	• No environmental deficiency was identified during site inspection.	
	D. Air Quality	
170214-R01	• Dusty material at P54 should be cleared.	D7
	E. Noise	
	• No environmental deficiency was identified during site inspection.	
	F. Waste / Chemical Management	
170214-R02	• Oil stain at P56 and Portion A P89 should be cleared.	F8
170214-R03	• Drip tray should be provided to chemical containers at P57 and Portion A P89.	F8,9
170214-R04	• General waste at Portion A P83 and chemical waste at Portion C should be cleared.	F1i,2i
	G. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	H. Others	
	• Follow-up on previous audit section (Ref. No.:170207), all identified environmental deficiency was observed improved/rectified by the Contractor.	

	Name	Signature	Date
Recorded by	Cecilia Yang	Ceci	14 February 2017
Checked by	Dr. Priscilla Choy		14 February 2017

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge

Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Environmental Observations Identified during the Environmental Site Inspection (14 February 2017)

Ref No: 170214-R01

Impact:

Air Quality (D7)

Details:
Dusty material at P54 should be cleared.

Ref No: 170214-R02

Impact:

Waste / Chemical Management (F8)

Details:
Oil stain at P56 and Portion A P89 should be cleared.

Ref No: 170214-R03

Impact:

Waste / Chemical Management (F8,9)

Details:

Drip tray should be provided to chemical containers at P57 and Portion A P89.

Ref No: 170214-R04

Impact:

Waste / Chemical Management (F1i,2i)

Details:

General waste at Portion A P83 and chemical waste at Portion C should be cleared.

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge

Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Rectification Actions taken by the Contractor for Environmental Deficiencies Identified during Previous Audit Session

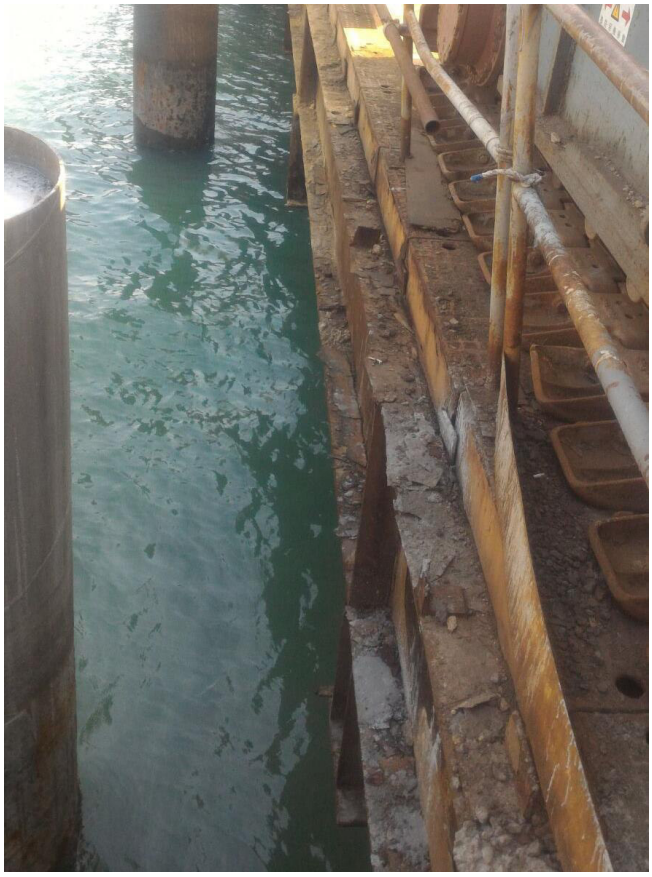
Ref No: 170207-R01

Impact:

Waste / Chemical Management (F8,9)

Details:
Chemical containers at P69 should be provided with drip trays.

Follow-up:
Chemical containers at P69 were removed or provided with drip tray.



Ref No: 170207-R02

Impact:

Water Quality (B15)

Details:
Sand and debris near the site boundary of P69 should be cleared.

Follow-up:
Sand and debris near the site boundary of P69 was cleared.

Ref No: 170207-R03

Impact:

Waste / Chemical Management (F1i)

Details:

Oil stain at P69, 75, 76 should be cleared.

Follow-up:

Oil stain at P69, 75, 76 was cleared.

	**Ref No:** 170207-R04 **Impact:** Noise (D26) **Details:** NRMM label should be provided to the plant at P76. **Follow-up:** NRMM label was provided to the plant at P76.
	**Ref No:** 170207-R05 **Impact:** Waste / Chemical Management (F8,9) **Details:** Power plant at Portion C should be provided with drip tray and oil stain should be removed. **Follow-up:** Power plant at Portion C was removed and oil stain was also removed.

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge

Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary

Checklist Reference Number	170221
Date	21 February 2017 (Tuesday)
Time	9:30-12:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	B. Water Quality	
170221-R05	• Contaminated sand near the site boundary at P55 should be cleared to prevent muddy discharge into sea.	B15
	C. Ecology	
	• No environmental deficiency was identified during site inspection.	
	D. Air Quality	
170221-R03	• Dusty material along P54-58 should be cleared.	D7
	E. Noise	
	• No environmental deficiency was identified during site inspection.	
	F. Waste / Chemical Management	
170221-R01	• House-keeping should be enhanced at P59, P82 Portion A.	F1i,iii
170221-R02	• Oil stain at P57 should be cleared.	F8
170221-R04	• Chemical waste at P57 should be properly stored.	F2i
	G. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	H. Others	
	• Follow-up on previous audit section (Ref. No.:170221), item 170214-R01 was found outstanding and remarked as 170221-R03. Review will be needed during next audit section.	

	Name	Signature	Date
Recorded by	Cecilia Yang	Ceci	21 February 2017
Checked by	Dr. Priscilla Choy		21 February 2017

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge

Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Environmental Observations Identified during the Environmental Site Inspection (21 February 2017)

Ref No: 170221-R01

Impact:

Waste / Chemical Management (F1i,iii)

Details:
House-keeping should be enhanced at P59, P82 Portion A.

Ref No: 170221-R02

Impact:

Waste / Chemical Management (F8)

Details:
Oil stain at P57 should be cleared.

Ref No: 170221-R03

Impact:

Air Quality (D7)

Details:

Dusty material along P54-58 should be cleared.

Ref No: 170221-R04

Impact:

Waste / Chemical Management (F2i)

Details:

Chemical waste at P57 should be properly stored.

	**Ref No:** 170221-R04 **Impact:** Water Quality (B15) **Details:** Contaminated sand near the site boundary at P55 should be cleared to prevent muddy discharge into sea.

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge

Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Rectification Actions taken by the Contractor for Environmental Deficiencies Identified during Previous Audit Session

Ref No: 170214-R01

Impact:

Air Quality (D7)

Details:
Dusty material at P54 should be cleared.

Follow-up:

Dusty material was still found at P54. This item is remarked as 170221-R03.

Ref No: 170214-R02

Impact:

Waste / Chemical Management (F8)

Details:
Oil stain at P56 and Portion A P89 should be cleared.

