

Your ref
Our ref 214487/(HY/2011/09)/M45/630/B 2 2 9 4 4

ARUP

BY HAND

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For the attention of Ms HO Yuen Han, Marlene

22 December 2016

Dear Madam

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

Submission under Environmental Permit (EP-352/2009/D – Condition 4.4)
Quarterly EM&A Report – June to August 2016

On behalf of HyD/HZMB Project Management Office (the Permit Holder) of the captioned Environmental Permit (EP), I submit herewith three hard copies and one electronic copy (two hard copies and one electronic copy to EPD Wanchai, one hard copy to EPD Quarry Bay) of the Quarterly EM&A Report for June to August 2016 as per Condition 4.4 of EP-352/2009/D.

I confirm that this submission package has been certified by Environmental Team Leader and verified by Independent Environmental Checker.

Yours faithfully

Michael Chan
CRE / Supervising Officer's Representative

cc	HyD/HZMB/HKPMO	- Mr K Y Yung	w/e – CD only
	EPD	- Mr Alfred Lo	w/e – One hard copy
	AFCD	- Mr C P Lam	w/e – One hard copy
	ENPO	- Mr Y H Hui	w/e – One hard copy and one CD
	IEC	- Mr Antony Wong	w/o – By fax only
	Arup	- Mr Eric Chan	w/e – CD only

Response required : No, thank you
Date required : -
Attachments : Yes

KHW/DS/JC/mw

21 December 2016

By Fax (3767 5922) and By Post

ARUP
Level 5, Festival Walk
80 Tat Chee Avenue
Kowloon Tong, Kowloon

Attention: Mr. Colin Meadows / Mr. Michael Chan

Dear Sirs,

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

**Contract No. HY/2011/09 HZMB Hong Kong Link Road –
Section between HKSAR Boundary and Scenic Hill
Quarterly EM&A Report No. 14 for June to August 2016**

Further to the captioned submission (version 2) certified by the ET Leader provided to us via email on 19 December 2016, please be advised that we have no adverse comments on the captioned report.

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

Yours sincerely,
For and on behalf of
Ramboll Environ Hong Kong Limited



Antony Wong
Independent Environmental Checker
Hong Kong Link Road

c.c.	HyD	Mr. Matthew Fung	(By Fax: 3188 6614)
	HyD	Mr. Y K Lam	(By Fax: 3188 6614)
	ARUP	Mr. Eric Chan	(By Fax: 2268 3970)
	Cinotech	Dr. Priscilla Choy	(By Fax: 3107 1388)
	DCVJV	Mr. Chu Chung Sing	(By Fax: 3121 6688)

Internal: DY, YH, ENPO Site


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**

Quarterly EM&A Report

June to August 2016

(Version 2.0)

Certified By	 Dr. Priscilla Choy Environmental Team Leader
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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 14th Quarterly 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 performed in the period between June and August 2016.

Environmental Monitoring and Audit Progress

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

Table I Summary Table for Monitoring Activities in the Reporting Period

Parameter(s)	Monitoring Date(s)
1-hr TSP Monitoring	6 th , 10 th , 16 th , 22 nd and 28 th June 2016
24-hr TSP Monitoring	4 th , 8 th , 14 th , 20 th and 26 th July 2016 1 st , 5 th , 11 th , 17 th , 23 rd and 29 th August 2016
Noise Monitoring	1 st , 7 th , 17 th , 23 rd and 29 th June 2016 5 th , 15 th , 21 st and 27 th July 2016 3 rd , 12 th , 18 th , 24 th and 30 th August 2016
Water Quality Monitoring	1 st , 3 rd , 6 th , 8 th , 10 th , 13 th , 15 th , 17 th , 20 th , 22 nd , 24 th , 27 th and 29 th June 2016 2 nd , 4 th , 6 th , 8 th , 11 th , 14 th , 16 th , 18 th , 20 th , 22 nd , 25 th , 27 th and 29 th July 2016 1 st , 3 rd , 5 th , 8 th , 10 th , 12 th , 15 th , 17 th , 19 th , 22 nd , 24 th , 26 th , 29 th and 31 st August 2016
Dolphin Monitoring (Line-transect Vessel Surveys)	8 th and 20 th June 2016 6 th and 13 th July 2016 9 th and 16 th August 2016
Additional Land-based Dolphin Behaviour and Movement Monitoring	2 nd and 16 th June 2016 7 th and 15 th July 2016 11 th and 25 th August 2016
Environmental Site Inspection	7 th , 14 th , 21 st and 28 th June 2016 5 th , 12 th , 19 th and 26 th July 2016 3 rd , 9 th , 16 th , 23 rd and 30 th August 2016
Archaeological Site Inspection	28 th June 2016

Breaches of Action and Limit Levels

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

Table II Summary Table for Events Recorded in the Reporting Period

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
Noise	L _{eq} (30min)	0	0	0	0
Water Quality	Dissolved Oxygen (DO) (Surface & Middle)	0	0	0	0
	Dissolved Oxygen (DO) (Bottom)	3	0	0	0
	Turbidity	0	0	0	0
	Suspended Solids (SS)	0	0	0	0
Dolphin Monitoring	Line-transect Vessel Surveys	0	0	0	0

4. Environmental monitoring works were performed in the reporting period and all monitoring results were checked and reviewed. The details of each exceedance were attached in the Monthly EM&A Reports.

Complaint Log

5. No environmental complaint was received in the reporting period.

Notification of Summons and Successful Prosecutions

6. No notification of summons and successful prosecution was received in the reporting period.

Reporting Changes

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

Future Key Issues

8. 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 Lad 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

Marine Viaduct (P0 to P80)

Deck Erection

- Segment erection
- Erection of SOP segments
- Dismantling of LG1
- Erection of cantilever
- Construction of cross beam precast shell
- In-situ RC works
- Erection of precast SOP unit to Turnaround

External Prestressing Tendon Installation

Internal Trestressing 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 14th Quarterly EM&A report which summarises the impact monitoring results and audit findings for the EM&A programme in the period between June and August 2016.

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: **Environmental Monitoring and Audit Requirements** - summarises the monitoring parameters, monitoring frequency, monitoring locations, Action and Limit Levels, Event / Action Plans, site audit summary and environmental mitigation measures.

Section 4: **Environmental Monitoring Results** - summarises the environmental monitoring results in terms of air quality, noise, water quality, dolphin and waste management.

Section 5: **Environmental Non-conformance** - summarises any monitoring exceedance, environmental complaints, environmental summons and successful prosecutions within the reporting period.

Section 6: **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	Name	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 Period

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

June 2016:**Ancillary and Associated Facilities**

- (a) E&M installation at ML5 commence.
- (b) E&M ducting installation at ML18 and ML19.
- (c) Installation of precast parapets between P109 to P114 is in progress. The Progress is as follows.

Item	Number in this month	Cumulative No. of Precast Parapet Completed (up to end of month)
Parapet Casting	132	416
Parapet Installation	146	149

Land Viaduct (P85 to Abutment at SHT) & Marine Viaduct (P81 - P84)

- (a) P82R - Removal of filled platform at P82R is in progress.
- (b) P115 & P114 interface area - Reinstatement of slope area temporarily hold for drainage and reinstatement detailing.
- (c) Construction of longitudinal stitching between P110 to P114 (in-situ) and P109 to P107 (planking) is in progress.

Marine Viaduct (P0 to P80)**Precast Column Erection**

Description	Pier Location (in this reporting period)	Cumulative No. of Gridline (up to 28th of each month)
Commencement (i.e. starting from 1 st precast unit)	P2, P4	All completed 40 (P1 - P16, P21-P44)
Completion (i.e. completed installation of pier head unit)	P2, P4	All completed 40 (P1 - P16, P21-P44)
Vertical Tendons Stressed	P4, P5, P12	39 (P1, P3 -P16, P21-P44)
Grouting Vertical Tendons	P4, P5, P6, P12	39 (P1, P3 - P16, P21-P44)
Pier Head Concrete	P1, P9, P10, P11	32 (P1, P9-P11, P13-P16, P21-P44)

In-situ Double Blade Column Construction

(a) All in-situ double blade columns were completed. Progress in this reporting period is as follows.

Pier Location	Side	Progress
P75	L	2 nd lift, 3 rd lift and 4 th lift (pierhead) cast on 6, 18 and 28 June 2016 respectively
	R	2 nd lift and 3 rd lift (pierhead) cast on 31 May and 13 June 2016 respectively

Deck Erection

(a) Segment erection in June 2016:

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)*	P85, P86 and P87	50	976
Launching Gantry 2 (LG2)	P21, P22 and P23	56	1084
Lifting Frames 1 (LF1) and Hanger Beam (HB)	P17, P18, P71, P72, P73 and P76	90	363
Lifting Frames 3 (LF3)	P57R&L, P58R&L and P61L	62	534
Typical Span SOP	P15 and P14	8	188
Long Span SOP	P80	4	64

* includes crane erection for P109

External Prestressing Tendon Installation

Viaduct	Activities	Quantities	Unit	Done %
ML19C	Threading	47.55	T	100%
	Stressing	12	U	100%
	Grouting	9.42	M3	100%
ML19R	Threading	48.65	T	100%
	Stressing	12	U	100%
	Grouting	9.64	M3	100%
ML19L	Threading	46.91	T	100%
	Stressing	12	U	100%
	Grouting	9.29	M3	100%
ML18R	Threading	77.90	T	100%
	Stressing	18	U	100%
	Grouting	15.38	M3	100%
ML18L	Threading	76.40	T	100%
	Stressing	18	U	100%
	Grouting	15.08	M3	100%
ML17R	Threading	63.09	T	100%
	Stressing	16	U	100%
	Grouting	12.44	M3	100%
ML17L	Threading	62.86	T	100%
	Stressing	16	U	100%
	Grouting	12.39	M3	100%

Viaduct	Activities	Quantities	Unit	Done %
ML16R	Threading	56.69	T	100%
	Stressing	15	U	100%
	Grouting	9.91	M3	78%
ML16L	Threading	87.34	T	100%
	Stressing	18	U	100%
	Grouting	17.2	M3	70%
ML07R	Threading	129.58	T	26
	Stressing	32	U	17%
	Grouting	25.59	M3	0%
ML07L	Threading	140.43	T	24%
	Stressing	32	U	16%
	Grouting	27.76	M3	0%
ML06R	Threading	113.04	T	100%
	Stressing	24	U	100%
	Grouting	22.35	M3	100%
ML06L	Threading	113.04	T	100%
	Stressing	24	U	100%
	Grouting	22.35	M3	100%
ML05R	Threading	113.68	T	100%
	Stressing	24	U	100%
	Grouting	22.48	M3	30%
ML05L	Threading	112.39	T	100%
	Stressing	24	U	100%
	Grouting	22.22	M3	70%
ML04R	Threading	113.04	T	30%
	Stressing	24	U	30%
	Grouting	22.35	M3	0%
ML04L	Threading	113.04	T	30%
	Stressing	24	U	30%
	Grouting	22.35	M3	0%

Precast Segment

(a) Segment Casting:

- Production affected by inclement weather: 7 days.
- New CH3 & 4 moulds no.34, 35 & 36 at Line 0 assembling were completed. All new moulds at Line 0 commenced production.
- 2 nos. new CH5 & 1 no. of B* mould are being assembled It is anticipated to commence casting works in early July and end of June 2016 respectively.

Item	Number in this reporting period	Cumulative No. of Precast Segment Completed (up to 28th of each month)
Segment Cast	251	4432

Remarks: Cumulative no. excludes 7 nos. of damaged segment due to toppled incident at the casting yard.

(b) Off-site Storage:

Area	No. in Off-site Storage
A1	0
A2	0
A3	157
A4	0

Delivery for Precast Concrete Elements (by barge)

(a) Precast Deck Segments:

- Number of barges engaged in this period: 19.
- Number of deck segment deliveries in this period: 54 trips.
- Cumulative number of deck segment deliveries: 649 trips.

Segment Types	Segment Delivered in this reporting period	Cumulative No. of Precast Segment Delivered (up to 28th of each month)
A	117	1,653
B	0	6
C	114	454
D	22	162
E	67	987

(a) Temporary storage of long span segments:

- The last long span storage barge departed from Zhongshan port in mid-April. Since that time one barge has remained engaging in moving long span segments within the site from the temporary storage areas (on pile caps and dolphins) to the required erection locations.

July 2016:**Ancillary and Associated Facilities**

- (d) E&M installation at ML5 continue.
- (e) E&M ducting installation at ML18 and ML19.
- (f) Installation of precast parapet skins between P109 to P100 is in progress. The Progress is as follows.

Item	Number in this month	Cumulative No. of Precast Parapet Completed (up to end of month)
Parapet Casting	412	828
Parapet Installation	260	409

- (g) Erection of Radar Platform in progress at P20.

Land Viaduct (P85 to Abutment at SHT) & Marine Viaduct (P81 - P84)

- (d) P82R - Removal of filled platform at P82R was completed.
- (e) P115 & P114 interface area - Reinstatement of slope area temporarily on-hold pending for drainage and reinstatement detailing.

- (f) Construction of longitudinal stitching between P114 to P102 (planking) is in progress.
- (g) Road barrier construction was commenced with 52m of central divider and 12m of side barrier installed.

Marine Viaduct (P0 to P80)

Precast Column Erection

Description	Pier Location (in this reporting period)	Cumulative No. of Gridline (up to 28th of each month)
Column unit erection	Nil	All completed 40 (P1 - P16, P21 - P44)
Vertical Tendons Stressed	Nil	39 (P1, P3 - P16, P21 - P44)
Grouting Vertical Tendons	Nil	39 (P1, P3 - P16, P21 - P44)
Pier Head Concrete	P8, P9, P12	34 (P1, P8-P12, P13-P16, P21-P44)

Deck Erection

- (b) Segment erection in July 2016:

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)*	P84 and P85	38	1014
Launching Gantry 2 (LG2)	P16 and P21	38	1122
Lifting Frames 1 (LF1) and Hanger Beam (HB)	P17, P71, P72, P73 and P76	85	448
Lifting Frames 3 (LF3) and Hanger Beam (HB)	P52R&L, P58R&L, P59R&L and P61L	64	598
Typical Span SOP	P11 and P13	8	196
Long Span SOP	P80 and P83	8	72
Movement Joint (MJ) SOP Airport Channel	P81	4	4
Short Span (SS) SOP type B	P54	2	2

* includes crane erection for P109

External Prestressing Tendon Installation

Viaduct	Activities	Quantities	Unit	Done %
ML19C	Threading	47.55	T	100%
	Stressing	12	U	100%
	Grouting	9.42	M3	100%
	Threading	48.65	T	100%

Viaduct	Activities	Quantities	Unit	Done %
ML19R	Stressing	12	U	100%
	Grouting	9.64	M3	100%
ML19L	Threading	46.91	T	100%
	Stressing	12	U	100%
	Grouting	9.29	M3	100%
ML18R	Threading	77.90	T	100%
	Stressing	18	U	100%
	Grouting	15.38	M3	100%
ML18L	Threading	76.40	T	100%
	Stressing	18	U	100%
	Grouting	15.08	M3	100%
ML17R	Threading	63.09	T	100%
	Stressing	16	U	100%
	Grouting	12.44	M3	100%
ML17L	Threading	62.86	T	100%
	Stressing	16	U	100%
	Grouting	12.39	M3	100%
ML16R	Threading	56.69	T	100%
	Stressing	15	U	100%
	Grouting	9.91	M3	78%
ML16L	Threading	87.34	T	100%
	Stressing	18	U	100%
	Grouting	17.2	M3	70%
ML07R	Threading	129.58	T	26
	Stressing	32	U	17%
	Grouting	25.59	M3	0%
ML07L	Threading	140.43	T	24%
	Stressing	32	U	16%
	Grouting	27.76	M3	0%
ML06R	Threading	113.04	T	100%
	Stressing	24	U	100%
	Grouting	22.35	M3	100%
ML06L	Threading	113.04	T	100%
	Stressing	24	U	100%
	Grouting	22.35	M3	100%
ML05R	Threading	113.68	T	100%
	Stressing	24	U	100%
	Grouting	22.48	M3	70%
ML05L	Threading	112.39	T	100%
	Stressing	24	U	100%
	Grouting	22.22	M3	70%
ML04R	Threading	113.04	T	30%
	Stressing	24	U	30%
	Grouting	22.35	M3	0%
ML04L	Threading	113.04	T	30%
	Stressing	24	U	30%
	Grouting	22.35	M3	0%

Internal Prestressing Grouting Progress

Viaduct	Activities	Quantities	Unit	Done %
ML19C	Air test & Grouting	14.09	M3	100%
ML19R	Air test & Grouting	14.90	M3	99%
ML19L	Air test & Grouting	13.90	M3	100%
ML18R	Air test & Grouting	25.24	M3	100%
ML18L	Air test & Grouting	24.76	M3	96%

Viaduct	Activities	Quantities	Unit	Done %
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	45%
ML15L	Air test & Grouting	39.69	M3	44%
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	57%
ML06L	Air test & Grouting	58.31	M3	51%
ML05R	Air test & Grouting	58.62	M3	15%
ML05L	Air test & Grouting	58.01	M3	43%
ML04R	Air test & Grouting	57.64	M3	0%
ML04L	Air test & Grouting	57.69	M3	0%

Precast Segment

(c) Segment Casting:

- Production affected by inclement weather: 9.75 days.
- Production in new CH5 mould no.40 & B* mould no.42 commenced operation in July. CH5 mould no.41 will commence operation soon.

Item	Number in this reporting period	Cumulative No. of Precast Segment Completed (up to 28th of each month)
Segment Cast	254	4686

Remarks: Cumulative no. excludes the 7 nos. recast following damages to segments due to toppled incident at the casting yard.

(d) Off-site Storage:

Area	No. in Off-site Storage
A1	0
A2	0
A3	146
A4	0

Delivery for Precast Concrete Elements (by barge)

(b) Precast Deck Segments:

- Number of barges engaged in this period: 19.
- Number of deck segment deliveries in this period: 54 trips.

- Cumulative number of deck segment deliveries: 723 trips.

Segment Types	Segment Delivered in this reporting period	Cumulative No. of Precast Segment Delivered (up to 28th of each month)
A	91	1763
B	7	13
C	120	600
D	19	183
E	18	1014

- (b) Temporary storage of long span segments:

- The last long span storage barge departed from Zhongshan port in mid-April. Since that time one barge has remained engaging in moving long span segments within the site from the temporary storage areas (on pile caps and dolphins) to the required erection locations.

August 2016:

Ancillary and Associated Facilities

- (h) P115 & P114 interface area - Reinstatement of slope area temporarily on-hold pending for drainage and reinstatement detailing.
- (i) Installation of precast parapet skins between P109 to P96 is in progress. The Progress is as follows.

Item	Number in this month	Cumulative No. of Precast Parapet Completed (up to end of month)
Parapet Casting	349	1177
Parapet Installation	211	620

- (j) Construction of side barriers from P112 to P113 is in progress, currently total 75m side barriers were cast.
- (k) Construction of median barriers from P109 to P105 is in progress, currently total 96m of median barriers were cast.
- (l) Construction of longitudinal stitching between P114 to P102 (concrete planking) is in progress.
- (m) E&M installation at ML6 continues.
- (n) E&M ducting installation at ML15 to ML17.
- (o) Construction of Load Centre 1 (LC1) commence.
- (p) Installation of carrier drains from P113 to P109 is in progress.
- (q) LHS gantry posts for Sign gantry GE15 & GW13 were erected.
- (r) Erection of Radar Platform at P20 is in progress.

Deck Erection

(c) Segment erection in August 2016:

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)*	P84	6	1020 (Completed)
Launching Gantry 2 (LG2)	P16 and P15	74	1196
Lifting Frames 1 (LF1) and Hanger Beam (HB)	P71, P72, P73 and P76	122	570
Lifting Frames 3 (LF3) and Hanger Beam (HB)	P52R&L, P59R&L	55	653
Typical Span SOP	P12, P10 and P09	12	208
Long Span SOP	NA	0	72
Movement Joint (MJ) SOP Airport Channel	P70	4	8
Short Span (SS) SOP type B	P53 and P55	6	8

External Prestressing Tendon Installation

Viaduct	Activities	Quantities	Unit	Done %
ML19C	Threading	47.55	T	100%
	Stressing	12	U	100%
	Grouting	9.42	M3	100%
ML19R	Threading	48.65	T	100%
	Stressing	12	U	100%
	Grouting	9.64	M3	100%
ML19L	Threading	46.91	T	100%
	Stressing	12	U	100%
	Grouting	9.29	M3	100%
ML18R	Threading	77.90	T	100%
	Stressing	18	U	100%
	Grouting	15.38	M3	100%
ML18L	Threading	76.40	T	100%
	Stressing	18	U	100%
	Grouting	15.08	M3	100%
ML17R	Threading	63.09	T	100%
	Stressing	16	U	100%
	Grouting	12.44	M3	100%
ML17L	Threading	62.86	T	100%
	Stressing	16	U	100%
	Grouting	12.39	M3	100%
ML16R	Threading	56.69	T	100%
	Stressing	15	U	100%
	Grouting	9.91	M3	78%
ML16L	Threading	87.34	T	100%
	Stressing	18	U	100%
	Grouting	17.2	M3	70%
ML07R	Threading	129.58	T	26%
	Stressing	32	U	17%
	Grouting	25.59	M3	0%

Viaduct	Activities	Quantities	Unit	Done %
ML07L	Threading	140.43	T	24%
	Stressing	32	U	16%
	Grouting	27.76	M3	0%
ML06R	Threading	113.04	T	100%
	Stressing	24	U	100%
	Grouting	22.35	M3	100%
ML06L	Threading	113.04	T	100%
	Stressing	24	U	100%
	Grouting	22.35	M3	100%
ML05R	Threading	113.68	T	100%
	Stressing	24	U	100%
	Grouting	22.48	M3	70%
ML05L	Threading	112.39	T	100%
	Stressing	24	U	100%
	Grouting	22.22	M3	70%
ML04R	Threading	113.04	T	30%
	Stressing	24	U	30%
	Grouting	22.35	M3	0%
ML04L	Threading	113.04	T	30%
	Stressing	24	U	30%
	Grouting	22.35	M3	0%

Internal Prestressing Grouting Progress

Viaduct	Activities	Quantities	Unit	Done %
ML19C	Air test & Grouting	14.09	M3	100%
ML19R	Air test & Grouting	14.90	M3	99%
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	45%
ML15L	Air test & Grouting	39.69	M3	44%
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	87%
ML06L	Air test & Grouting	58.31	M3	82%
ML05R	Air test & Grouting	58.62	M3	51%
ML05L	Air test & Grouting	58.01	M3	55%
ML04R	Air test & Grouting	57.64	M3	24%
ML04L	Air test & Grouting	57.69	M3	41%

Precast Segment

(e) Segment Casting:

- Production affected by inclement weather: 7.75 days.
- The last new mould no. 41 (CH5) commenced production in early Aug 2016. All new moulds are under full operation.
- Mould no. 20 has been modified from Type C production to Type A after casting P74.

Item	Number in this reporting period	Cumulative No. of Precast Segment Completed (up to 28th of each month)
Segment Cast	236	4922

Remarks: Cumulative no. excludes the 7 nos. recast following damages to segments due to toppled incident at the casting yard.

(f) Off-site Storage:

Area	No. in Off-site Storage
A1	0
A2	0
A3	76
A4	0

Delivery for Precast Concrete Elements (by barge)

(c) Precast Deck Segments:

- Number of barges engaged in this period: 19.
- Number of deck segment deliveries in this period: 46 trips.
- Cumulative number of deck segment deliveries: 769 trips.

Segment Types	Segment Delivered in this reporting period	Cumulative No. of Precast Segment Delivered (up to 28th of each month)
A	101	1864
B	15	28
C	102	702
D	9	192
E	0	1014

Status of Environmental Licences, Notification and Permits

2.11 The valid environmental licenses and permits were attached in the Monthly EM&A Reports.

3 ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS

Monitoring Parameters and Monitoring Locations

3.1 The EM&A Manual designates locations for the ET to monitor environmental impacts in terms of air quality, noise, underwater noise, water quality and dolphin to the Contract. The monitoring locations are depicted in **Figures 3 to 6**. The details of monitoring requirements are presented in **Table 3.1**.

Table 3.1 Summary of Impact EM&A Requirements

Type of Monitoring	Parameter	Frequency	Location	Remarks
Air Quality	1-hr TSP	Three times / 6 days	AMS1 – Sha Lo Wan AMS4 – San Tau	While the highest dust impact was expected
	24-hr TSP	Once / 6 days		--
Noise	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)	Once per week	NMS1 – Sha Lo Wan NMS4 – San Tau	Daytime on normal weekdays (0700-1900 hrs)
Water Quality	<ul style="list-style-type: none"> • 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) 	Impact monitoring: 3 days per week, at mid-flood and mid-ebb tides (within ± 1.75 hour of the predicted time) during the construction period of the Contract	IS1, IS2, IS3 IS4, CS1, CS2, SR1, SR2, SR3, SR6, ST1, ST2, ST3, SRA	<ul style="list-style-type: none"> • 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.
Dolphin	Line-transect Methods	Twice per month	West Lantau	--

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

Monitoring Methodology and Calibration Details

3.3 Monitoring works/equipments were conducted/calibrated regularly in accordance with the EM&A Manual. Copies of calibration certificates are attached in the appendices of the Monthly EM&A Reports.

Environmental Quality Performance Limits (Action and Limit Levels)

- 3.4 The environmental quality performance limits, i.e. Action and Limit Levels were derived from the baseline monitoring results (except the Action and Limit Levels for underwater noise monitoring). Should the measured environmental quality parameters exceed the Action/Limit Levels, the respective action plans would be implemented. The Action/Limit Levels for each environmental parameter are given in **Table 3.2a-f**.

Table 3.2a Action and Limit Levels for 1-Hour TSP

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
AMS1	381	500
AMS4	352	

Table 3.2b Action and Limit Levels for 24-Hour TSP

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
AMS1	170	260
AMS4	171	

Table 3.2c 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 3.2d 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	<u>5.0</u>	4.2 except 5 for FCZ
	Bottom	<u>4.7</u>	3.6
Turbidity (NTU)	Depth average	<u>27.5</u> and 120% of upstream control station's turbidity at the same tide of the same day	<u>47.0</u> and 130% of turbidity at the upstream control station at the same tide of same day
Suspended Solids (mg/L)	Depth average	<u>23.5</u> and 120% of upstream control station's SS at the same tide of the same day	<u>34.4</u> 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 than 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.

Table 3.2e Action and Limit Levels for Dolphin Line Transect Monitoring

	West Lantau
Action Level	STG < 60% of baseline & ANI <60% of baseline
Limit Level	STG < 45% of baseline & ANI <45% of baseline

Derived Value of Action Level (AL) and Limit Level (LL):

	West Lantau
Action Level	STG < 9.8 & ANI <36.3
Limit Level	STG < 7.4 & ANI <27.2

Remarks:

1. STG means quarterly encounter rate of number of dolphin sightings
2. ANI means quarterly encounter rate of total number of dolphins
3. Baseline value: 16.4 for ER (STG) and 60.5 for ER (ANI)

Event and Action Plan

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

Implementation Status of Environmental Mitigation Measures

- 3.6 Relevant mitigation measures as recommended in the EIA report have been stipulated in the EM&A Manual for the Contractor to implement. The implementation status of environmental mitigation measures (EMIS) is given in **Appendix H**.
- 3.7 Regular marine travel route for marine vessels were implemented properly in accordance with the submitted plan and relevant records were kept properly.
- 3.8 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.
- 3.9 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.
- 3.10 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.

Site Audit Summary

- 3.11 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 observations and recommendations made during the reporting period are summarized in **Appendix I**.
- 3.12 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. One inspection to the Sha Lo Wan (West) Archaeological Site was conducted in the reporting period (28th June 2016). No access to Sha Lo Wan (West) Archaeological site for works areas and storage of construction equipment was observed. The photographic records of the inspection to the Sha Lo Wan (West) Archaeological Site are shown in the Monthly EM&A Reports.

Status of Waste Management

- 3.13 The amount of wastes generated by the activities of the Contract during the reporting month is shown in **Appendix J**.

4 ENVIRONMENTAL MONITORING RESULTS

Air Quality Monitoring Results

- 4.1 The monitoring results for 1-hour TSP and 24-hour TSP are summarized in **Table 4.1 and 4.2** respectively. Graphical presentations of 1-hour and 24-hour TSP monitoring results are shown in **Appendices B and C** respectively.

Table 4.1 Summary Table of 1-hour TSP Monitoring Results during the Reporting Period

Month	Monitoring Station	Concentration (µg/m ³)		Action Level, µg/m ³	Limit Level, µg/m ³
		Average	Range		
June 2016	AMS1	16	7 – 37	381	500
	AMS4	37	8 – 148	352	
July 2016	AMS1	18	4 – 44	381	
	AMS4	51	3 – 211	352	
August 2016	AMS1	28	3 – 86	381	
	AMS4	37	5 – 125	352	

Table 4.2 Summary Table of 24-hour TSP Monitoring Results during the Reporting Period

Month	Monitoring Station	Concentration (µg/m ³)		Action Level, µg/m ³	Limit Level, µg/m ³
		Average	Range		
June 2016	AMS1	20	6 – 49	170	260
	AMS4	26	20 – 33	171	
July 2016	AMS1	16	11 – 24	170	
	AMS4	34	13 – 91	171	
August 2016	AMS1	25	9 – 42	170	
	AMS4	36	9 – 50	171	

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

Table 4.3 Observation at Dust Monitoring Stations

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

- 4.3 The wind data monitoring results were attached in the Monthly EM&A Reports

Noise Monitoring Results

4.4 The noise monitoring results are summarized in **Table 4.4**. Graphical presentations of noise monitoring are shown in **Appendix D**.

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

Month	Monitoring Station	Noise Level, $L_{eq(30min)}$ dB(A)		Limit Level
		Average	Range	
June 2016	NMS1	67	57 – 71	75 dB(A)
	NMS4	58	55 – 62	
July 2016	NMS1	64	57 – 68	
	NMS4	57	55 – 58	
August 2016	NMS1	66	57 – 71	
	NMS4	58	54 – 59	

Remark: +3dB(A) Façade correction included

4.5 According to our field observations, the major noise source identified at the designated noise monitoring stations in the reporting period 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

Water Quality Monitoring Results

4.6 The graphical presentation of water quality at the monitoring stations is shown in **Appendix E**.

4.7 Water quality impact sources during the water quality monitoring were the construction activities of the Contract, nearby construction activities by other parties and nearby operating vessels by other parties.

Dolphin Monitoring (Line-transect Vessel Survey)

Summary of survey effort and dolphin sightings

4.8 During the period of June to August 2016, six sets of systematic line-transect vessel surveys were conducted to cover all transect lines in WL survey area twice per month.

4.9 From these surveys, a total of 197.77 km of survey effort was collected, with 100% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility). The total survey effort conducted on primary lines was 133.78 km, while the effort on secondary lines was 63.99 km.

Survey effort conducted on primary and secondary lines were both considered as on-effort survey data. Summary table of the survey effort is shown in **Appendix I of Appendix F**.

- 4.10 During the six sets of monitoring surveys in June to August 2016, a total of 30 groups of 86 Chinese White Dolphins were sighted. All except three dolphin sightings were made during on-effort search. Nineteen on-effort sightings were made on primary lines, while the other eight on-effort sightings were made on secondary lines. Summary table of the dolphin sightings is shown in **Appendix II of Appendix F**.

Distribution

- 4.11 Distribution of dolphin sightings made during monitoring surveys in June to August 2016 is shown in **Figure 1 of Appendix F**. The dolphin groups were mainly sighted in the central and southern portions of the survey area, from the south of Tai O Peninsula to Fan Lau, with slightly higher concentration near Kai Kung Shan and Peaked Hill (**Figure 1 of Appendix F**).
- 4.12 Sighting distribution of dolphins in the present quarter was quite different from the one during the baseline period in September to November 2011. When compared to the baseline period, dolphins occurred much less frequently in the offshore waters and around Tai O Peninsula during the present impact phase period (**Figure 1 of Appendix F**).
- 4.13 None of the 30 dolphin groups was sighted near the HKLR09 alignment in WL survey area during the present quarter (**Figure 2 of Appendix F**).
- 4.14 Distribution patterns of dolphin sightings in the past three spring quarters of 2013-15 were also compared. Dolphins appeared to occur less frequently in the spring of 2016 when compared to the previous three spring periods, especially near the Tai O Peninsula and in the offshore waters (**Figure 3 of Appendix F**).

Encounter rate

- 4.15 During the present three-month impact phase monitoring period (June to August 2016), the encounter rates of Chinese White Dolphins deduced from the survey effort and on-effort sighting data from the primary transect lines under favourable conditions (Beaufort 3 or below) from West Lantau survey area are shown in **Table 4.6**. The average encounter rates deduced from the six sets of surveys from the present quarter were also compared with the ones deduced from the baseline monitoring period (September – November 2011) (**Table 4.7**).

Table 4.6 Dolphin encounter rates (sightings per 100 km of survey effort) during the impact monitoring period (June – August 2016)

Survey Area	Dolphin Monitoring	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 (June 8 th)	8.9	22.3
	Set 2 (June 20 th)	26.9	53.7
	Set 3 (July 6 th)	17.7	57.4
	Set 4 (July 13 th)	13.7	36.5
	Set 5 (August 9 th)	4.6	4.6
	Set 6 (August 16 th)	13.1	34.9

Table 4.7 Comparison of average dolphin encounter rates from impact monitoring period (June to August 2016) and baseline monitoring period (September-November 2011)

	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)	
	June – August 2016	September-November 2011	June – August 2016	September-November 2011
West Lantau	14.14 ± 7.66	16.43 ± 7.70	34.91 ± 19.69	60.50 ± 38.47

4.16 Notably, the encounter rates of sightings (ER(STG)) for the present spring quarter of 2016 was the lowest among all quarters since 2013, while the encounter rates of dolphins (ER(ANI)) from the present quarter was also among the lowest since 2013 but was slightly higher than the one from the spring quarter of 2015 (**Table 4 of Appendix F**). Both encounter rates in spring quarters of 2015 and 2016 were lower than the ones in 2013 and 2014 (**Table 4 of Appendix F**), which is a concern. Such temporal trend should be continuously monitoring to detect any further decline in the future, even though the Action or Limit Level has not been triggered under the Event and Action Plan for this quarter.

4.17 A one-way ANOVA was conducted to examine whether there were any significant differences in the average encounter rates between the baseline and impact monitoring periods. For the comparison between the baseline period and the present quarter (i.e. thirteenth quarter of the impact phase), the p-value for the differences in average dolphin encounter rates of STG and ANI were 0.617 and 0.178 respectively. Therefore, no significant difference in dolphin encounter rate was detected between the baseline

period and the present quarter.

- 4.18 Another comparison was made between the baseline period and the cumulative quarters in the impact phase (i.e. first thirteen quarters of the impact phase), and the p-value for the differences in average dolphin encounter rates of STG and ANI were 0.708 and 0.858 respectively. As a result, no significant difference was found in the dolphin encounter rates between the baseline period and the cumulative quarters in the impact phase.

Group size

- 4.19 Group size of Chinese White Dolphins ranged from 1-13 individuals per group in WL survey area during June to August 2016. The average dolphin group size for the three-month period was compared with the one deduced from the baseline period in September to November 2011, as shown in **Table 4.8**.

Table 4.8 Comparison of average dolphin group sizes from impact monitoring period (June – August 2016) and baseline monitoring period (September-November 2011)

	Average Dolphin Group Size	
	June-August 2016	September – November 2011
West Lantau	2.87 ± 2.05 (n = 30)	3.63 ± 2.97 (n = 46)

- 4.20 The average dolphin group size in the WL region during the present quarter was slightly larger than the one recorded in the three-month baseline period (**Table 4.8**). Among the 30 groups, 22 of them were composed of only 1-3 dolphins, while there were only six groups with five or more animals per group.
- 4.21 Distribution of dolphins with the larger groups during June to August 2016 is shown in **Figure 4 of Appendix F**. Most of these groups were scattered in the waters between Tai O Peninsula and Peaked Hill, with no particular concentration (**Figure 4 of Appendix F**).
- 4.22 Distribution of larger dolphin groups in the present impact phase period was very different from the baseline period, when they were more concentrated to the northwest of Tai O Peninsula as well as near Kai Kung Shan and Peaked Hill (**Figure 4 of Appendix F**).

Habitat use

- 4.23 From June to August 2016, the most heavily utilized habitats by the dolphins with higher densities were primarily found between Tai O Peninsula and Kai Kung Shan as well as between Peaked Hill and Fan Lau (**Figures 5a and 5b of Appendix F**). However, it should be cautioned that the amount of survey effort collected in each grid during the three-month period was fairly low (six units of survey effort for most grids),

and therefore the habitat use pattern derived from the three-month dataset should be treated with caution. A more complete picture of dolphin habitat use pattern will be presented when more survey effort for each grid will be collected throughout the impact phase monitoring programme.

- 4.24 When compared with the habitat use pattern recorded during the baseline period in 2011, it appears that the overall dolphin densities were less evenly distributed in the present impact phase monitoring period, and also lower in certain areas such as the waters just to the south of the HKLR09 alignment, around Tai O Peninsula and Kai Kung Shan (**Figure 6 of Appendix F**).

Mother-calf pairs

- 4.25 During the three-month impact phase monitoring period, only one young calf (a unspotted juvenile) was sighted in WL survey area. This young calf comprised 1.2% of all animals sighted, which was much lower than the percentage recorded during the baseline monitoring period (6.6%).
- 4.26 The rare occurrence of this mother-calf pair was sighted to the southwest of Tai O Peninsula during the quarterly period, which was very different from the baseline period when calf occurrence was more frequent and concentrated near Tai O Peninsula at the northern portion of WL waters (**Figure 7 of Appendix F**).

Activities and associations with fishing boats

- 4.27 During the three-month impact monitoring period, two dolphin groups were engaged in feeding activities near Kai Kung Shan and Peaked Hill (**Figure 8 of Appendix F**), comprising 6.7% of the total number of dolphin sightings. This percentage was much lower the percentage recorded during the baseline period (13.0%).
- 4.28 On the other hand, two dolphin groups were engaged in socializing and traveling activities respectively near Kai Kung Shan during the present quarter (**Figure 8 of Appendix F**).
- 4.29 Distribution of different activities during the present impact phase monitoring period was quite different from the one during the baseline period, when the main concentration of the feeding and socializing activities occurred at the central portion of the survey area between Tai O Peninsula and Peaked Hill (**Figure 8 of Appendix F**).
- 4.30 During the three-month monitoring period, none of the 30 dolphin groups was associated with any operating fishing vessel.

Summary of photo-identification works

- 4.31 From June to August 2016, over 2,000 digital photographs of Chinese White Dolphins were taken during the impact phase monitoring surveys for the photo-identification work.
- 4.32 In total, 26 individuals sighted 30 times altogether were identified (see summary table in **Appendix III of Appendix F** and photographs of identified individuals in **Appendix**

IV of Appendix F). All identified individuals were sighted only once or twice during the three-month period.

Individual range use

- 4.33 Ranging patterns of the 26 individuals identified during the three-month study period were determined by fixed kernel method, as shown in **Appendix V of Appendix F**.
- 4.34 Notably, a number of individual dolphins (e.g. NL120, NL123, NL287) that primarily centered their range use in North Lantau in the past were found extending their ranges to West Lantau waters (especially to the south of the HKLR09 alignment), further shifting or expanding their range use away from North Lantau waters (**Appendix V of Appendix F**).
- 4.35 On the contrary, the majority of these individuals that primarily centered their range use in West Lantau were still sighted within their normal range during the present quarterly period, with some extending their range use into Southwest Lantau waters (**Appendix V of Appendix F**).

Conclusion

- 4.36 During the present quarter of dolphin monitoring, no adverse impact from the activities of the HKLR09 construction project on Chinese White Dolphins was noticeable from general observations.
- 4.37 Nevertheless, the dolphin usage in WL region should be continuously monitored, to further examine whether it has been significantly affected by the on-going construction activities in relation to the HZMB works.

Additional Land-based Dolphin Behaviour and Movement Monitoring

- 4.38 Additional land-based dolphin behavior and movement monitoring were conducted in the reporting period. The progress of the monitoring is summarized in the **Table 4.9**.

Table 4.9 Progress Record of Additional Land-based Dolphin Behaviour and Movement Monitoring (June to August 2016)

Date	Time	Weather		Number of Staff	Number of Dolphin Sighting
		Beaufort	Visibility		
02/06/16	09:10 - 14:32	3-4	2.5	3	0
16/06/16	09:27 - 14:31	2-3	2.5	3	1
07/07/16	09:22 - 14:30	2-3	2	3	1
15/07/16	09:24 - 14:30	2-4	4.5	3	1
11/08/16	09:57 - 14:34	2	2-3	3	0
25/08/16	09:15 - 14:15	2	2.5	3	2

4.39 Detailed monitoring methodology and results will be provided in a separate report after the completion of full set of additional land-based dolphin behavior and movement monitoring.

Advice on the Solid and Liquid Waste Management Status

4.40 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.

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

5 ENVIRONMENTAL NON-CONFORMANCE (EXCEEDANCES)

Summary of Exceedances

5.1 Summary of exceedance is provided in **Appendix K**. The details of the exceedances were attached in the Monthly EM&A Report.

Air Quality

5.2 For 1-hour TSP monitoring, no Action/Limit Level exceedance was recorded in the reporting period.

5.3 For 24-hr TSP monitoring, no Action/Limit Level exceedance was recorded in the reporting period.

Noise

5.4 No Action/Limit Level exceedance was recorded in the reporting period.

Water Quality

5.5 There are 3 Action Level exceedances and no Limit Level exceedances were recorded for Dissolved Oxygen (bottom depth). No Action/Limit Level exceedance for dissolved oxygen (surface and middle depth), turbidity and suspended solids were recorded in the reporting period.