Follow-up:
Oil stain at P56 and Portion A P89 was cleared.

Ref No: 170214-R03

Impact:

Waste / Chemical Management (F8,9)

Details:

Drip tray should be provided to chemical containers at P57 and Portion A P89.

Follow-up:

Chemical containers at P57 and Portion A P89 were cleared.

Ref No: 170214-R04

Impact:

Waste / Chemical Management (F1i,2i)

Details:

General waste at Portion A P83 and chemical waste at Portion C should be cleared.

Follow-up:

General waste at Portion A P83 and chemical waste at Portion C was cleared.

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge

Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary

Checklist Reference Number	170228
Date	28 February 2017 (Tuesday)
Time	9:30-12:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	B. Water Quality	
	• No environmental deficiency was identified during site inspection.	
	C. Ecology	
	• No environmental deficiency was identified during site inspection.	
	D. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	E. Noise	
	• No environmental deficiency was identified during site inspection.	
	F. Waste / Chemical Management	
170228-R01	• Accumulated waste at P57 and Portion A(P84) should be cleared regularly.	F1i,iii
170228-R02	• Chemical containers at Portion C(P107) should be with chemical labels and provided with drip tray.	F8,9
	G. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	H. Others	
	• Follow-up on previous audit section (Ref. No.:170221), all identified environmental deficiency was observed improved/rectified by the Contractor.	

	Name	Signature	Date
Recorded by	Cecilia Yang	Ceci	28 February 2017
Checked by	Dr. Priscilla Choy		28 February 2017

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge

Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Environmental Observations Identified during the Environmental Site Inspection (28 February 2017)

<table>
<tr>
<td> 
  </td>
<td>Ref No: 170228-R01

Impact:
Waste / Chemical Management (F1i,iii)

Details:
Accumulated waste at P57 and Portion A(P84) should be cleared regularly.</td>
</tr>
<tr>
<td>  </td>
<td>Ref No: 170228-R02

Impact:
Waste / Chemical Management (F8,9)

Details:
Chemical containers at Portion C(P107) should be with chemical labels and provided with drip tray.</td>
</tr>
</table>

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge

Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Rectification Actions taken by the Contractor for Environmental Deficiencies Identified during Previous Audit Session

Ref No: 170221-R01

Impact:

Waste / Chemical Management (F1i,iii)

Details:
House-keeping should be enhanced at P59, P82 Portion A.

Follow-up:
House-keeping was improved at P59, P82 Portion A.

Ref No: 170221-R02

Impact:

Waste / Chemical Management (F8)

Details:
Oil stain at P57 should be cleared.

Follow-up:
Oil stain at P57 was cleared.

Ref No: 170221-R03

Impact:

Air Quality (D7)

Details:

Dusty material along P54-58 should be cleared.

Follow-up:

Dusty material along P54-58 was cleared.

Ref No: 170221-R04

Impact:

Waste / Chemical Management (F2i)

Details:

Chemical waste at P57 should be properly stored.

Follow-up:

Chemical waste at P57 was removed.

Ref No: 170221-R05

Impact:

Water Quality (B15)

Details:

Contaminated sand near the site boundary at P55 should be cleared to prevent muddy discharge into sea.

Follow-up:

Contaminated sand near the site boundary at P55 was cleared.

APPENDIX N
UPDATED ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE (EMIS)

EIA Ref.	EM&A Log 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?	Implementation Status
Air Quality							
S5.5.6.1	A1	1) The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	Good construction site practices to control the dust impact at the nearby sensitive receivers to within the relevant criteria.	Contractor	All construction sites	Construction stage	^
S5.5.6.2	A2	2) Proper watering of exposed spoil should be undertaken throughout the construction phase: • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; • A stockpile of dusty material should not be extend beyond the pedestrian barriers, fencing or traffic cones. • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores;	Good construction site practices to control the dust impact at the nearby sensitive receivers to within the relevant criteria.	Contractor	All construction sites	Construction stage	* ^ ^ ^ ^

EIA Ref.	EM&A Log 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?	Implementation Status
S5.5.6.2	A2	• When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding; • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverised fuel	Good construction site practices to control the dust impact at the nearby sensitive receivers to within the relevant criteria.	Contractor	All construction sites	Construction stage	^ ^ ^ ^ N/A ^ ^

EIA Ref.	EM&A Log 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?	Implementation Status
		ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides;					
S5.5.6.2	A2	• Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.	Good construction site practices to control the dust impact at the nearby sensitive receivers to within the relevant criteria.	Contractor	All construction sites	Construction stage	N/A N/A N/A
S5.5.6.3	A3	3) The Contractor should undertake proper watering on all exposed spoil (with at least 8 times per day) throughout the construction phase.	Control construction dust	Contractor	All construction sites	Construction stage	^
S5.5.6.4	A5	5) Implement regular dust monitoring under EM&A programme during the construction stage.	Monitor the 24 hr and 1hr TSP levels at the representative dust monitoring stations to ensure compliance with relevant criteria throughout the construction period.	Contractor	Selected representative dust monitoring station	Construction stage	^
S5.5.7.1	A6	The following mitigation measures should be adopted to prevent fugitive	Monitor the 24 hr and 1hr	Contractor	Selected	Construction	

EIA Ref.	EM&A Log 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?	Implementation Status
		dust emissions for concrete batching plant: • Loading, unloading, handling, transfer or storage of any dusty materials should be carried out in totally enclosed system; • All dust-laden air or waste gas generated by the process operations should be properly extracted and vented to fabric filtering system to meet the emission limits for TSP; • Vents for all silos and cement/pulverised fuel ash (PFA) weighing scale should be fitted with fabric filtering system; • The materials which may generate airborne dusty emissions should be wetted by water spray system; • All receiving hoppers should be enclosed on three sides up to 3m above unloading point; • All conveyor transfer points should be totally enclosed; • All access and route roads within the premises should be paved and wetted; and • Vehicle cleaning facilities should be provided and used by all concrete trucks before leaving the premises to wash off any dust on the wheels and/or body.	TSP levels at the representative dust monitoring stations to ensure compliance with relevant criteria throughout the construction period.		representative dust monitoring station	stage	N/A N/A N/A N/A N/A N/A N/A N/A N/A
S5.5.2.7	A7	The following mitigation measures should be adopted to prevent fugitive dust emissions at barging point: • All road surface within the barging facilities will be paved; • Dust enclosures will be provided for the loading ramp; • Vehicles will be required to pass through designated wheels wash facilities; and • Continuous water spray at the loading points.	Control construction dust	Contractor	All construction sites	Construction stage	N/A N/A N/A N/A

EIA Ref.	EM&A Log 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?	Implementation Status
Construction Noise (Air borne)							
S6.4.10	N1	1) Use of good site practices to limit noise emissions by considering the following: • 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 officer and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.	Control construction airborne noise by means of good site practices	Contractor	All construction sites	Construction stage	^ ^ ^ ^ ^ ^
S6.4.11	N2	2) Install temporary hoarding located on the site boundaries between noisy construction activities and NSRs. The conditions of the hoardings shall be properly maintained throughout the construction period.	Reduce the construction noise levels at low-level zone of NSRs through partial screening.	Contractor	All construction sites	Construction stage	^
S6.4.12	N3	3) Install movable noise barriers (typically density @14kg/m^2), acoustic mat or full enclosure close to noisy plants including air compressor, generators, saw.	Screen the noisy plant items to be used at all construction sites	Contractor	For plant items listed in Appendix 6D of the EIA report at all	Construction stage	^

EIA Ref.	EM&A Log 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?	Implementation Status
					construction sites		
S6.4.13	N4	4) Select "Quiet plants" which comply with the BS 5228 Part 1 or TM standards.	Reduce the noise levels of plant items	Contractor	For plant items listed in Appendix 6D of the EIA report at all construction sites	Construction stage	^
S6.4.14	N5	5) Sequencing operation of construction plants where practicable.	Operate sequentially within the same work site to reduce the construction airborne noise	Contractor	All construction sites where practicable	Construction stage	^
	N6	6) Implement a noise monitoring under EM&A programme.	Monitor the construction noise levels at the selected representative locations	Contractor	Selected representative noise monitoring station	Construction stage	^
Waste Management (Construction Waste)							
S8.3.8	WM1	*Construction and Demolition Material* The following mitigation measures should be implemented in handling the waste: • Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement; • Carry out on-site sorting; • Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; • Adopt 'Selective Demolition' technique to demolish the existing structures and facilities with a view to recovering broken concrete	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	^ ^ ^ N/A

EIA Ref.	EM&A Log 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?	Implementation Status
		effectively for recycling purpose, where possible; • Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified; and • Implement an enhanced Waste Management Plan similar to ETWBTC (Works) No. 19/2005 – "Environmental Management on Construction Sites" to encourage on-site sorting of C&D materials and to minimize their generation during the course of construction. • In addition, disposal of the C&D materials onto any sensitive locations such as agricultural lands, etc. should be avoided. The Contractor shall propose the final disposal sites to the Project Proponent and get its approval before implementation					^ ^ ^
S8.3.9 - S8.3.11	WM2	*C&D Waste* • Standard formwork or pre-fabrication should be used as far as practicable in order to minimise the arising of C&D materials. The use of more durable formwork or plastic facing for the construction works should be considered. Use of wooden hoardings should not be used, as in other projects. Metal hoarding should be used to enhance the possibility of recycling. The purchasing of construction materials will be carefully planned in order to avoid over ordering and wastage. • The Contractor should recycle as much of the C&D materials as possible on-site. Public fill and C&D waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. Where	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	^ ^

EIA Ref.	EM&A Log 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?	Implementation Status
		practicable, concrete and masonry can be crushed and used as fill. Steel reinforcement bar can be used by scrap steel mills. Different areas of the sites should be considered for such segregation and storage.					
S8.2.12-S8.3.15	WM3	*Chemical Waste* • Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, should be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. • Containers used for the storage of chemical wastes should be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; have a capacity of less than 450 liters unless the specification has been approved by the EPD; and display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the regulation. • The storage area for chemical wastes should be clearly labelled and used solely for the storage of chemical waste; enclosed on at least 3 sides; have an impermeable floor and bunding of sufficient capacity to accommodate 110% of the volume of the largest container or 20 % of the total volume of waste stored in that area, whichever is the greatest; have adequate ventilation; covered to prevent rainfall entering; and arranged so that incompatible materials are adequately separated. • Disposal of chemical waste should be via a licensed waste	Control the chemical waste and ensure proper storage, handling and disposal.	Contractor	All construction sites	Construction stage	* ^ *

EIA Ref.	EM&A Log 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?	Implementation Status
		collector; be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Centre which also offers a chemical waste collection service and can supply the necessary storage containers; or be to a reuser of the waste, under approval from the EPD.					^
S8.3.16	WM4	*Sewage* • Adequate numbers of portable toilets should be provided for the workers. The portable toilets should be maintained in a state, which will not deter the workers from utilizing these portable toilets. Night soil should be collected by licensed collectors regularly.	Proper handling of sewage from worker to avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	^
S8.3.17	WM5	*General Refuse* • General refuse generated on-site should be stored in enclosed bins or compaction units separately from construction and chemical wastes. • A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimize odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law. • Aluminium cans are often recovered from the waste stream by individual collectors if they are segregated and made easily accessible. Separate labelled bins for their deposit should be provided if feasible. • Office wastes can be reduced through the recycling of paper if volumes are large enough to warrant collection. Participation in a	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	* * ^

EIA Ref.	EM&A Log 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?	Implementation Status
		local collection scheme should be considered by the Contractor. In addition, waste separation facilities for paper, aluminum cans, plastic bottles etc., should be provided. • Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including reduction, reuse and recycling of wastes.					^ ^
Water Quality (Construction Phase)							
S9.11.1 – S9.11.1.2	W1	• Mitigation during the marine works to reduce impacts to within acceptable levels have been recommended and will comprise a series of measures that restrict the method and sequencing of dredging/backfilling, as well as protection measures. Details of the measures are provided below and summarised in the Environmental Mitigation Implementation Schedule in EM&A Manual. • Export for dredged spoils from NWWCZ avoiding exerting high demand on the disposal facilities in the NWWCZ and, hence, minimise potential cumulative impacts; • For the marine viaducts of HKLR, the bored piling will be undertaken within a metal casing; • where public fill is proposed for filling below -2.5mPD, the fine content in the public fill will be controlled to 25%; • single layer silt curtains will be applied around all works; • during the first two months of dredging work for HKLR, the silt-removal efficiency of the silt-curtains shall be verified by examining the results of water quality monitoring points. The water quality	To control construction water quality	Contractor	During seawall dredging and filling	Construction stage	^ ^ ^ N/A ^ N/A

EIA Ref.	EM&A Log 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?	Implementation Status
		monitoring points to be selected for the above shall be those close to the locations of the initial period of dredging work. Details in this regard shall be determined by the ENPO to be established, taking account of the Contractor's proposed actual locations of his initial period of dredging work. • silt curtain shall be fully maintained throughout the works. In addition, dredging operations should be undertaken in such a manner as to minimise resuspension of sediments. Standard good dredging practice measures should, therefore, be implemented including the following requirements which should be written into the dredging contract. • trailer suction hopper dredgers shall not allow mud to overflow; • use of Lean Material Overboard (LMOB) systems shall be prohibited; • mechanical grabs shall be designed and maintained to avoid spillage and should seal tightly while being lifted; • barges and hopper dredgers shall have tight fitting seals to their bottom openings to prevent leakage of material; • any pipe leakages shall be repaired quickly. Plant should not be operated with leaking pipes; • loading of barges and hoppers shall be controlled to prevent splashing of dredged material to the surrounding water. Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation;					^ N/A N/A ^ ^ ^ ^ ^