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

- 1) No pollution discharge was observed from the site;
- 2) Control Station value already exceeded either the Baseline Action or Limit Levels. (Please refer to table below);

Station(s)	Tide	Dissolved Oxygen at Bottom Depth (mg/L)
CS1	Mid-Flood Tide	4.6

- 3) Rough sea condition was recorded during the water quality monitoring. The low dissolved oxygen results are considered due to the stirring up of bottom sediments which cause the decomposition of organic matter by bacteria.

Dolphin Monitoring (Line-transect Vessel Survey)

5.7 No Action/Limit Level exceedance was recorded in the reporting period.

Summary of Environmental Complaint

5.8 No environmental related complaint was received in the reporting period. The Complaint Log is attached in **Appendix L**.

Summary of Notification of Summons and Successful Prosecution

- 5.9 There was one prosecution or notification of summons received since the Contract commencement. Summary of successful prosecution is attached in **Appendix M**.

6 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

- 6.1 This Quarterly Environmental Monitoring and Audit (EM&A) Report presents the EM&A works undertaken in the period between June and August 2016 in accordance with EM&A Manual.
- 6.2 No Action/Limit Level exceedance was recorded for air quality and noise.
- 6.3 For water quality monitoring, there are 3 Action Level exceedances recorded for dissolved oxygen. No Action/Limit Level exceedance for suspended solids and turbidity were recorded in the reporting period.
- 6.4 According to the investigation, all exceedances are considered not due to the Contract.
- 6.5 During this quarter of dolphin monitoring, no adverse impact from the activities of the HKLR09 construction project on Chinese White Dolphins was noticeable from general observations.
- 6.6 Environmental site inspection was conducted on 7th, 14th, 21st and 28th June 2016, 5th, 12th, 19th and 26th July 2016, 3rd, 9th, 16th, 23rd and 30th August 2016 by ET in the reporting month. All deficiencies identified during the site inspection have already rectified / improved during the follow-up audit session.
- 6.7 The inspection to the Sha Lo Wan (West) Archaeological Site was conducted on 28th June 2016. No access to Sha Lo Wan (West) Archaeological site for works areas and storage of construction equipment was observed.
- 6.8 There was no environmental complaint, notification of summons and successful prosecution received in the reporting period.
- 6.9 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

- 6.10 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.

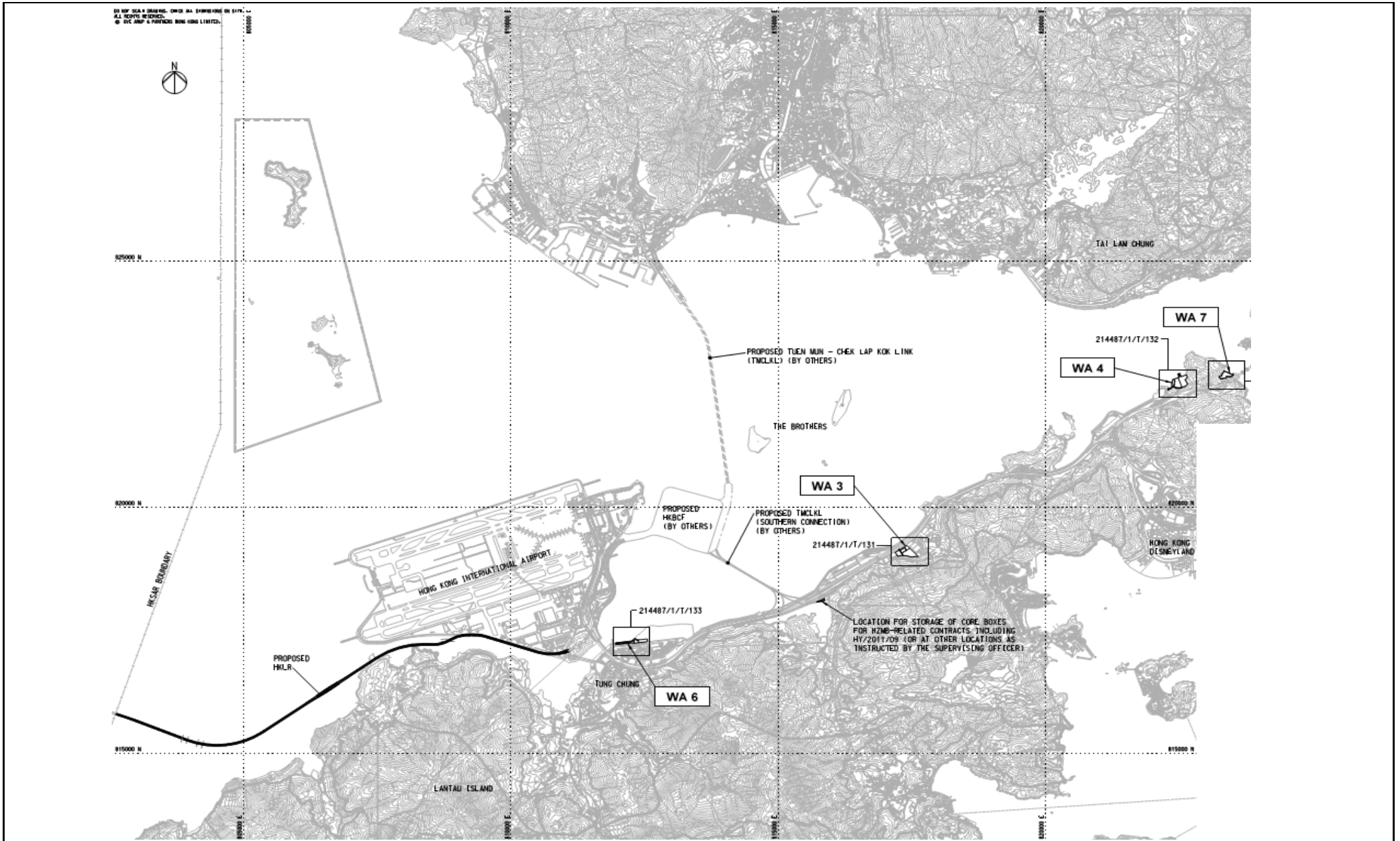
Ecology Impact

- 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.

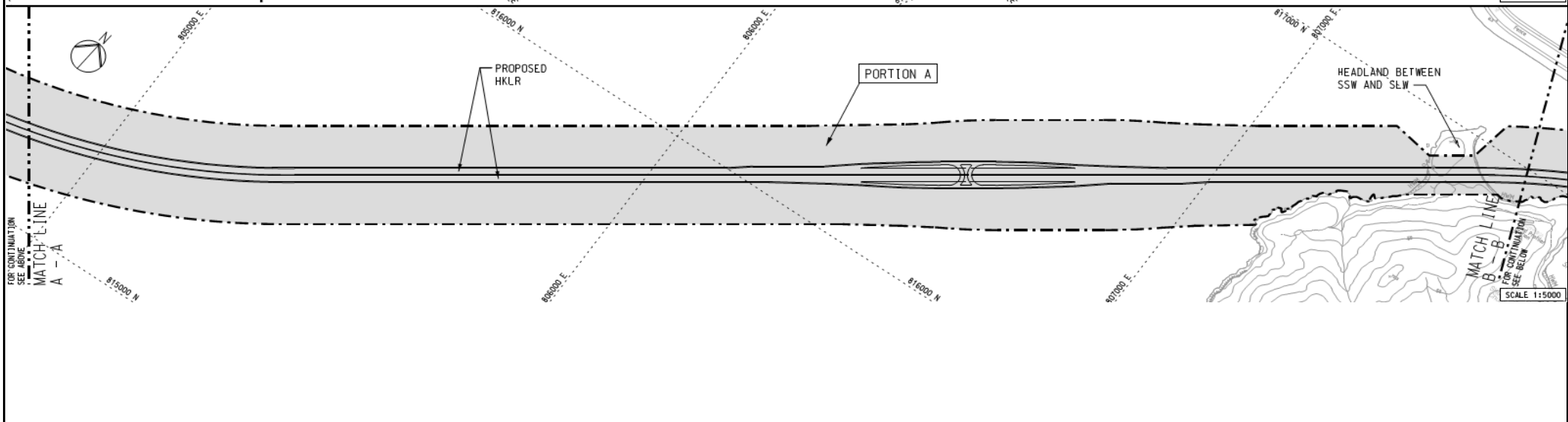
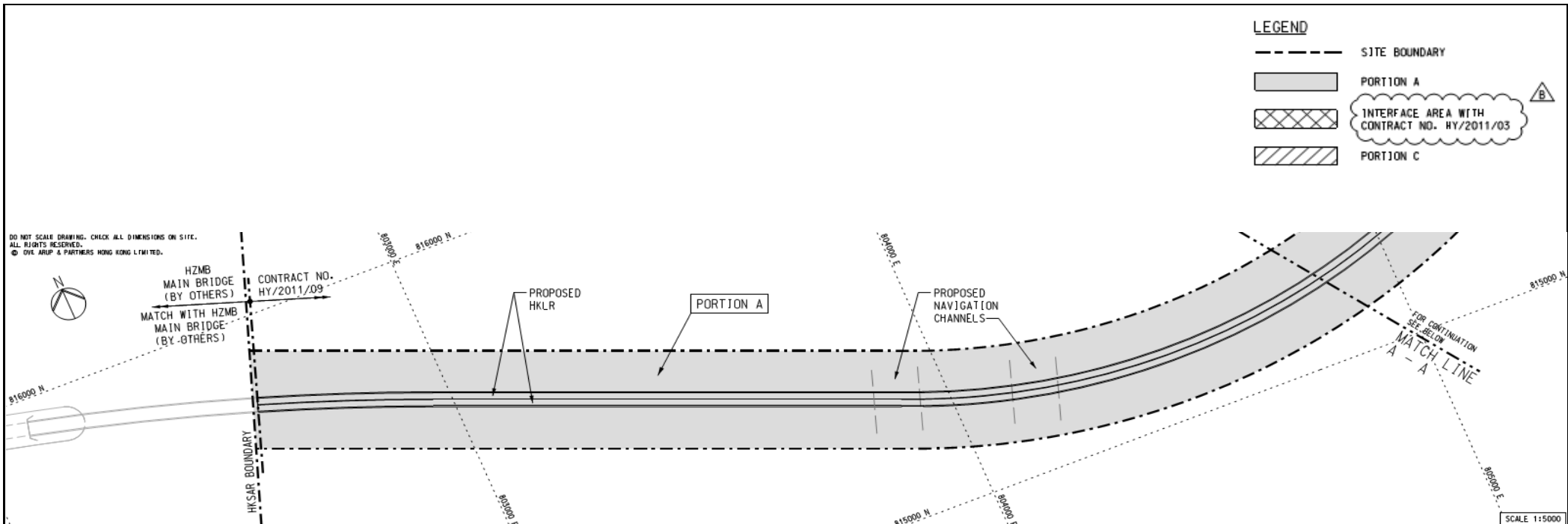
Waste/Chemical Management

- 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)

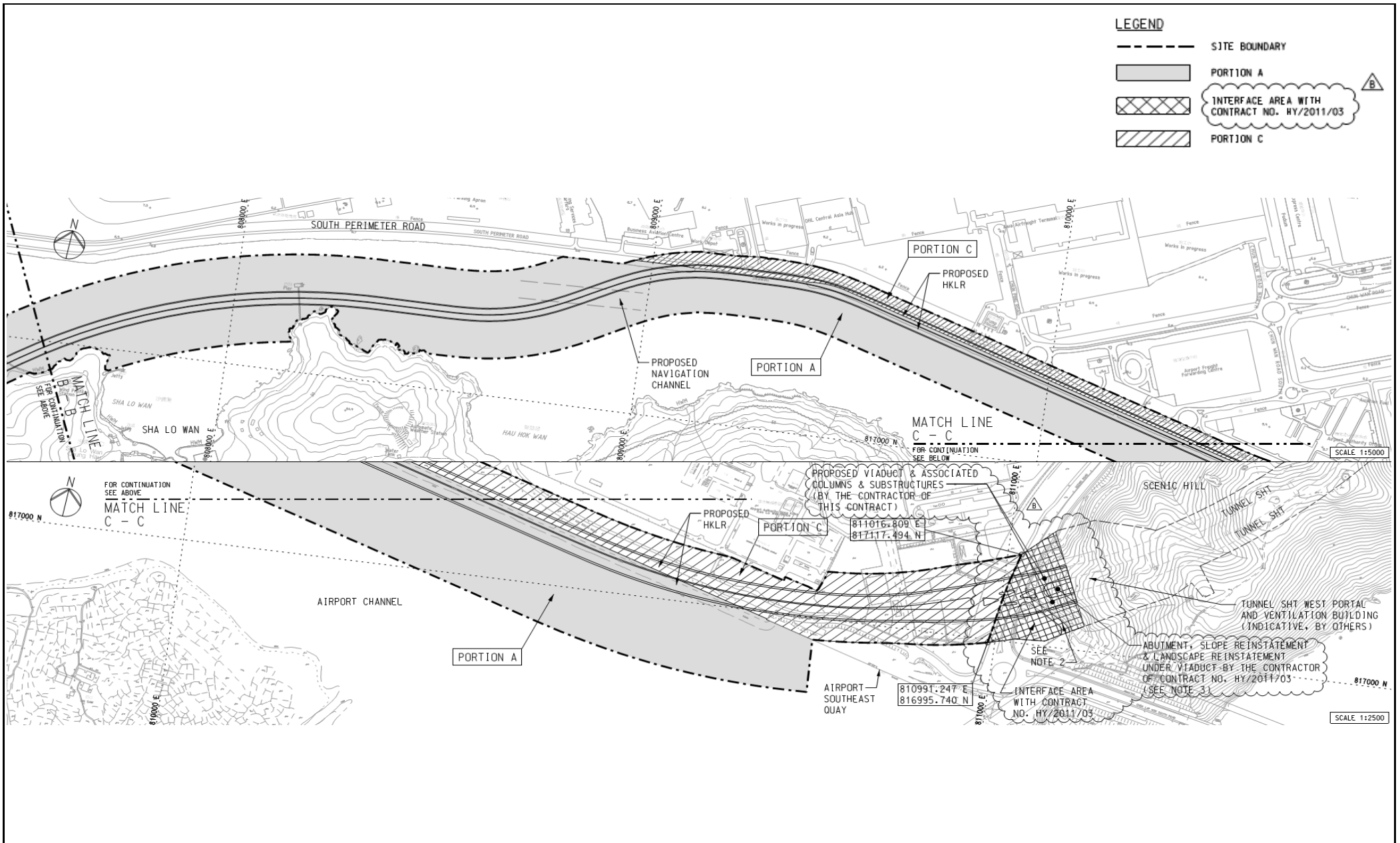


Title	Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Site Layout Plan (WA3, WA4, WA6 and WA7)		Scale	N.T.S	Propose	No. MA12014 Figure 1a	CINOTECH
	Date	Oct-15					



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

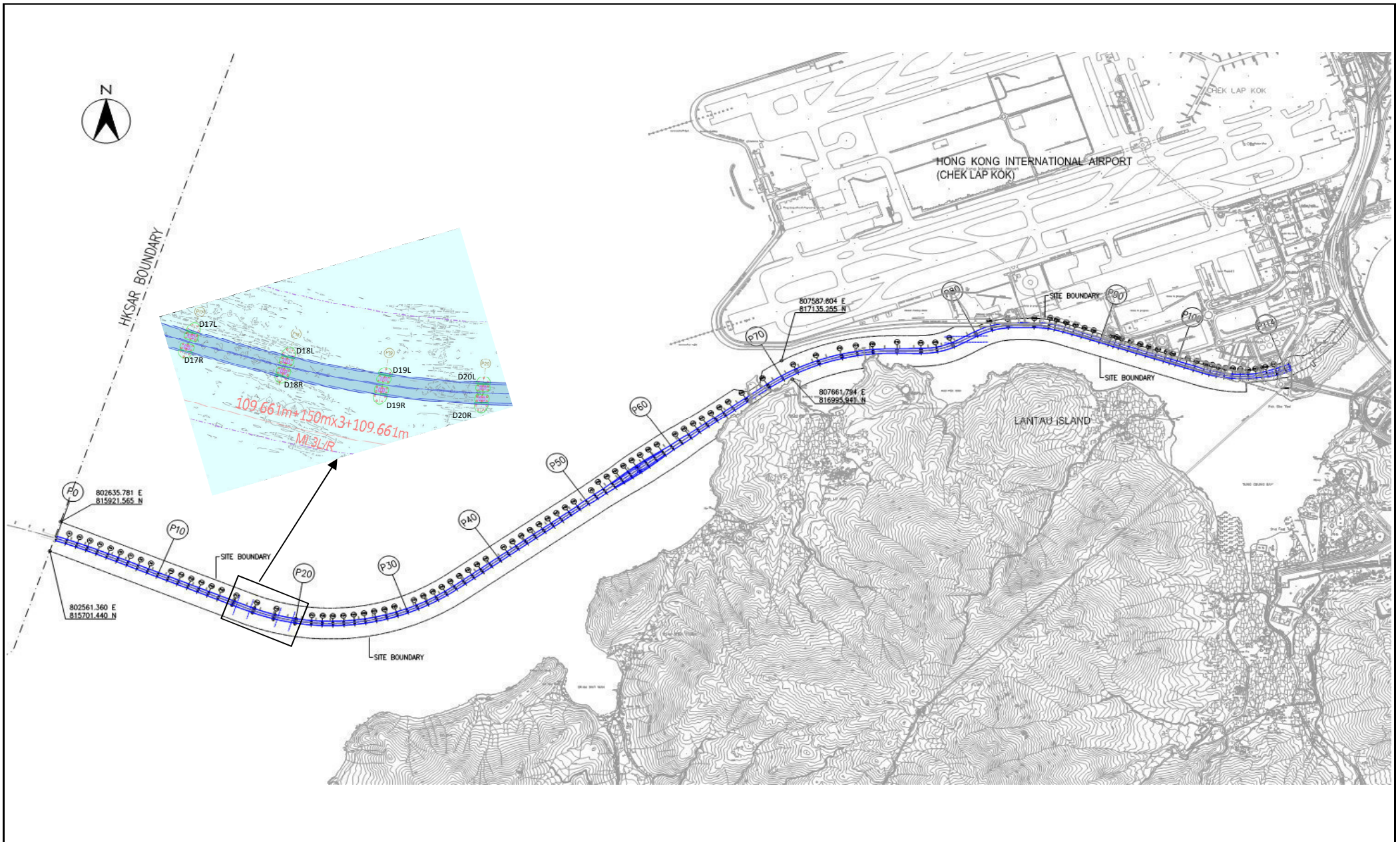




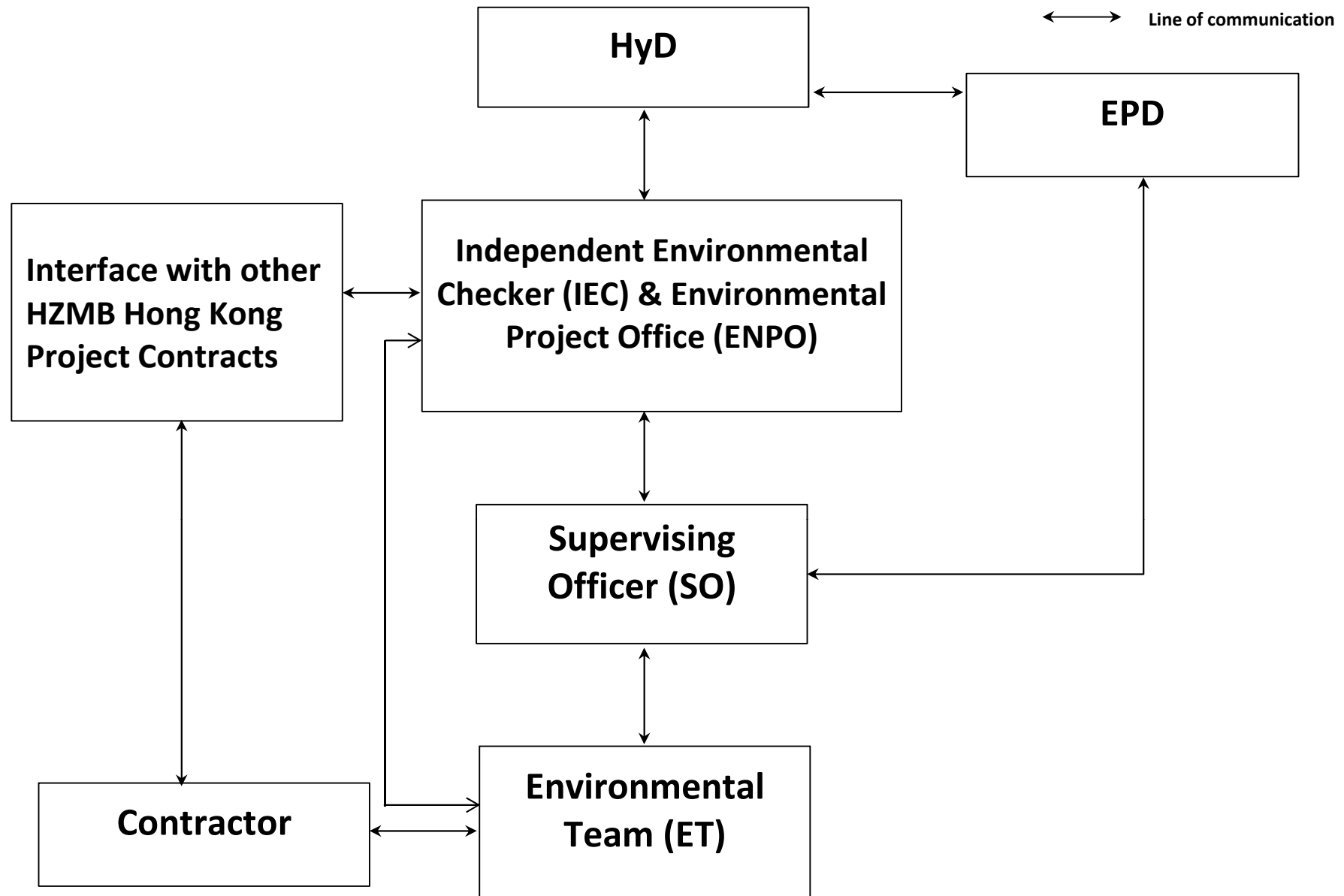
Title	Contract No. HY/2011/09	
	Hong Kong-Zhuhai-Macao Bridge	
	Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill	
	Site Layout Plan (Portion A and C)	

Scale	N.T.S	Propose No.	MA12014
Date	五月-13	Figure	1c





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

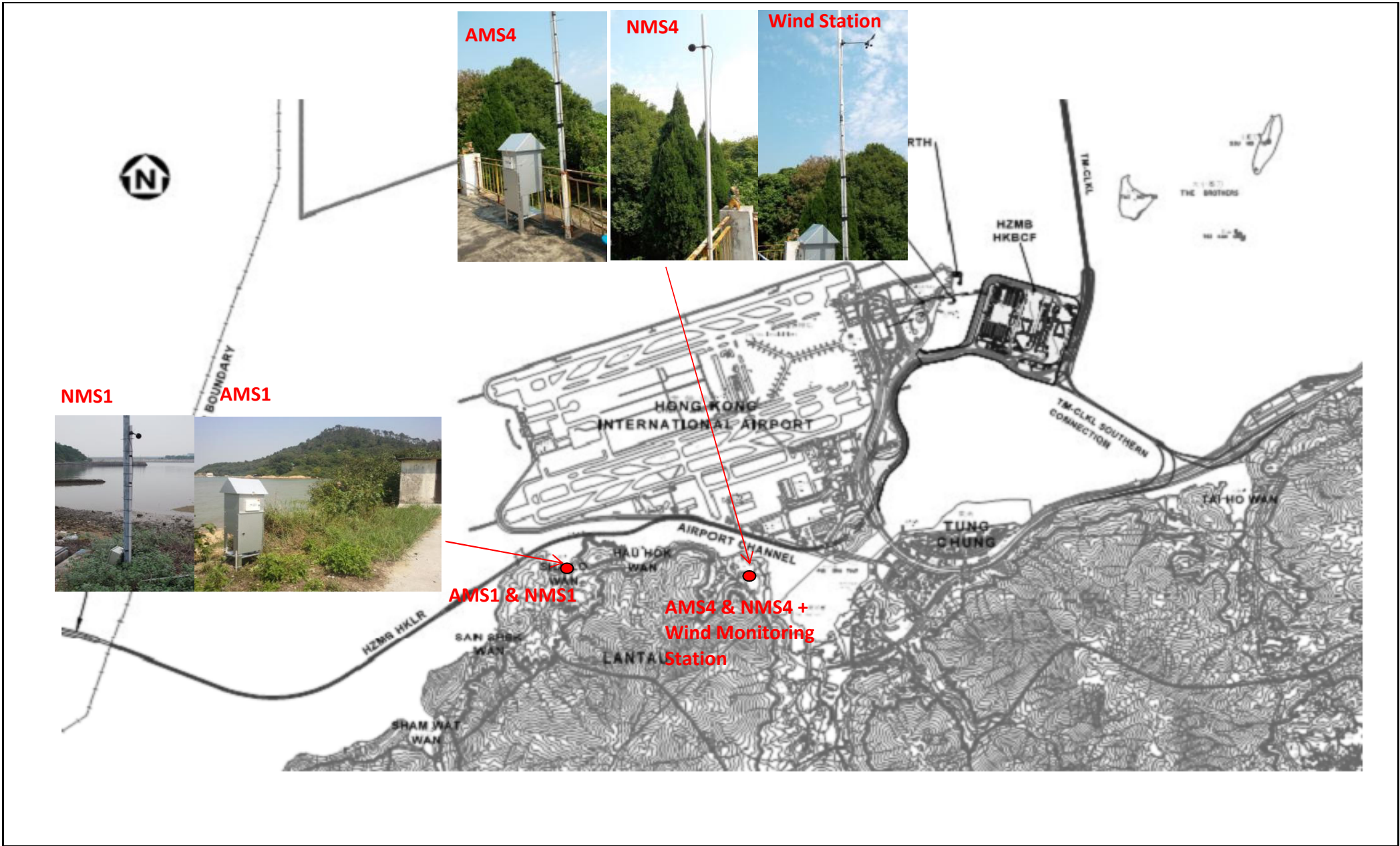


Title Contract No. HY/2011/09
 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between
 HKSAR Boundary and Scenic Hill
 Project Organisation for Environmental Works

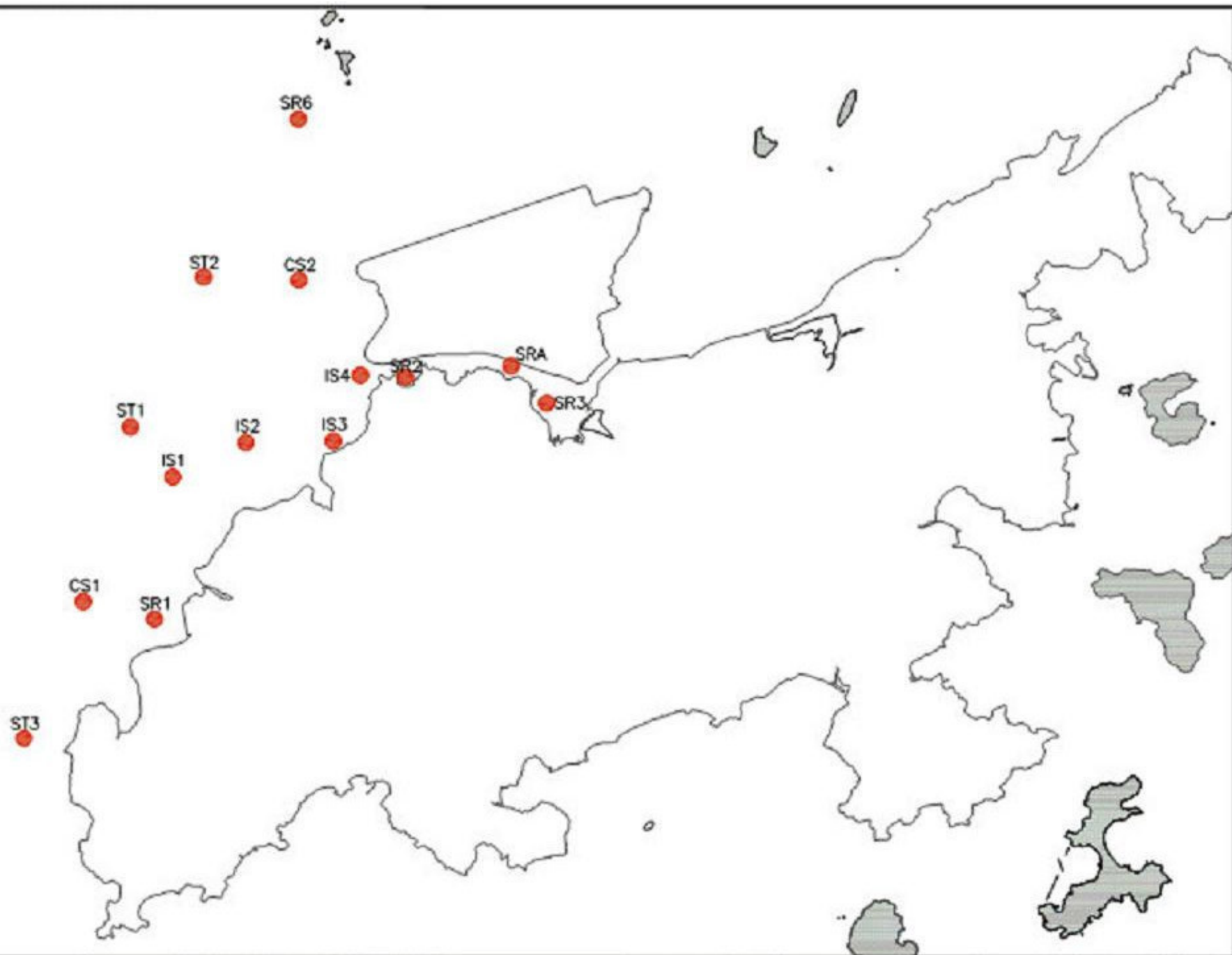
Scale N.T.S
 Date Feb-13

Propose No. MA12014
 Figure 2





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



**APPENDIX A
CONSTRUCTION PROGRAMME**



Dragages - China Harbour - VSL Joint Venture 廣通 - 中國港務 - 威路利華

- SECTION BETWEEN HKSAR BOUNDARY AND SCENIC HILL

Activity ID	Activity Name	2016		
		Jun	Jul	Aug
HKZB Hong Kong Link Road - 3 Months Rolling Prog				
Project General Submission				
MTTA for existing navigation channel				
PGS1620	Divert marine traffic to permanent navigation channel (P17 to P20)	◆ Divert marine traffic to permanent navigation channel (P17 to P20),		
PROCUREMENT				
Segment Casting				
Type A Segment				
Segment on Pier (SOP)				
SCA1000	Segment Casting for P0 SOP			
SCA1040	Segment Casting for P2 SOP			
SCA1060	Segment Casting for P3 SOP			
SCA1080	Segment Casting for P4 SOP			
SCA1100	Segment Casting for P5 SOP			
SCA1120	Segment Casting for P6 SOP			
SCA2200	Segment Casting for P67 SOP			
Field Segment				
SCA1130	Segment Casting for P6 field segment			
SCA1150	Segment Casting for P7 field segment			
SCA1170	Segment Casting for P8 field segment			
SCA1190	Segment Casting for P9 field segment			
SCA1210	Segment Casting for P10 field segment			
SCA1230	Segment Casting for P11 field segment			
SCA1250	Segment Casting for P12 field segment			
SCA1270	Segment Casting for P13 field segment			
SCA1290	Segment Casting for P14 field segment			
Type B Segment				
Field Segment				
SCB1040	Segment Casting for P54 field segment			
SCB1080	Segment Casting for P56 special segment			
Type C Segment				
Segment on Pier (SOP)				
SCC1040	Segment Casting for P67 SOP			
Field Segment				
SCC1050	Segment Casting for P67 field segment			
SCC1090	Segment Casting for P74 field segment			
Type CV Segment				
Field Segment				
SCC1130	Segment Casting for P81 field segment (CV)			
SCC1140	Segment Casting for P84 field segment (CV)			
Type EV Segment				
Field Segment				
SCE1000	Segment Casting for P84 field segment (EV)			
Type CH Segment				
Segment on Pier (SOP) CPA & CPB				
ML10 (P68 & P69) 180m span				
SCH2380	Segment Casting for P69L SOP (MSOP)			
























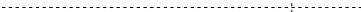










█ Actual Work █ Critical Remaining Work
█ Remaining Work ◆ Milestone

Date	Revision	Checked	Approved
16/12/16	EM&A Report Jun 16 to Aug 16	Tim	

Activity ID	Activity Name	2016		
		Jun	Jul	Aug
SCH2490	Segment Casting for P69R SOP (MSOP)			Segment Casting for P69R SOP (MSOP)
SCH2610	Segment Casting for P68L SOP (MSOP)		Segment Casting for P68L SOP (MSOP)	
SCH2730	Segment Casting for P68 CPB (MSOP)			Segment Casting for P68 CPB (MSOP)
Type CH1 Segment (CH1 to CH6)				
ML10 (P68 & P69) 180m span				
SCH2390	Segment Casting for P69L CH1 to CH6 (MCH1)			
SCH2620	Segment Casting for P68L CH1 to CH6 (MCH1)			Segment Casting for P68L CH1 to CH6 (MCH1)
SCH2670	Segment Casting for P68R CH1' to CH6' (MCH1)			Segment Casting for P68R CH1' to CH6' (MCH1)
SCH2740	Segment Casting for P68R CH1 to CH6 (MCH1)			Segment Casting for P68R CH1 to CH6 (MCH1)
SCH2790	Segment Casting for P68L CH1' to CH6' (MCH1)			Segment Casting for P68L CH1' to CH6' (MCH1)
ML12 (P75 to P77) 165m span				
SCH2960	Segment Casting for P75R CH1 to CH3 (MCH1)			Segment Casting for P75R CH1 to CH3 (MCH1)
Type CH2 Segment (CH7 to CH10)				
ML10 (P68 & P69) 180m span				
SCH2680	Segment Casting for P68R CH7' to CH10' (MCH2)			Segment Casting for P68R CH7' to CH10' (MCH2)
SCH2750	Segment Casting for P68R CH7 to CH10 (MCH2)			Segment Casting for P68R CH7 to CH10 (MCH2)
ML12 (P75 to P77) 165m span				
SCH2910	Segment Casting for P75R CH4' to CH7' (MCH2)			Segment Casting for P75R CH4' to CH7' (MCH2)
SCH2970	Segment Casting for P75R CH4 to CH7 (MCH2)			Segment Casting for P75R CH4 to CH7 (MCH2)
SCH3020	Segment Casting for P75L CH4' to CH7' (MCH2)			Segment Casting for P75L CH4' to CH7' (MCH2)
Type CH3 Segment (CH11 to CH15)				
ML12 (P75 to P77) 165m span				
SCH2870	Segment Casting for P75L CH8 to CH12 (MCH3)			Segment Casting for P75L CH8 to CH12 (MCH3)
SCH2920	Segment Casting for P75R CH8' to CH12' (MCH3)			Segment Casting for P75R CH8' to CH12' (MCH3)
SCH2980	Segment Casting for P75R CH8 to CH12 (MCH3)			Segment Casting for P75R CH8 to CH12 (MCH3)
SCH3030	Segment Casting for P75L CH8' to CH12' (MCH3)			Segment Casting for P75L CH8' to CH12' (MCH3)
Type CH4 Segment (CH16 to CH19)				
ML10 (P68 & P69) 180m span				
SCH2420	Segment Casting for P69L CH16 to CH19 (MCH4)			Segment Casting for P69L CH16 to CH19 (MCH4)
SCH2650	Segment Casting for P68L CH16 to CH19 (MCH4)			Segment Casting for P68L CH16 to CH19 (MCH4)
SCH2700	Segment Casting for P68R CH16' to CH19' (MCH4)			Segment Casting for P68R CH16' to CH19' (MCH4)
SCH2770	Segment Casting for P68R CH16 to CH19 (MCH4)			Segment Casting for P68R CH16 to CH19 (MCH4)
ML12 (P75 to P77) 165m span				
SCH2880	Segment Casting for P75L CH13 to CH16 (MCH4)			Segment Casting for P75L CH13 to CH16 (MCH4)
SCH2990	Segment Casting for P75R CH13 to CH16 (MCH4)			Segment Casting for P75R CH13 to CH16 (MCH4)
Type CH5 Segment (CH20 to CH25)				
ML10 (P68 & P69) 180m span				
SCH2660	Segment Casting for P68L CH20 to CH25 (MCH5)			Segment Casting for P68L CH20 to CH25 (MCH5)
SCH2780	Segment Casting for P68R CH20 to CH25 (MCH5)			Segment Casting for P68R CH20 to CH25 (MCH5)
ML12 (P75 to P77) 165m span				
SCH3380	Segment Casting for P76L CH17' to CH22' (MCH5)			Segment Casting for P76L CH17' to CH22' (MCH5)
SCH3390	Modify mould TD > WD (MCH5)			Modify mould TD > WD (MCH5)
Type CHV Segment				
Segment on Pier (SOP) CPVA & CPVB				
ML14 (P82 & P83) 180m span				
SCH4570	Segment Casting for P83 CPB (MSOP)			Segment Casting for P83 CPB (MSOP)
Type CH1 Segment (CHV1 to CHV6)				
ML14 (P82 & P83) 180m span				
SCH4170	Segment Casting for P82R CH1' to CH6' (MCH1)			Segment Casting for P82R CH1' to CH6' (MCH1)
SCH4250	Segment Casting for P82R CH1 to CH6 (MCH1)			Segment Casting for P82R CH1 to CH6 (MCH1)
SCH4360	Segment Casting for P83L CH1 to CH6 (MCH1)			Segment Casting for P83L CH1 to CH6 (MCH1)
SCH4410	Segment Casting for P83R CH1' to CH6' (MCH1)			Segment Casting for P83R CH1' to CH6' (MCH1)
SCH4470	Segment Casting for P83R CH1 to CH6 (MCH1)			Segment Casting for P83R CH1 to CH6 (MCH1)
SCH4520	Segment Casting for P83L CH1' to CH6' (MCH1)			Segment Casting for P83L CH1' to CH6' (MCH1)
Type CH2 Segment (CHV7 to CHV10)				
ML13 (P79 & P80) 180m span				

Actual Work
 Critical Remaining Work
 Remaining Work
 Milestone

Date	Revision	Checked	Approved
16/12/16	EM&A Report Jun 16 to Aug 16	Tim	

Activity ID	Activity Name	2016		
		Jun	Jul	Aug
SCH3920	Segment Casting for P80R CH7' to CH10' (MCH2)			
ML14 (P82 & P83) 180m span				
SCH4130	Segment Casting for P82L CH7 to CH10 (MCH2)		Segment Casting for P82L CH7 to CH10 (MCH2)	
SCH4180	Segment Casting for P82R CH7' to CH10' (MCH2)			
SCH4420	Segment Casting for P83R CH7' to CH10' (MCH2)			Segment Casting for P83R CH7' to CH10' (MCH2)
SCH4480	Segment Casting for P83R CH7 to CH10 (MCH2)			
SCH4530	Segment Casting for P83L CH7' to CH10' (MCH2)			Segment Casting for P83L CH7' to CH10' (MCH2)
Type CH3 Segment (CHV11 to CHV15)				
ML13 (P79 & P80) 180m span				
SCH3880	Segment Casting for P80L CH11 to CH15 (MCH3)		Segment Casting for P80L CH11 to CH15 (MCH3)	
SCH4070	Segment Casting for P80L CH11' to CH15' (MCH3)		Segment Casting for P80L CH11' to CH15' (MCH3)	
ML14 (P82 & P83) 180m span				
SCH4140	Segment Casting for P82L CH11 to CH15 (MCH3)			Segment Casting for P82L CH11 to CH15 (MCH3)
SCH4320	Segment Casting for P82L CH11' to CH15' (MCH3)			Segment Casting for P82L CH11' to CH15' (MCH3)
SCH4430	Segment Casting for P83R CH11' to CH15' (MCH3)			
SCH4490	Segment Casting for P83R CH11 to CH15 (MCH3)			
SCH4540	Segment Casting for P83L CH11' to CH15' (MCH3)			
Type CH4 Segment (CHV16 to CHV19)				
ML13 (P79 & P80) 180m span				
SCH3830	Segment Casting for P79L CH16' to CH19' (MCH4)		Segment Casting for P79L CH16' to CH19' (MCH4)	
SCH3890	Segment Casting for P80L CH16 to CH19 (MCH4)			Segment Casting for P80L CH16 to CH19 (MCH4)
SCH4090	Segment Casting for P80L CH16' to CH19' (MCH4)			Segment Casting for P80L CH16' to CH19' (MCH4)
ML14 (P82 & P83) 180m span				
SCH4150	Segment Casting for P82L CH16 to CH19 (MCH4)			
SCH4330	Segment Casting for P82L CH16' to CH19' (MCH4)			
SCH4390	Segment Casting for P83L CH16 to CH19 (MCH4)		Segment Casting for P83L CH16 to CH19 (MCH4)	
SCH4550	Segment Casting for P83L CH16' to CH19' (MCH4)			
Type CH5 Segment (CHV20 to CHV25)				
ML12 (P75 to P77) 165m span				
SCH3450	Segment Casting for P77L CH17 to CH22 (MCH5)		Segment Casting for P77L CH17 to CH22 (MCH5)	
SCH3560	Segment Casting for P77R CH17 to CH22 (MCH5)			Segment Casting for P77R CH17 to CH22 (MCH5)
SCH3610	Segment Casting for P77L CH17' to CH22' (MCH5)			Segment Casting for P77L CH17' to CH22' (MCH5)
ML13 (P79 & P80) 180m span				
SCH3670	Segment Casting for P79L CH20 to CH25 (MCH5)			Segment Casting for P79L CH20 to CH25 (MCH5)
SCH3720	Segment Casting for P79R CH20' to CH25' (MCH5)			Segment Casting for P79R CH20' to CH25' (MCH5)
SCH3790	Segment Casting for P79R CH20 to CH25 (MCH5)			Segment Casting for P79R CH20 to CH25 (MCH5)
SCH3840	Segment Casting for P79L CH20' to CH25' (MCH5)			Segment Casting for P79L CH20' to CH25' (MCH5)
ML14 (P82 & P83) 180m span				
SCH4400	Segment Casting for P83L CH20 to CH25 (MCH5)			
LAND VIADUCT				
ML19				
DECK FINISHING WORKS				
UTILITY TROUGH & ROAD BARRIER				
M19F_1020	Utility trough, road barrier and firemain installation for ML19			
CIVIL PROVISION FOR TCSS				
M19F_1060	Install sign gantry GW13			
M19F_1070	Install sign gantry GE15			
M19F_1090	Remain civil provisions for TCSS ML19			
E&M AND ROAD FINISHING WORKS				
M19L_2020	Drainage works for ML19			
ML18				
DECK FINISHING WORKS				
UTILITY TROUGH & ROAD BARRIER				
M18F_1020	Utility trough, road barrier and firemain installation for ML18			