EIA Ref.	EM&A Log 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?	Implementation Status
		• excess material shall be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved; • adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action; • all vessels shall be sized such that adequate clearance is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; and • the works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site.					^ ^ ^
S9.11.1.3	W2	<u>*Land Works*</u> General construction activities on land should also be governed by standard good working practice. Specific measures to be written into the works contracts should include: • wastewater from temporary site facilities should be controlled to prevent direct discharge to surface or marine waters; • sewage effluent and discharges from on-site kitchen facilities shall be directed to Government sewer in accordance with the requirements of the WPCO or collected for disposal offsite. The use of soakaways shall be avoided; • storm drainage shall be directed to storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins. Channels, earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt	To control construction water quality	Contractor	During seawall dredging and filling	Construction stage	^ N/A ^

EIA Ref.	EM&A Log 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?	Implementation Status
		removal facilities. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks; • silt removal facilities, channels and manholes shall be maintained and any deposited silt and grit shall be removed regularly, including specifically at the onset of and after each rainstorm; • temporary access roads should be surfaced with crushed stone or gravel; • rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities; • measures should be taken to prevent the washout of construction materials, soil, silt or debris into any drainage system; • open stockpiles of construction materials (e.g. aggregates and sand) on site should be covered with tarpaulin or similar fabric during rainstorms; • manholes (including any newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers; • discharges of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system; • all vehicles and plant should be cleaned before they leave the construction site to ensure that no earth, mud or debris is deposited by them on roads. A wheel washing bay should be provided at every site exit;					^ ^ ^ * ^ ^ ^ ^

EIA Ref.	EM&A Log 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?	Implementation Status
		• wheel wash overflow shall be directed to silt removal facilities before being discharged to the storm drain; • the section of construction road between the wheel washing bay and the public road should be surfaced with crushed stone or coarse gravel; • wastewater generated from concreting, plastering, internal decoration, cleaning work and other similar activities, shall be screened to remove large objects; • vehicle and plant servicing areas, vehicle wash bays and lubrication facilities shall be located under roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor in accordance with the requirements of the WPCO or collected for off site disposal; • the contractors shall prepare an oil / chemical cleanup plan and ensure that leakages or spillages are contained and cleaned up immediately; • waste oil should be collected and stored for recycling or disposal, in accordance with the Waste Disposal Ordinance; • all fuel tanks and chemical storage areas should be provided with locks and be sited on sealed areas. The storage areas should be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank; and • surface run-off from bunded areas should pass through oil/grease traps prior to discharge to the stormwater system.					^ ^ ^ N/A ^ ^ ^ ^
S9.14	W3	Implement a water quality monitoring programme	Control water quality	Contractor	At identified	During	^

EIA Ref.	EM&A Log 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?	Implementation Status
					monitoring location	construction period	
Ecology (Construction Phase)							
S10.7	E1	• Good site practices to avoid runoff entering woodland habitats in Scenic Hill • Reinstate works areas in Scenic Hill • Avoid stream modification in Scenic Hill	Avoid potential disturbance on habitat of Romer's Tree Frog in Scenic Hill	Designer; Contractor	Scenic Hill	During construction	^ N/A ^
S10.7	E2	• Use closed grab in dredging works. • Install silt curtain during the construction. • Limit dredging and works fronts. • Good site practices • Strict enforcement of no marine dumping. • Site runoff control • Spill response plan	Minimise marine water quality impacts	Contractor	Seawall,	During construction	^ ^ ^ ^ ^ ^ ^
S10.7	E3	• Reprovision of replacement Artificial Reefs (of the same volume as the existing ARs inside Marine Exclusion Zone)	Mitigate water quality impacts on the existing ARs	Project proponent	To be determined	Construction phase or operation phase	N/A
S10.7	E4	Watering to reduce dust generation; prevention of siltation of freshwater habitats; Site runoff should be desilted, to reduce the potential for suspended sediments, organics and other contaminants to enter streams and standing freshwater	Prevent Sedimentation from Land-based works areas	Contractor	Land-based works areas	During construction	^
S10.7	E5	Good site practices, including strictly following the permitted works hours, using quieter machines where practicable, and avoiding excessive lightings during night time	Prevent disturbance to terrestrial fauna and habitats	Contractor	Land-based works areas	During construction	^
S10.7	E6	• Dolphin Exclusion Zone;	Minimize temporary marine	Contractor	Marine works	During marine	^

EIA Ref.	EM&A Log 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?	Implementation Status
		• Dolphin watching plan	habitat loss impact to dolphins			works	^
S10.7	E7	• Decouple compressors and other equipment on working vessels • Avoidance of percussive piling • Marine underwater noise monitoring • Temporal suspension of drilling bored pile casing in rock during peak dolphin calving season in May and June	Minimise marine noise impacts on dolphins	Contractor	Marine works	During marine works	^ ^ ^ N/A
S10.7	E8	• Control vessel speed • Skipper training. • Predefined and regular routes for working vessels; avoid Brothers Islands.	Minimise marine traffic disturbance on dolphins	Contractor	Marine traffic	During marine works	^ ^ ^
S10.10	E9	• Dolphin vessel monitoring	Minimise marine traffic disturbance on dolphins	Contractor	North Lantau and West Lantau	Prior to construction, during construction, and 1 year after operation	^
Fisheries							
S11.7	F1	• Reprovision of replacement Artificial Reefs(of the same volume as the existing ARs inside Marine Exclusion Zone)	Mitigate water quality impacts on the existing ARs	Project proponent	To be determined	Construction phase or operation phase	N/A
S11.7	F2	• Reduce re-suspension of sediments • Limit dredging and works fronts. • Good site practices	Minimise marine water quality impacts	Contractor	Seawall,	During construction	^ ^ ^

EIA Ref.	EM&A Log 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?	Implementation Status
		• Strict enforcement of no marine dumping • Spill response plan					^ ^
Landscape & Visual (Construction Phase)							
S14.3.3.3	LV2	Mitigate both Landscape and Visual Impacts • G1. Grass-hydroseed bare soil surface and stock pile areas. • G2. Add planting strip and automatic irrigation system if appropriate at some portions of bridge or footbridge to screen bridge and traffic. • G3. For HKLR, providing aesthetic design on the viaduct, tunnel portals, at-grade roads (e.g. subtle colour tone and slim form for viaduct, featured form of tunnel portals, roadside planting along at-grade roads and landscape berm on) to beautify the HKLR alignment. • G5. Vegetation reinstatement and upgrading to disturbed areas. • G6. Maximize new tree, shrub and other vegetation planting to compensate tree felled and vegetation removed. • G7. Provide planting area around peripheral of and within HKLR for tree screening buffer effect. • G8. Plant salt tolerant native tree and shrubs etc along the planter strip at affected seawall. • G9. Reserve of loose natural granite rocks for re-use. Provide new coastline to adopt “natural-look” by means of using armour rocks in the form of natural rock materials and planting strip area accommodating screen buffer to enhance “natural-look” of the new coastline (see Figure 14.4.2 for example).	Minimise visual & landscape impact	Contractor	HKLR	Construction stage	 N/A N/A N/A N/A N/A N/A N/A N/A
S14.3.3.3	LV3	<u>Mitigate Visual Impacts</u>					

EIA Ref.	EM&A Log 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?	Implementation Status
		• V1.Minimize time for construction activities during construction period. • V2.Provide screen hoarding at the portion of the project site / works areas / storage areas near VSRs who have close low-level views to the Project during HKLR construction.					^ ^
EM&A							
S15.2.2	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	Control EM&A Performance	Project Proponent	All construction sites	Construction stage	^
S15.5 - S15.6	EM2	1) An Environmental Team needs to be employed as per the EM&A Manual. 2) Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures. 3) An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with.	Perform environmental monitoring & auditing	Contractor	All construction sites	Construction stage	^ ^ ^

Remarks: ^ Compliance of mitigation measure

* Recommendation was made during site audit but improved/rectified by the contractor

N/A Not Applicable at this stage as no such site activities were conducted in the reporting month (e.g. concrete batching plan, barging point, seawall dredging and filling, bored piling, landscaping works etc)

APPENDIX O
WASTE GENERATION IN THE REPORTING MONTH

Appendix: C6 Monthly Summary Waste Flow Table

Name of Department: HyD

Contract No.: HY/2011/09

Monthly Summary Waste Flow Table for 2017 (Year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated[9]	Hard Rock and Large Broken Concrete[6]	Reused in the Contract[7]	Reused in other Projects[5,7,11]	Disposed as Public Fill[7]	Imported Fill[6,7]	Metals[10]	Paper/ cardboard packaging	Plastics[3]	Chemical Waste	Others, e.g. general refuse[7]
	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 m^3)
Jan	0.355	0.000	0.000	0.000	0.355	0.000	0.069	0.746	0.000	0.000	0.286
Feb	7.781	0.000	0.000	0.000	7.781	0.000	0.026	1.153	0.000	0.000	0.306
Mar											
Apr											
May											
Jun											
Sub-Total	8.136	0.000	0.000	0.000	8.136	0.000	0.095	1.899	0.000	0.000	0.592
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	8.136	0.000	0.000	0.000	8.136	0.000	0.095	1.899	0.000	0.000	0.592

Forecast of Total Quantities of C&D Materials to be Generated from the Contract [8]										
Total Quantity Generated[9]	Hard Rock and Large Broken Concrete[6]	Reused in the Contract[7]	Reused in other Projects[5,7]	Disposed as Public Fill[6]	Imported Fill[6,7]	Metals[10]	Paper/ cardboard packaging	Plastics[3]	Chemical Waste	Others, e.g. general refuse[7]
(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 m^3)
245.000	0.000	5.000	76.000	110.000	54.000	5.500	45.000	0.000	35.000	20.000

Notes:

(1) The performance targets are given in ER Appendix 8J Clause 14 and the EM&A Manual.

(2) The waste flow table shall also include C&D materials to be imported for use at the Site.

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

(4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the total amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m^3. (ER Part 8 Clause 8.8.5 (d) (ii) refers).

(5) The materials reused in other Project shall not be treated as waste under the Waste Disposal Ordinance (CAP354).

(6) According to the EIA Appendix 8B, the density of rock (bulked) and soil (bulked) are 2.0 tonnes/m^3 and 1.8 tonnes/m^3 respectively.

(7) Assuming the loading quantities of a 30-tonne truck and a 24-tonne truck are 8.0m^3 and 6.5m^3 respectively.

(8) The forcast of C&D materials to be generated from the Contract is sourced from the works program in December 2016.

(9) The volume of Total Quantity Generated means the volume of Hard Rock and Large Broken Concrete+Disposed as Public Fill+Imported Fill-Reused in the Contract-Reused in other Projects.

(10) The density of metal is 7,850 kg/m^3.

(11) The C&D materials were delivered to TM-CLKL and HK/2009/02 Projects.

APPENDIX P
COMPLAINT LOG

Appendix P - Complaint Log

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
Com-2013-04-001	Near Tung Chung New Development Pier	8 April 2013	EPD received the complaint on 8 April 2013. The complainant complained about oil was dumped from various vessels operating for Hong Kong-Zhuhai-Macao Bridge Hong Kong (HZMB HK) Projects near Tung Chung New Development Pier over the past few months.	1) The vessels photos in the complainant's photo are not the working vessels under Contract No. HK/2011/09. 2) No oil dumped from Contract No. HK/2011/09's working vessels was observed according to ET's site inspection conducted on 9 April 2013 at near Tung Chung New Development Ferry Pier. 3) Joint site inspection (DCVJV and ARUP) was conducted on 10 April 2013 and confirmed that Contract No. HY/2011/09's vessels are not involved the complaint case. 4) DCVJV will keep remind their boat crews not discharging contaminated effluent directly into the sea.	Closed
Com-2013-05-001	WA6	2 May 2013	ARUP received the complaint on 2 May 2013. The complainant alleged the noise nuisance was generated from the Works Area WA6 at around 13:00 on 1 May 2013 (Wednesday).	The site diary report was reviewed and confirmed that no works were carried out at WA6 on 1 May 2013. In addition, no noise was heard from WA6 according to the security guard who on duty at WA6 on 1 May 2013. Based on the information provided, the complaint regarding the construction noise at WA6 is not considered justifiable.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
Com-2013-05-002	WA6	18 May 2013	ARUP received the complaint on 18 May 2013. The complainant advised that the noise nuisance due to loading of metal parts at barge near the seawall of Works Area WA6 early morning (around8:45a.m) on 18 May 2013 (Saturday).	Based on the record of site activities at WA6 on 18 May 2013, 4 metal plates and 2 oxygen-acetylene set were lifted onto a derrick boat "Chiu Kee" by a crane near seawall at WA6 in the morning on that day. Such operation was commenced around 8:40a.m and completed in 10 minutes during the normal construction working hour (0700 – 1900 Monday to Saturday). However, the duration of aforesaid activities is very short and infrequent. Nevertheless, the Contractor was reminded to strengthen their site supervision and provide training for the workers regularly to increase awareness of their environmental responsibilities to minimize the noise impact to the nearby residents and the specific mitigation measures for the complaint including but not limited to:- •To place wooden planks or rubber mats on ground for loading and unloading heavy or metal objects; and •To deploy professional personnel to supervise the works.	Closed
Com-2013-05-003	Near Tung Chung New Development Pier	18 May 2013	EPD received the public complaint on 18 May 2013. This complaint was a follow-up of a previous complaint received by EPD on 8	After receiving the complaint, additional site inspection was conducted at near Tung Chung New Development Pier on 30 May 2013 to investigate whether oil	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
			April 2013 (Com-2013-04-001). The complainant complained again about the oil was dumped from various vessels operating for Hong Kong-Zhuhai-Macao Bridge Hong Kong (HZMB HK) Projects near Tung Chung New Development Pier over the past months.	dumped was due to Contract No. HY/2011/09's vessels. During the site inspection, three working vessels under Contract No.HY/2011/09 was anchored off near Tung Chung New Development Pier. No oil dumped from Contract No. HY/2011/09's vessels were observed and the water around the vessels was clear. The following mitigation measures have been implemented by DCVJV: • DCVJV has sent the letter to the shipping agent to remind them to ensure the vessels under Contract No. HY/2011/09 are in good condition and any oil dumped to sea should be avoided to prevent water pollution. • Provide training to the vessel skippers for prevention of pollution from ships. • DCVJV requested vessel skippers to provide engine oil disposal records The vessel skippers assured to us that all waste lubricants were sent to waste collectors regularly and no oil discharge into seawater.	
Com-2013-07-001	Southeast Quay of Chek Lap Kok near the junction of Chek Lap Kok South Road and Scenic Road	17 July 2013	The complaint was received by EPD on 17th July 2013. According to the EPD's letter, the complainant was concerned for the noise nuisance generated from the	In response to the complaint, ET conducted two times site inspections at Southeast Quay at Chek Lap Kok between 18:45 and 20:30 hours on 23 July 2013 and 20:30 to 22:30 hours on 30 July 2013.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
			operation of concrete lorry mixers during evening and night-time period at Southeast Quay of Chek Lap Kok.	During the inspections, the Ro-Ro barge was observed anchored off Southeast Quay at Chek Lap Kok but no concrete lorry mixer was observed throughout the inspection. On 23 July 2013, at about 19:35, one tug boat was observed travelling to Southeast Quay, Chek Lap Kok and left at about 19:40. On 30 July 2013, no tug boat and concrete lorry mixers were observed during the inspection. According to the Contractor, there was no concreting works for the pier sites on 23 July 2013 and therefore no loading and unloading operation at Southeast Quay at Chek Lap Kok. Concreting works were performed at Pier 0 on 30 July 2013. As the Contractor anticipated the arrival time of tug boat and flap-top barge at Southeast Quay will exceed 23:00 hours after the concreting works, they decided to arrange the tug boat and flap-top barge with concrete	