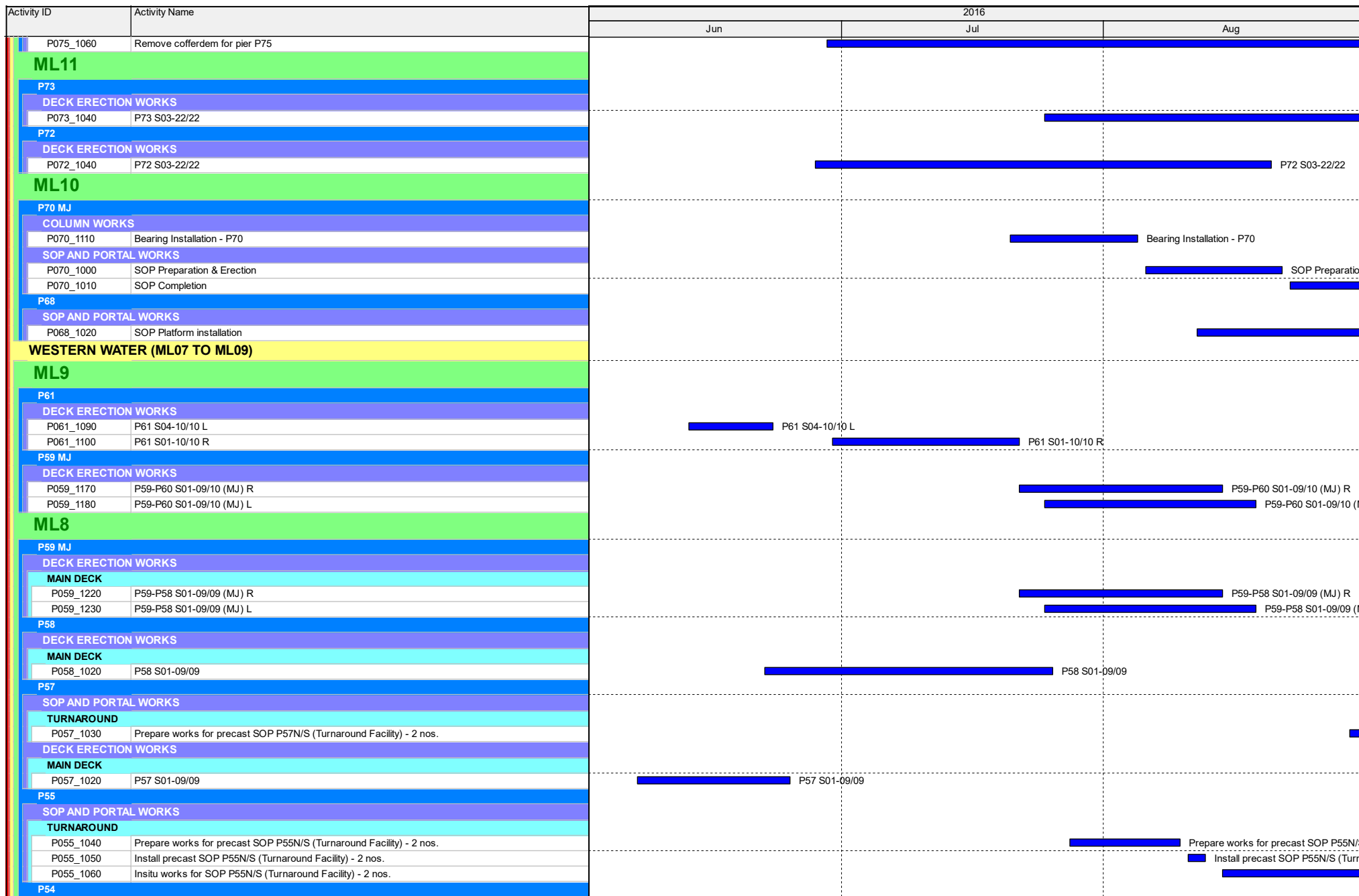
 Actual Work
  Critical Remaining Work
 Remaining Work
 ◆ Milestone

Date	Revision	Checked	Approved
16/12/16	EM&A Report Jun 16 to Aug 16	Tim	

Activity ID	Activity Name	2016		
		Jun	Jul	Aug
CIVIL PROVISION FOR TCSS				
ML18F_1200	Remain civil provisions for TCSS ML18		[Actual Work Bar]	
E&M AND ROAD FINISHING WORKS				
M18L_2020	Drainage works for ML18			[Actual Work Bar]
ML17				
DECK FINISHING WORKS				
UTILITY TROUGH & ROAD BARRIER				
ML17F_1010	Utility trough, road barrier and firemain installation for ML17		[Actual Work Bar]	
CIVIL PROVISION FOR TCSS				
ML17F_1200	Remain civil provisions for TCSS ML17			[Actual Work Bar]
ML16				
DECK FINISHING WORKS				
UTILITY TROUGH & ROAD BARRIER				
ML16F_1020	Utility trough, road barrier and firemain installation for ML16			[Actual Work Bar]
ML15				
P86				
DECK ERECTION WORKS				
P086_1070	P86 S02-09/09	[Actual Work Bar]		
P85				
DECK ERECTION WORKS				
P085_1000	P85 S01-01/09		[Actual Work Bar]	
P085_1060	P85 S02-09/09		[Actual Work Bar]	
P84 MJ				
DECK ERECTION WORKS				
P084_1110	P84 S01-03/03 (MJ)			[Actual Work Bar]
P084_1120	Stitches 84-85			[Actual Work Bar]
AIRPORT CHANNEL				
ML14				
P84 MJ				
DECK ERECTION WORKS				
P084_1000	P84 S01-03/03 (MJ)			[Actual Work Bar]
P83				
SOP AND PORTAL WORKS				
P083_1000	SOP Platform installation		[Actual Work Bar]	
P083_1010	SOP Segments erection		[Actual Work Bar]	
P083_1020	SOP Completion + cross beam			[Actual Work Bar]
ML13				
P81 MJ				
COLUMN WORKS				
P081_1100	Bearing Installation - P81	[Actual Work Bar]		
SOP AND PORTAL WORKS				
P081_1000	SOP Preparation & Erection		[Actual Work Bar]	
P081_1010	SOP Completion			[Actual Work Bar]
P80				
SOP AND PORTAL WORKS				
P080_1010	SOP Segments erection	[Actual Work Bar]		
P080_1020	SOP Completion + cross beam			[Actual Work Bar]
ML12				
P75				
TEMPORARY WORKS				

Actual Work
 Critical Remaining Work
 Remaining Work
 Milestone

Date	Revision	Checked	Approved
16/12/16	EM&A Report Jun 16 to Aug 16	Tim	



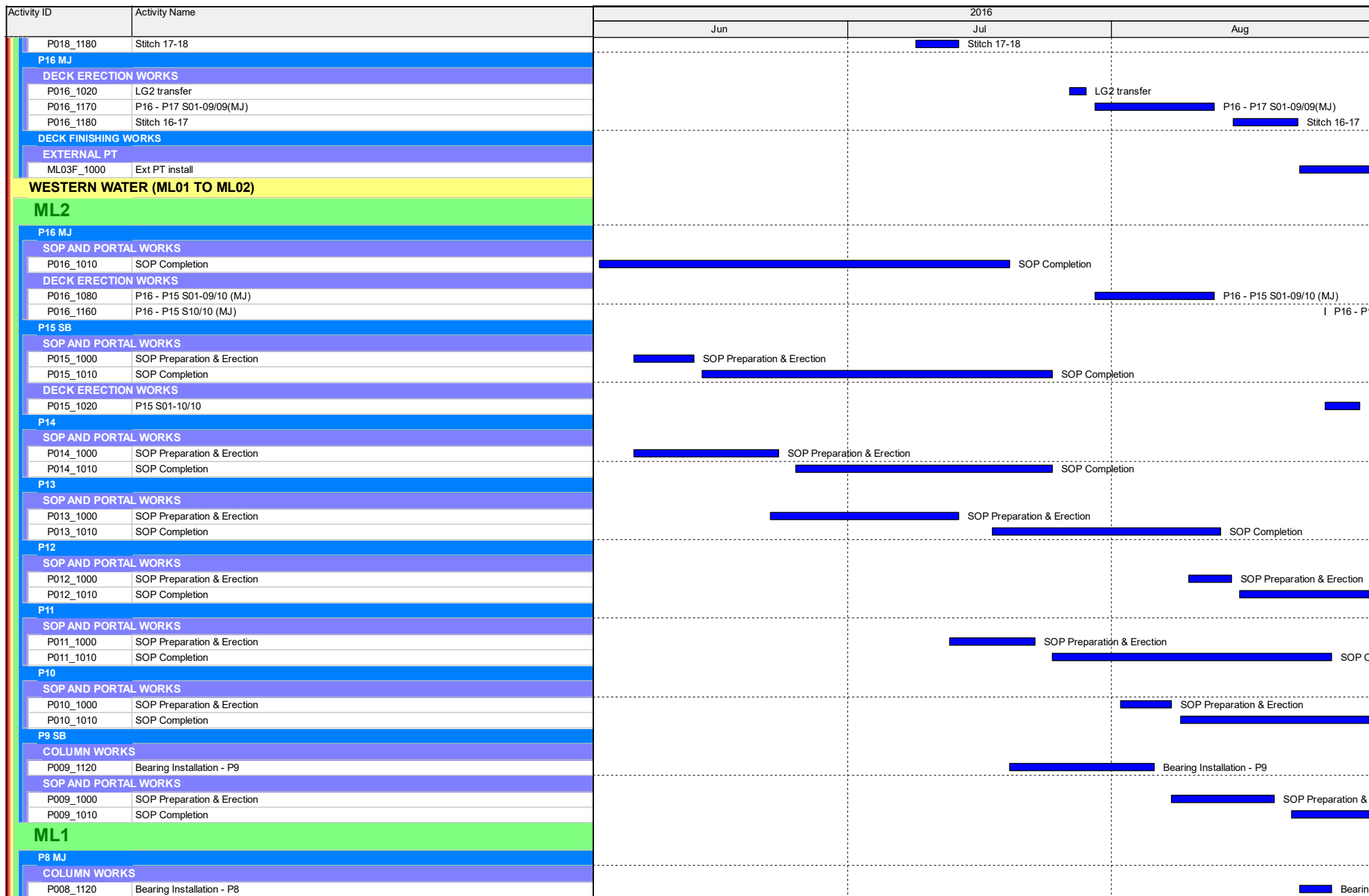
█ Actual Work █ Critical Remaining Work
█ Remaining Work ◆ Milestone

Date	Revision	Checked	Approved
16/12/16	EM&A Report Jun 16 to Aug 16	Tim	

Activity ID	Activity Name	2016		
		Jun	Jul	Aug
SOP AND PORTAL WORKS				
TURNAROUND				
P054_1030	Prepare works for precast SOP P54N/S (Turnaround Facility) - 2 nos.			
P054_1040	Install precast SOP P54N/S (Turnaround Facility) - 2 nos.			
P054_1050	In situ works for SOP P54N/S (Turnaround Facility) - 2 nos.			
ML7				
P53 MJ				
COLUMN WORKS				
TURNAROUND				
P053_1190	Bearing Installation - P53N/S			
SOP AND PORTAL WORKS				
TURNAROUND				
P053_1020	Prepare works for precast SOP P53N/S (Turnaround Facility) - 4 nos.			
P053_1030	Install precast SOP P53N/S (Turnaround Facility) - 4 nos.			
P52 SB (Portal)				
DECK ERECTION WORKS				
P052_1100	P52-P51 S04-10/10 L			
P052_1110	P52-P53 S04-10/10 L			
P052_1120	P52-P53 S04-10/10 RL			
P052_1130	P52-P51 S04-10/10 R			
P052_1140	P52-P53 S04-10/10 R			
P052_1150	P52-P53 S04-10/10 R R			
WESTERN WATER (ML04 TO ML06)				
ML6				
DECK FINISHING WORKS				
UTILITY TROUGH & ROAD BARRIER				
ML06F_1020	Utility trough, road barrier and firemain installation for ML06			
ML5				
DECK FINISHING WORKS				
E&M AND ROAD FINISHING WORKS				
M05L_2040	E&M & Finishing works for ML05			
ML4				
P22 SB				
DECK ERECTION WORKS				
P022_1020	P22 S01-10/10			
P022_1130	Stitch 22-21			
P21 MJ				
DECK ERECTION WORKS				
P021_1150	P21 - P22 S10/10 (MJ)			
P021_1160	P21 - P22 S01-09/10 (MJ)			
NAVIGATION CHANNEL				
ML3				
P21				
DECK ERECTION WORKS				
P021_1020	P21 - P20 S01-09/09 (MJ)			
P021_1170	Stitch 21-20			
P19				
DECK ERECTION WORKS				
P019_1170	Stitch 19-18			
P18				
DECK ERECTION WORKS				






█ Actual Work █ Critical Remaining Work
█ Remaining Work ◆ Milestone

Date	Revision	Checked	Approved
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█ Actual Work █ Critical Remaining Work
█ Remaining Work ◆ Milestone

Date	Revision	Checked	Approved
16/12/16	EM&A Report Jun 16 to Aug 16	Tim	

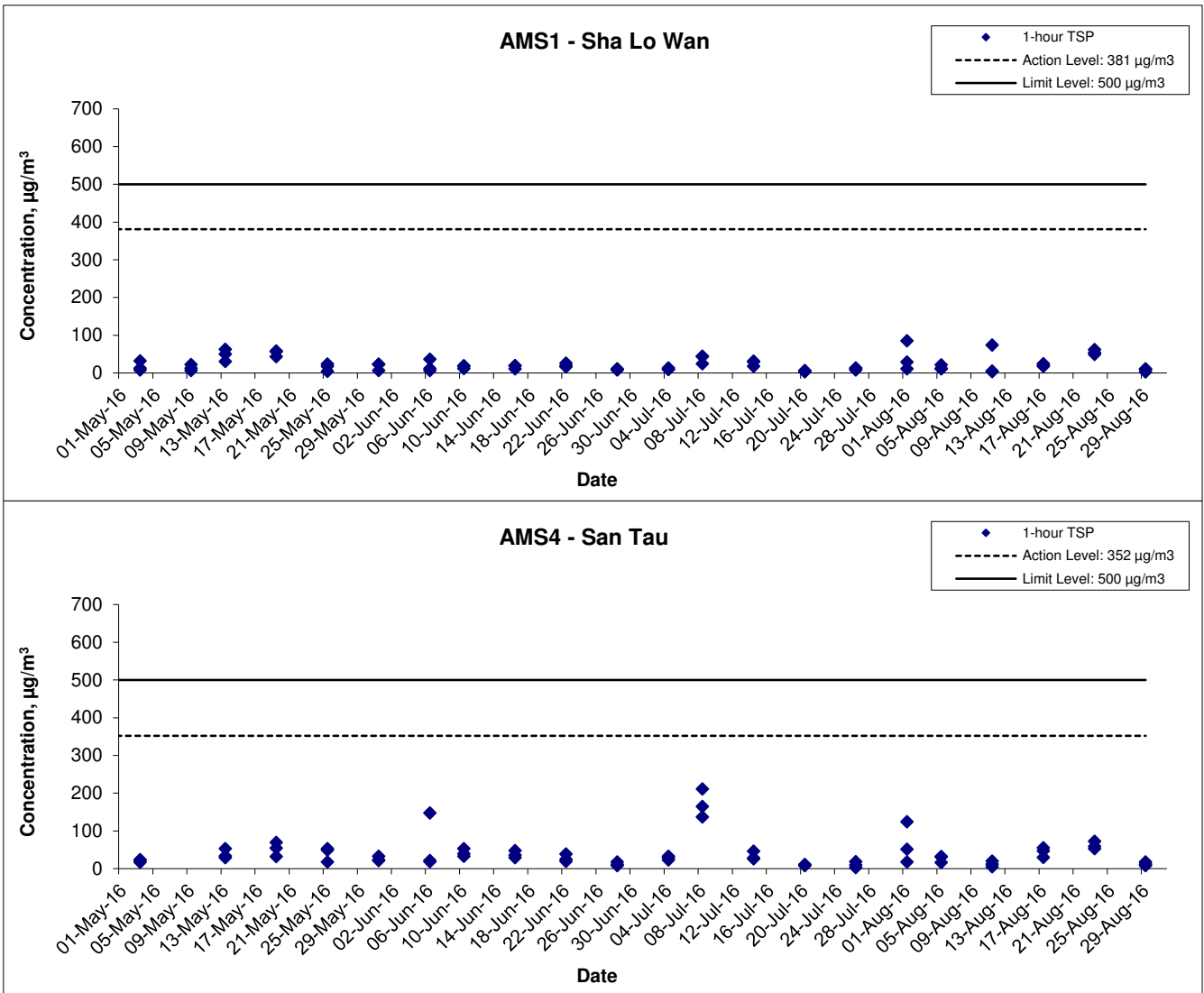
Activity ID	Activity Name	2016		
		Jun	Jul	Aug
SOP AND PORTAL WORKS				
P008_1000	SOP Preparation & Erection			
P4				
COLUMN WORKS				
P004_1120	Install remain precast column & column head segment at P4			
P004_1130	Prestress works & infill concrete at P4			
P2				
COLUMN WORKS				
P002_1080	Install remain precast column & column head segment at P2			
P002_1090	Align & cast stitch for base column segment at P2			
P002_1100	Prestress works & infill concrete at P2			
P1 SB				
COLUMN WORKS				
P001_1120	Bearing Installation - P1			

 Actual Work
  Critical Remaining Work
 Remaining Work
 ◆ Milestone
 ◆ Milestone

Date	Revision	Checked	Approved
16/12/16	EM&A Report Jun 16 to Aug 16	Tim	

**APPENDIX B
GRAPHICAL PRESENTATION OF 1-
HOUR TSP MONITORING RESULTS**

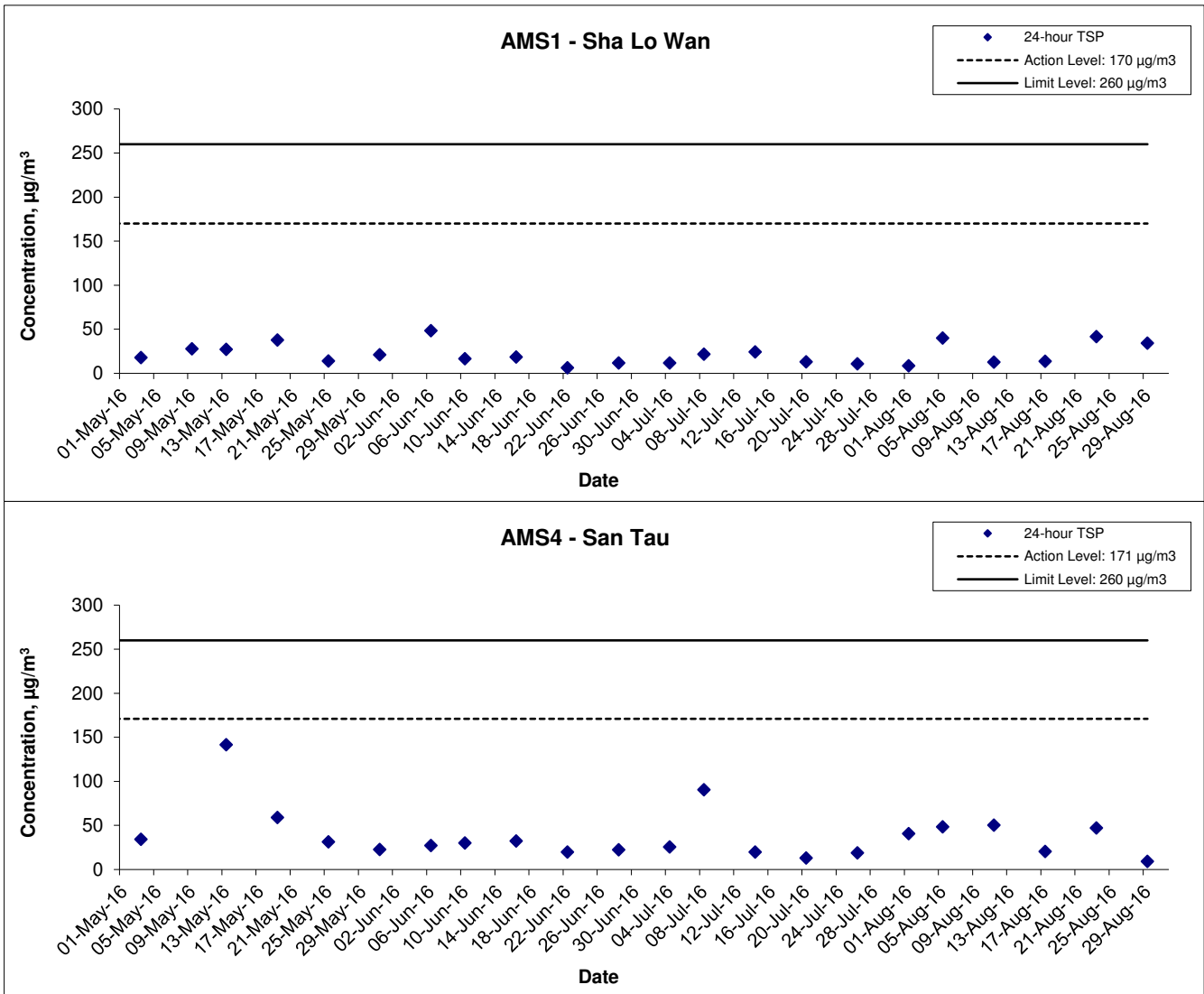
1-hour TSP Concentration Levels



Title Contract No. 117/2011/CS 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 Aug 16	Appendix B	

**APPENDIX C
GRAPHICAL PRESENTATION OF 24-
HOUR TSP MONITORING RESULTS**

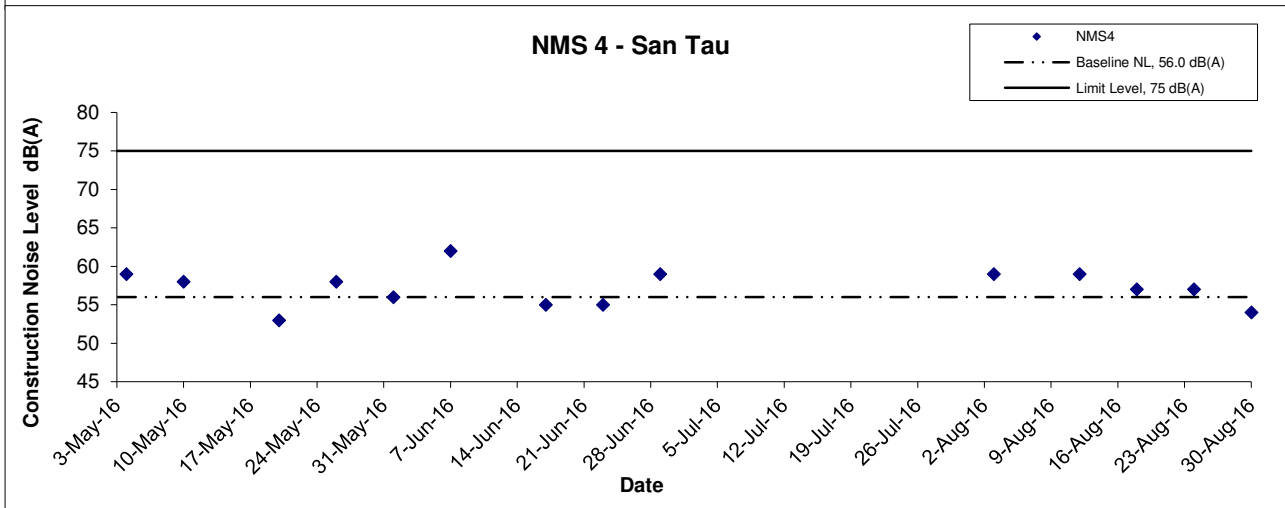
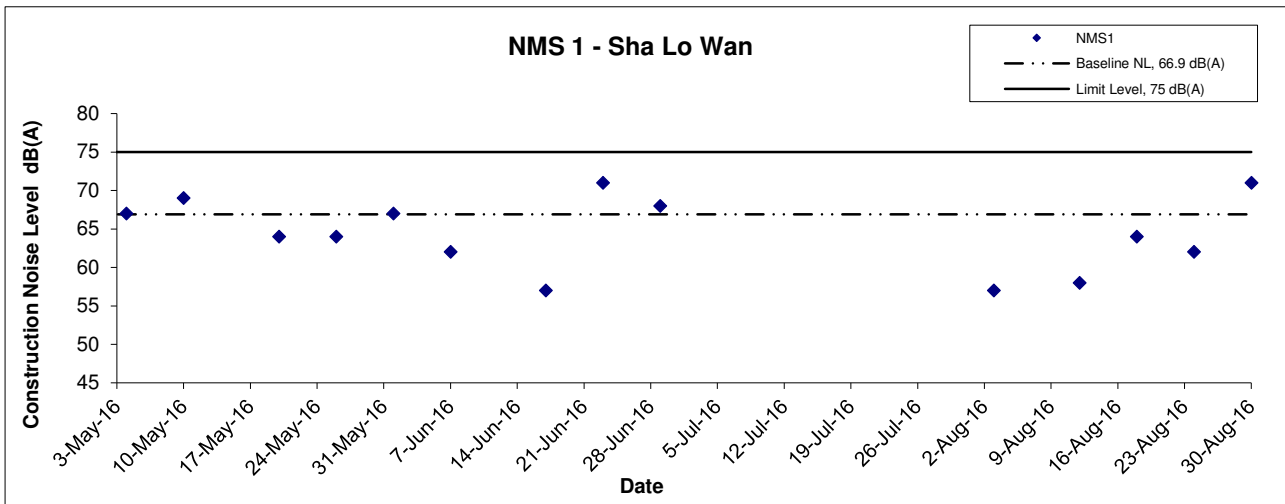
24-hour TSP Concentration Levels



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	Aug 16	Appendix	C	

**APPENDIX D
GRAPHICAL PRESENTATION OF
NOISE MONITORING RESULTS**

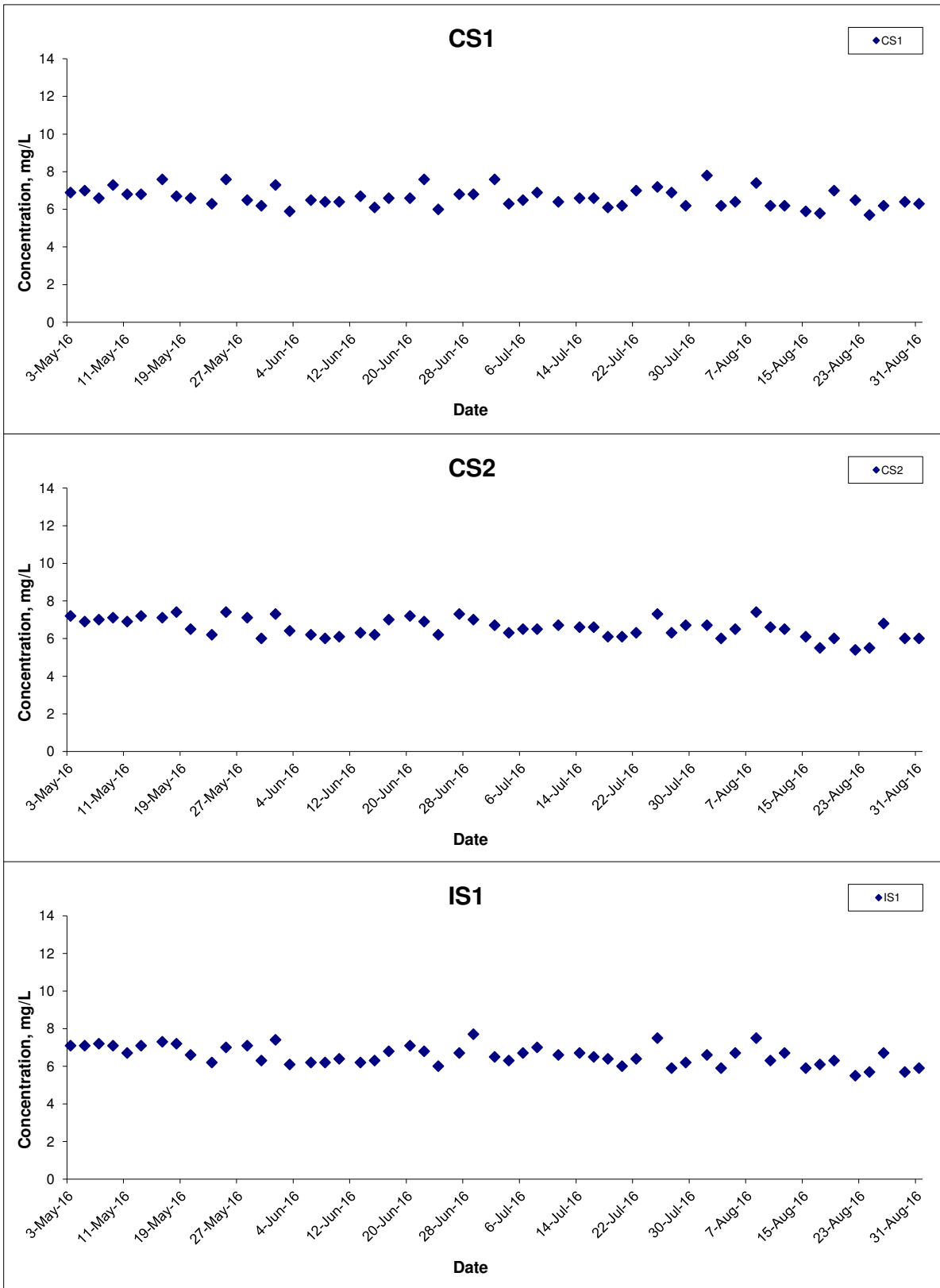
Noise Levels



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
	Date Aug 16	Appendix G	

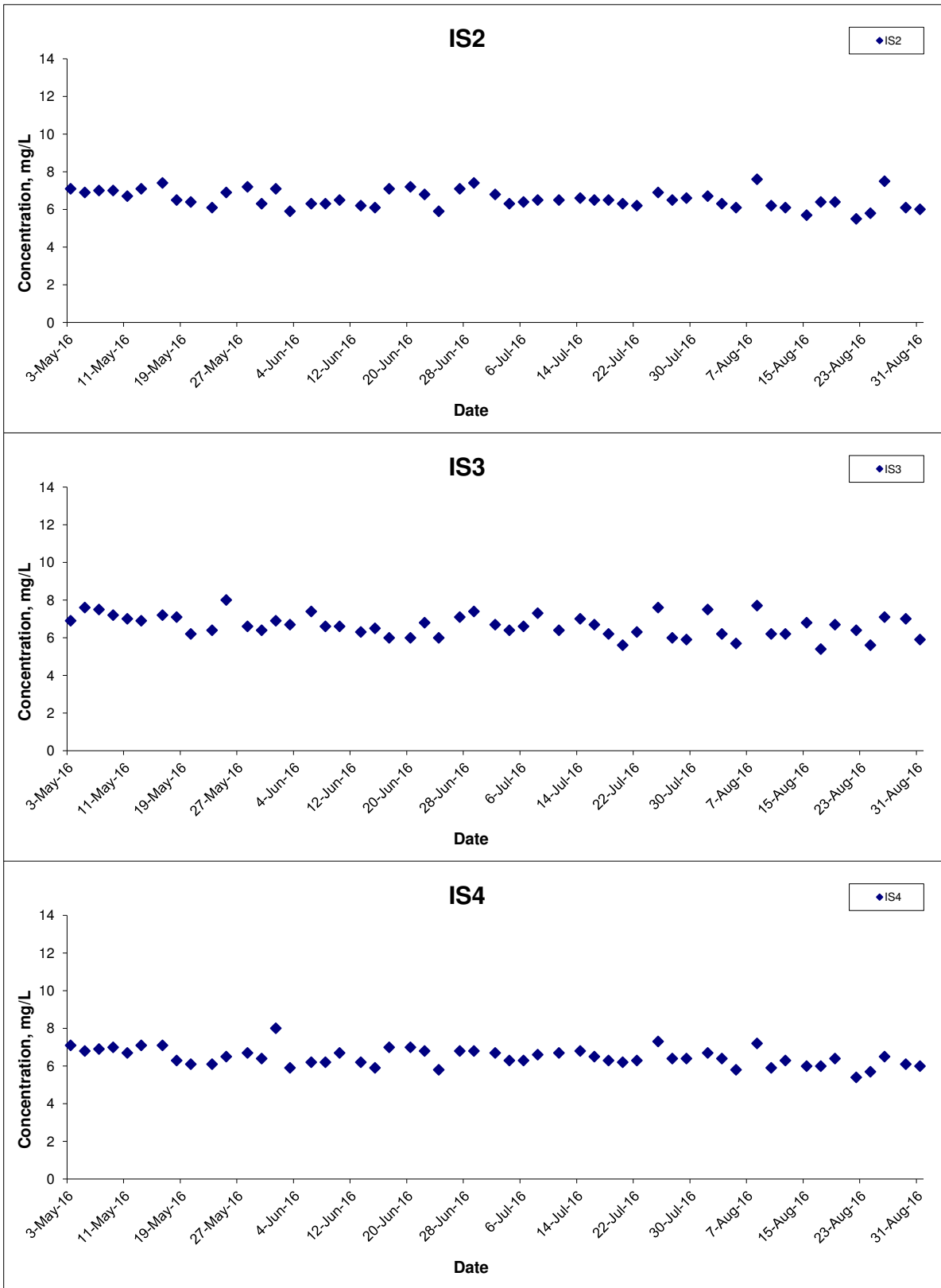
**APPENDIX E
GRAPHICAL PRESENTATION OF
WATER QUALITY MONITORING
RESULTS**

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



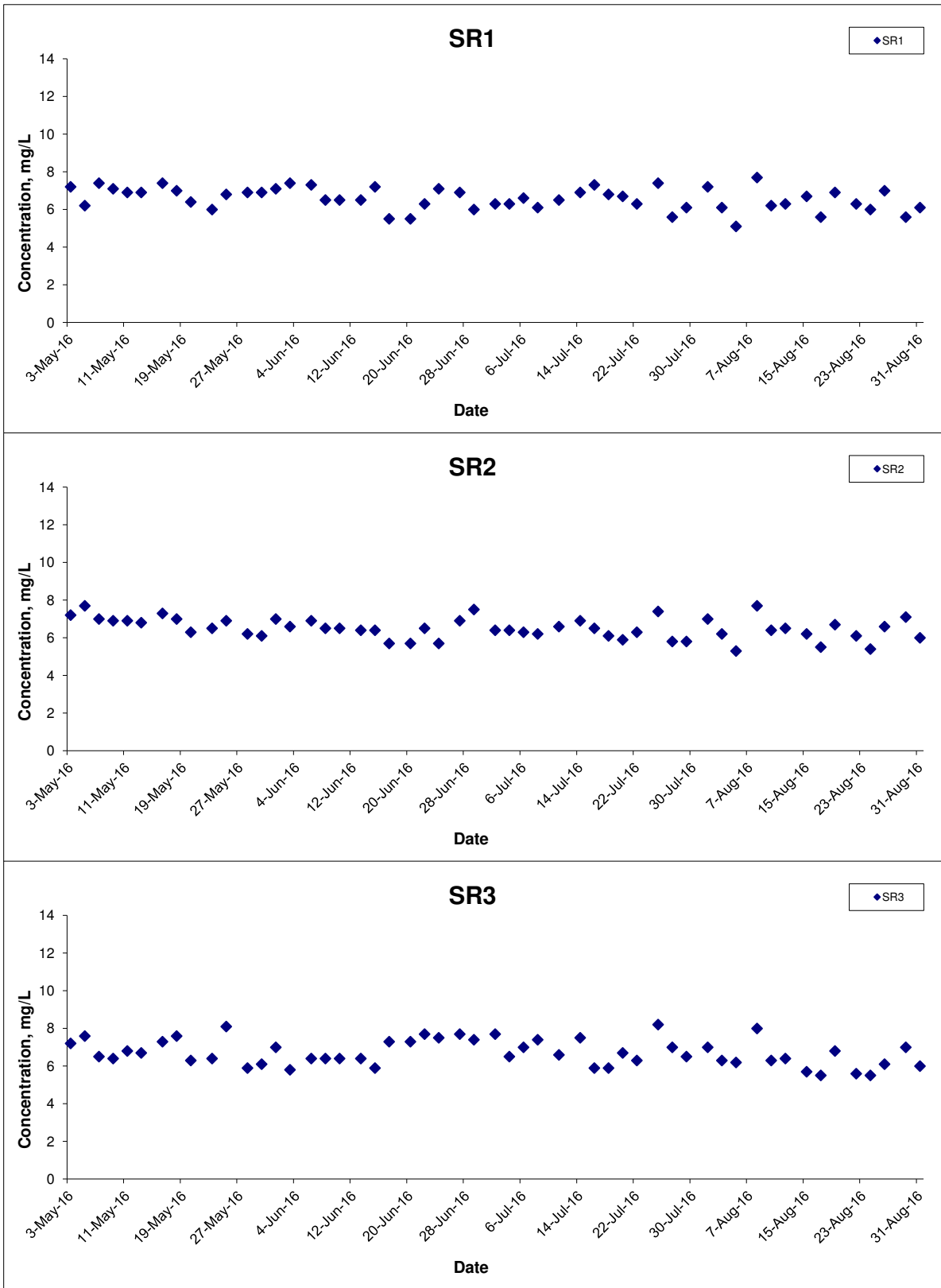
Title Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA12014	CINOTECH
	Date Aug 16	Appendix H	

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



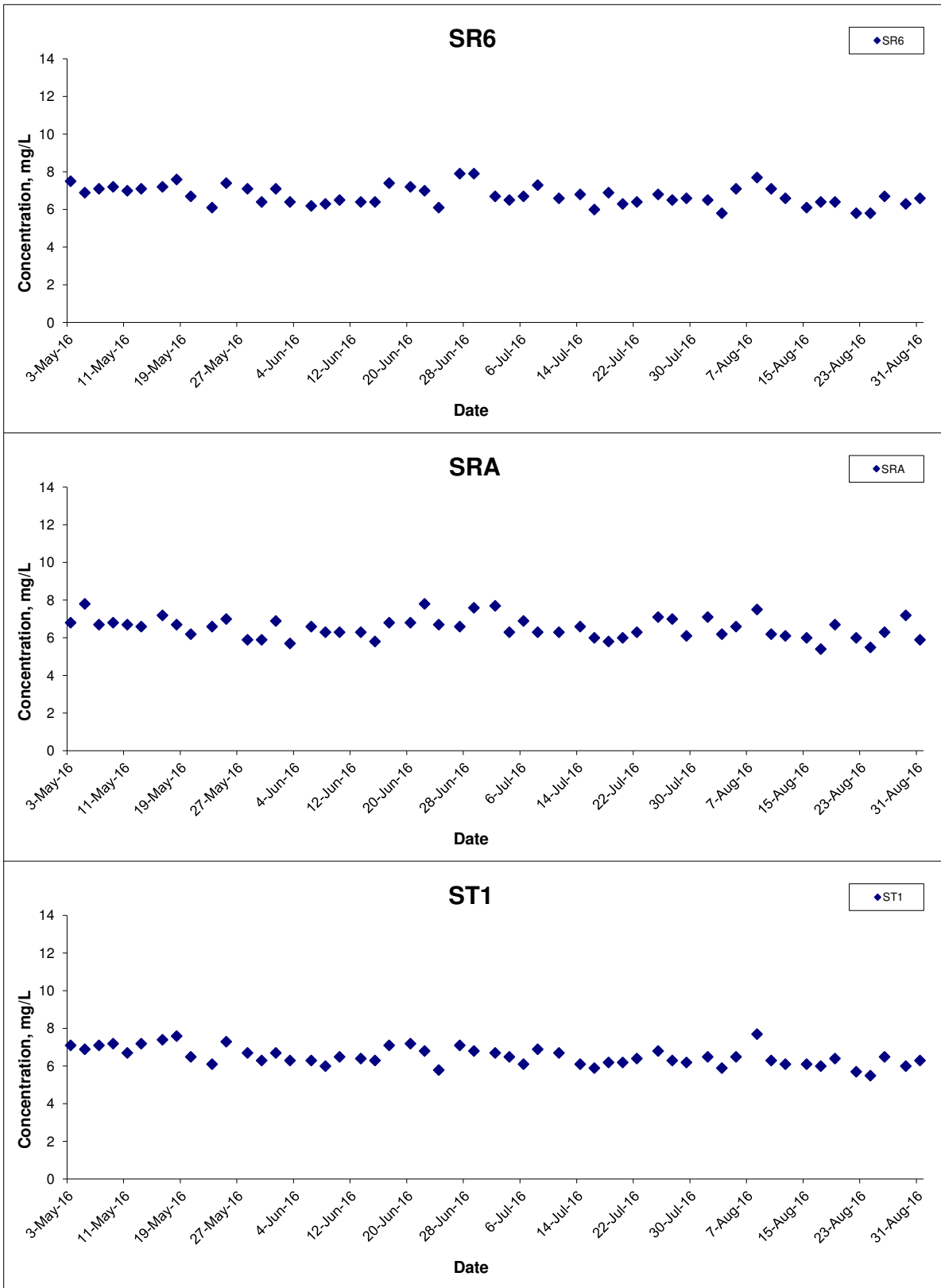
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	Date Aug 16	Appendix H	