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				lorry mixers anchored off around Pier 66 after 23:00 hours. So, no loading and unloading operation at Southeast Quay at Chek Lap Kok was observed. Further night time site inspection was conducted on 22 August 2013 during the loading and unloading operation at Southeast Quay of Chek Lap Kok, the construction works conducted under Contract No. HY/2011/09 complied with the conditions in the CNP No. GW-RS0895-13.	
Com-2013-11-001	Chek Lap Kok (CLK) South Road	16 November 2013	The complaint was received by project customer services on 16th November 2013 regarding the dust problem at Chek Lap Kok (CLK) South Road.	After receiving the complaint, ET conducted the site inspection on 19 and 29 November 2013 to check the appropriate environmental protection and pollution control measures which are properly implemented by the Contractor under HY/2011/09 (DCVJV). The observation are summarized as below:- • Dust generation works was conducted by the other Contractor at South East Quay • Proper watering of haul road to avoid dust generation during vehicle / plant equipment movement. • Vehicle washing facilities provided	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				at every site exit at CLK South Road and South Perimeter Road. • No dark smoke was observed emitting from the plant equipments. Based on the information collected, the complaint of dust problem at Check Lap Kok South Road is considered not related to Contract No. HY/2011/09 as dust suppression measures has been properly implemented by the Contractor on site to prevent dust nuisance from the construction activities.	
Com-2014-01-001	Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill (Contract No. HY/2011/09	3 January 2014	The complaint was received by EPD on 3rd January 2014. According to the EPD's letter, a resident in Tai O District was concerned for the noise nuisance occasionally arising from the hammering or hitting of metals from Contract No. HY/2011/09.	In response to the complaint, ET conducted an ad hoc night time site inspection at P0, P18 and P19 on 14 January 2014 between around 23:00 and 00:30 hours of 15 January 2014. In accordance with the site activities record and site inspections, the construction works conducted under Contract No. HY/2011/09 complied with the conditions in the CNP No. GW-RS1108-13. Nevertheless, the Contractor was advised to strictly follow the conditions of the permit because any deviation from the	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				conditions may lead to cancellation of the permit, subsequent prosecution action and the Authority's refusal to issue further permit. In addition, the following environmental mitigation measures were recommended: • Review and adjust the lighting directions of the barge, under safety consideration, to avoid potential visual impacts to residents in vicinities; • To ensure the equipment are maintaining in good operation condition; and • To strengthen site supervision and provide training for the workers regularly to increase awareness of their environmental responsibilities to minimize the noise impact to the nearby residents and the specific mitigation measures.	
Com-2014-01-002	Hong Kong-Zhuhai-Macao Bridge	16 January 2014	The complaint was received by HyD's PR Team on 16 January 2014 that the complainant advised that the heavy exhaust fume affecting Tung Chung Crescent.	After receiving the complaint, ET conducted the site inspection on 21 January 2014 to check all the plant equipments which were operated for the construction works and air quality	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				mitigation measures. Based on the information collected, the complaint of heavy exhausts affecting Tung Chung Crescent is considered not related to Contract No. HY/2011/09 due to the following reason(s):- 1) The work sites at Portion C and South East Quay at Portion A under Contract No. HY/2011/09 are approximately 800m from Tung Chung Crescent. Any unpleasant smell of exhaust fume would not be anticipated. 2) No heavy smoke was observed emitting from plants / equipment during the site inspection on 21 January 2014. 3) The vehicles and equipments were switched off while not in use. 4) All plant and equipment were well maintained and in good operating condition. 5) Air quality mitigation measures has been properly implemented by the Contractor on site to prevent dust nuisance from the construction activities.	

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
Com-2014-03-001	Oil Spillage at near Sha Lo Wan	5 March 2014	The complaint was received by EPD on 5 March 2014. The complainant suspected the oil leakage from the works area of Contract No. HY/2011/09 near Sha Lo Wan	Based on ET site inspection, no oil spillage from the works area under Contract No. HY/2011/09 at near Sha Lo Wan was observed. In addition, spill kits are ready on site in order to dealing with spillage cases promptly. Nevertheless, DCVJV was also recommended the mitigation measures as below: • Provide training for the workers regularly regarding the mitigation measures on waste / chemical management. • Provide sufficient chemical spillage kit (e.g. oil absorbent) to all vessels and working platform. • Regular check the condition of vessels and plant equipments to ensure no leakage of oil.	Closed
Com-2014-03-002	Construction Noise in the vicinity of the waters outside Sha Lo Wan	11 March 2014	The complaint was received by EPD on 11 March 2014. According to the EPD's letter, the complainant was concerned for the mobile crane which operating in the vicinity of the waters outside Sha Lo Wan after 23:00.	In accordance with an ad hoc site inspection on 18 March 2014, no construction works were conducted during the restricted hours. The 1st investigation report has been submitted to EPD on 21 March 2014 and the 2nd investigation report was submitted to EPD on 26 June 2014. The Contractor was advised to strictly	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				follow the conditions of the permit because any deviation from the conditions may lead to cancellation of the permit, subsequent prosecution action and the Authority's refusal to issue further permit. Nevertheless, the Contractor was reminded to take sufficient noise mitigation measures to minimize the environmental impact on the nearby community: · To space out noisy equipment and position it as far away as possible from the sensitive receivers; · To avoid concurrent uses of noisy equipment near the sensitive area; · To ensure the equipment are maintaining in good operation condition; · To turned off any idle equipment on site; and · To enclose the noisy part of the machine by acoustic insulation material if feasible. · To arrange tailor-made training for the Production Team including the management and foremen to explain to them the conditions and requirements listed on the CNP. · To delegate one Engineer for ensuring that all construction activities and PMEs used are in full compliance with the CNP	