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



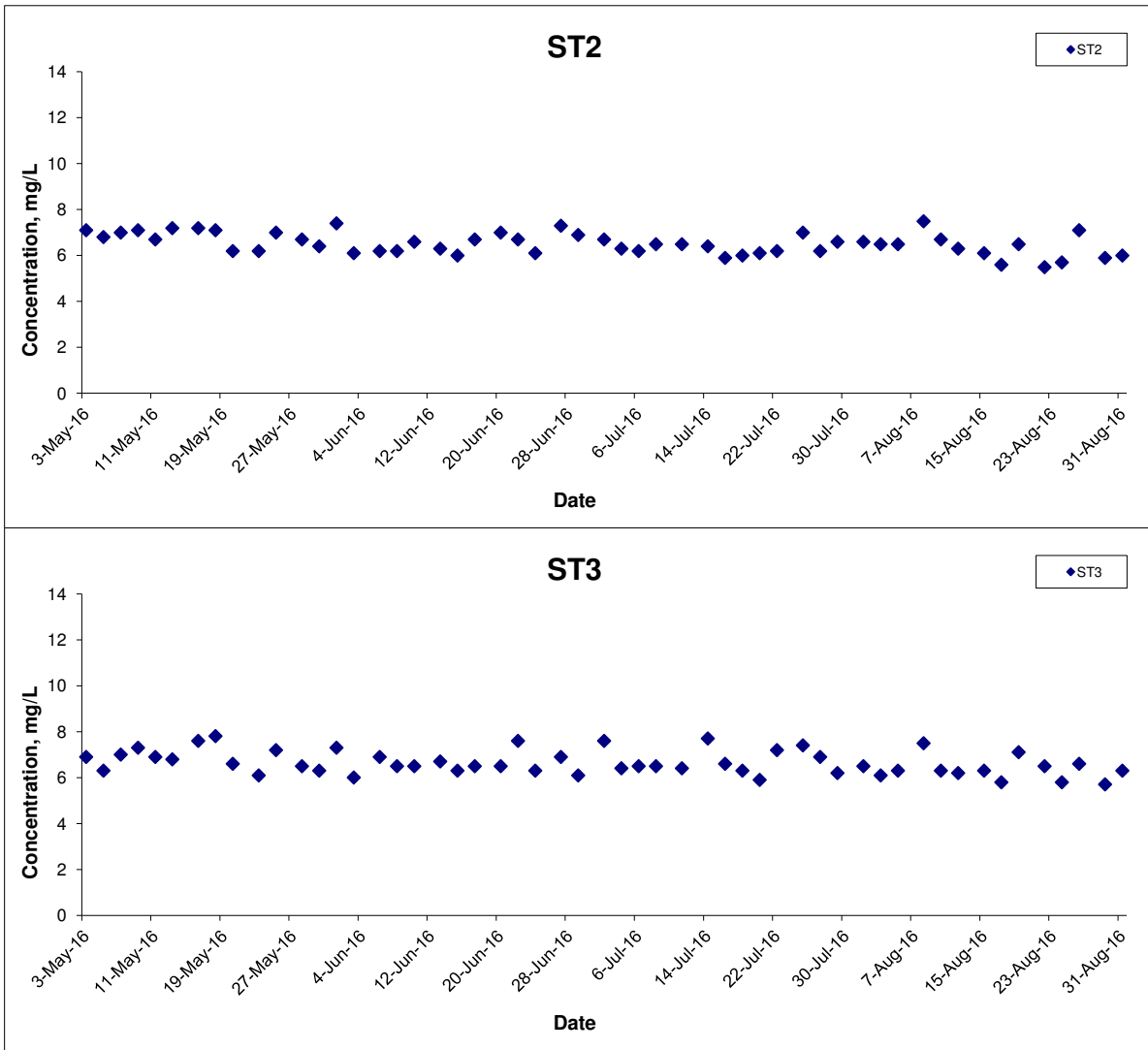
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	Date Aug 16	Appendix H	

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



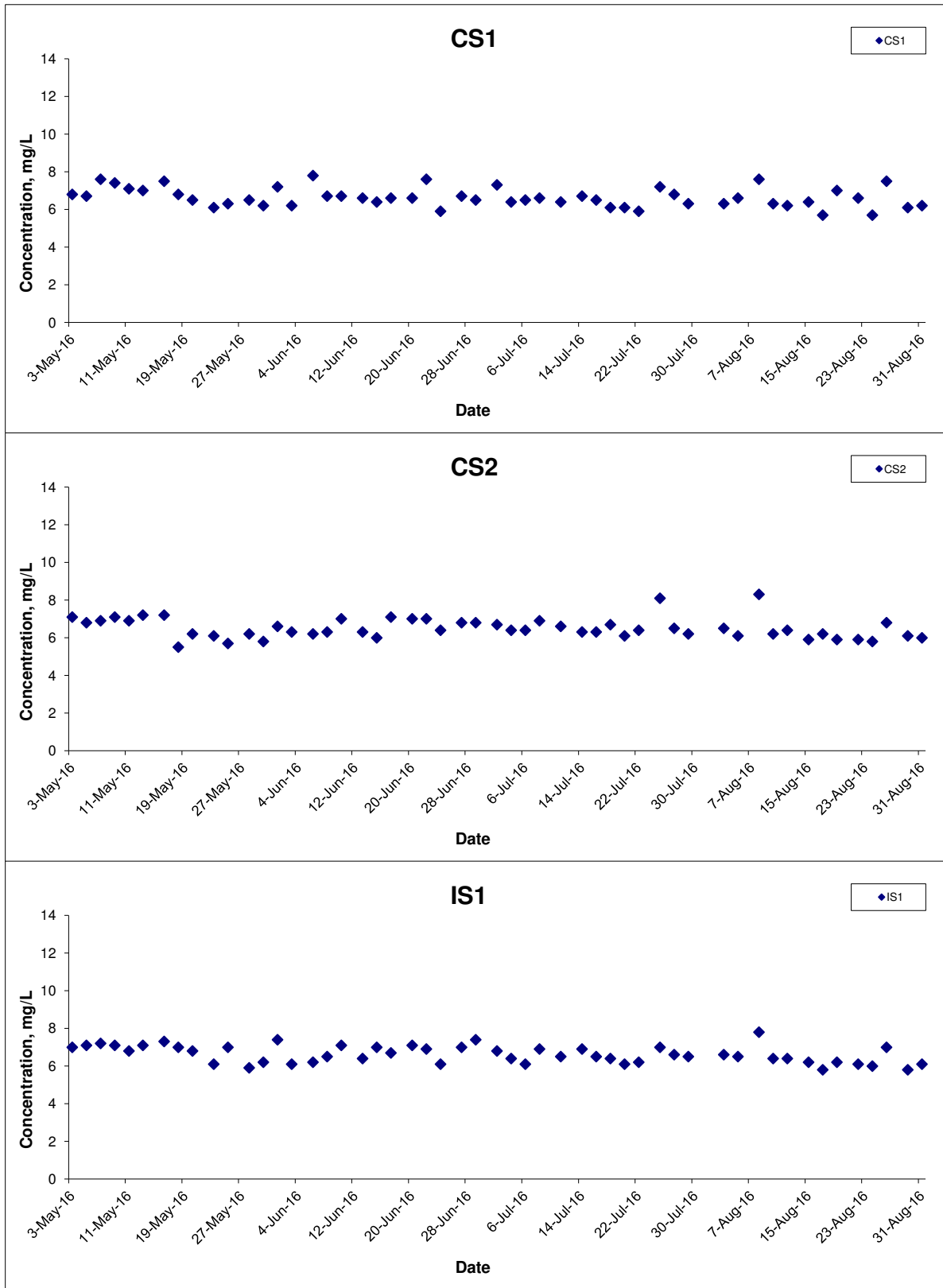
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	Date Aug 16	Appendix H	

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
	Date Aug 16	Appendix H	

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



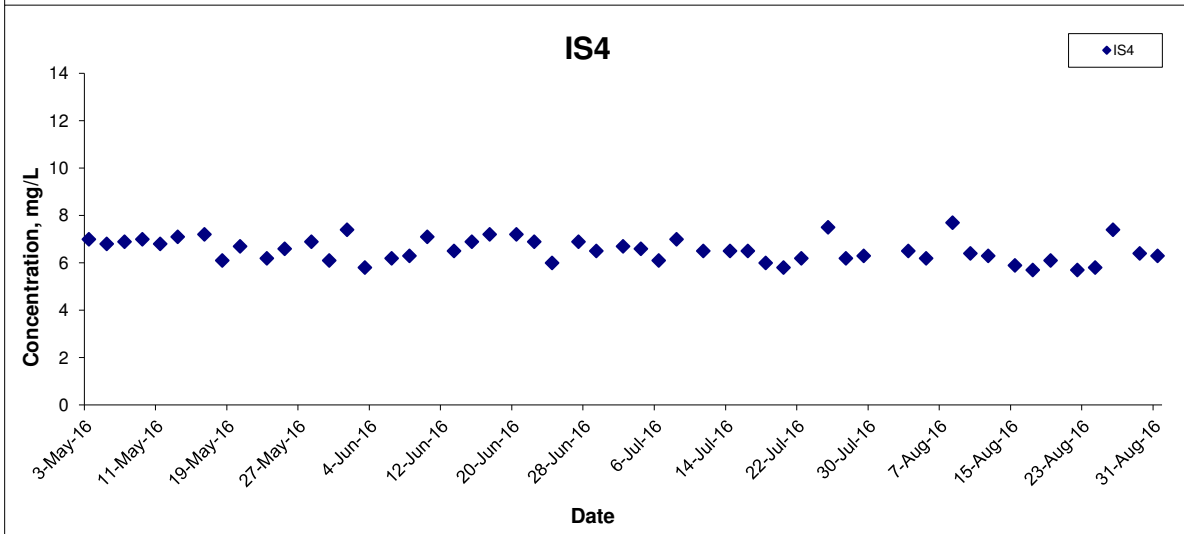
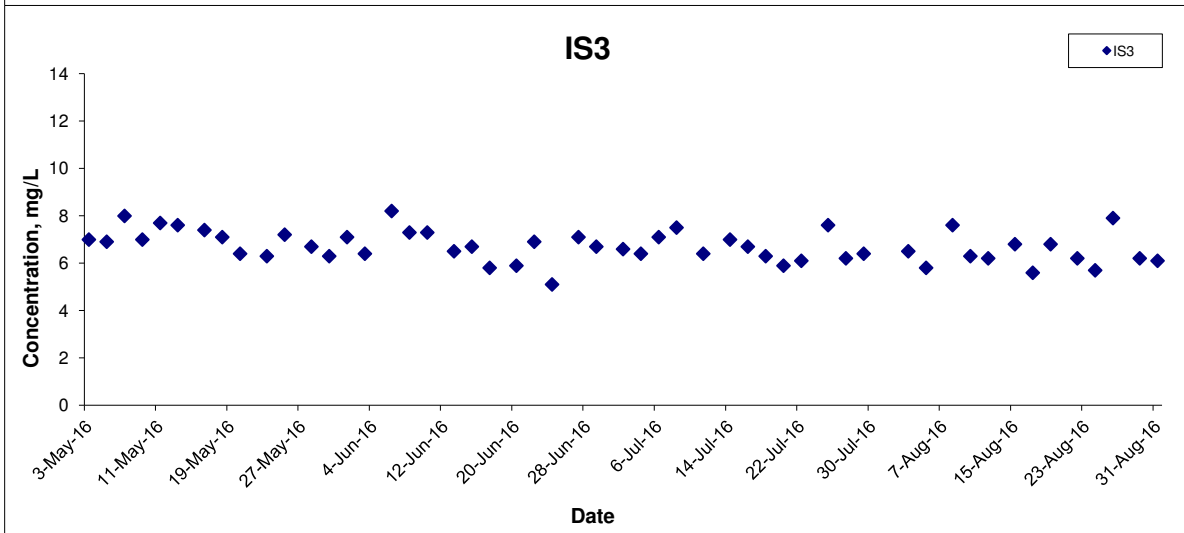
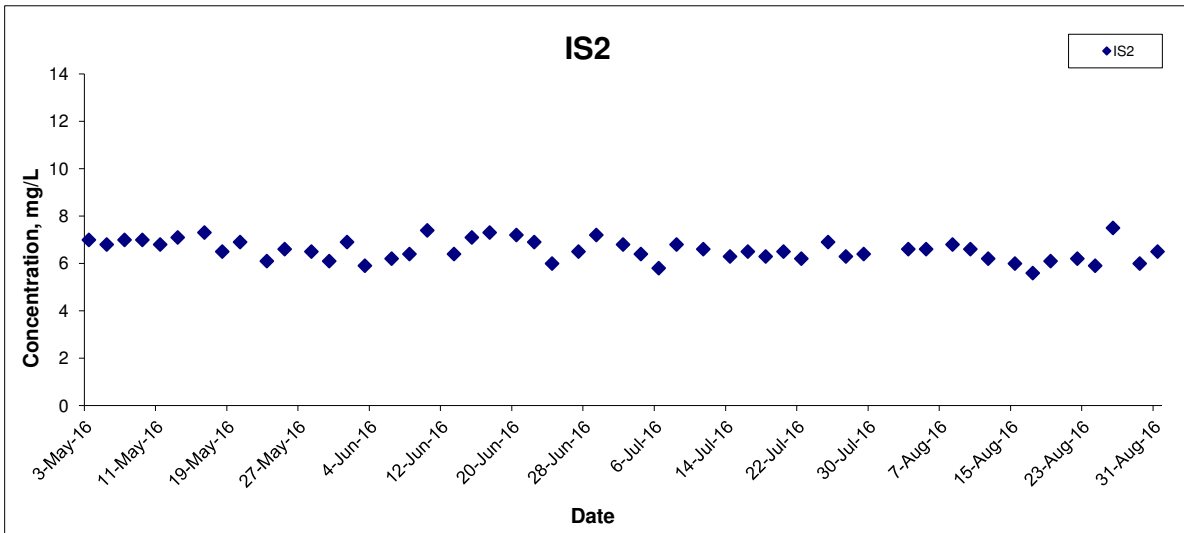
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 Hong Kong Link Road-Section between
 HKSAR Boundary and Scenic Hill
 Graphical Presentation of Water Quality Monitoring
 Results

Scale N.T.S
 Date Aug 16

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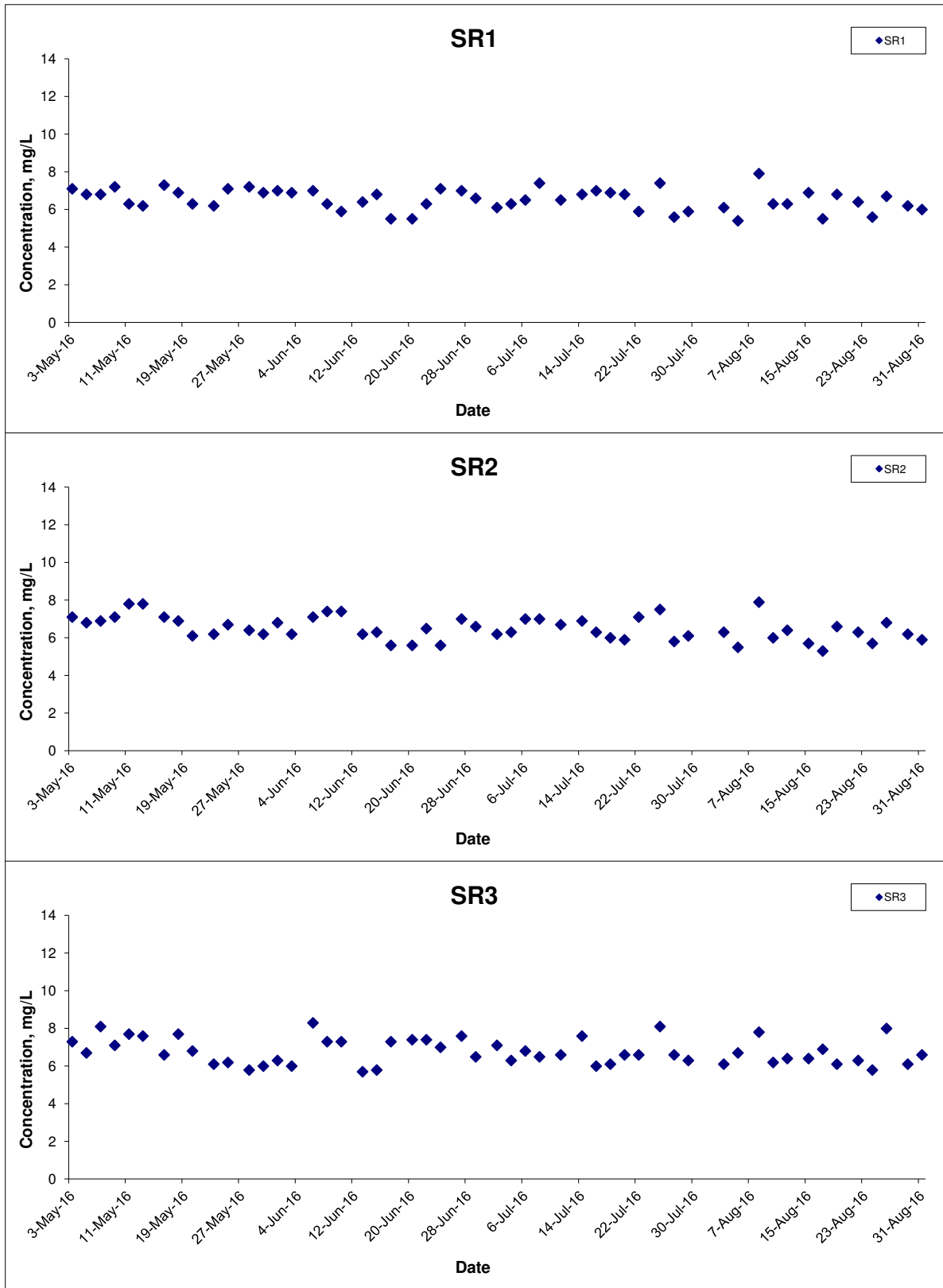


Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



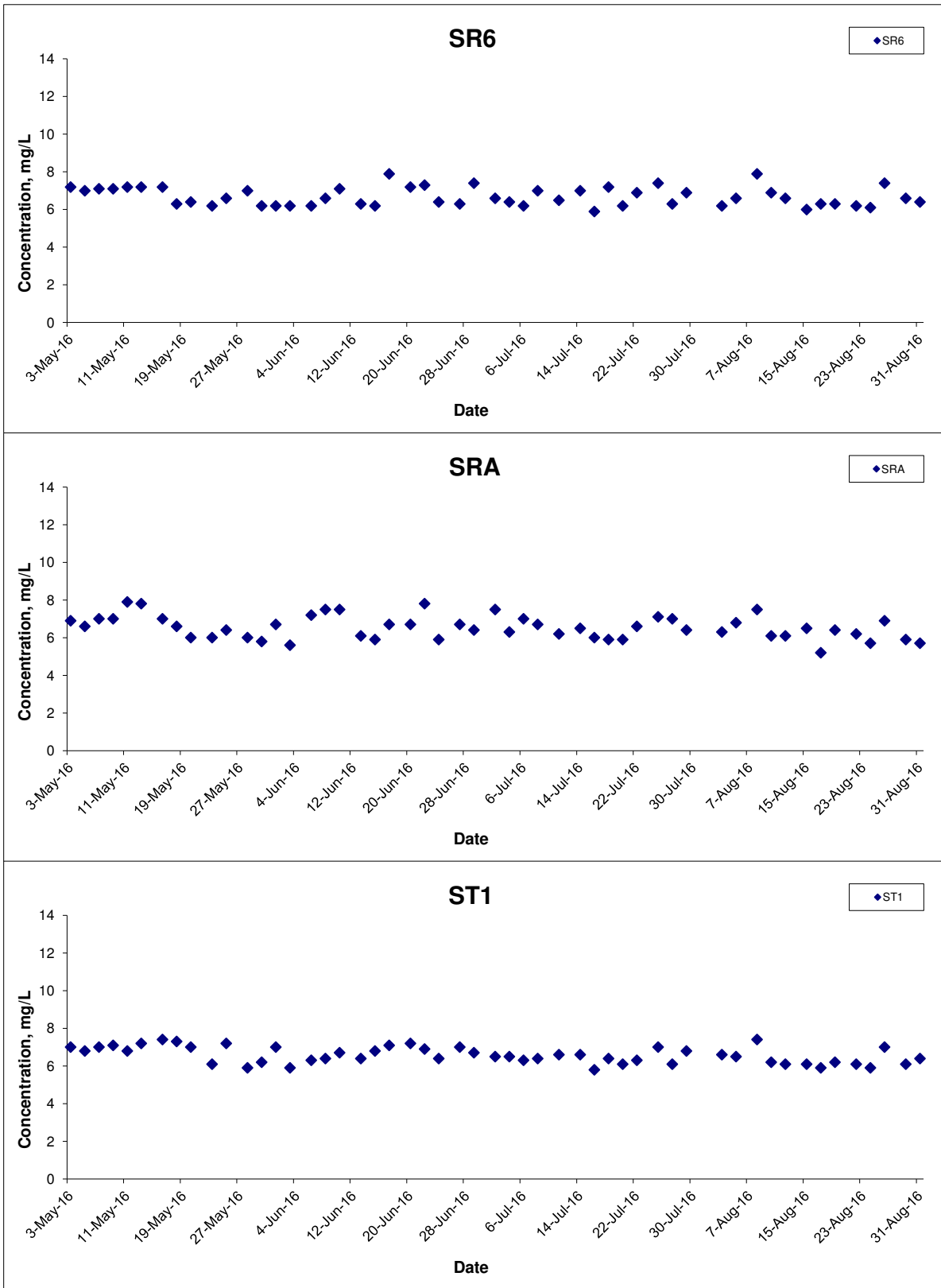
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	Date Aug 16	Appendix H	

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



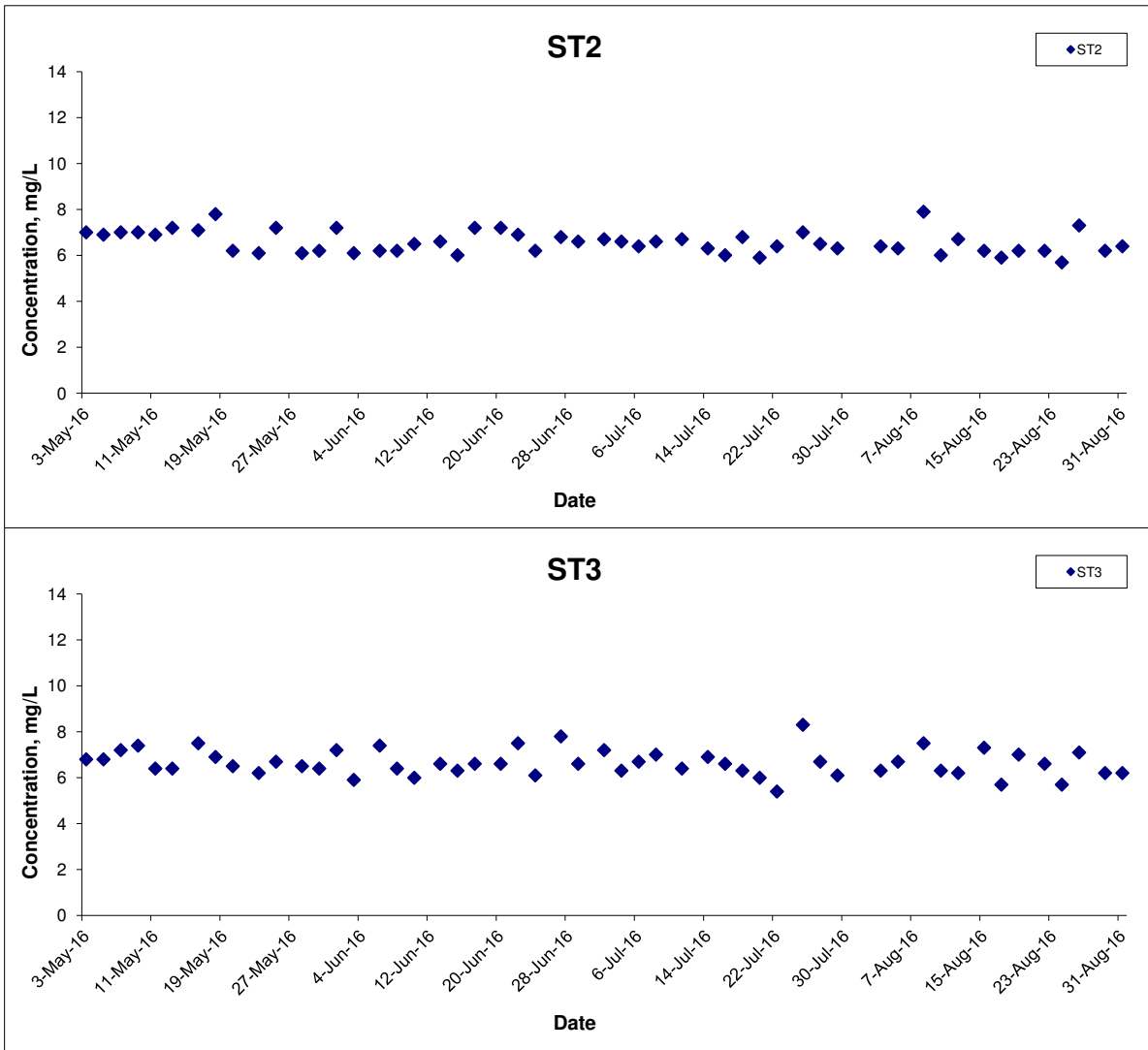
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	Date Aug 16	Appendix H	

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



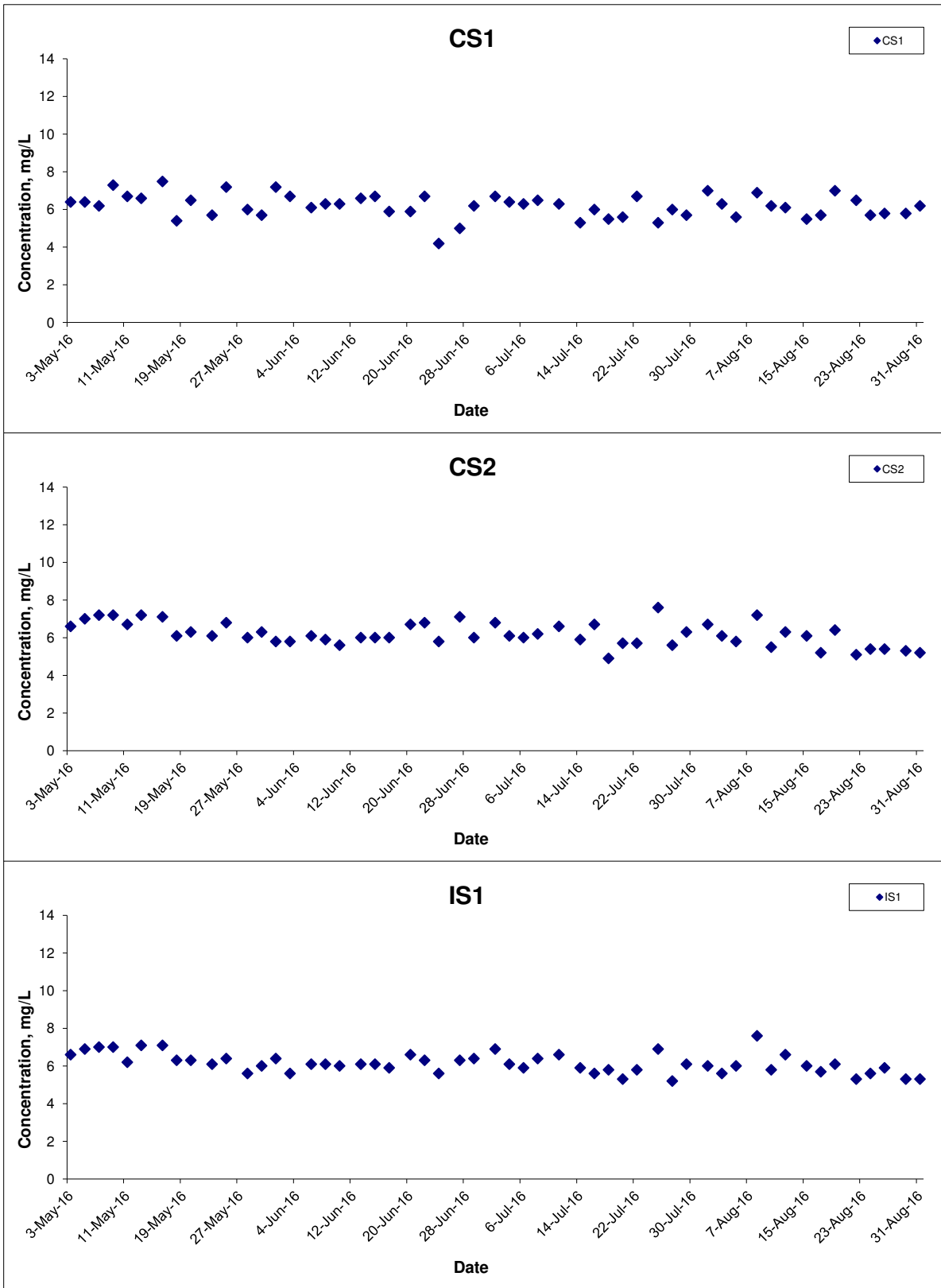
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	Date Aug 16	Appendix H	

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



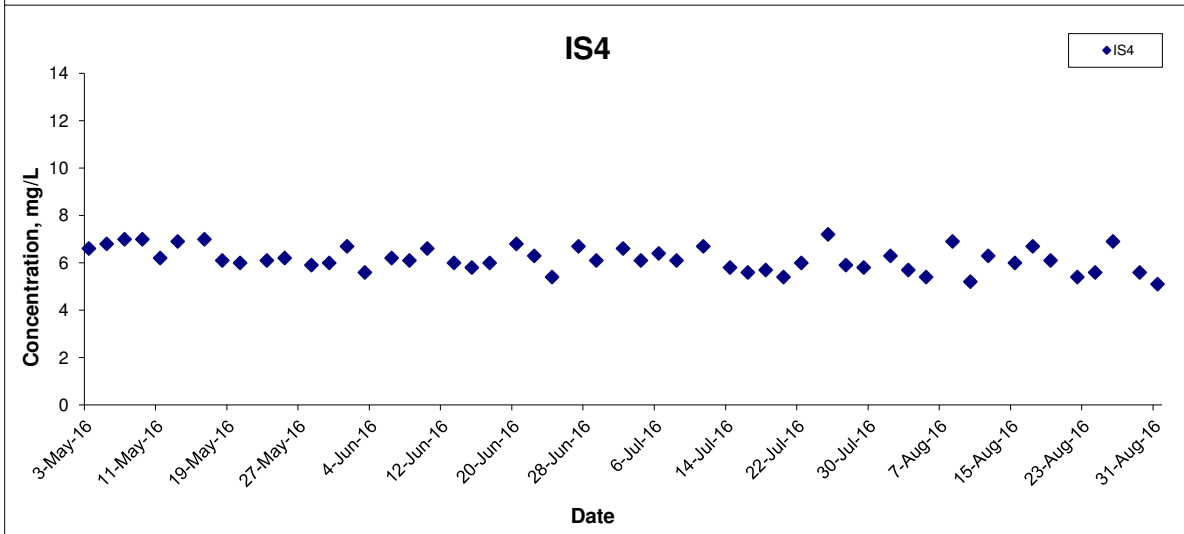
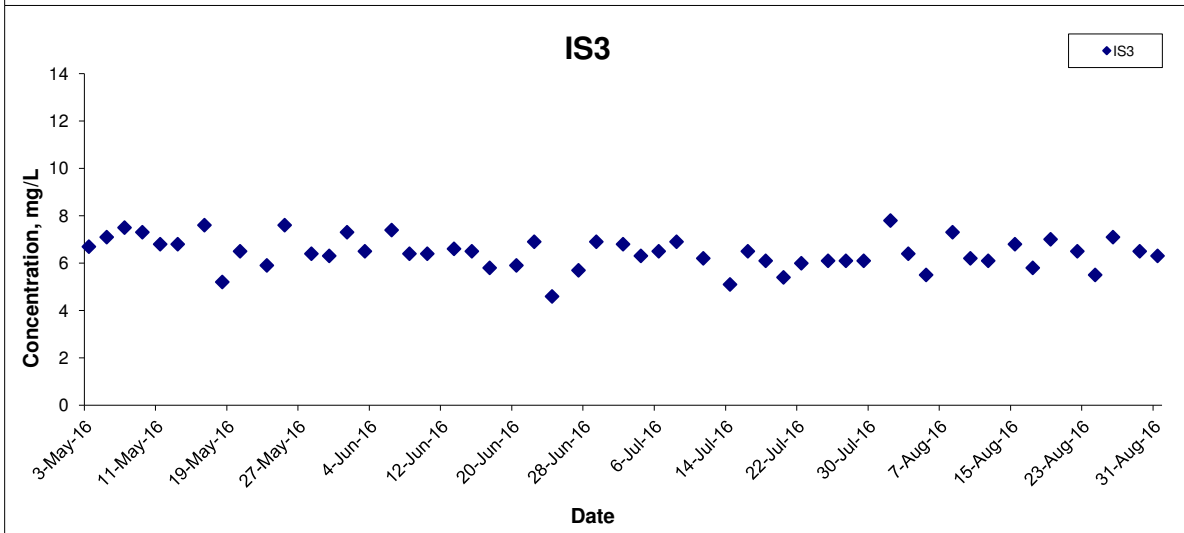
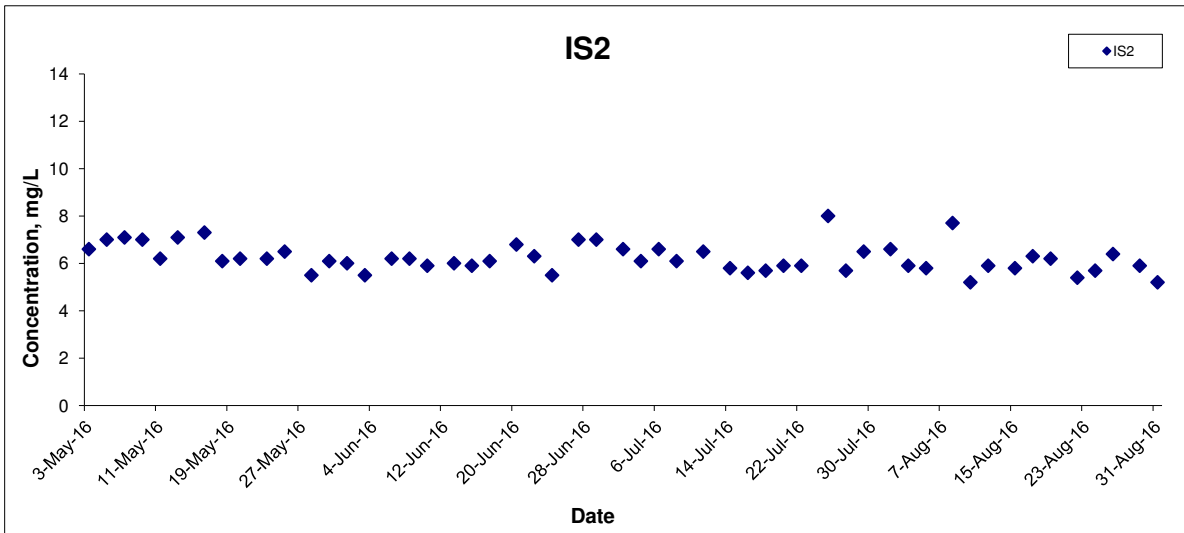
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Dissolved Oxygen (Bottom) at Mid-Ebb Tide



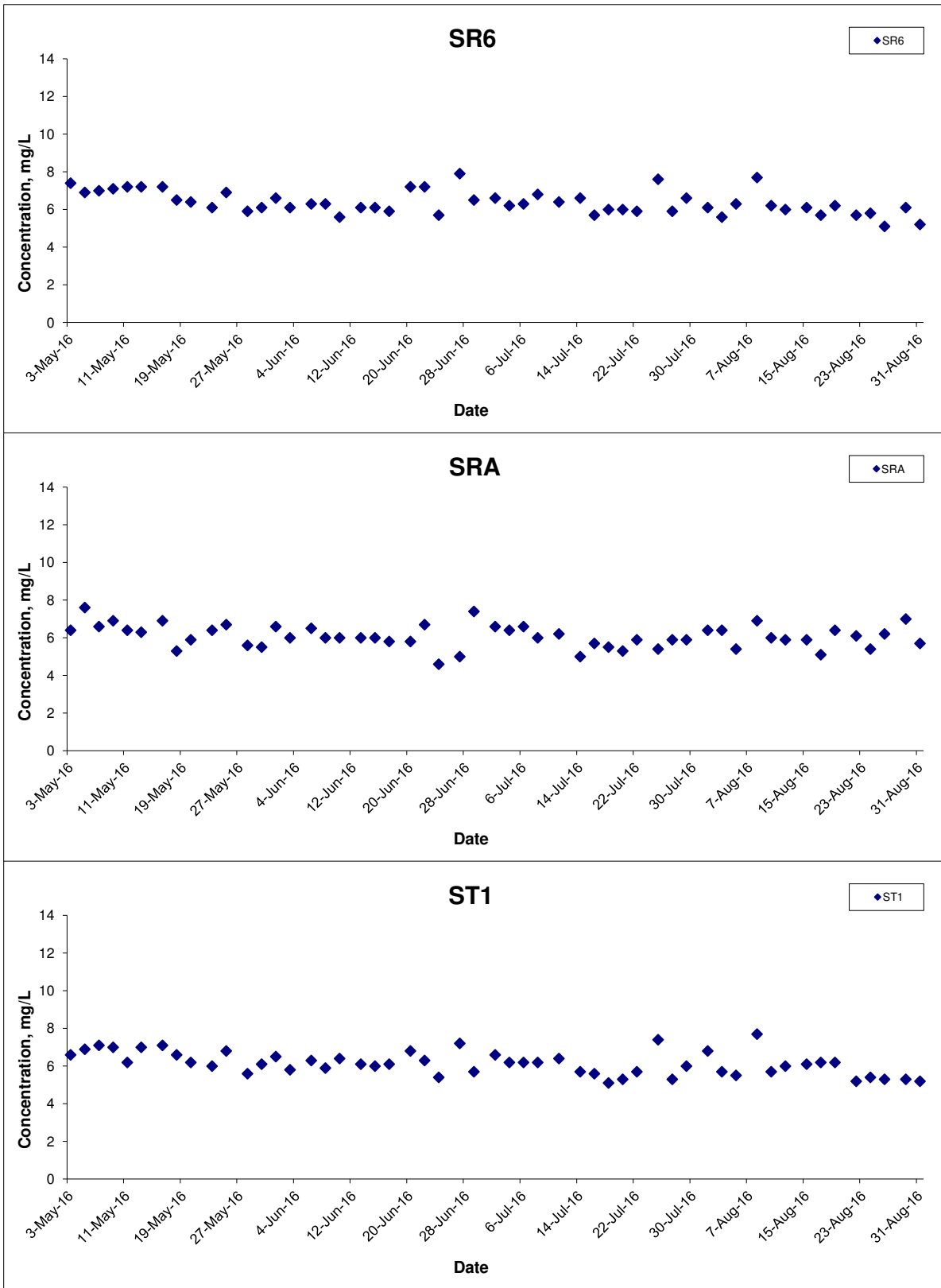
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Dissolved Oxygen (Bottom) at Mid-Ebb Tide



Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill	Scale	N.T.S	Project No.	MA12014	CINOTECH
	Graphical Presentation of Water Quality Monitoring Results	Date	Aug 16	Appendix	H	