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				and legislative requirements.	
Com-2014-04-001	Construction marine works by the company Bauer Hong Kong in Tung Chung	14 April 2014	The complaint was received by Agriculture, Fisheries and Conservation Department (AFCD) on 14 April 2014, the complainant complained that the dead dolphin was found under a platform at construction marine works by the company Bauer Hong Kong in Tung Chung (Macau Bridge Piling Works)	In accordance with the photos showing a date of 27 November 2013 (08:00 – 08:25a.m.) which provided by the complainant, the dolphin was observed has been dead for some time and shows signs of decomposition. It was difficult to determine the cause of death of the deceased dolphin based on the photographs and the dead dolphin was found a few months ago. By examining the photos, it is found that the body was beside a barge, not under a working platform. In addition, the dead dolphin was found in the early morning in which the marine construction works have not been commenced. Therefore, from the above information the dead dolphin is considered to be washed to the work site. However, there is no significant increase of cetacean stranding were found in Hong Kong since the commencement of Contact No. HY/2011/09. In regard to the complaint, the following recommendations were made:	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				➢ In case stranded cetaceans are found, the AFCD shall be contacted immediately and provide the following information to facilitate AFCD's investigation: 1. Name and telephone number; 2. Date and time of discovery; 3. Location (as specific as possible); 4. Status of the stranded animal (i.e. alive, freshly dead, slightly decomposed, rotten, mummified); 5. Type and size of the stranded animal. ➢ To implement Dolphin Exclusion Zone during the installation of bored pile casing located in the waters to the west of Airport. ➢ To implement Dolphin Watching Plan after the bored piling casing is installed.	
Com-2014-05-001	At the shore of Sha Lo Wan	13 May 2014	The complaint was received by EPD on 13 May 2014. According to the EPD's email, the complainant was concerned about the sand material that was excavated on the shore of Sha Lo Wan for the construction of Hong Kong -	After receiving the complaint from a Sha Lo Wan's village resident, the sub-contractor was instructed to stop the sand excavation and leave immediately. In addition, all sands excavated from the shore of Sha Lo Wan were returned back to the original area on 13 May 2014.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
			Zhuhai - Macao Bridge (HZMB) Project on 11 May 2014.	Nevertheless, the Contractor was advised to arrange tailor-made training for Production Team including the management and foremen to explain to them the conditions and requirements listed on the Environmental Permit. In addition, indicative poles and flags are recommended to put within the site boundary to identify the extent of land areas in Sha Lo Wan / Sha Lo Wan (West) Archaeological site.	
Com-2014-05-002	At the shore of Sha Lo Wan	27 May 2014	The complaint was received by EPD on 27 May 2014. According to the EPD's email, the complainant was concerned about the dumping rubbles along the shore area of Sha Lo Wan on 27 May 2014.	The complaint investigation report for the complaint of dumping rubbles along the shore area of Sha Lo Wan was submitted to EPD on 4 June 2014. EPD and AFCD provided their comments on 5 and 9 June 2014 respectively. A meeting among DCVJV, ARUP, IEC, ET, EPD and AFCD was held on 17 June 2014. According to the meeting, further information is required to include in the complaint investigation report and the report was submitted to EPD on 4 March 2015.	Complaint investigation report is under review by EPD

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
Com-2014-05-003	Pier 39 to 50	29 May 2014	ARUP received the complaint on 29 May 2013. The complainant advised that the workers disposed hundreds of kg of waste spoils (concrete and earth) into the sea every day in the existing locations of HZMB site area.	Based on the investigation findings, the waste spoils (concrete and earth) were disposed to HY/2010/02 Project according to approved WMP. The following recommendations were made: • To check for any accumulation of waste spoils (concrete and earth) on site. • To cover the wastes skip with waste spoils before removing from site. • To carry out inspection of pier(s) regularly to ensure the frontline staff loads inert materials to approved barge properly. • To clean the waste storage areas regularly and do not cause dust nuisance.	Closed
Com-2014-08-001	Near Sha Lo Wan	27 August 2014	ARUP received the complaint on 27 August 2013. The complainant was concerned about the dust on the surface of the roro-barge.	Based on the investigation findings, dusty materials at the ro-ro barge at P63 and dust generation when vehicles passing by at the roro-barge at Southeast Quay were observed. The following recommendations were made: • To check for any accumulation of dusty materials at roro-barge. • To cover the stockpile of dusty materials before removing from site. • To clean the surface of roro-barge	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				regularly and do not cause dust and water quality nuisance. • To maintain the surface of roro-barge wet especially during the vehicle movements. Water misting is considered an acceptable measure to control dust emissions. • To check and replace the worn sand bags at the surface of roro-barge to prevent the turbid water from entering to the sea when watering the barge surface.	
Com-2014-11-001	HZMB-HKLR – Section between HKSAR Boundary and Scenic Hill (Contract No. HY/2011/09)	11 November 2014	The complaint was received by EPD on 11 November 2014. According to the EPD's email, the complaint was received from one of the green groups Sea Shepherd. They complained that the residual concrete had been washed off from the deck surface of a flat-top barge into the sea, and marine littering had been spotted by a worker of HZMB-HKLR – Section between HKSAR Boundary and Scenic Hill (Contract No. HY/2011/09)	Based on the investigation findings, residue concrete or wastewater contaminated with concrete overflowing/spilling into the sea from the roro barge and marine littering were suspected. The following recommendations were made: ➢ Properly clear the concrete stains on the three ro-ro barges (e.g. hand-held equipments such as shovel etc). Tarpaulin sheet is also recommended to provide when clearing the concrete stains at the edge of roro barge to prevent these removed materials from getting into the sea. The worker should also pay special care to remove the concrete stains to	Closed
Com-2014-11-002	HZMB-HKLR – Section between HKSAR Boundary and Scenic Hill	18 November 2014	The complaint was received by EPD on 18 November 2014. According to the EPD's email, it was alleged that residual concrete		Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
	(Contract No. HY/2011/09)		had been poured out directly from the concrete lorry mixers on a roro barge into the sea during night-time by the workers of HZMB-HKLR – Section between HKSAR Boundary and Scenic Hill (Contract No. HY/2011/09)	minimize the water quality nuisance. ➢ Keep cleanliness of the surface of roro-barge and do not cause water quality nuisance. ➢ To check and reinforce the concrete / sand bag bund between baffles erected near the edge of the three ro-ro barges to avoid accidental leakage of wastewater from the deck regularly. ➢ Keep all debris/ aggregate away from the edge of ro-ro barge to prevent them from falling into the sea. ➢ Provide sufficient skips for temporary storage of concrete residue/wastewater. ➢ To check for any accumulation of residual waste concrete at the waste skip on roro-barge. ➢ Provide spare and sufficient sand bags at each roro barges to confine the concerned area in the event of accidental spillage of concrete when discharge the concrete from the concrete lorry mixers to pump truck. ➢ Provide absorptive materials to absorb the wastewater in case of accidental spillage of wastewater	