Dissolved Oxygen (Bottom) at Mid-Ebb Tide



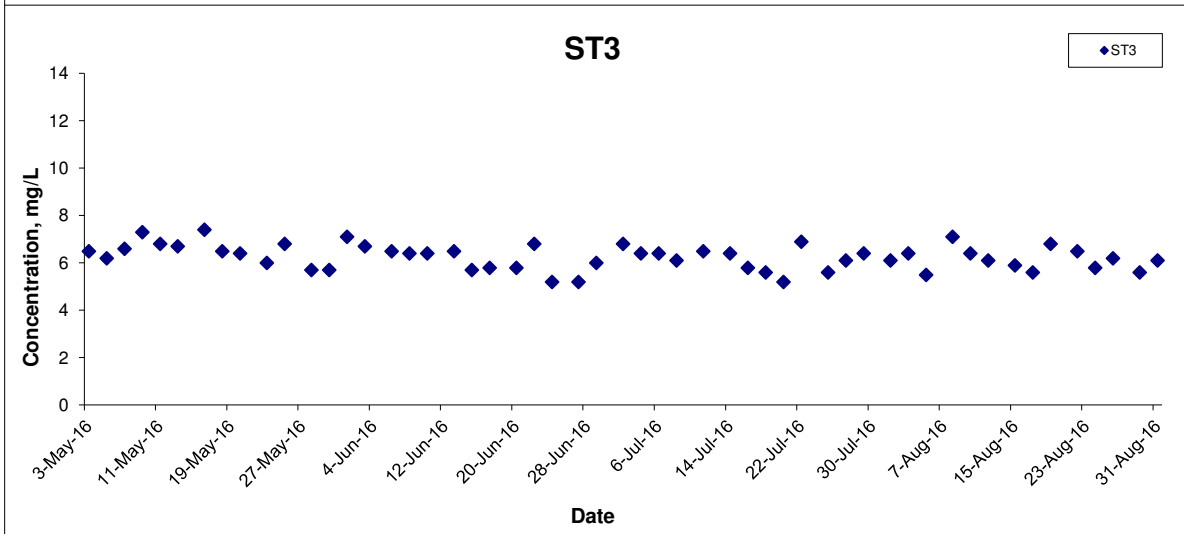
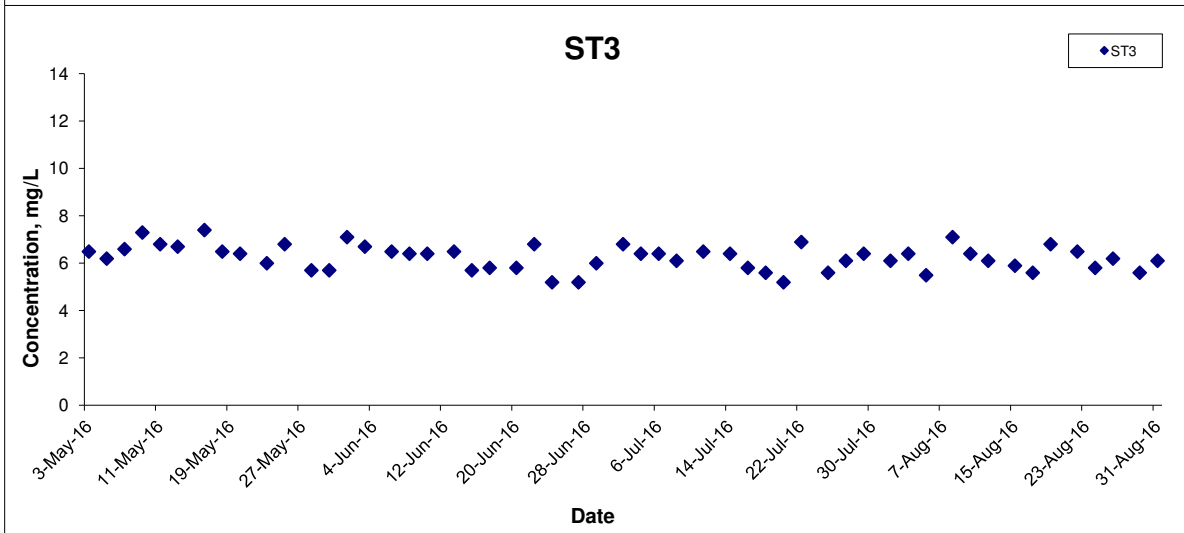
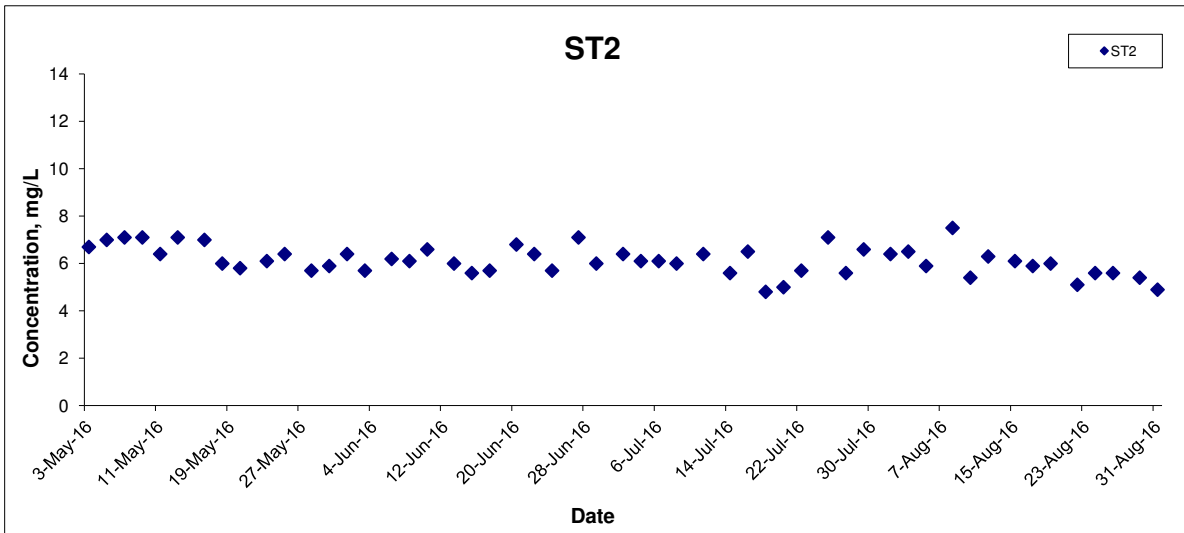
Title Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge
 Hong Kong Link Road-Section between
 HKSAR Boundary and Scenic Hill
 Graphical Presentation of Water Quality Monitoring
 Results

Scale N.T.S
 Date Aug 16

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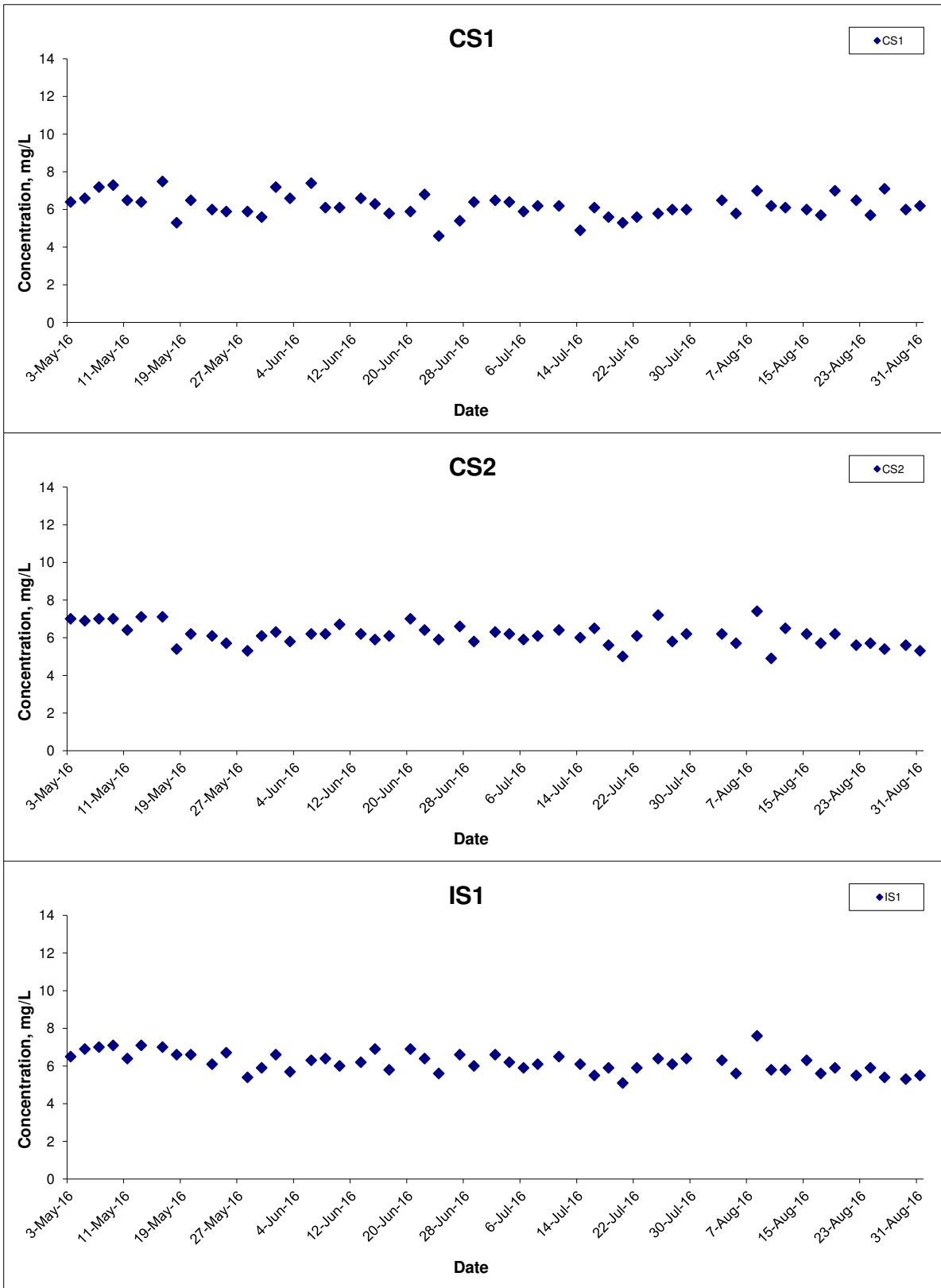


Dissolved Oxygen (Bottom) at Mid-Ebb Tide



Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill	Scale	N.T.S	Project No.	MA12014	CINOTECH
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Dissolved Oxygen (Bottom) at Mid-Flood Tide



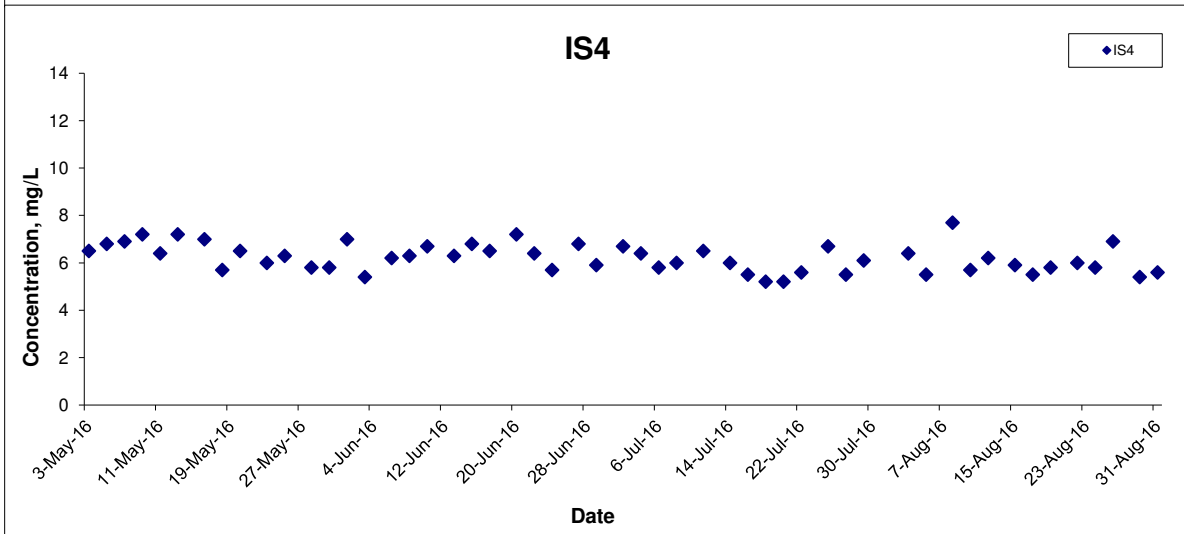
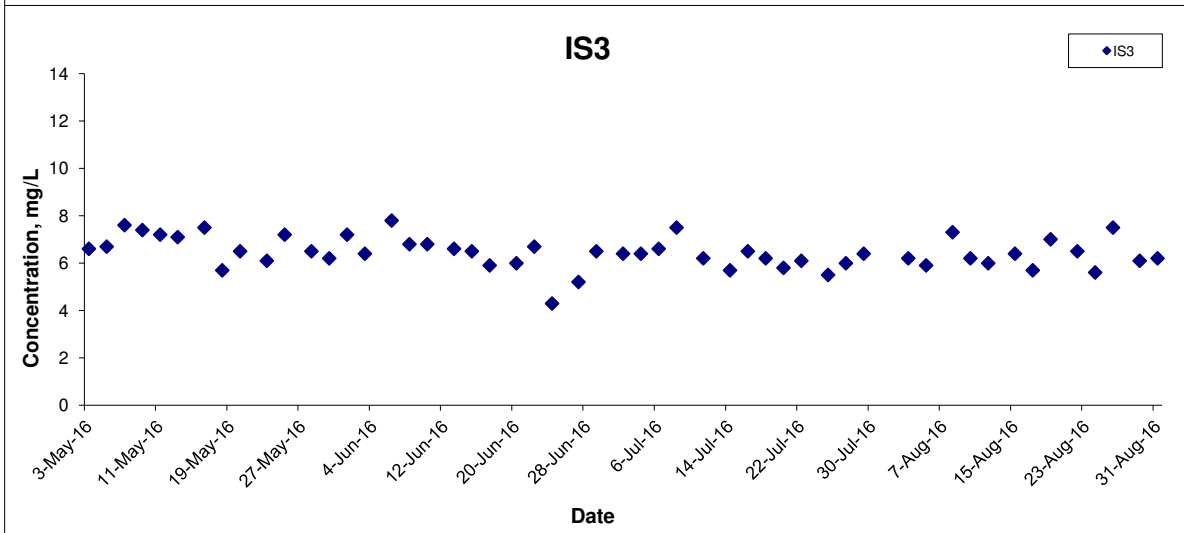
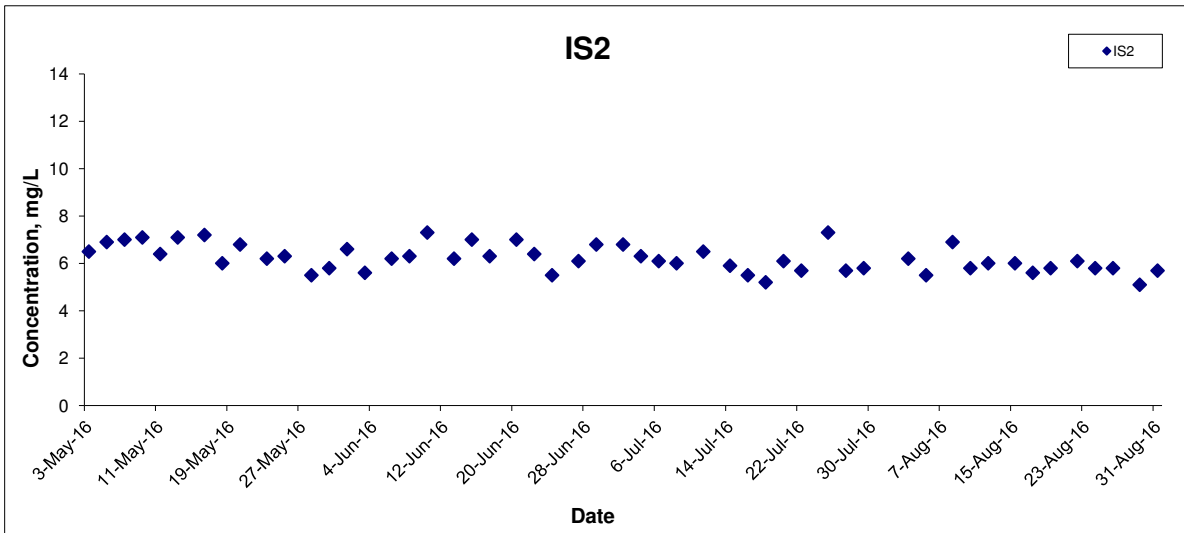
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 Hong Kong Link Road-Section between
 HKSAR Boundary and Scenic Hill
 Graphical Presentation of Water Quality Monitoring
 Results

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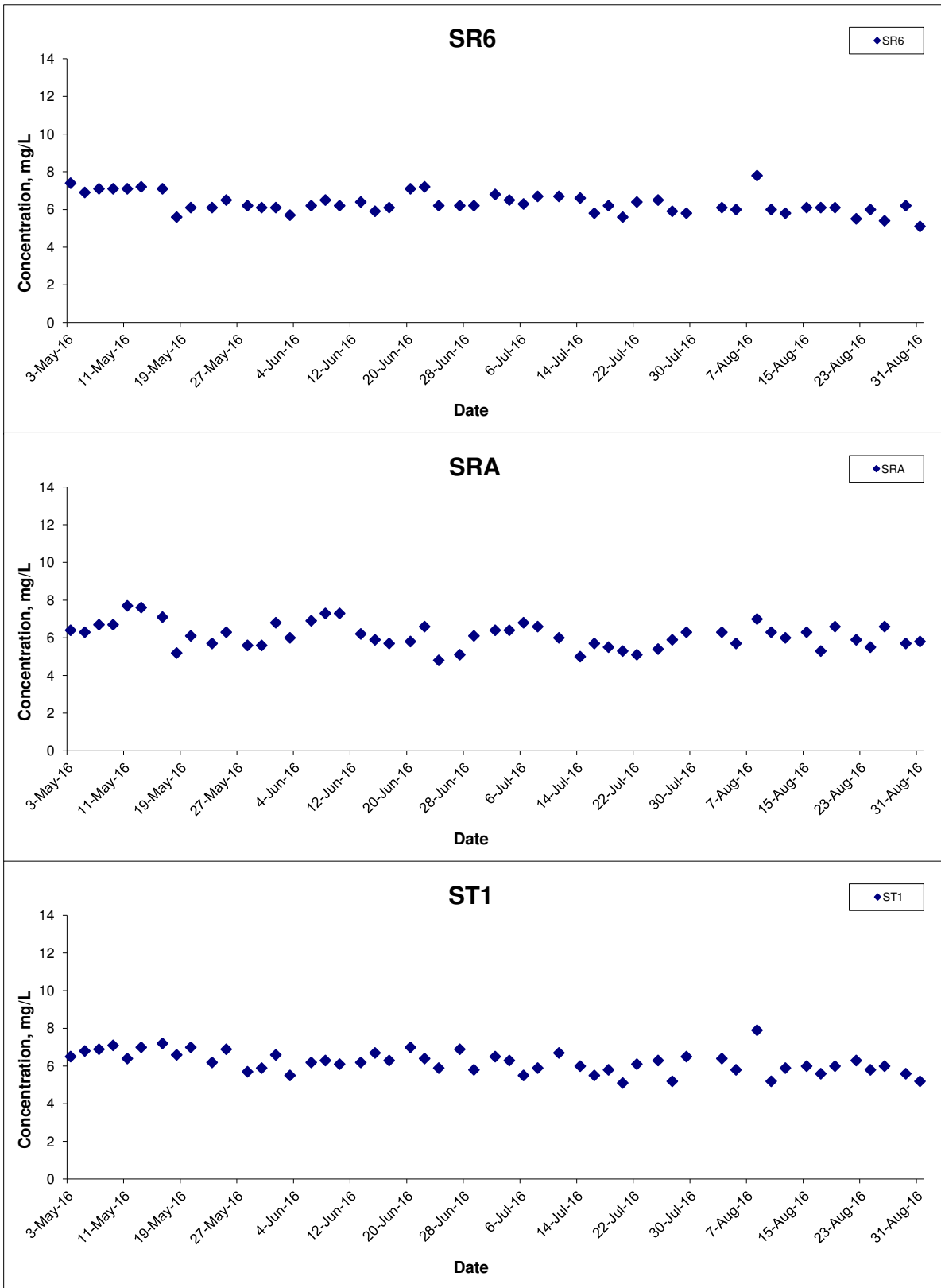


Dissolved Oxygen (Bottom) at Mid-Flood Tide



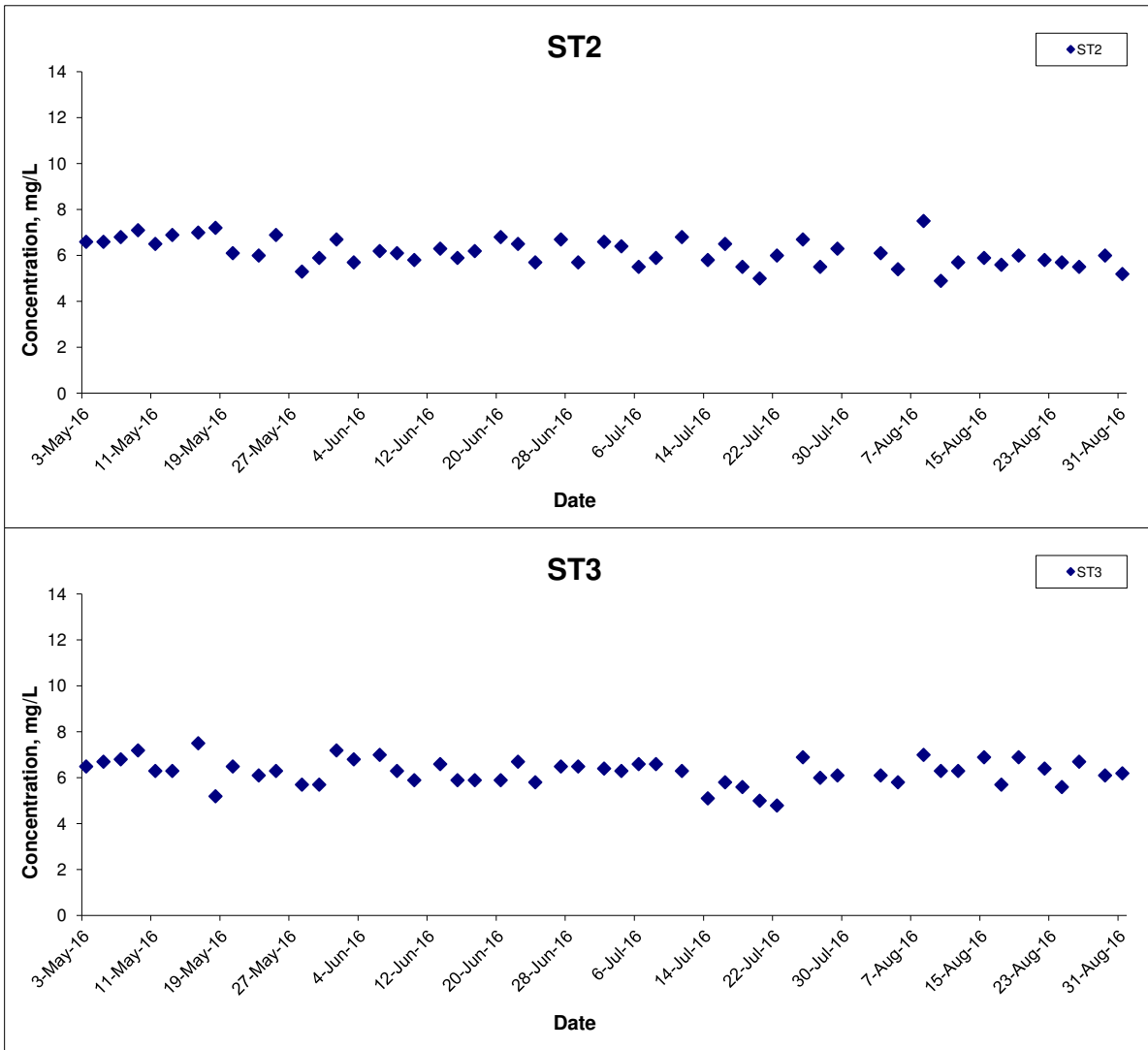
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Dissolved Oxygen (Bottom) at Mid-Flood Tide



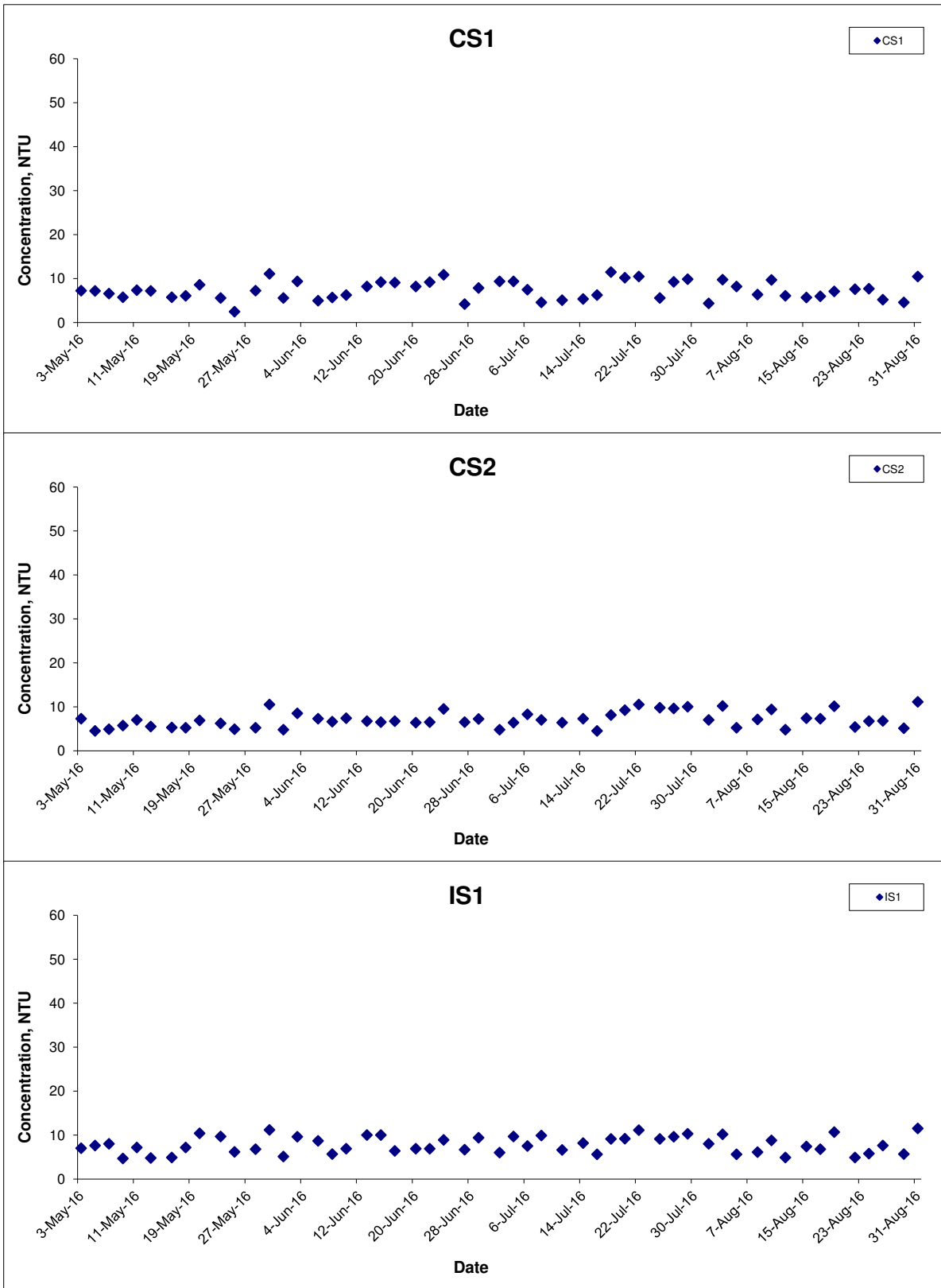
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	Date Aug 16	Appendix H	

Dissolved Oxygen (Bottom) at Mid-Flood Tide



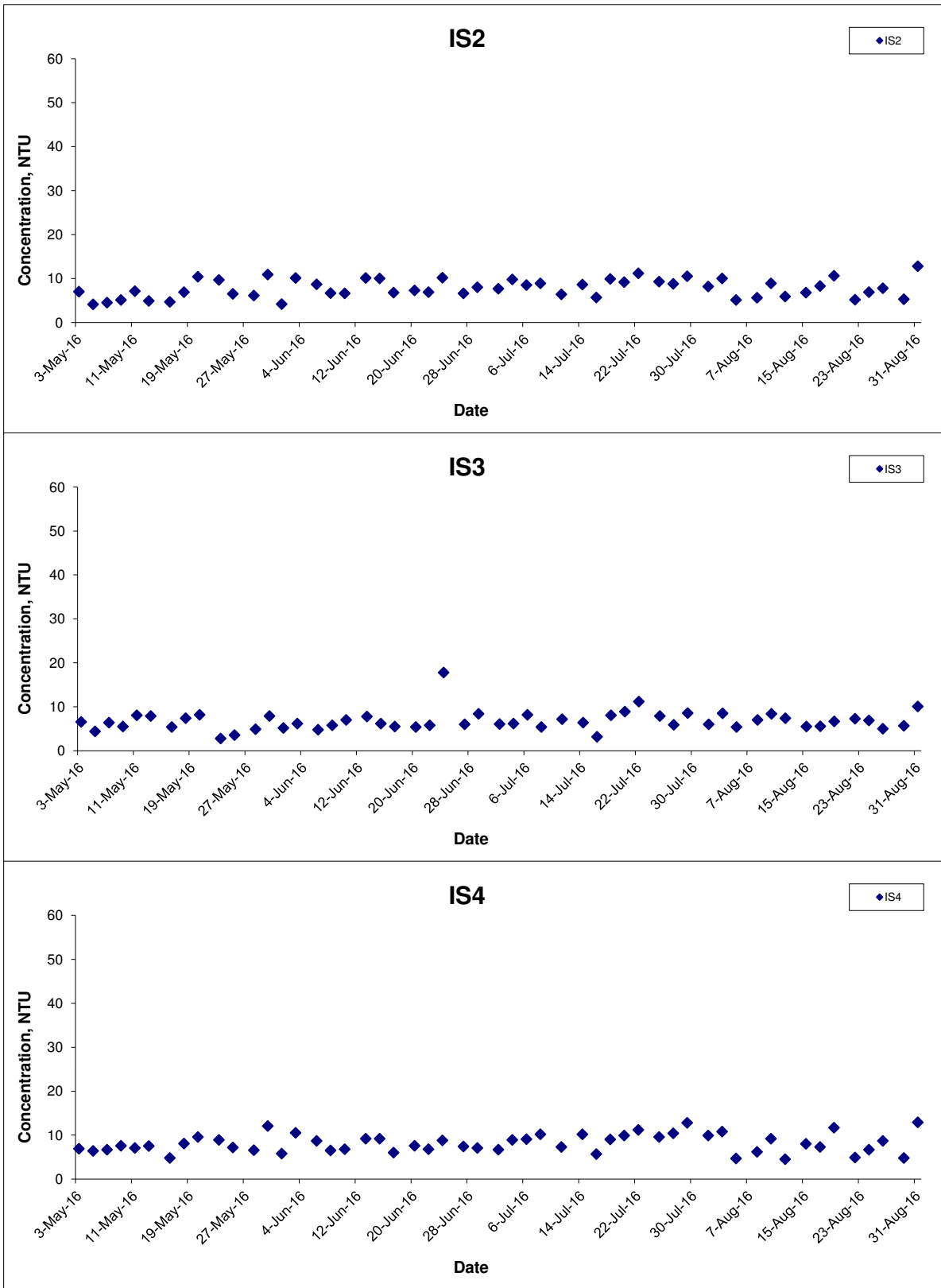
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Turbidity (Depth-averaged) at Mid-Ebb Tide



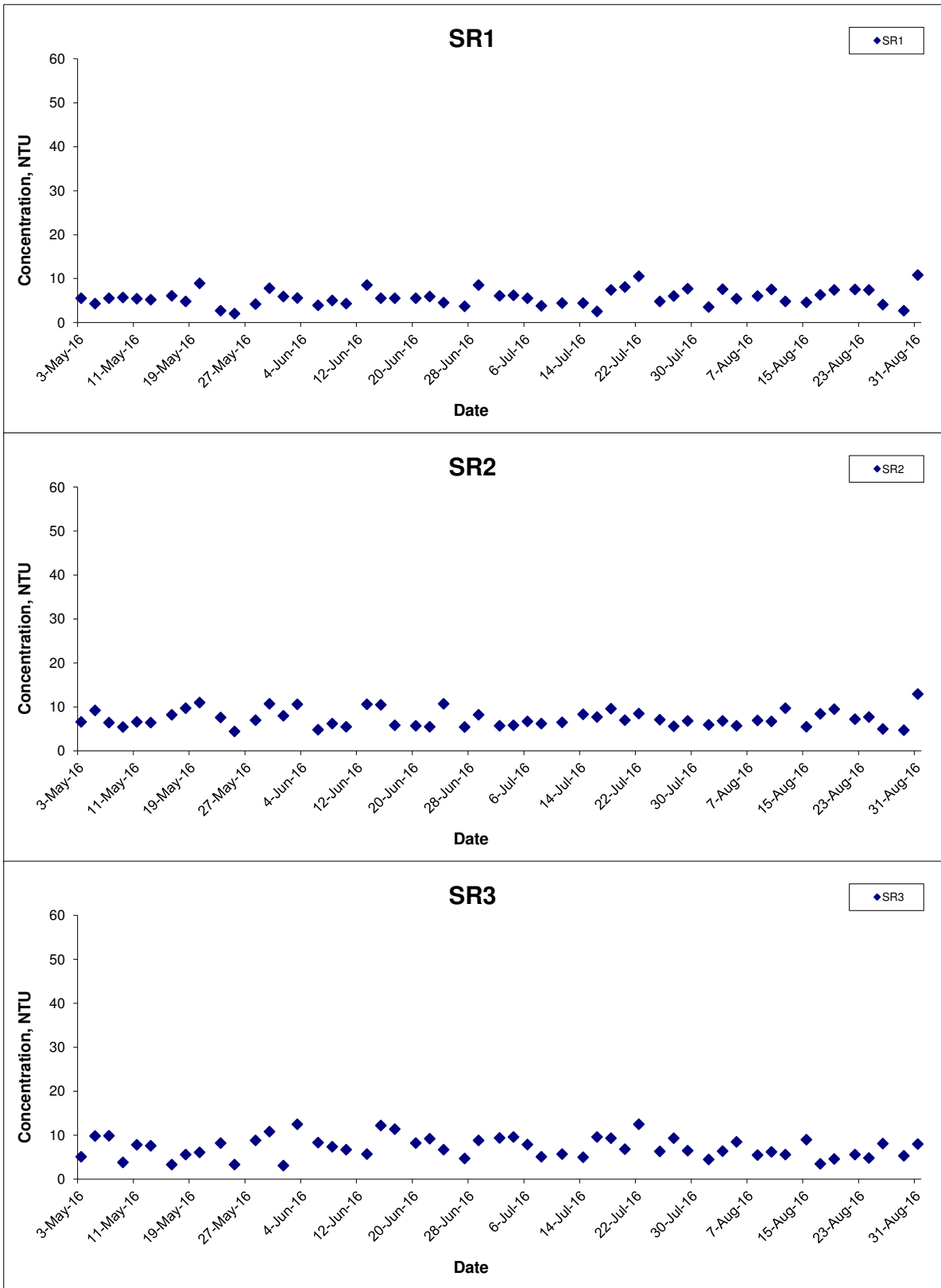
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Turbidity (Depth-averaged) at Mid-Ebb Tide



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
	Date Aug 16	Appendix H	

Turbidity (Depth-averaged) at Mid-Ebb Tide



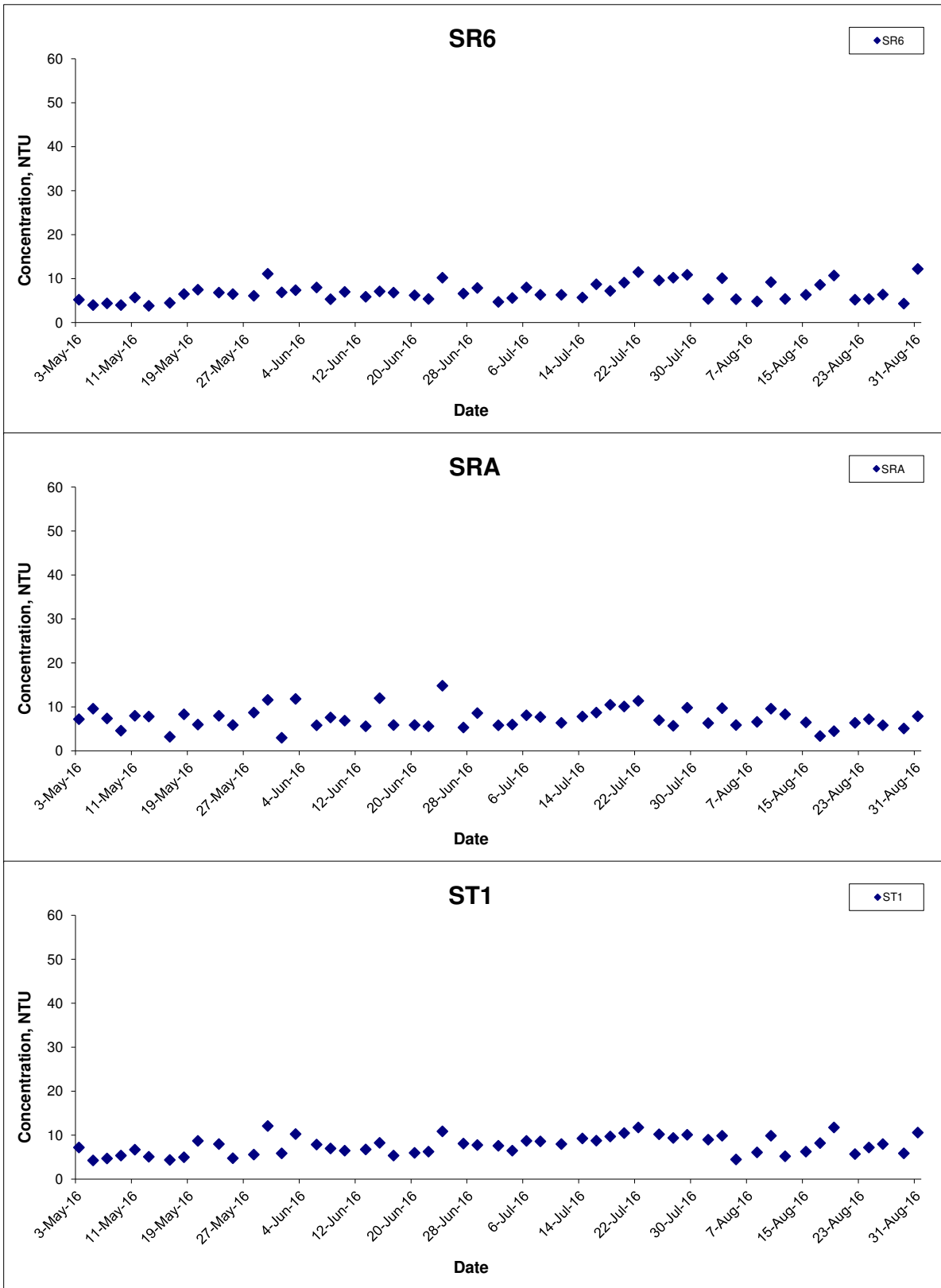
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 Hong Kong Link Road-Section between
 HKSAR Boundary and Scenic Hill
 Graphical Presentation of Water Quality Monitoring
 Results

Scale N.T.S
 Date Aug 16

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Turbidity (Depth-averaged) at Mid-Ebb Tide



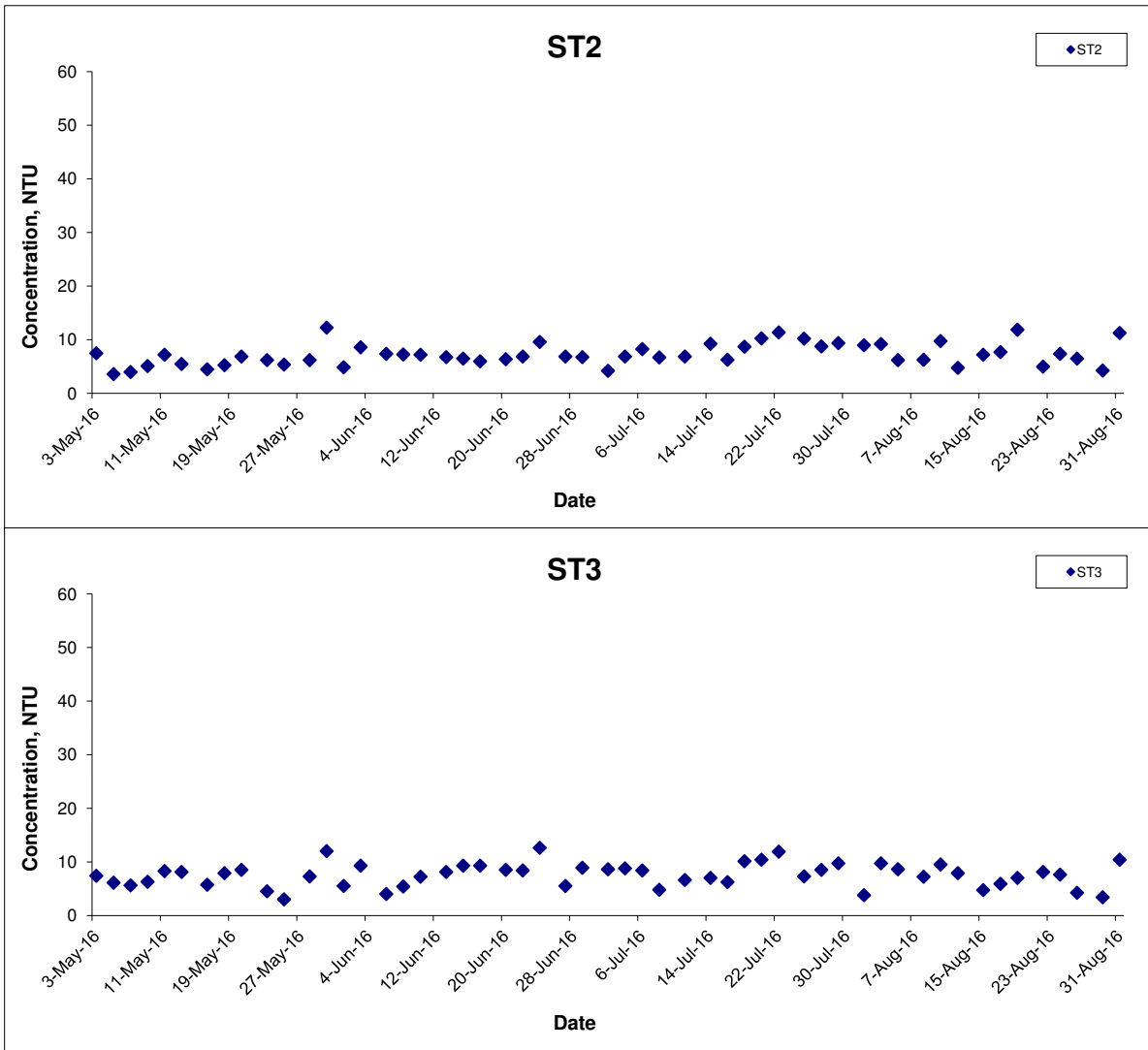
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 Hong Kong Link Road-Section between
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 Graphical Presentation of Water Quality Monitoring
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Scale N.T.S
 Date Aug 16

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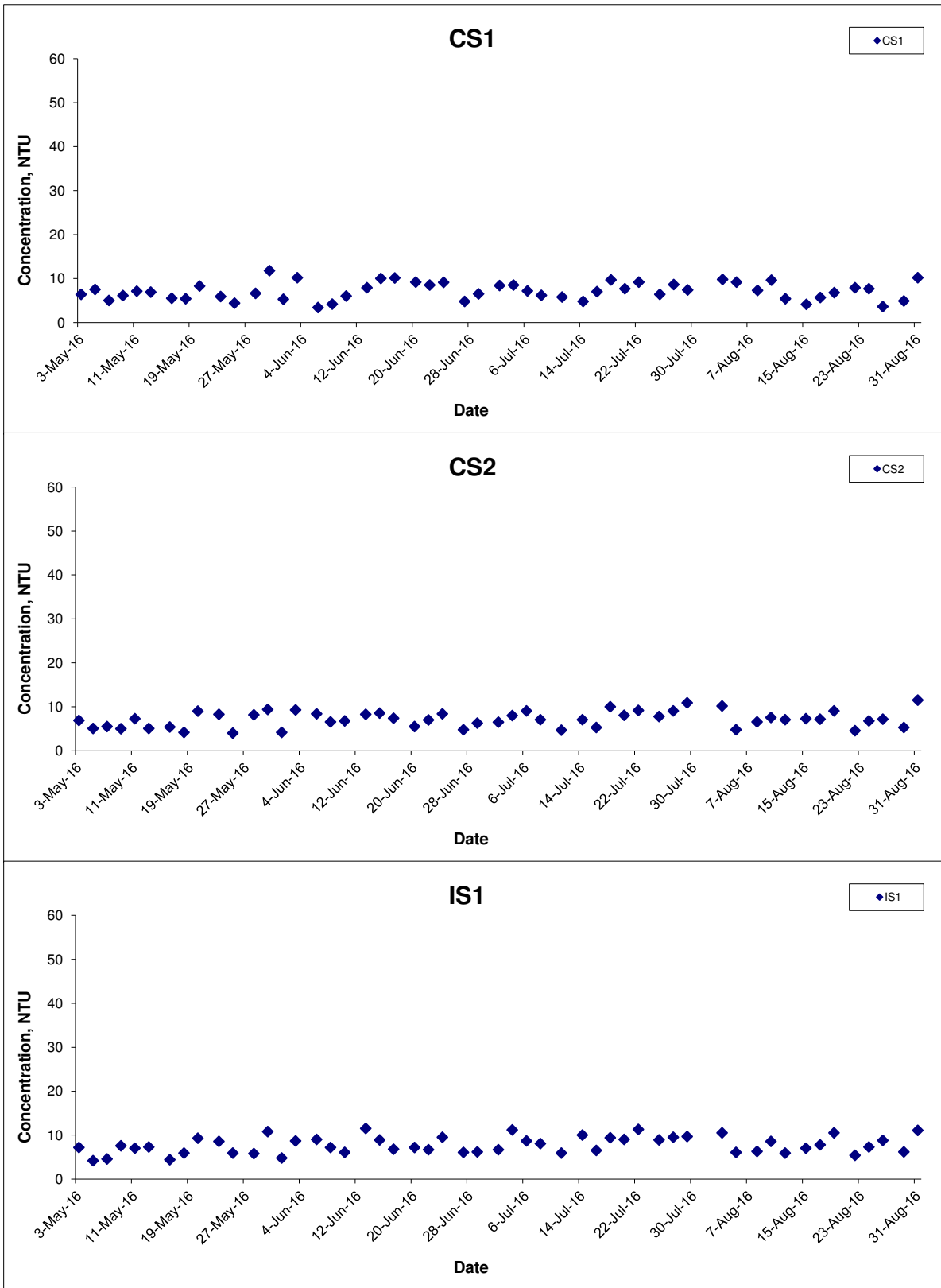


Turbidity (Depth-averaged) at Mid-Ebb Tide



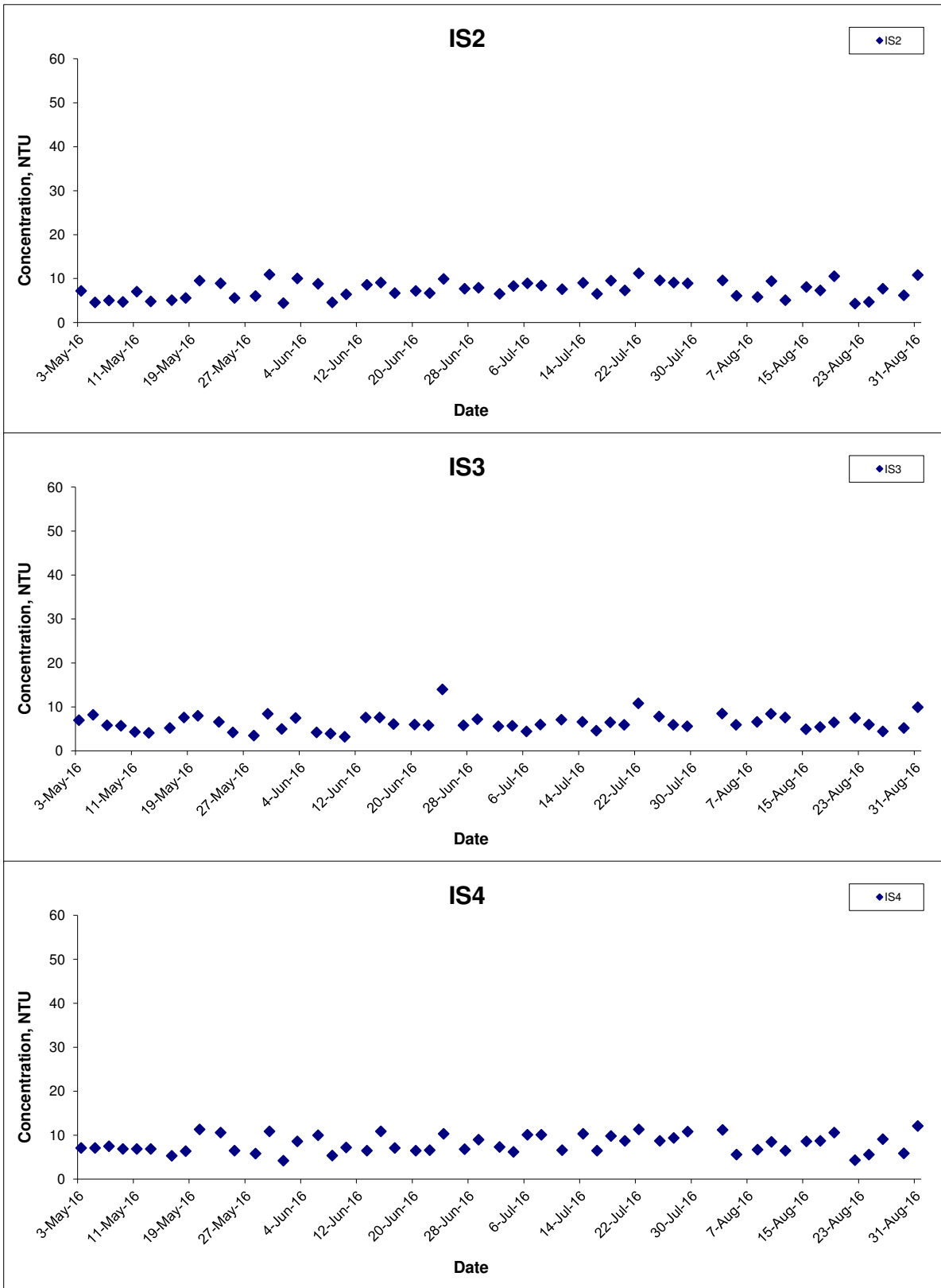
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	Date Aug 16	Appendix H	

Turbidity (Depth-averaged) at Mid-Flood Tide



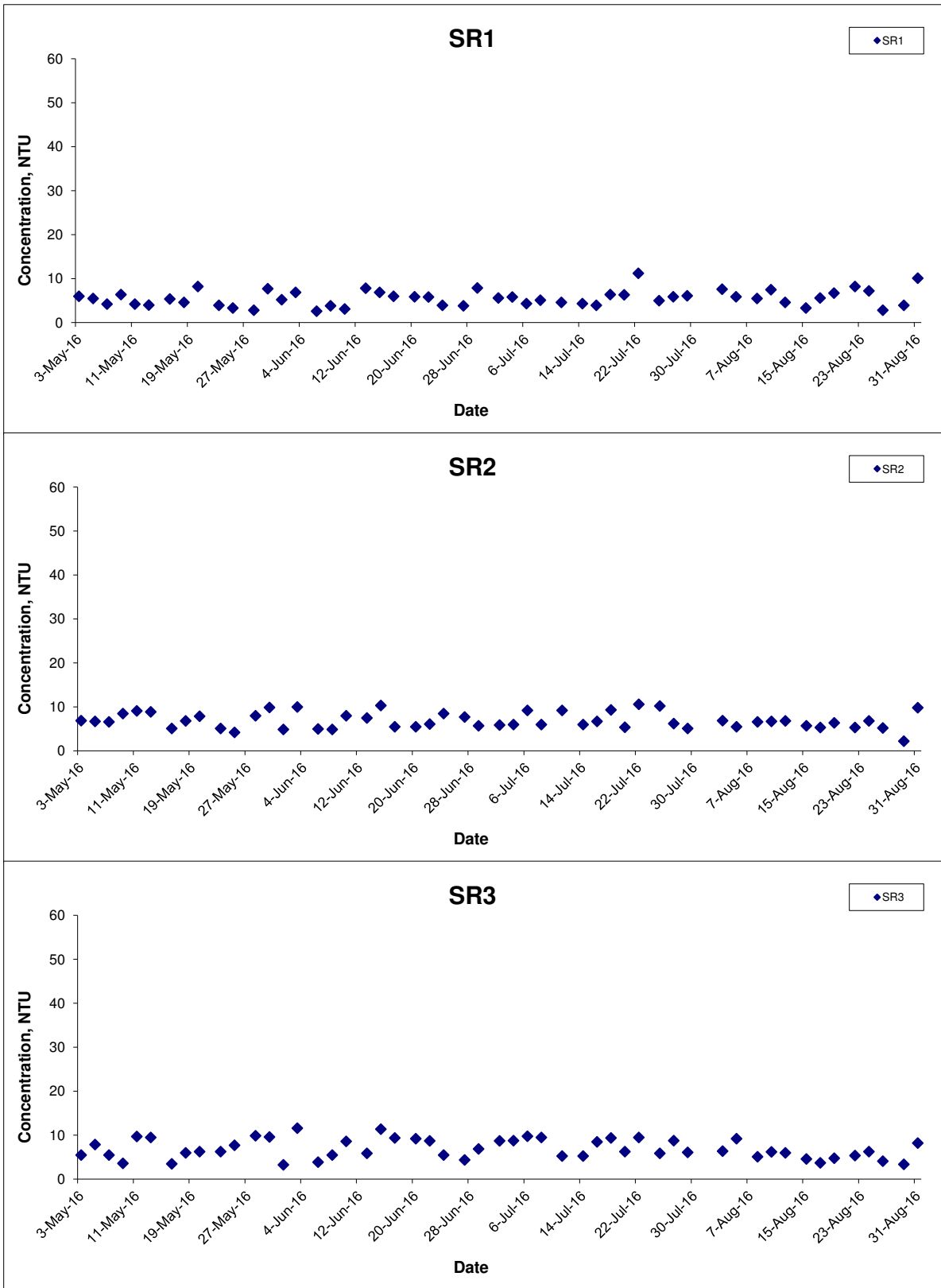
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	Date Aug 16	Appendix H	

Turbidity (Depth-averaged) 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
	Date Aug 16	Appendix H	

Turbidity (Depth-averaged) at Mid-Flood Tide



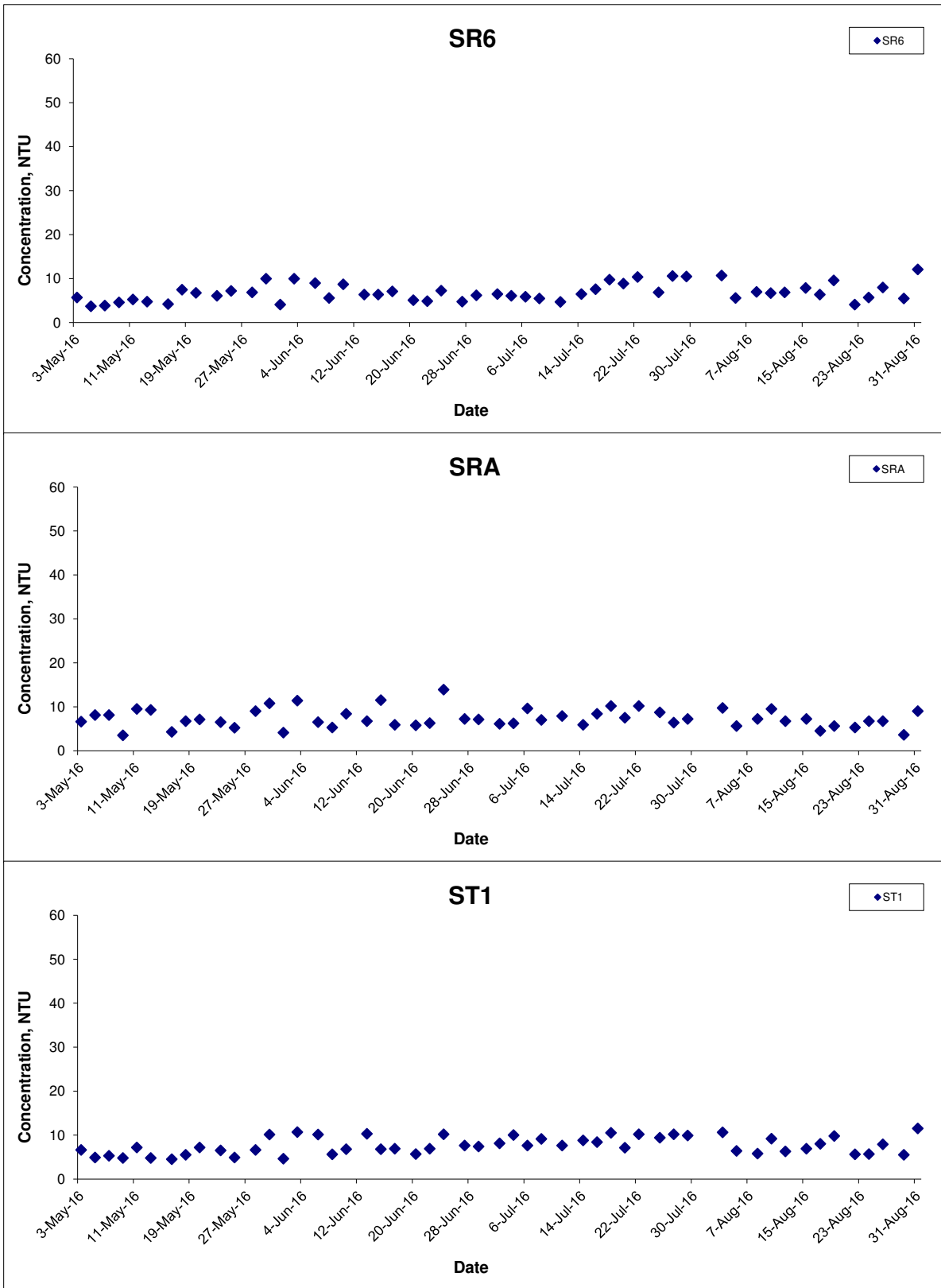
Title Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge
 Hong Kong Link Road-Section between
 HKSAR Boundary and Scenic Hill
 Graphical Presentation of Water Quality Monitoring
 Results

Scale N.T.S
 Date Aug 16

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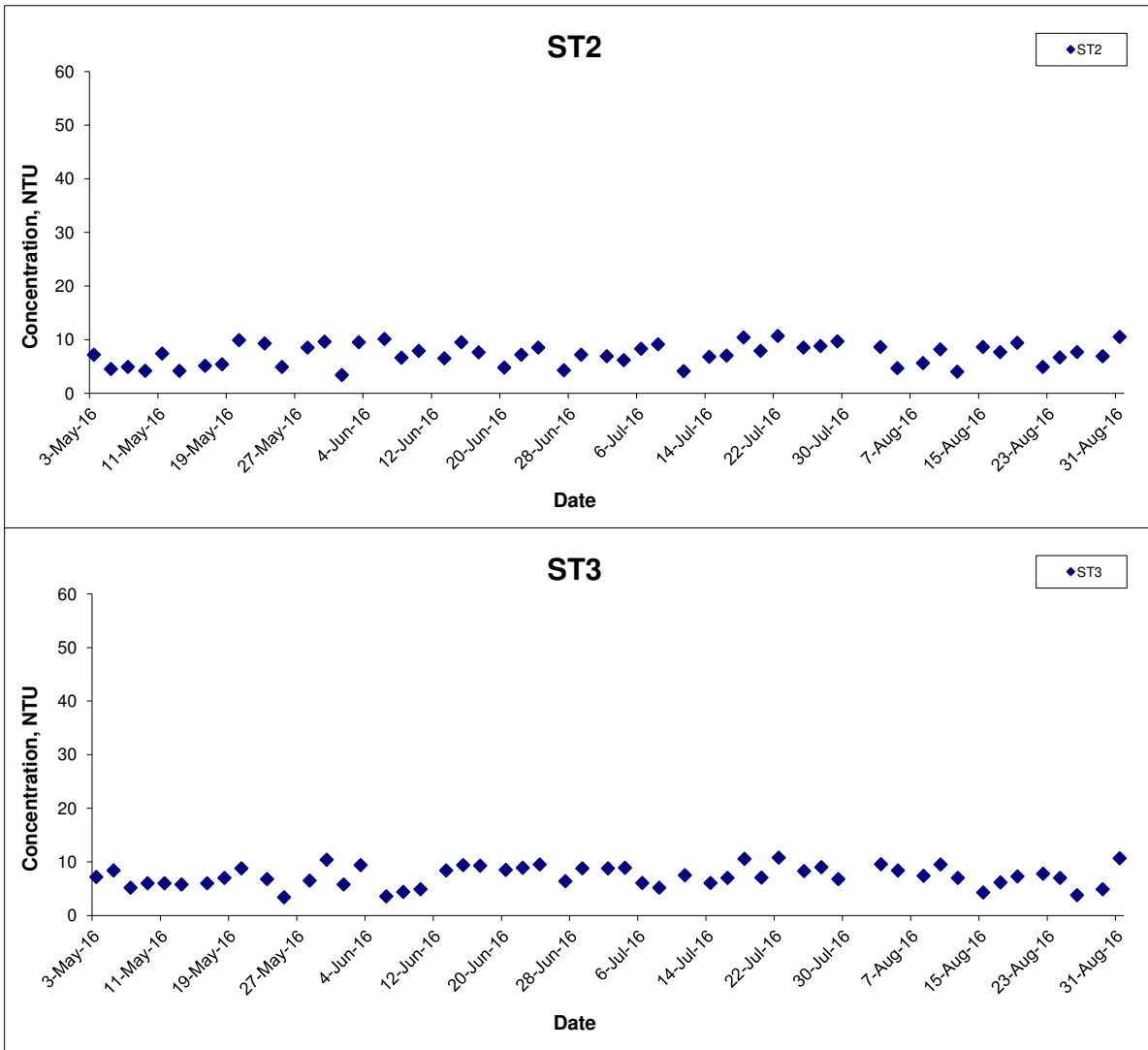


Turbidity (Depth-averaged) at Mid-Flood Tide



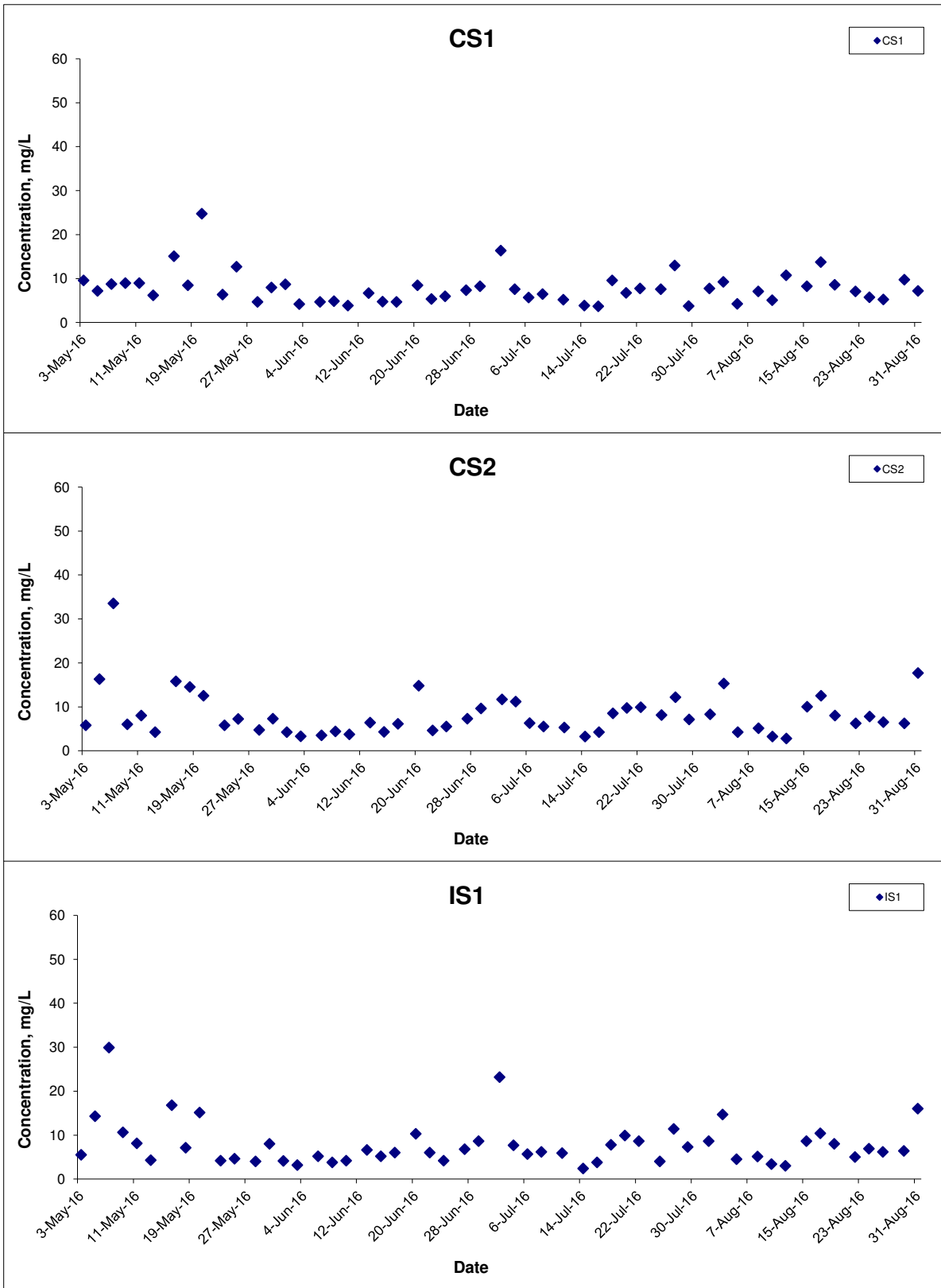
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Turbidity (Depth-averaged) at Mid-Flood Tide



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



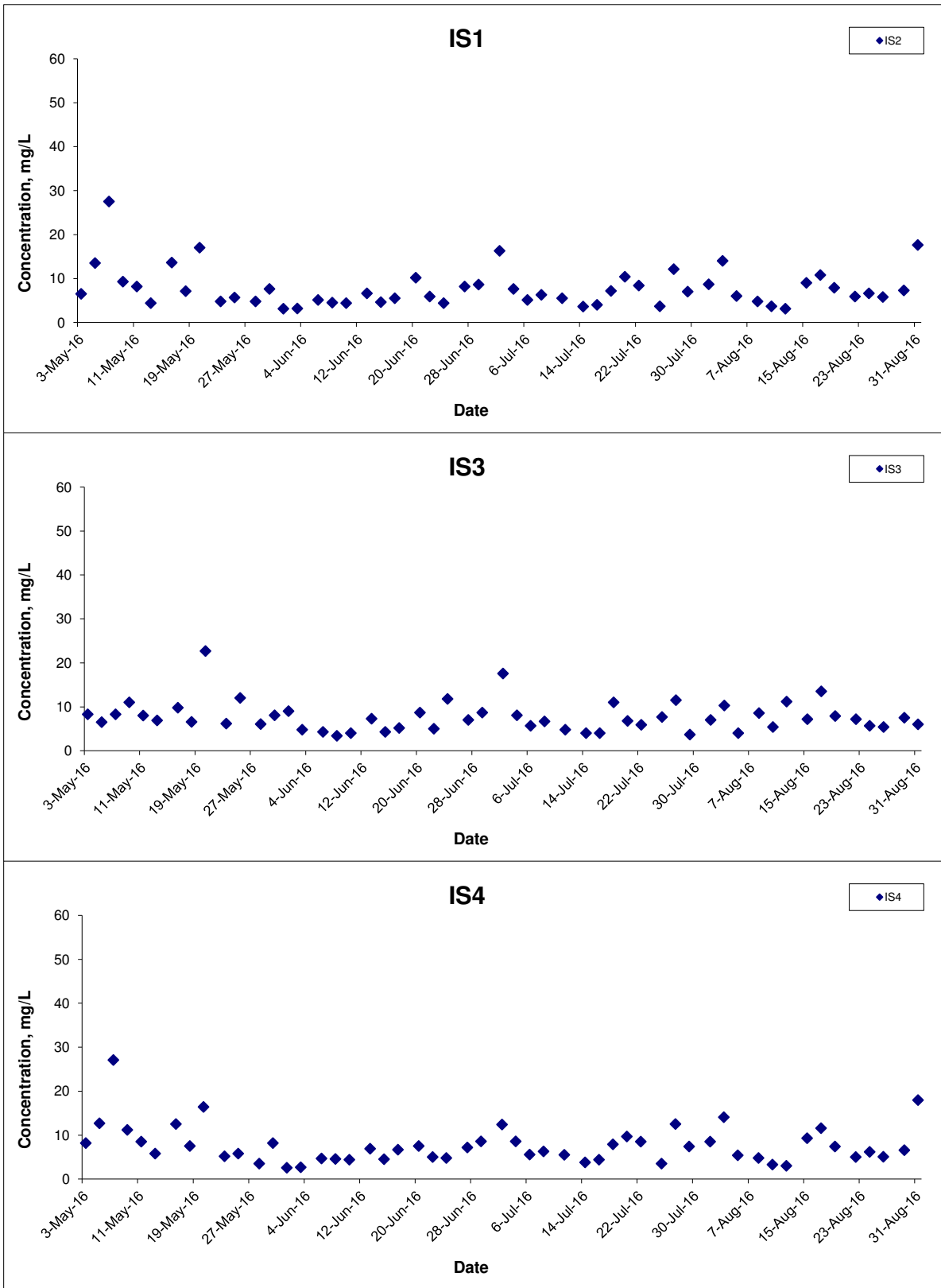
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Scale N.T.S
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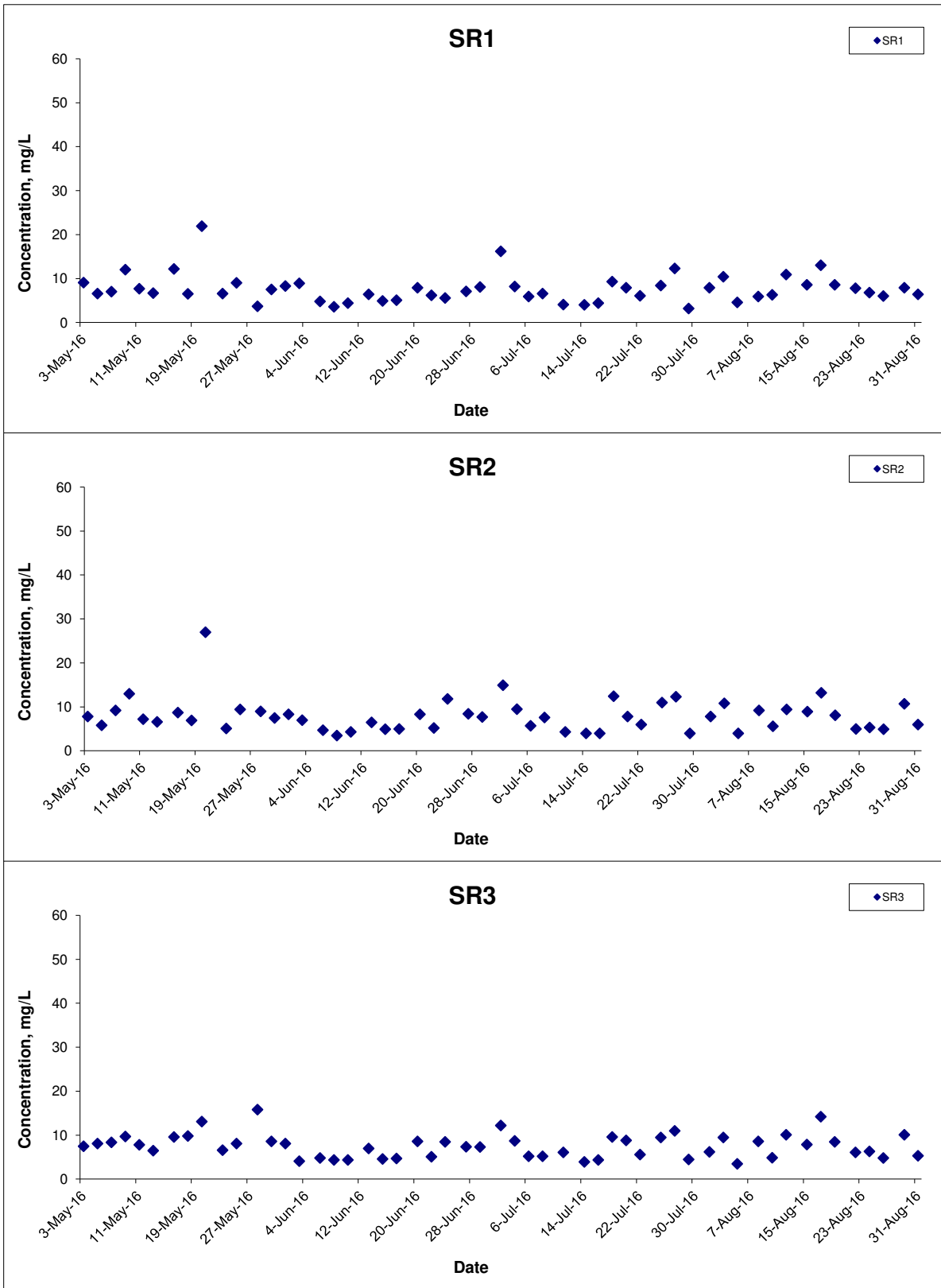


Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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



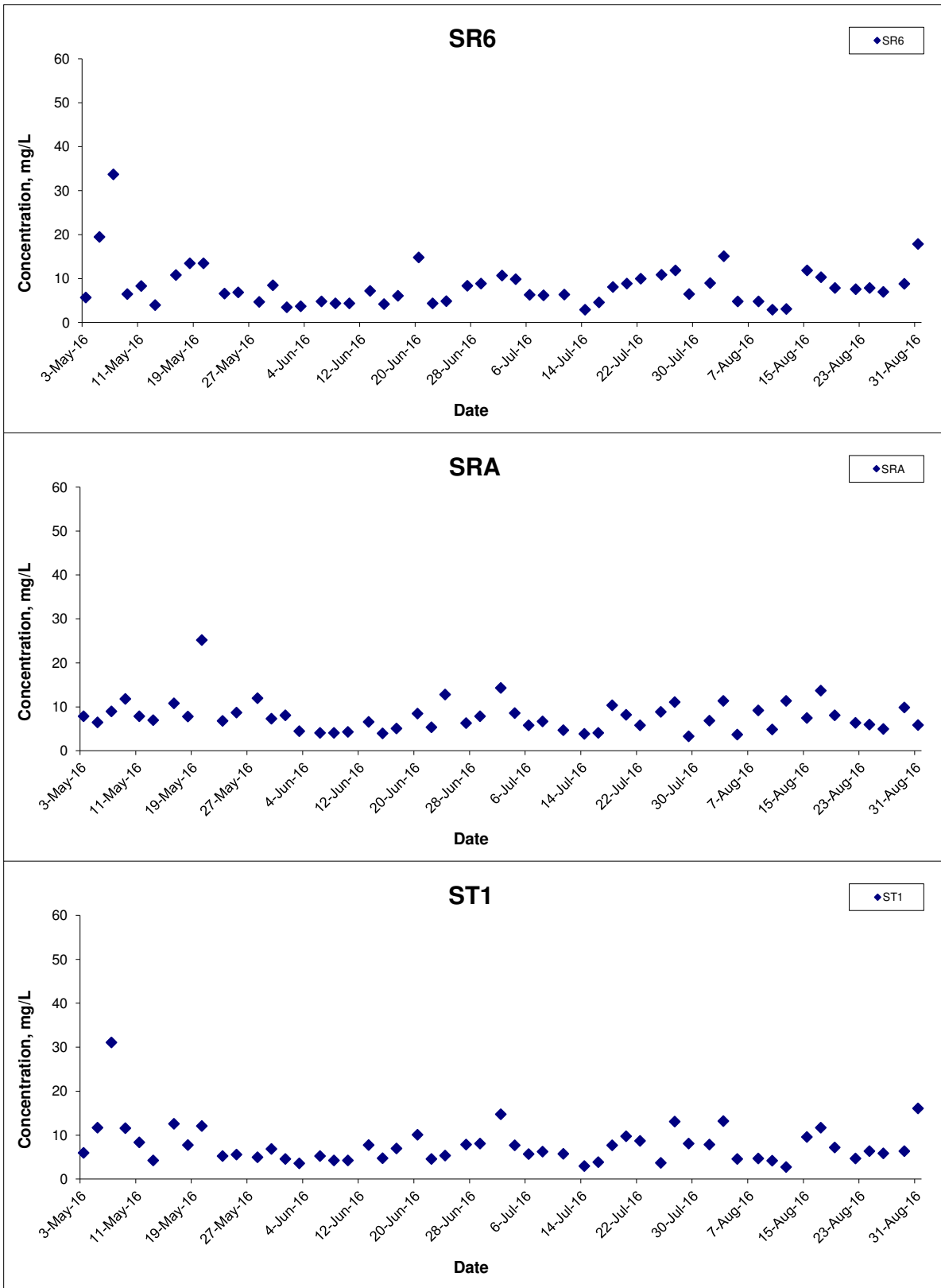
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Scale N.T.S
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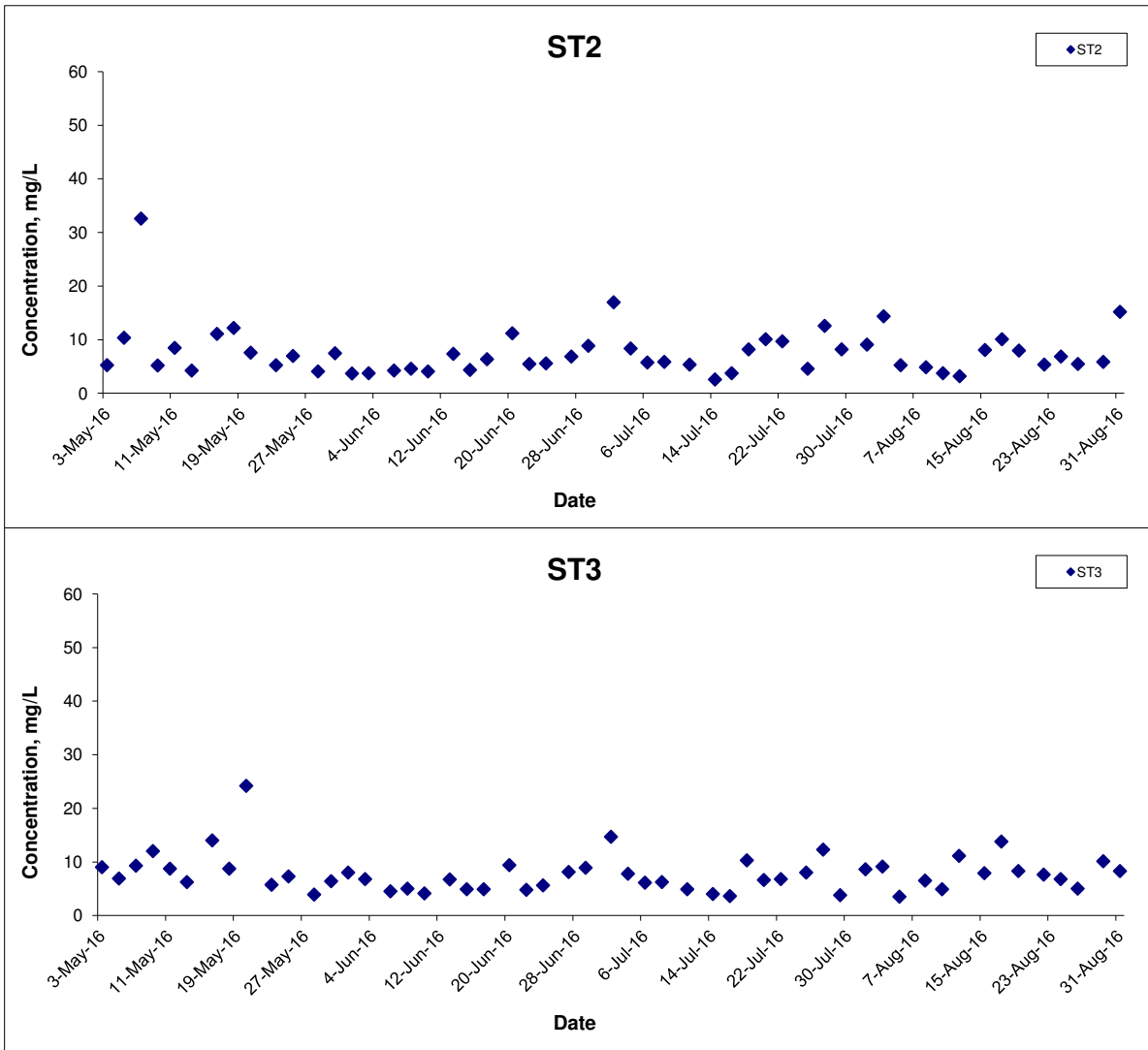


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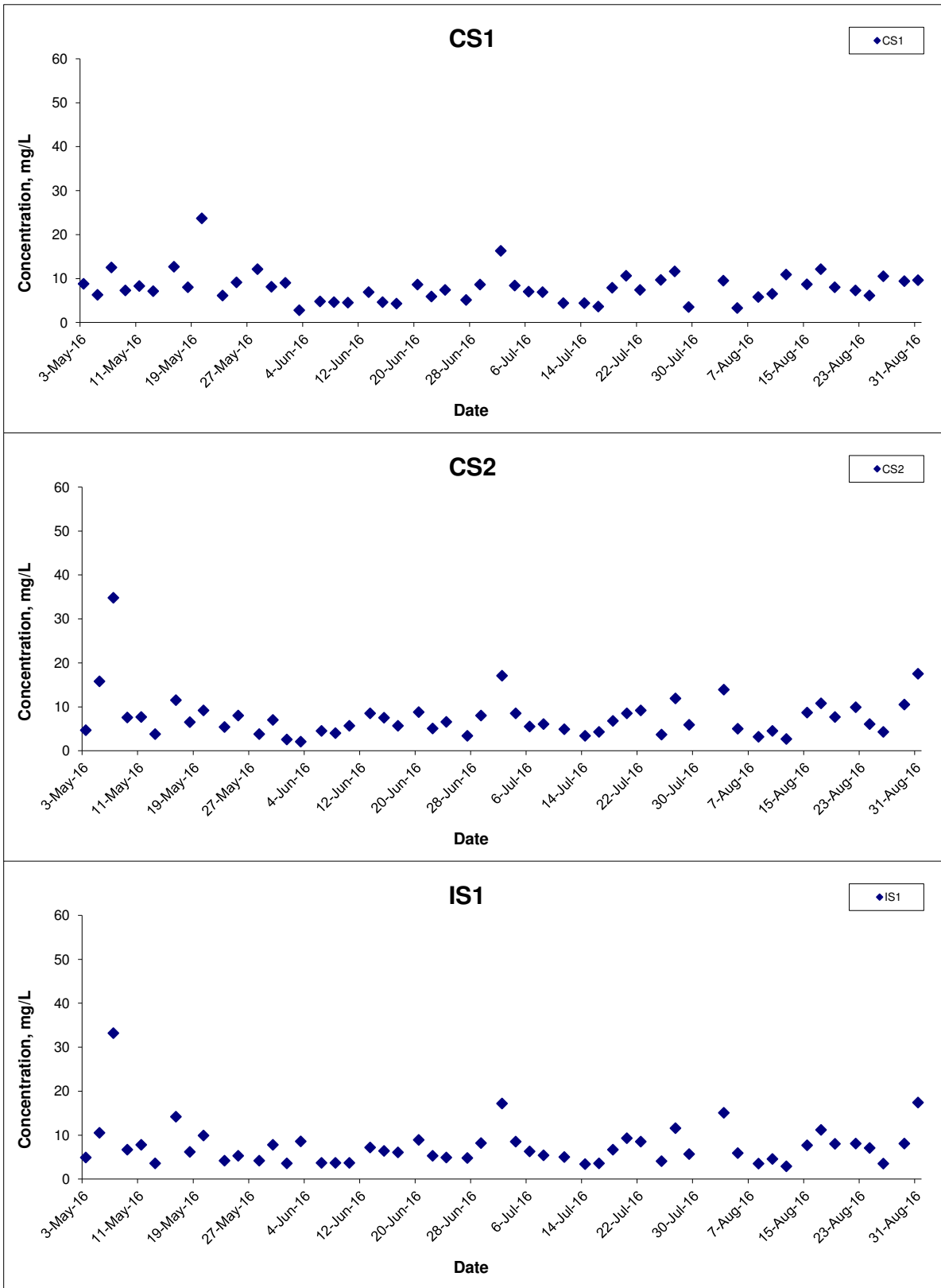
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Suspended Solids (Depth-averaged) at Mid-Ebb Tide