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				during washing concrete lorry mixers or other equipments. ➢ Assign trained staff to ensure proper management of environmental matters on each of the ro-ro barges in particular the handling of concrete residue/wastewater generated during operation. ➢ Keep record for collection of skip or temporary storage tank for wastewater and excess concrete. ➢ Ensure sufficient garbage bag / rubbish bin are provided at working barge / pier site. ➢ Provide training for the workers regularly regarding the water quality mitigation measures and waste management to increase their awareness of environmental protection.	
Com-2014-11-003	Floating Concrete Batching Plant (FCBP)	28 November 2014	The complaint was received by EPD on 28 November 2014. The complaint was received from one of the green groups Green Lantau Association. They complained about the hauling of the floating concrete batching plant (FCBP) by the tug boat to the site of Contract No. HY/2011/09 from the north-	Based on the information collected, the following conclusions were drawn: 1) It is suspected that the wake following the FCBP was resulted from disturbance to the bottom sediment when it was traveling during the lowest tide on that day. 2) The FCBP was traveling within the	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
			east side had disturbed the seabed causing an increase of turbidity in marine waters at around noon of 15 November 2014.	site area and the maximum number of movement of a floating plant (and therefore tug boat) is two times per day. Average duration of each movement is around 1 hour/day. Therefore, the disturbance to the bottom sediment is considered temporary, localized and infrequent. 3) No illegally discharge of wastewater or domestic wastewater to the sea from FCBP. 4) Relevant environmental mitigation measures as shown in EP-352/2009/C were properly implemented. 5) No deterioration of marine water quality based on the marine water quality monitoring results on 15 November 2014. Nevertheless, DCVJV was also recommended the mitigation measures as below: • The vessel skipper should pay special care about the movement of deep draught vessel to avoid seabed disturbance. (e.g. speed restrictions) • In case of sediment plume was found behind vessel, the vessel skipper	

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				should further reduce vessel speed. • Minimum clearance of 0.6m should be 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. (Reference: EIA-081/2002 - Construction of Lung Kwu Chau Jetty)	
Com-2014-12-001	Shores of Po Chue Tam and Shek Tsai Po, Tai O	7 December 2014	The complaint was received from one of the green groups Green Lantau Association. They complained about some waste materials (including a number of grey plastic mats and buoys) suspected in relation to the HZMB works have recently washed up on the shores of Po Chue Tam and Shek Tsai Po, Tai O	The owner of objects found on the shores could not be identified. DCVJV has taken initiative to remove these materials after receiving the complaint. Nevertheless, DCVJV was also recommended the mitigation measures as below: • Gather up and remove debris to keep the work site orderly. • Maintain site housekeeping. Designate areas for waste materials and provide containers. • Secure loose or light material that is stored on open floors. • Do not permit rubbish to fall freely from any level of the pier sites. • Provide training for the workers	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				regularly regarding the water quality mitigation measures and waste management to increase their awareness of environmental protection.	
Com-2014-12-002	Site Office of HZMB-HKLR – Section between HKSAR Boundary and Scenic Hill	2 December 2014	Highways Department (HyD) received a public complaint from a resident of Le Bleu Duex on 2 December 2014. According to the email from ARUP dated 3 December 2014, the complainant advised that the noise nuisance due to the metal parts were dropped onto the ground by people repetitively and loading or unloading a boat at the pier. The complaint was quoted, "*A resident living in Le Bleu Duex addressed a complaint to CE of HyD at about 20:04 hrs last night. He complained about the noise nuisance coming from site office since 19:30 hrs last night. Repetitively metal parts had been dropped on the ground by people who seem to*	Based on the information collected, the noise generated is considered due to the metal parts were dropped onto the ground at the seashore area near Le Bleu Duex. The metal pipe was unloaded at non-designated area and no powered mechanical equipment was used for unloading works at WA6 during restricted hour. The Contractor was reminded to take sufficient noise mitigation measures to minimize the environmental impact on the nearby community as recommended in the approved EIA report and the specific mitigation measures for the complaint including but not limited to:- • To place wooden planks or rubber mats on ground for loading and unloading heavy or metal objects; and • To deploy professional personnel to	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
			be loading or unloading a boat at the pier. Noise was still going on right now at 20:04."	supervise the works.	
Com-2014-12-003	Along the shore from Yat Tung to Tai O	24 December 2014	The complainant was concerned about the increase of marine refuse (water bottles and debris) along the shore from Yat Tung to Tai O suspected in relation to the HZMB works.	The owner of marine refuse found on the shores could not be identified. DCVJV has taken initiative to remove these wastes after receiving the complaint. DCVJV will also take the initiative to clear the marine refuse along the shore from Yat Tung to Tai O, if necessary. Nevertheless, DCVJV was also recommended the mitigation measures as below: • Gather up and remove debris to keep the work site orderly. • Maintain site housekeeping. Designate areas for waste materials and provide containers. • Secure loose or light material that is stored on open floors. • Do not permit rubbish to fall freely from any level of the pier sites. • Provide training for the workers regularly regarding the water quality mitigation measures and waste management to increase their awareness of environmental	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				protection.	
Com-2015-06-001	The sea side at WA6 vertical seawall	6 June 2015	A resident living in Le Bleu Duex complained about noise from a barge which unloading materials at about 21:00 hrs last Saturday i.e. 6 June 2015	Based on the information collected, the noise generated is considered due to the unloading of steel casings to the seashore area opposite to the China State Site Office. The person-in-charge of the barge has been reprimanded by the Contractor for causing noise nuisance to resident nearby. In addition, the Contractor had also reminded their subcontractors to avoid unloading of materials during restricted hours (i.e. 19:00 to 07:00 hours on any day and any time on public holidays including Sundays) without Construction Noise Permit (CNP). The Contractor was reminded to obtain Construction Noise Permit (CNP) for PME use in restricted hours. The Contractor was reminded again to take sufficient noise mitigation measures to minimize the environmental impact on the nearby community as recommended in the approved EIA report and the specific mitigation measures for the complaint including but not limited to:- • To place wooden planks or rubber	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				mats on ground for loading and unloading heavy or metal objects; and • To deploy professional personnel to supervise the works.	

APPENDIX Q
SUMMARY OF SUCCESSFUL PROSECUTION

Appendix Q - Summary of Successful Prosecution

Date of Successful Prosecution	Details of the Successful Prosecution	Status	Follow Up
20 October 2014	The non-compliance of construction noise permit (CNP) numbered GW-RS1217-13 that use of powered mechanical equipment not permitted in the CNP on 15 March 2014 between the hours of 7p.m. and 7a.m. at Pier 72.	The subcontractor was fined.	To ensure the construction works would comply with the CNP during restricted hours, a Permit-to-work system was formulated to control daily operation of the CNPs.