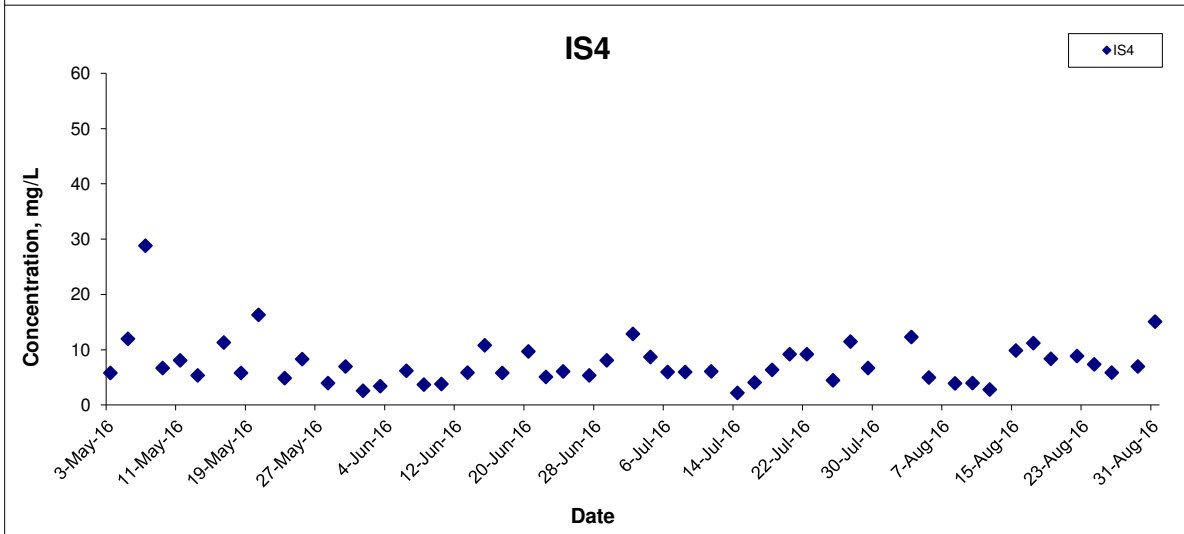
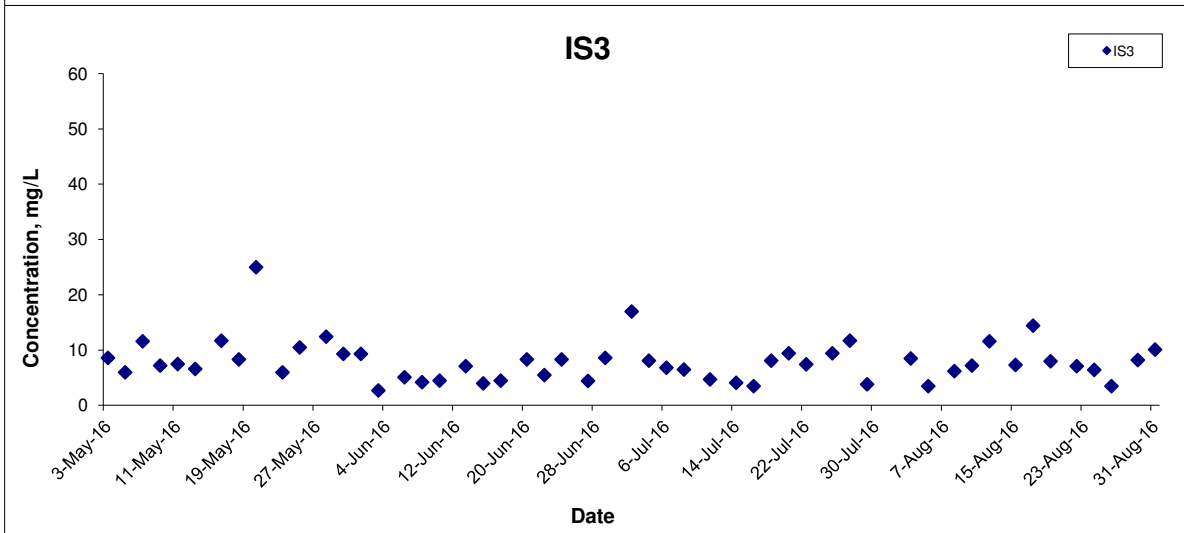
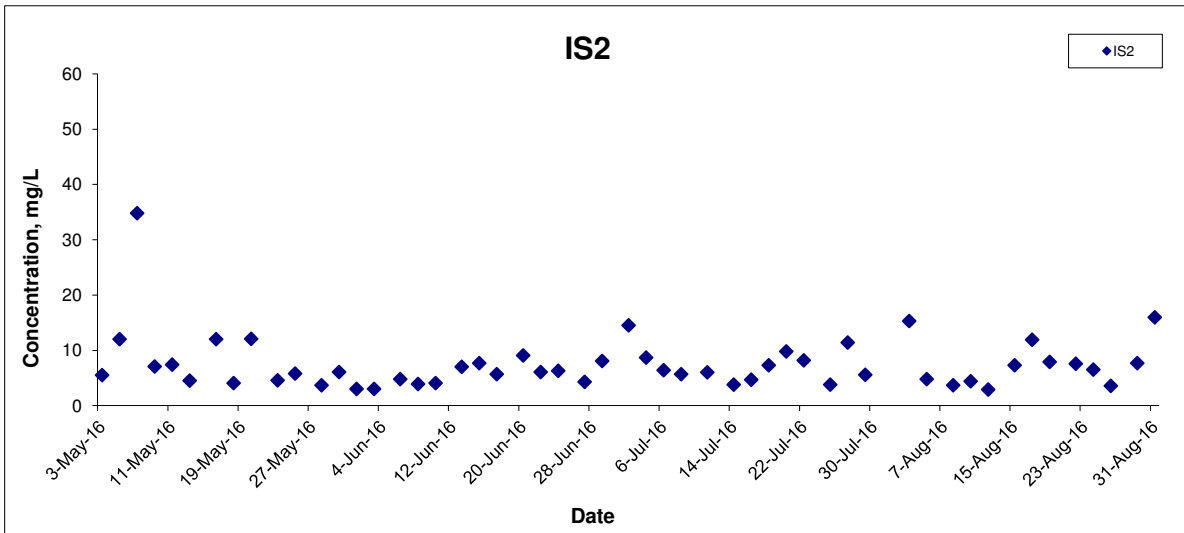
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Suspended Solids (Depth-averaged) at Mid-Flood Tide



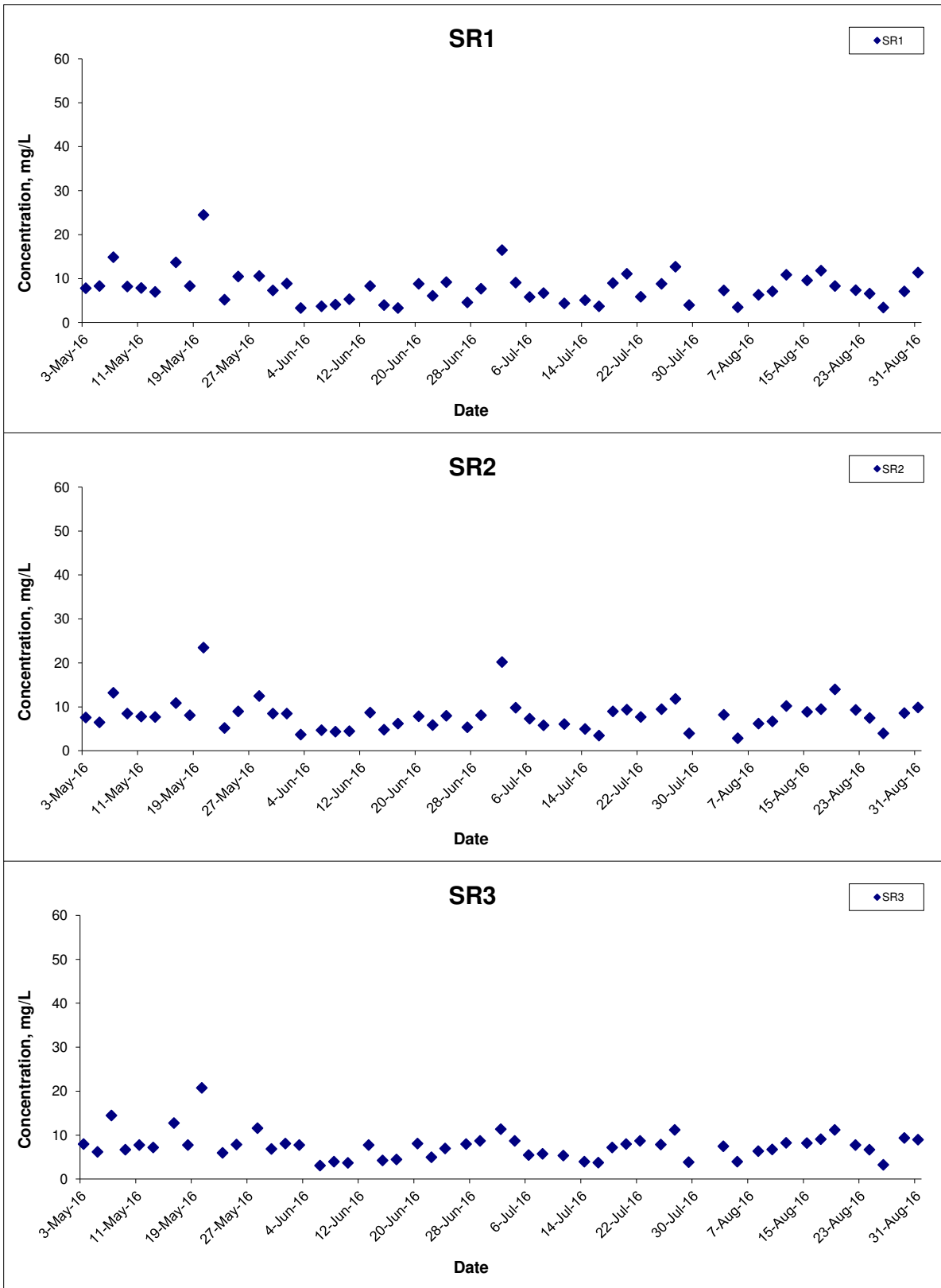
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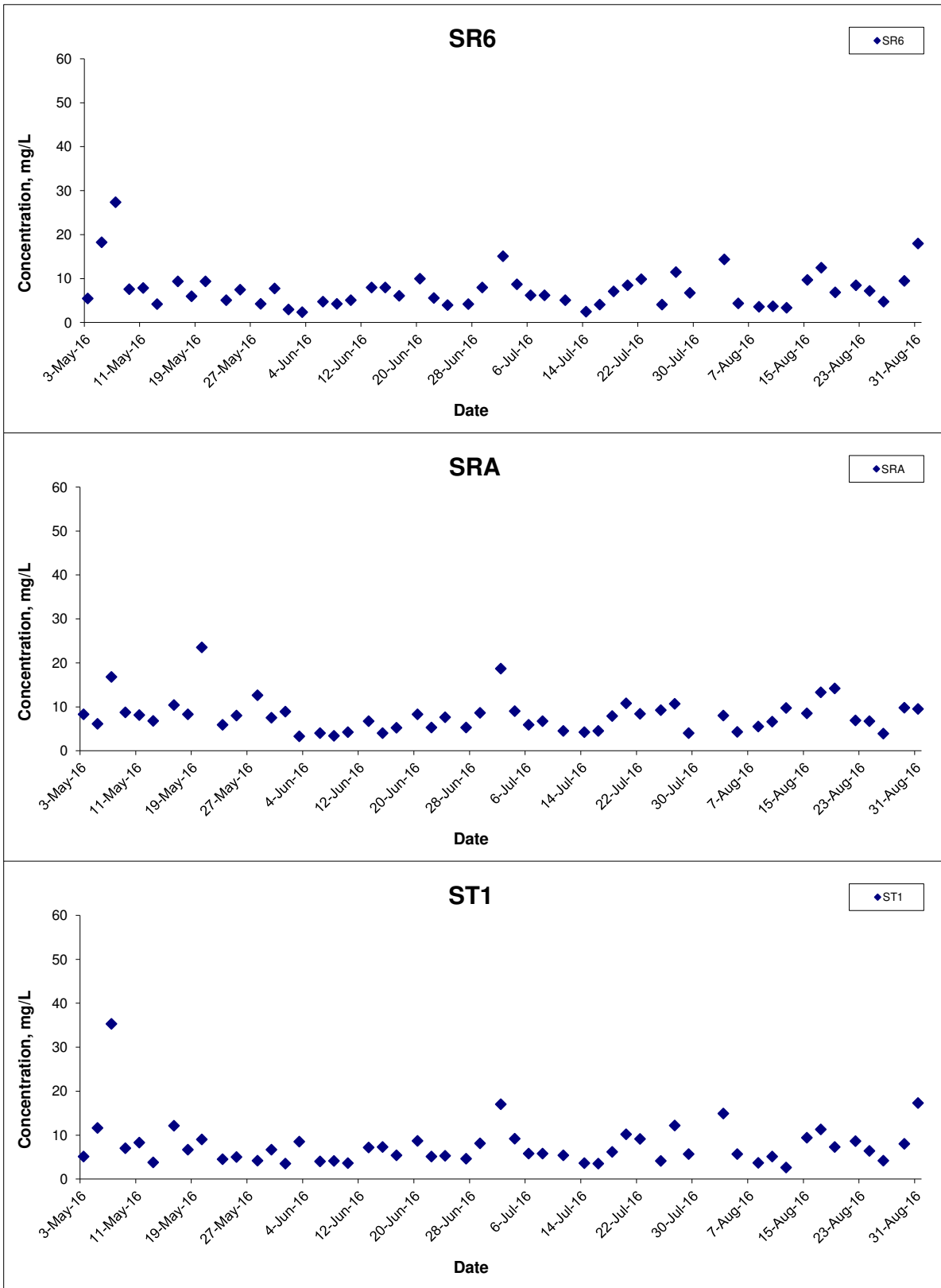
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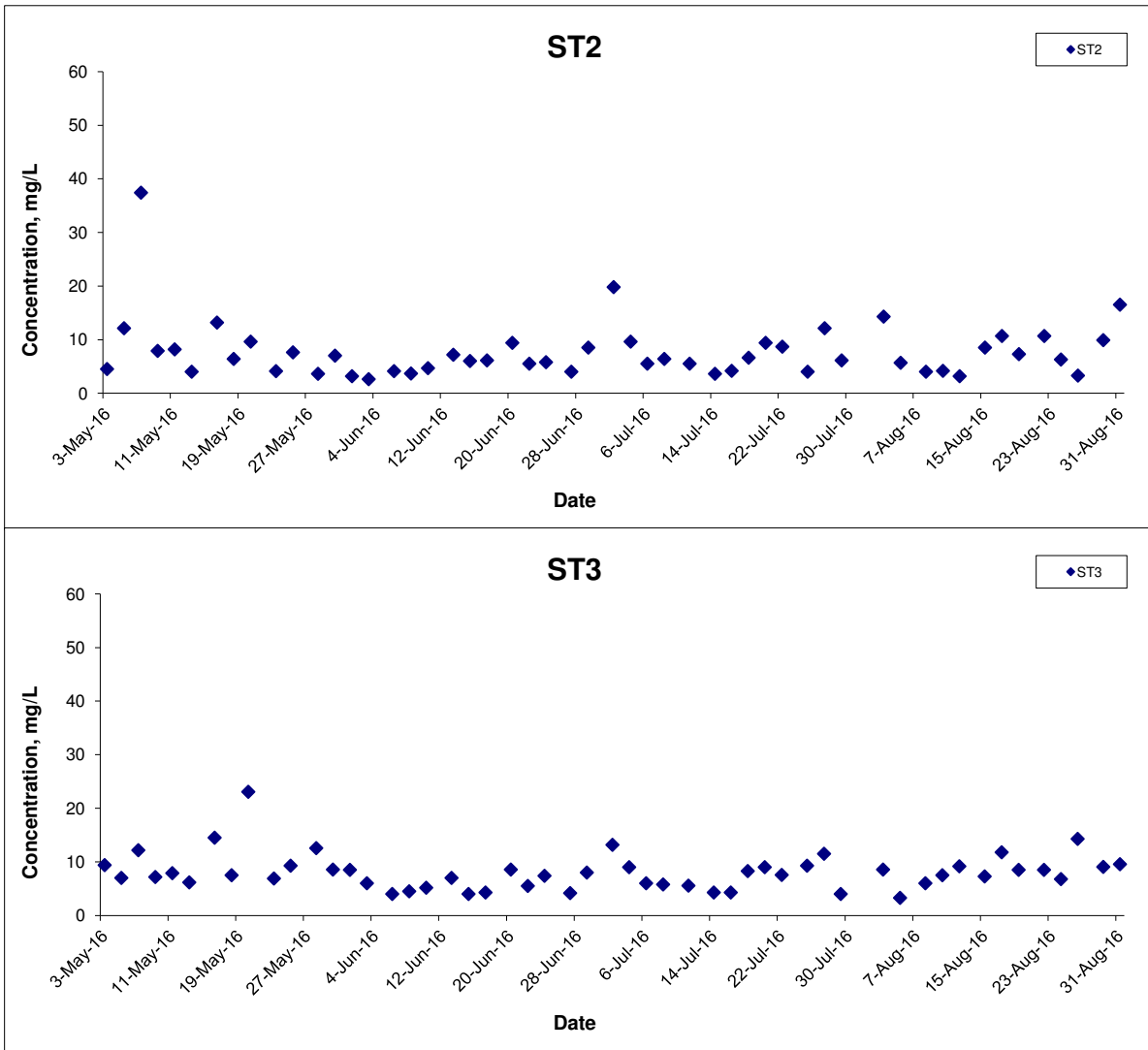
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**APPENDIX F
DOLPHIN MONITORING REPORT
(LINE TRANSECT)**

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

14th Quarterly Progress Report (June-August 2016)

Submitted by

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

26 September 2016

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 (DCVJV) 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 14th quarterly progress report under the HKLR09 construction

phase dolphin monitoring programme submitted to DCVJV, summarizing the results of the surveys findings during the period of June to August 2016.

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 17 years of marine mammal monitoring surveys in Hong Kong developed by HKCRP (see Hung 2013). 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° and 90° (in relation to the bow, which is defined as 0°). 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 (*Garmin eTrex Legend*).
- 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 (Hung 2013). Therefore, primary and secondary survey effort were both presented as on-effort survey effort in this report.

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. One to two professional digital cameras (*Canon* EOS 7D and/or 60D models), each 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.
- 2.3. *Data analysis*
- 2.3.1. Distribution Analysis – The line-transect survey data was integrated with the Geographic Information System (GIS) in order to visualize and interpret different spatial and temporal patterns of dolphin distribution using sighting positions. Location data of dolphin groups were plotted on map layers of Hong Kong using a desktop GIS (ArcView[®] 3.1) to examine their distribution patterns in details. The dataset was also stratified into different subsets to examine distribution patterns of dolphin groups with different categories of group sizes, young calves and activities.
 - 2.3.2. Encounter rate analysis – Encounter rates of Chinese white dolphins (number of on-effort sightings per 100 km of survey effort, and total number of dolphins sighted on-effort per 100 km of survey effort) were calculated in West Lantau (WL) survey area in relation to the amount of survey effort conducted during each month of monitoring survey. Dolphin encounter rates were calculated in two ways for comparisons with the HZMB baseline monitoring results as well as to AFCD long-term marine mammal monitoring results.

Firstly, for the comparison with the HZMB baseline monitoring results, the encounter rates were calculated using primary survey effort alone, and only data collected under Beaufort 3 or below condition would be used for encounter rate analysis. The average encounter rate of sightings (STG) and average encounter rate of dolphins (ANI) were deduced based on the encounter rates from six events during the present quarter (i.e. six sets of line-transect surveys in West Lantau), which was also compared with the one deduced from the six events during the baseline period (i.e. six sets of line-transect surveys in West Lantau).

Secondly, the encounter rates were calculated using both primary and secondary survey effort collected under Beaufort 3 or below condition as in AFCD long-term monitoring study. The encounter rate of sightings and dolphins were deduced by dividing the total number of on-effort sightings (STG) and total number of dolphins (ANI) by the amount of survey effort for the present quarterly period.

- 2.3.3. Quantitative grid analysis on habitat use – To conduct quantitative grid analysis of habitat use, positions of on-effort sightings of Chinese White Dolphins collected during the quarterly impact phase monitoring period were plotted onto 1-km² grids in WL survey area on GIS. Sighting densities (number of on-effort sightings per km²) and dolphin densities (total number of dolphins from on-effort sightings per km²) were then calculated for each 1 km by 1 km grid with the aid of GIS. Sighting density grids and dolphin density grids were then further normalized with the amount of survey effort conducted within each grid. The total amount of survey effort spent on each grid was calculated by examining the survey coverage on each line-transect survey to determine how many times the grid was surveyed during the study period. For example, when the survey boat traversed through a specific grid 50 times, 50 units of survey effort were counted for that grid. With the amount of survey effort calculated for each grid, the sighting density and dolphin density of each grid were then normalized (i.e. divided by the unit of survey effort).

The newly-derived unit for sighting density was termed SPSE, representing the number of on-effort sightings per 100 units of survey effort. In addition, the derived unit for actual dolphin density was termed DPSE, representing the number of dolphins per 100 units of survey effort. Among the 1-km² grids that were partially covered by land, the percentage of sea area was calculated using GIS tools, and their SPSE and DPSE values were adjusted accordingly. The following formulae were used to estimate SPSE and DPSE in each 1-km² grid within the study area:

$$SPSE = ((S / E) \times 100) / SA\%$$

$$DPSE = ((D / E) \times 100) / SA\%$$

where S = total number of on-effort sightings
D = total number of dolphins from on-effort sightings
E = total number of units of survey effort
SA% = percentage of sea area

- 2.3.4. Behavioural analysis – When dolphins were sighted during vessel surveys, their behaviour was observed. Different activities were categorized (i.e. feeding, milling/resting, traveling, socializing) and recorded on sighting datasheets. This data was then input into a separate database with sighting information, which can be used to determine the distribution of behavioural data with a desktop GIS. Distribution of sightings of dolphins engaged in different activities and behaviours would then be plotted on GIS and carefully examined to identify important areas for different activities of the dolphins.
- 2.3.5. Ranging pattern analysis – Location data of individual dolphins that occurred during the three-month impact phase monitoring period were obtained from the dolphin sighting database and photo-identification catalogue. To deduce home ranges for individual dolphins using the fixed kernel methods, the program Animal Movement Analyst Extension, was loaded as an extension with ArcView[®] 3.1 along with another extension Spatial Analyst 2.0. Using the fixed kernel method, the program calculated kernel density estimates based on all sighting positions, and provided an active interface to display kernel density plots. The kernel estimator then calculated and displayed the overall ranging area at 95% UD level.

3. Monitoring Results

3.1. Summary of survey effort and dolphin sightings

- 3.1.1. During the period of June to August 2016, six sets of systematic line-transect vessel surveys were conducted to cover all transect lines in WL survey area twice per month.
- 3.1.2. From these surveys, a total of 197.77 km of survey effort was collected, with 100.0% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility). The total survey effort conducted on primary lines was 133.78 km, while the effort on secondary lines was 63.99 km. Survey effort conducted on primary and secondary lines were both considered as on-effort survey data. A summary table of the survey effort is shown in Appendix I.

3.1.3. During the six sets of monitoring surveys in June to August 2016, a total of 30 groups of 86 Chinese White Dolphins were sighted. All except three dolphin sightings were made during on-effort search. Nineteen on-effort sightings were made on primary lines, while the other eight on-effort sightings were made on secondary lines. A summary table of the dolphin sightings is shown in Appendix II.

3.2. *Distribution*

3.2.1. Distribution of dolphin sightings made during HKLR09 monitoring surveys during June to August 2016 is shown in Figure 1. The dolphin groups were mainly sighted in the central and southern portions of the survey area, with higher concentration near Kai Kung Shan and Fan Lau (Figure 1). On the contrary, only a few sightings were made just to the north of Tai O Peninsula, while they were completely absent from the waters adjacent to the HKLR09 alignment (Figure 1).

3.2.2. Sighting distribution of dolphins in the present quarter was quite different from the one during the baseline period in September to November 2011. When compared to the baseline period, dolphins occurred much less frequently in the offshore waters and around Tai O Peninsula but more frequently near Fan Lau during the present impact phase period (Figure 1).

3.2.3. None of the 30 dolphin groups was sighted near the HKLR09 alignment in WL survey area during the present quarter (Figure 2). However, when pooling the data from HKLR03 monitoring surveys from the same summer quarter of 2016, two dolphin groups did occur adjacent to the HKLR09 alignment section in NWL survey area in the present quarter (Figure 2).

3.2.4. As in the past monitoring quarters, dolphins have mostly avoided the HKLR09 alignment during the present impact monitoring quarter. Even though disturbance arisen from the HKLR09 construction activities on the dolphins have progressively diminished in recent months since most piling works at sea have been completed, dolphins have not consistently utilized the water in the vicinity of the bridge alignment, which could be related to the potential obstruction from the permanent physical structure of the bridge piers. This should be continuously monitored in the upcoming quarters.

3.2.5. Distribution patterns of dolphin sightings in the past three summer quarters of 2013-15 were also compared with the one in 2016. Dolphins appeared to occur less frequently in the northern portion and the offshore waters of the WL survey area in the summer of 2016 when compared to the previous three summer periods (Figure 3).

3.3. *Encounter rate*

3.3.1. During the present three-month impact phase monitoring period (June to August 2016), the encounter rates of Chinese White Dolphins deduced from the survey effort and on-effort sighting data from the primary transect lines under favourable conditions (Beaufort 3 or below) from West Lantau survey area are shown in Table 2. The average encounter rates deduced from the six sets of surveys from the present quarter were also compared with the ones deduced from the baseline monitoring period (September – November 2011) (Table 3).

Table 2. Dolphin encounter rates (sightings per 100 km of survey effort) during the impact monitoring period (June – August 2016)

Survey Area	Dolphin Monitoring	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 (June 8 th)	8.9	22.3
	Set 2 (June 20 th)	26.9	53.7
	Set 3 (July 6 th)	17.7	57.4
	Set 4 (July 13 th)	13.7	36.5
	Set 5 (August 9 th)	4.6	4.6
	Set 6 (August 16 th)	13.1	34.9

Table 3. Comparison of average dolphin encounter rates from impact monitoring period (June to August 2016) and baseline monitoring period (September to November 2011) (Note: the encounter rates deduced from the baseline monitoring period have been recalculated based only on the survey effort and on-effort sighting data made along the primary transect lines under favourable conditions)

	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)	
	June – August 2016	September- November 2011	June – August 2016	September- November 2011
West Lantau	14.14 ± 7.66	16.43 ± 7.70	34.91 ± 19.69	60.50 ± 38.47

3.3.2. To facilitate the comparison with the AFCD long-term monitoring results, the encounter rates were also calculated for the present quarter using both primary and secondary survey effort. The encounter rates of sightings (STG) and dolphins (ANI) in WL were 13.7 sightings and 35.9 dolphins per 100 km of survey effort respectively during the present quarter.

3.3.3. Notably, the encounter rates of dolphin sightings (ER(STG)) for the present

summer quarter of 2016 remained at a lower level among all quarters, while the encounter rates of dolphins (ER(ANI)) from the present quarter was the lowest since 2013 (Table 4). Such temporal trend should be continuously monitoring to detect any further decline in the future, even though the Action or Limit Level still has not been triggered under the Event and Action Plan for this quarter.

Table 4. Comparison of average dolphin encounter rates in West Lantau survey area from all quarters of impact monitoring period and baseline monitoring period (September-November 2011) (Note: encounter rates deduced from the baseline monitoring period have been recalculated based only on survey effort and on-effort sighting data made along the primary transect lines under favourable conditions; the encounter rates in spring months were highlighted in blue; \pm denotes the standard deviation of the average encounter rates)

	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)	Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort)
September-November 2011 (Baseline)	16.43 \pm 7.70	60.50 \pm 38.47
March-May 2013 (Impact)	16.70 \pm 8.00	58.59 \pm 30.37
June-August 2013 (Impact)	26.89 \pm 12.46	94.75 \pm 57.61
September-November 2013 (Impact)	20.51 \pm 12.34	60.68 \pm 37.60
December 2013-February 2014 (Impact)	18.01 \pm 7.24	60.12 \pm 40.18
March-May 2014 (Impact)	14.40 \pm 10.28	65.23 \pm 46.13
June-August 2014 (Impact)	22.90 \pm 15.88	101.41 \pm 97.90
September-November 2014 (Impact)	10.57 \pm 10.45	36.63 \pm 30.19
December 2014-February 2015 (Impact)	12.84 \pm 7.17	57.36 \pm 37.35
March-May 2015 (Impact)	12.42 \pm 4.42	45.32 \pm 38.14
June-August 2015 (Impact)	12.36 \pm 5.81	61.19 \pm 38.63
September-November 2015 (Impact)	11.71 \pm 4.43	43.30 \pm 21.38
December 2015-February 2016 (Impact)	13.86 \pm 6.78	63.40 \pm 35.77
March-May 2016 (Impact)	9.64 \pm 6.44	49.01 \pm 36.69
June-August 2016 (Impact)	14.14 \pm 7.66	34.91 \pm 19.69

3.3.4. A one-way ANOVA was conducted to examine whether there were any significant differences in the average encounter rates between the baseline and impact monitoring periods. For the comparison between the baseline period and the present quarter (i.e. fourteenth quarter of the impact phase), the p-value for the differences in average dolphin encounter rates of STG and ANI were 0.617 and 0.178 respectively. Therefore, no significant difference in dolphin encounter rate was detected between the baseline period and the present quarter.

3.3.5. Another comparison was made between the baseline period and the cumulative quarters in the impact phase (i.e. first thirteen quarters of the impact phase), and the p-value for the differences in average dolphin encounter rates of STG and ANI were 0.708 and 0.858 respectively. As a result, no significant difference was found in the dolphin encounter rates between the baseline period and the cumulative quarters in the impact phase.

3.4. *Group size*

3.4.1. Group size of Chinese White Dolphins ranged from one to eight individuals per group in WL survey area during June to August 2016. The average dolphin group size for the three-month period was compared with the one deduced from the baseline period in September to November 2011, as shown in Table 5.

Table 5. Comparison of average dolphin group sizes from impact monitoring period (June-August 2016) and baseline monitoring period (September-November 2011)

	Average Dolphin Group Size	
	June – August 2016	September – November 2011
West Lantau	2.87 ± 2.05 (n = 30)	3.63 ± 2.97 (n = 46)

3.4.2. The average dolphin group size in the WL region during the present quarter was lower than the one recorded in the three-month baseline period (Table 5). Among the 30 groups, 22 of them were composed of only 1-3 dolphins, while there were only six groups with five or more animals per group.

3.4.3. Distribution of dolphins with the larger group sizes during June to August 2016 is shown in Figure 4. Most of these groups were scattered in the waters between Tai O Peninsula and Peaked Hill, with slightly higher concentration near Kai Kung Shan (Figure 4).

3.4.4. Distribution of the larger dolphin groups in the present impact phase period was very different from the baseline period, when they were more concentrated to the northwest of Tai O Peninsula as well as near Kai Kung Shan and Peaked Hill (Figure 4).

3.5. *Habitat use*

3.5.1. From June to August 2016, the most heavily utilized habitats by the dolphins with higher densities were primarily found near Tai O Peninsula, Kai Kung Shan and Fan Lau (Figures 5a & 5b). However, it should be cautioned that

the amount of survey effort collected in each grid during the three-month period was fairly low (six units of survey effort for most grids), and therefore the habitat use pattern derived from the three-month dataset should be treated with caution. A more complete picture of dolphin habitat use pattern will be presented when more survey effort for each grid will be collected throughout the impact phase monitoring programme.

3.5.2. When compared with the habitat use pattern recorded during the baseline period in September-November 2011, it appears that the overall dolphin densities were less evenly distributed in the present impact phase monitoring period, and were also lower in certain areas such as the waters just to the south of the HKLR09 alignment, and between Tai O Peninsula and Kai Kung Shan (Figure 6).

3.6. *Mother-calf pairs*

3.6.1. During the three-month impact phase monitoring period, only one young calf (an unspotted juvenile) was sighted in WL survey area. This young calf comprised 1.2% of all animals sighted, which was much lower than the percentage recorded during the baseline monitoring period (6.6%).

3.6.2. The rare occurrence of this mother-calf pair was sighted to the southwest of Tai O Peninsula during the quarterly period, which was very different from the baseline period when calf occurrence was more frequent and concentrated near Tai O Peninsula at the northern portion of WL waters (Figure 7).

3.7. *Activities and associations with fishing boats*

3.7.1. During the three-month impact monitoring period, two dolphin groups were engaged in feeding activities near Kai Kung Shan and Peaked Hill (Figure 8), comprising 6.7% of the total number of dolphin sightings. This percentage was much lower the percentage recorded during the baseline period (13.0%).

3.7.2. On the other hand, two dolphin groups were engaged in socializing and traveling activities respectively near Kai Kung Shan during the present quarter (Figure 8).

3.7.3. Distribution of different activities during the present impact phase monitoring period was quite different from the one during the baseline period, when the main concentration of the feeding and socializing activities occurred at the central portion of the survey area between Tai O Peninsula and Peaked Hill (Figure 8).

3.7.4. During the three-month monitoring period, none of the 30 dolphin groups was

associated with any operating fishing vessel.

3.8. *Summary of photo-identification works*

3.8.1. From June to August 2016, over 2,000 digital photographs of Chinese White Dolphins were taken during the impact phase monitoring surveys for the photo-identification work.

3.8.2. In total, 26 individuals sighted 30 times altogether were identified (see the summary table in Appendix III and photographs of identified individuals in Appendix IV). All identified individuals were sighted only once or twice during the three-month period.

3.8.3. Notably, only three of these 26 individuals (NL104, NL136 and NL302) were also sighted in North Lantau waters during the HKLR03 monitoring surveys in the same three-month period, showing a low level of individual movements across the HKLR09 bridge alignment. Notably, four other individuals (NL120, WL46, WL61 and WL216) sighted during the HKLR09 monitoring surveys in the present quarter were also found in SWL waters.

3.8.4. As in previous quarters, many individuals that were consistently sighted in North Lantau waters in the past were identified in West Lantau waters (e.g. NL37, NL104, NL120, NL123, NL136, NL261, etc.). It is likely that some of these identified dolphins have either shifted or expanded their range use into West Lantau due to the increased disturbance of HZMB-related construction works in North Lantau region, as documented in Hung (2015, 2016).

3.9. *Individual range use*

3.9.1. Ranging patterns of the 26 individuals identified during the three-month study period were determined by fixed kernel method, as shown in Appendix V.

3.9.2. Notably, a number of individual dolphins (e.g. NL120, NL123, NL287) that primarily centered their range use in North Lantau in the past were found extending their ranges to West Lantau waters (especially to the south of the HKLR09 alignment), further shifting or expanding their range use away from North Lantau waters (Appendix V).

3.9.3. On the contrary, the majority of these individuals that primarily centered their range use in West Lantau were still sighted within their normal ranges during the present quarterly period, with some extending their range use into Southwest Lantau waters (Appendix V).

4. Conclusion

- 4.1. During the present quarter of dolphin monitoring, no adverse impact from the activities of the HKLR09 construction project on Chinese White Dolphins was noticeable from general observations.
- 4.2. Nevertheless, the dolphin usage in WL region should be continuously monitored, to further examine whether it has been significantly affected by the on-going construction activities in relation to the HZMB works.

5. References

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Hung, S. K. 2015. Monitoring of marine mammals in Hong Kong waters – data collection: final report (2014-15). An unpublished report submitted to the Agriculture, Fisheries and Conservation Department of Hong Kong SAR Government, 198 pp.

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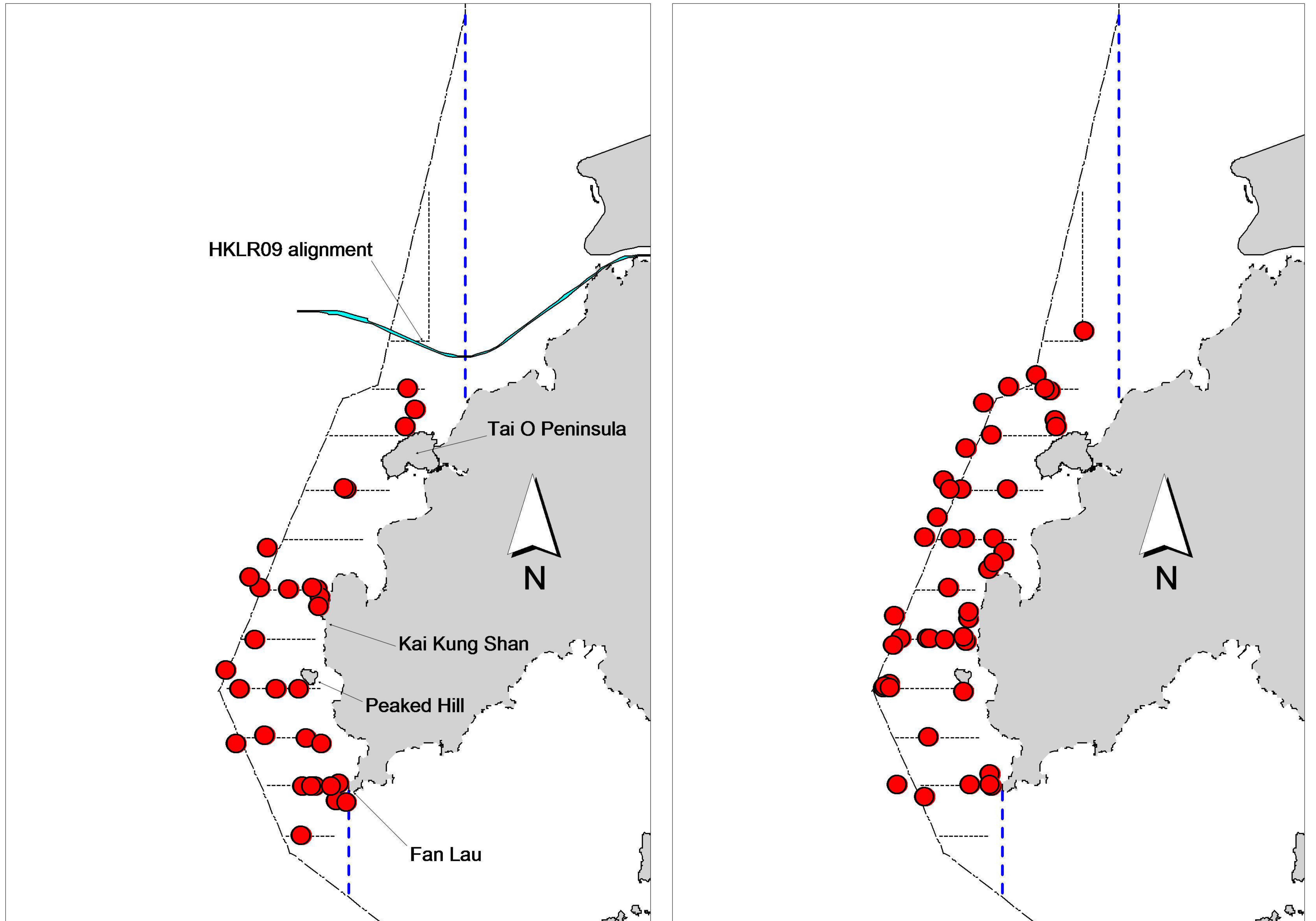


Figure 1. Distribution of Chinese white dolphin sightings in West Lantau during HKLR09 impact phase (left: June – August 2016) and baseline monitoring surveys (right: September – November 2011)

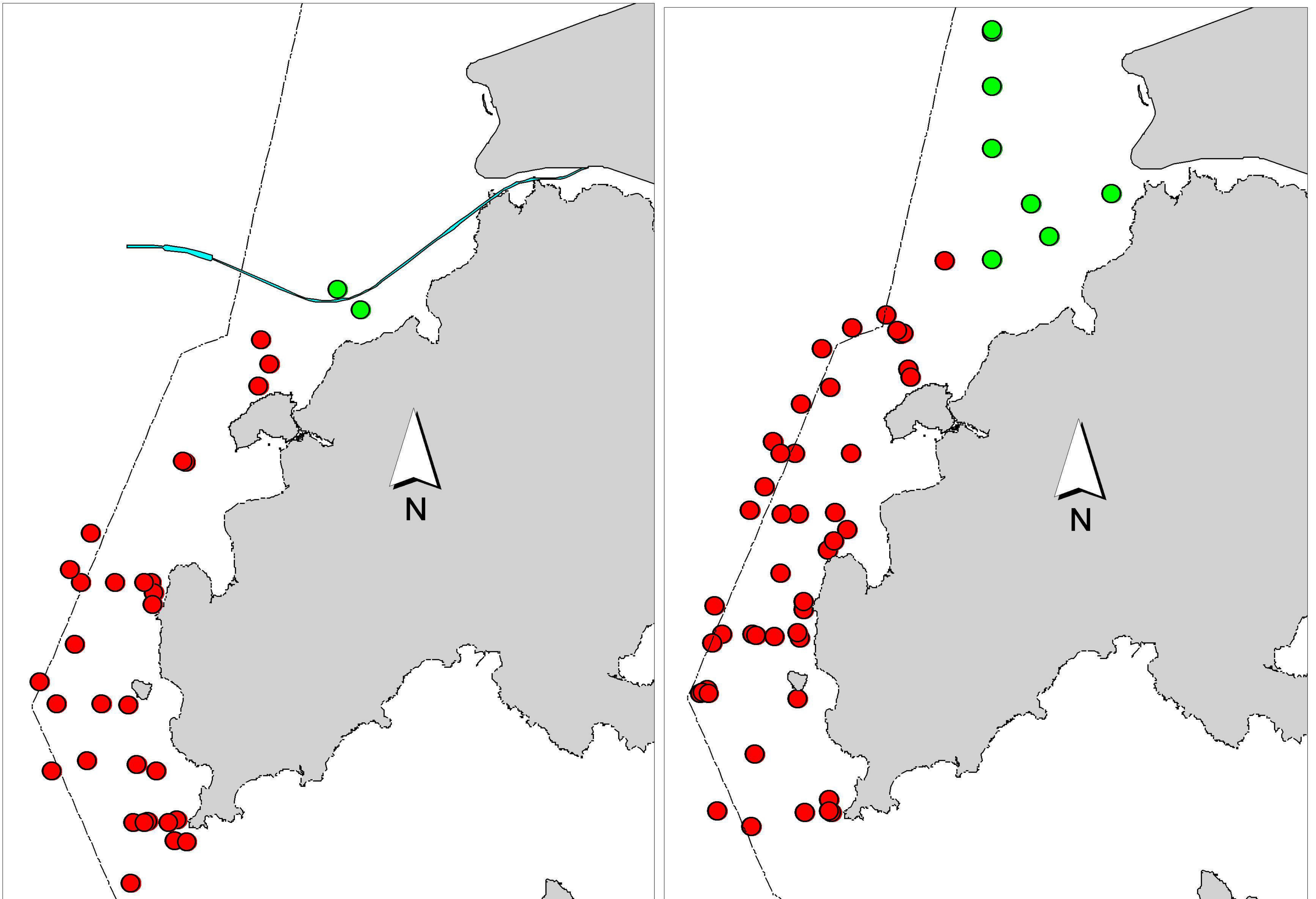


Figure 2. Distribution of Chinese white dolphin sightings from HKLR03 (in green) and HKLR09 surveys (in red) near the HKLR09 alignment during impact phase (left: June – August 2016) and baseline monitoring surveys (right: September – November 2011)

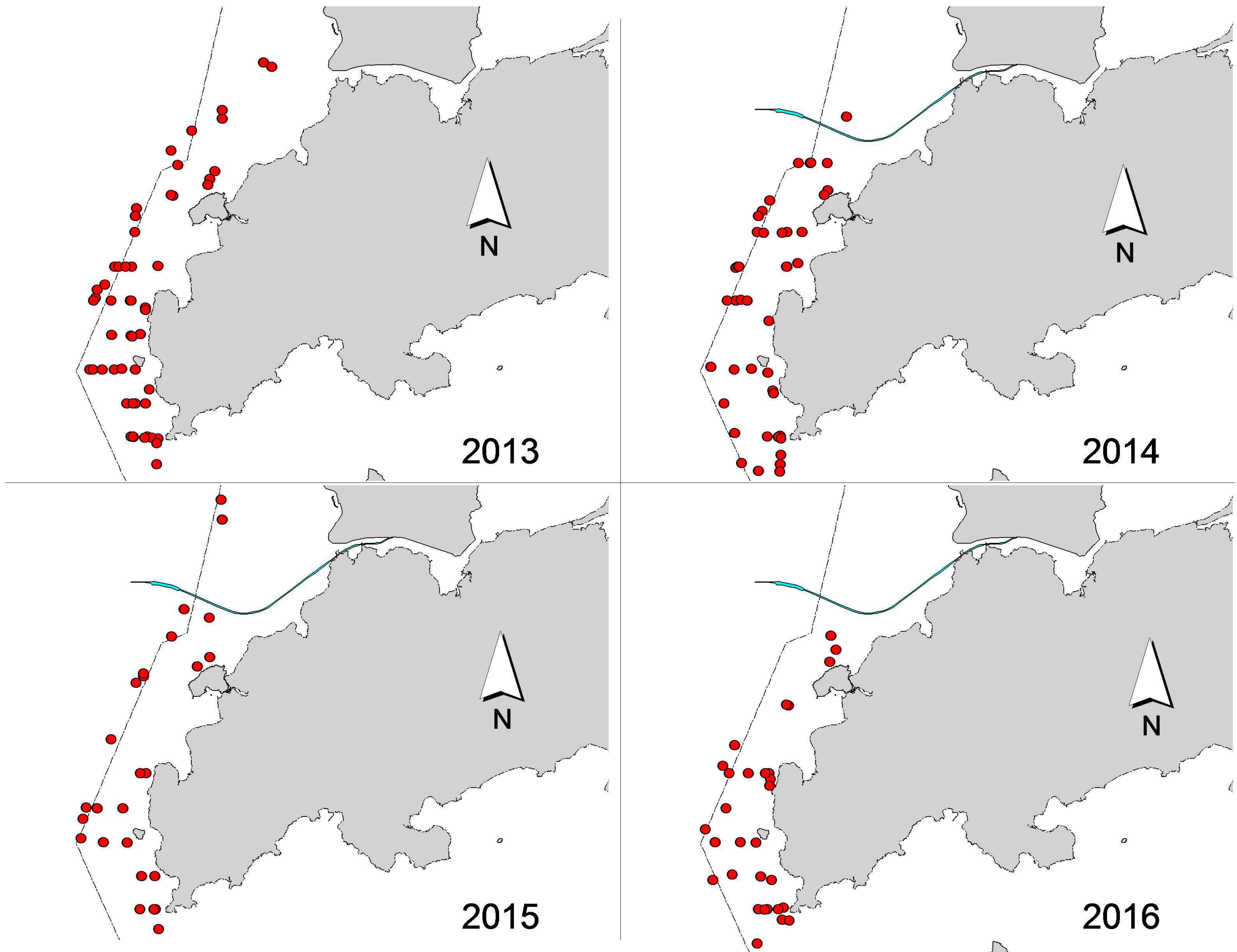


Figure 3. Comparisons on distribution of Chinese white dolphin sightings in West Lantau in the summer months (June – August) of 2013, 2014, 2015 and 2016 during HKLR09 impact phase

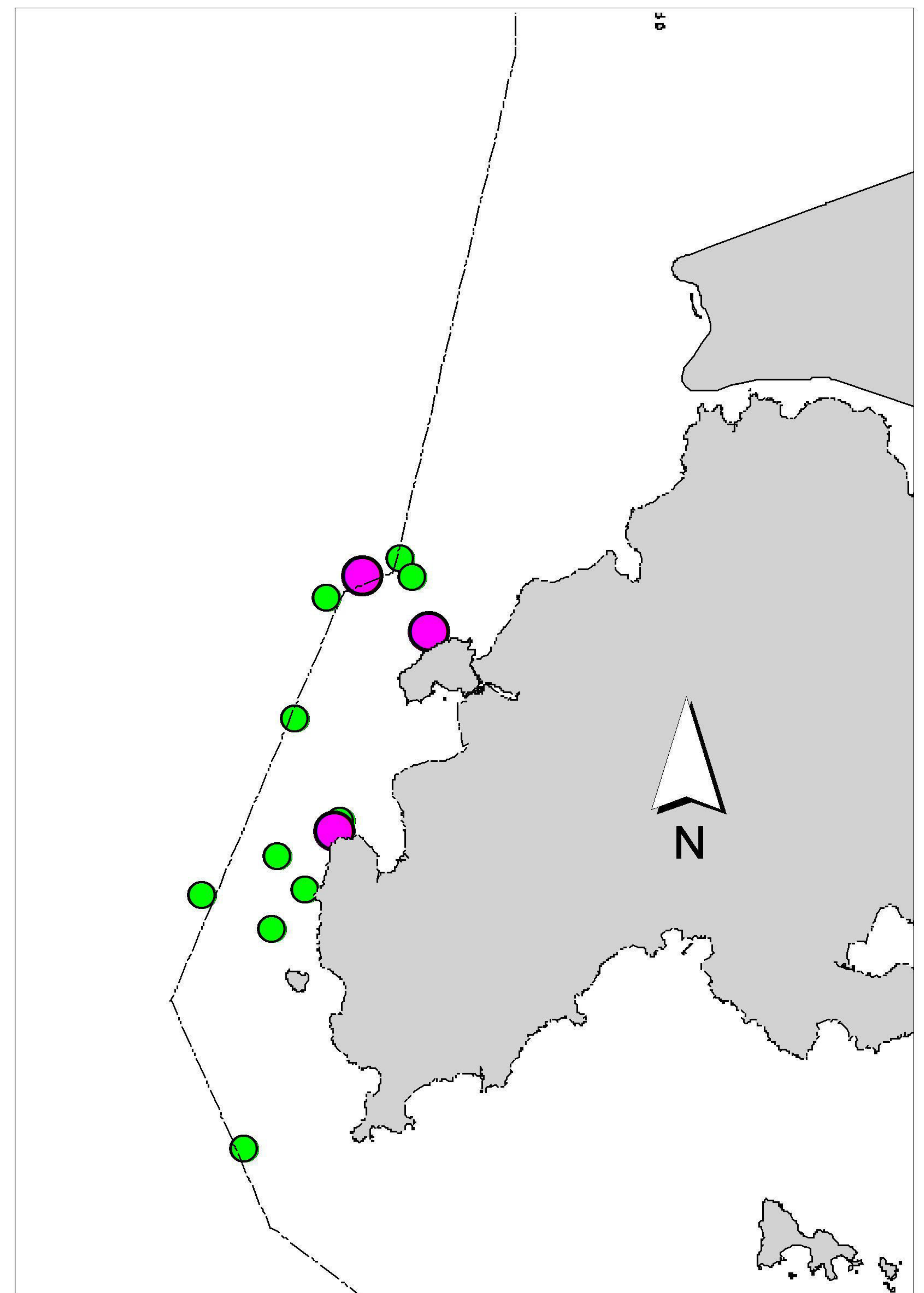
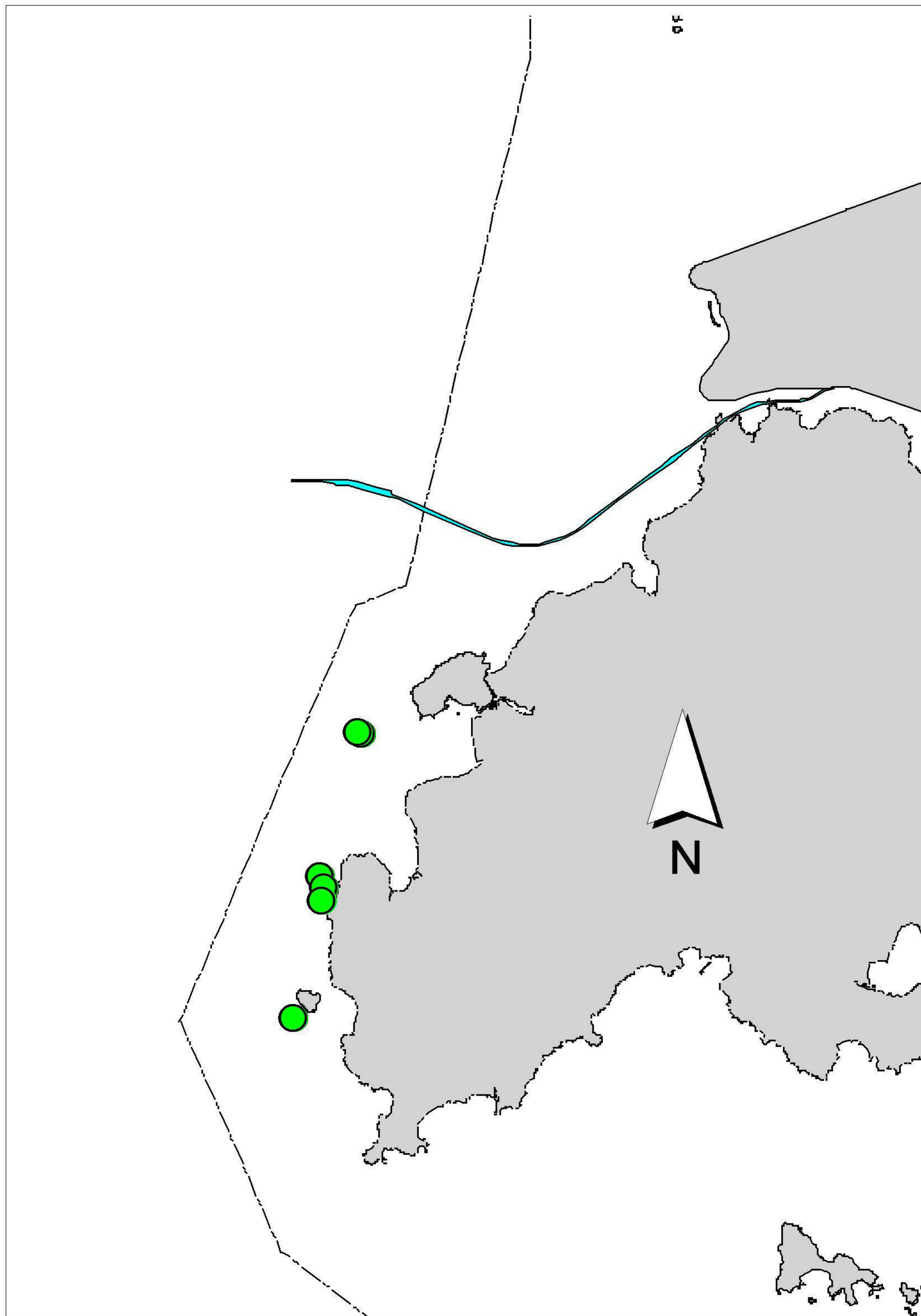


Figure 4. Distribution of Chinese white dolphins with larger group sizes during HKLR09 impact phase (left: June – August 2016) and baseline monitoring surveys (right: September – November 2011) (green dots: group sizes of 5 or more; purple dots: group sizes of 10 or more)

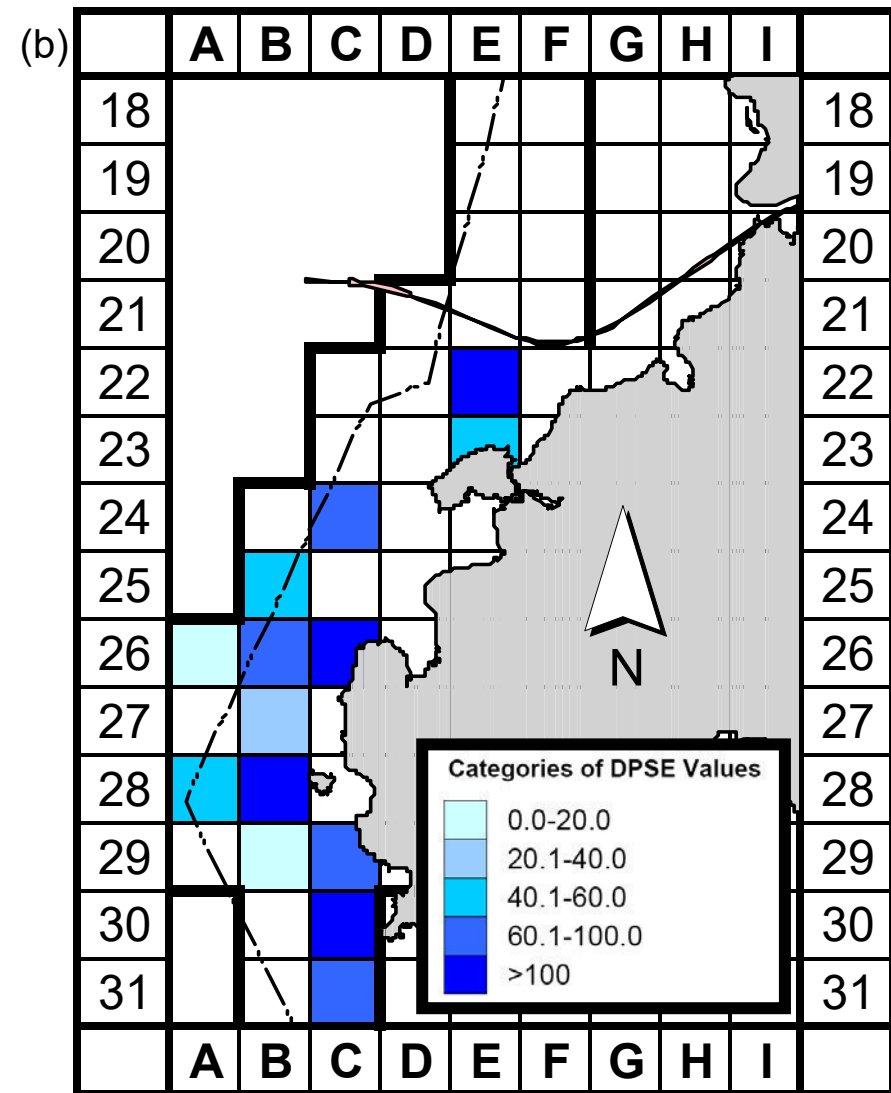
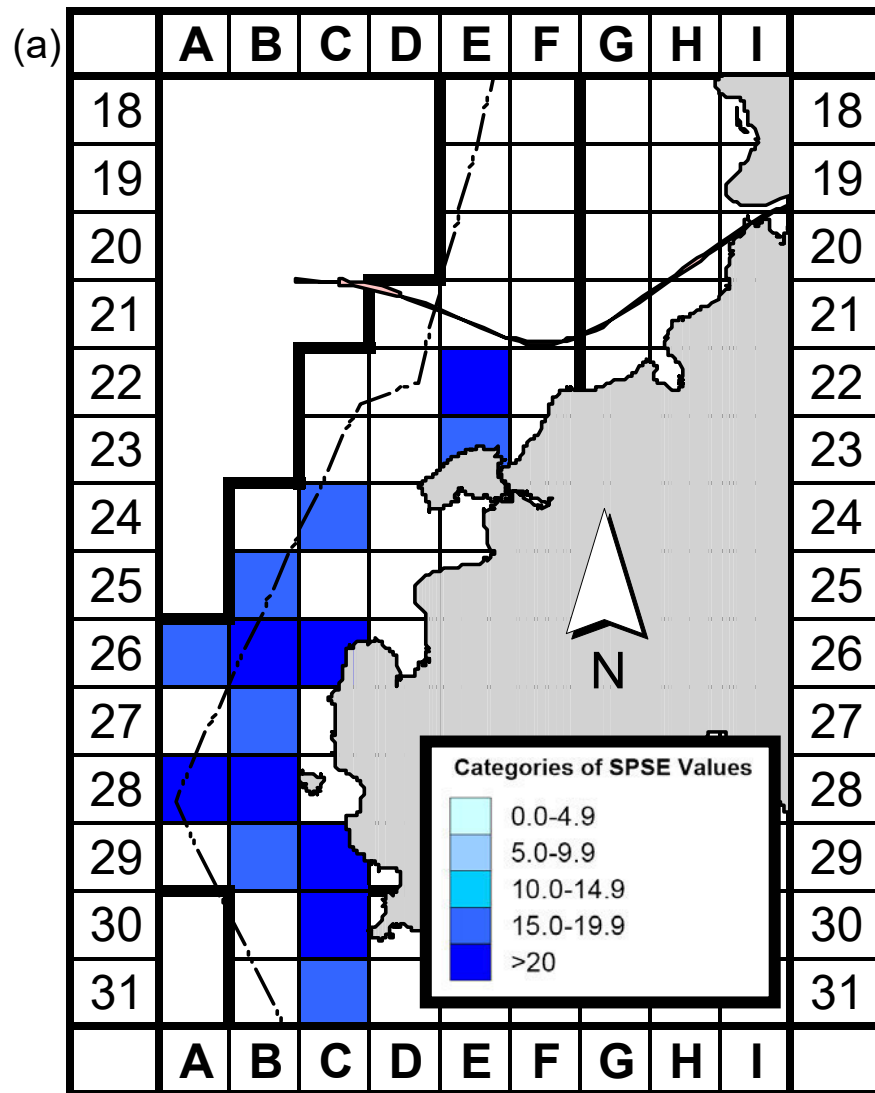


Figure 5a. Sighting density of Chinese white dolphins with corrected survey effort per km² in West Lantau survey area, using data collected during HKLR09 impact monitoring period (June-August 16) (SPSE = no. of on-effort sightings per 100 units of survey effort)

Figure 5b. Density of Chinese white dolphins with corrected survey effort per km² in West Lantau survey area, using data collected during HKLR09 impact monitoring period (June-August 16) (DPSE = no. of dolphins per 100 units of survey effort)

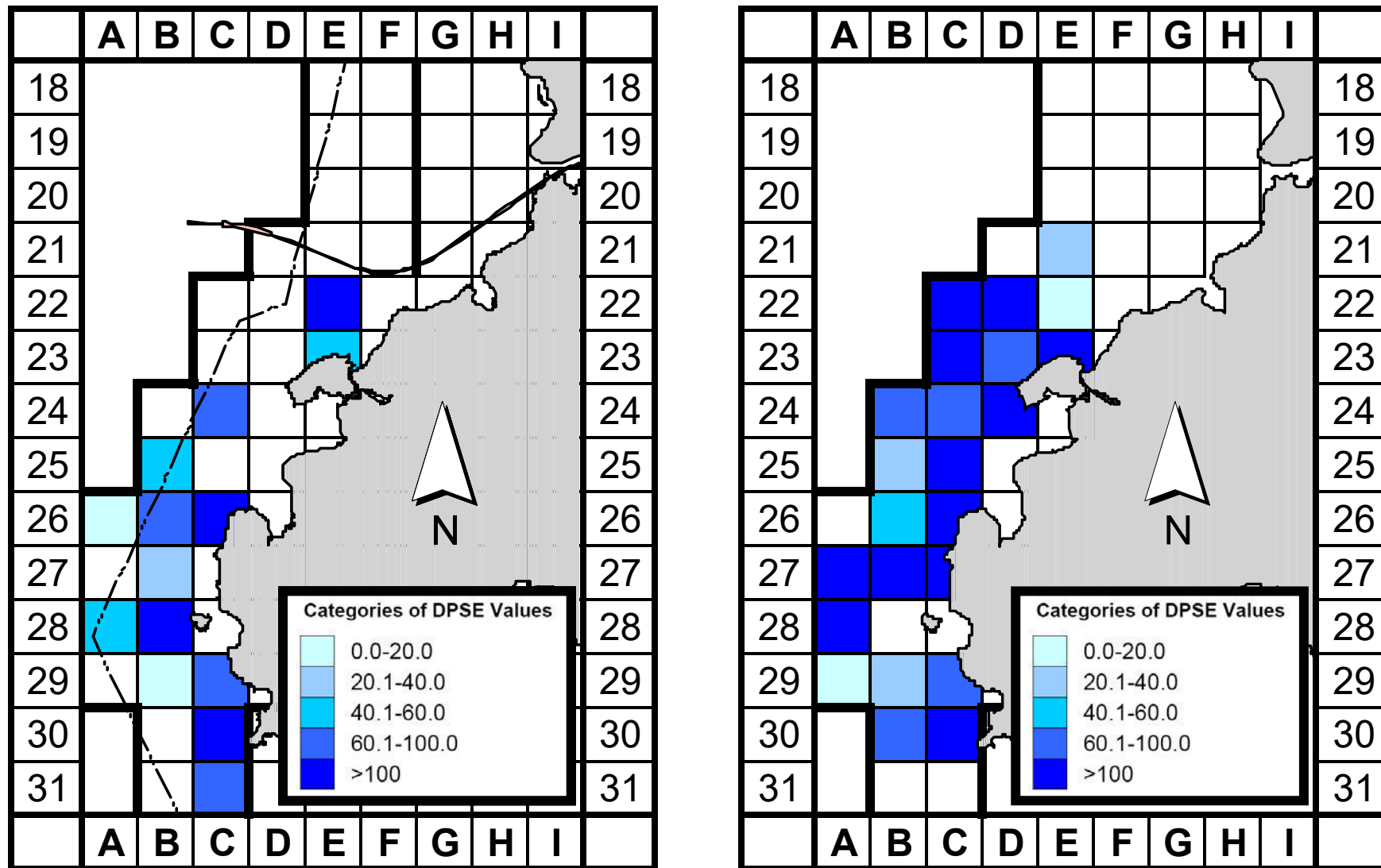


Figure 6. Comparison of density of Chinese white dolphins with corrected survey effort per km² in West Lantau survey area between the impact monitoring period (June-August 2016; left) and baseline monitoring period (September-November 2011; right) (DPSE = no. of dolphins per 100 units of survey effort)

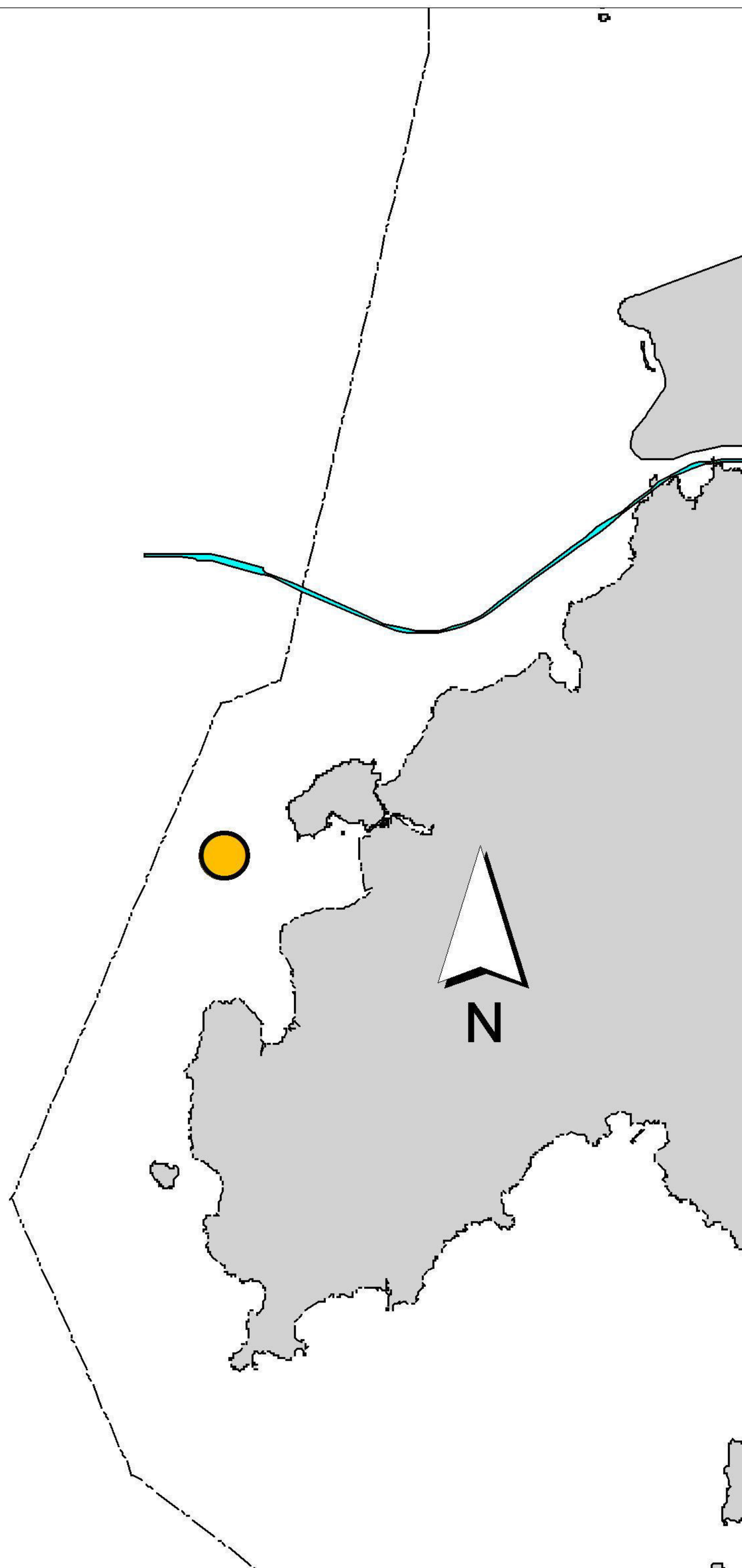


Figure 7. Distribution of young calves of Chinese white dolphins during HKLR09 impact phase (left: June – August 2016) and baseline monitoring surveys (right: September – November 2011)

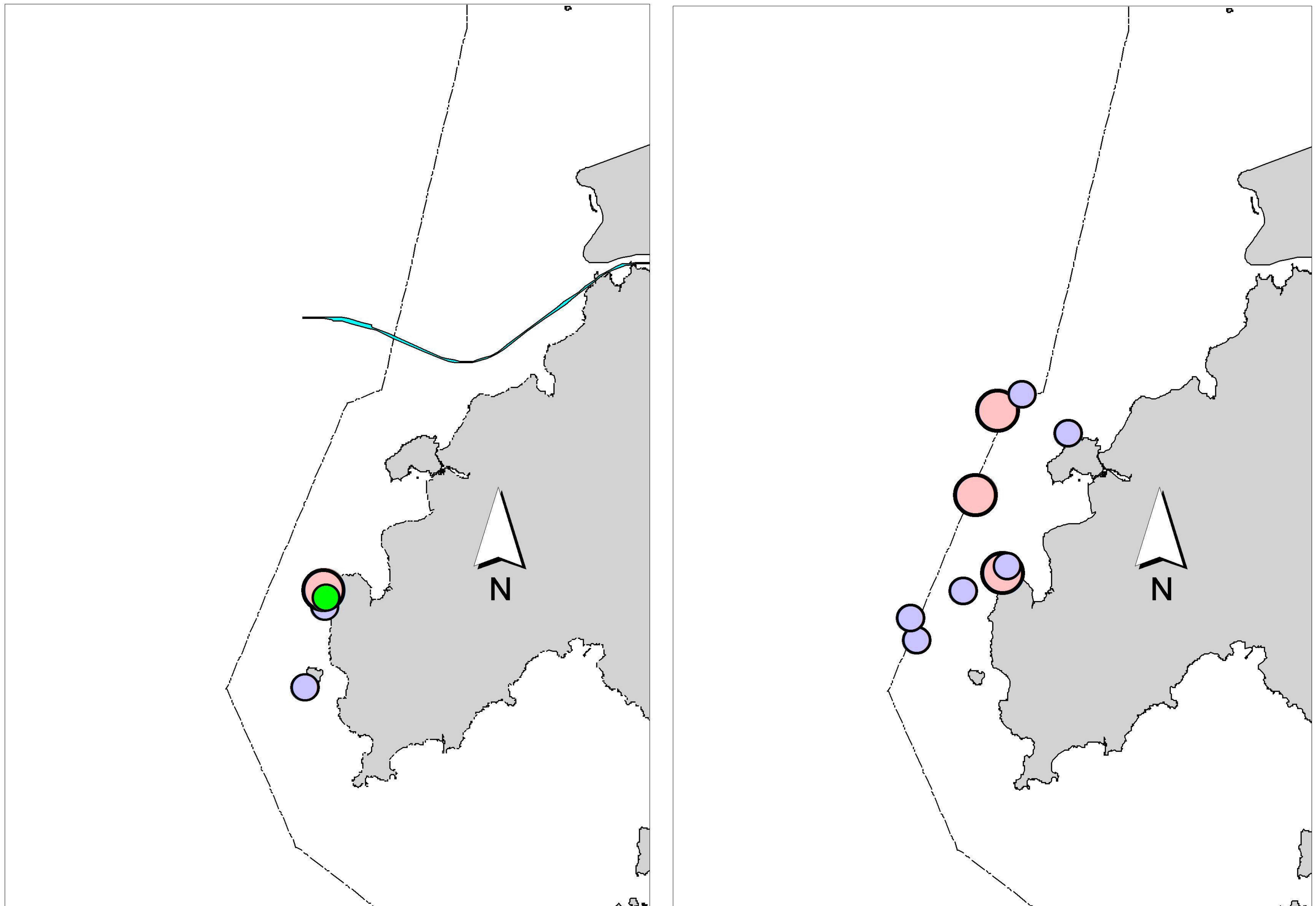


Figure 8. Distribution of dolphins engaged in feeding (in purple), socializing (in pink) and traveling (in green) activities during HKLR09 impact phase (left: June – August 2016) and baseline monitoring surveys (right: September – November 2011)

Appendix I. HKLR09 Survey Effort Database (June-August 2016)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
8-Jun-16	W LANTAU	2	11.86	SUMMER	STANDARD31516	HKLR	P
8-Jun-16	W LANTAU	3	10.60	SUMMER	STANDARD31516	HKLR	P
8-Jun-16	W LANTAU	2	6.28	SUMMER	STANDARD31516	HKLR	S
8-Jun-16	W LANTAU	3	4.69	SUMMER	STANDARD31516	HKLR	S
20-Jun-16	W LANTAU	2	8.28	SUMMER	STANDARD31516	HKLR	P
20-Jun-16	W LANTAU	3	14.05	SUMMER	STANDARD31516	HKLR	P
20-Jun-16	W LANTAU	2	4.07	SUMMER	STANDARD31516	HKLR	S
20-Jun-16	W LANTAU	3	6.62	SUMMER	STANDARD31516	HKLR	S
6-Jul-16	W LANTAU	1	3.59	SUMMER	STANDARD31516	HKLR	P
6-Jul-16	W LANTAU	2	11.87	SUMMER	STANDARD31516	HKLR	P
6-Jul-16	W LANTAU	3	7.20	SUMMER	STANDARD31516	HKLR	P
6-Jul-16	W LANTAU	2	9.06	SUMMER	STANDARD31516	HKLR	S
6-Jul-16	W LANTAU	3	2.07	SUMMER	STANDARD31516	HKLR	S
13-Jul-16	W LANTAU	2	21.36	SUMMER	STANDARD31516	HKLR	P
13-Jul-16	W LANTAU	3	0.55	SUMMER	STANDARD31516	HKLR	P
13-Jul-16	W LANTAU	1	0.60	SUMMER	STANDARD31516	HKLR	S
13-Jul-16	W LANTAU	2	9.93	SUMMER	STANDARD31516	HKLR	S
13-Jul-16	W LANTAU	3	0.19	SUMMER	STANDARD31516	HKLR	S
9-Aug-16	W LANTAU	1	3.12	SUMMER	STANDARD31516	HKLR	P
9-Aug-16	W LANTAU	2	17.31	SUMMER	STANDARD31516	HKLR	P
9-Aug-16	W LANTAU	3	1.10	SUMMER	STANDARD31516	HKLR	P
9-Aug-16	W LANTAU	1	1.09	SUMMER	STANDARD31516	HKLR	S
9-Aug-16	W LANTAU	2	9.52	SUMMER	STANDARD31516	HKLR	S
16-Aug-16	W LANTAU	1	0.62	SUMMER	STANDARD36826	HKLR	P
16-Aug-16	W LANTAU	2	20.78	SUMMER	STANDARD36826	HKLR	P
16-Aug-16	W LANTAU	3	1.49	SUMMER	STANDARD36826	HKLR	P
16-Aug-16	W LANTAU	1	1.35	SUMMER	STANDARD36826	HKLR	S
16-Aug-16	W LANTAU	2	7.20	SUMMER	STANDARD36826	HKLR	S
16-Aug-16	W LANTAU	3	1.32	SUMMER	STANDARD36826	HKLR	S

Appendix II. HKLR09 Chinese White Dolphin Sighting Database (June-August 2016)

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

DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	TYPE	NORTHING	EASTING	SEASON	BOAT ASSOC.	P/S
8-Jun-16	1	1149	4	W LANTAU	2	67	ON	HKLR	805445	801000	SUMMER	NONE	P
8-Jun-16	2	1208	3	W LANTAU	2	151	ON	HKLR	806152	801775	SUMMER	NONE	S
8-Jun-16	3	1248	1	W LANTAU	3	86	ON	HKLR	808426	799698	SUMMER	NONE	P
20-Jun-16	1	1043	4	W LANTAU	2	642	ON	HKLR	814498	803299	SUMMER	NONE	P
20-Jun-16	2	1107	3	W LANTAU	2	280	ON	HKLR	813734	803256	SUMMER	NONE	S
20-Jun-16	3	1150	1	W LANTAU	3	51	ON	HKLR	810463	800125	SUMMER	NONE	P
20-Jun-16	4	1211	2	W LANTAU	3	44	ON	HKLR	809422	800020	SUMMER	NONE	P
20-Jun-16	5	1239	3	W LANTAU	2	208	ON	HKLR	807415	801118	SUMMER	NONE	P
20-Jun-16	6	1256	1	W LANTAU	3	ND	OFF	HKLR	807319	799612	SUMMER	NONE	
20-Jun-16	7	1303	1	W LANTAU	3	178	ON	HKLR	806452	801044	SUMMER	NONE	P
20-Jun-16	8	1314	1	W LANTAU	3	42	ON	HKLR	806495	801828	SUMMER	NONE	P
6-Jul-16	1	1140	3	W LANTAU	3	539	ON	HKLR	810451	800733	SUMMER	NONE	P
6-Jul-16	2	1204	6	W LANTAU	3	6	ON	HKLR	810449	801362	SUMMER	NONE	P
6-Jul-16	3	1241	2	W LANTAU	2	312	ON	HKLR	808804	799389	SUMMER	NONE	S
6-Jul-16	4	1314	1	W LANTAU	2	602	ON	HKLR	808425	800481	SUMMER	NONE	P
6-Jul-16	5	1353	3	W LANTAU	2	107	ON	HKLR	806463	801312	SUMMER	NONE	P
13-Jul-16	1	1146	6	W LANTAU	2	ND	OFF	HKLR	810283	801413	SUMMER	NONE	
13-Jul-16	2	1208	7	W LANTAU	2	26	ON	HKLR	810095	801382	SUMMER	NONE	S
13-Jul-16	3	1242	6	W LANTAU	2	70	ON	HKLR	808412	800966	SUMMER	NONE	P
13-Jul-16	4	1313	1	W LANTAU	2	75	ON	HKLR	806441	801240	SUMMER	NONE	P
13-Jul-16	5	1319	1	W LANTAU	2	82	ON	HKLR	806451	801662	SUMMER	NONE	P
9-Aug-16	1	1048	3	W LANTAU	2	288	ON	HKLR	814088	803463	SUMMER	NONE	S
9-Aug-16	2	1114	8	W LANTAU	2	ND	OFF	HKLR	812452	801975	SUMMER	NONE	
9-Aug-16	3	1141	3	W LANTAU	2	183	ON	HKLR	811282	800292	SUMMER	NONE	S
9-Aug-16	4	1152	1	W LANTAU	2	212	ON	HKLR	810674	799919	SUMMER	NONE	S
9-Aug-16	5	1204	1	W LANTAU	2	233	ON	HKLR	810460	801249	SUMMER	NONE	P
16-Aug-16	1	1101	5	W LANTAU	3	232	ON	HKLR	812474	801923	SUMMER	NONE	P
16-Aug-16	2	1224	2	W LANTAU	2	308	ON	HKLR	807315	801448	SUMMER	NONE	P
16-Aug-16	3	1237	1	W LANTAU	2	454	ON	HKLR	807473	800221	SUMMER	NONE	P
16-Aug-16	4	1257	2	W LANTAU	2	33	ON	HKLR	806118	801992	SUMMER	NONE	S

Appendix III. Individual dolphins identified during HKLR09 monitoring surveys in June-August 2016

ID#	DATE	STG#	AREA
CH113	16/08/16	4	W LANTAU
NL37	09/08/16	2	W LANTAU
NL104	13/07/16	3	W LANTAU
NL120	13/07/16	2	W LANTAU
NL123	16/08/16	2	W LANTAU
NL136	13/07/16	2	W LANTAU
NL210	06/07/16	2	W LANTAU
NL247	20/06/16	1	W LANTAU
NL249	13/07/16	2	W LANTAU
NL261	20/06/16	1	W LANTAU
NL287	06/07/16	2	W LANTAU
	13/07/16	3	W LANTAU
NL295	09/08/16	2	W LANTAU
NL296	13/07/16	2	W LANTAU
NL302	16/08/16	1	W LANTAU
NL316	13/07/16	1	W LANTAU
NL321	13/07/16	3	W LANTAU
WL17	13/07/16	3	W LANTAU
WL46	09/08/16	2	W LANTAU
WL61	08/06/16	2	W LANTAU
WL79	06/07/16	1	W LANTAU
	09/08/16	1	W LANTAU

ID#	DATE	STG#	AREA
WL118	13/07/16	2	W LANTAU
WL124	06/07/16	2	W LANTAU
	16/08/16	1	W LANTAU
WL193	06/07/16	2	W LANTAU
WL216	09/08/16	1	W LANTAU
WL245	20/06/16	1	W LANTAU
	13/07/16	1	W LANTAU
WL246	20/06/16	8	W LANTAU

Appendix IV. Twenty-six individual dolphins that were identified during June to August 2016 under HKLR09 impact phase monitoring surveys

CH113



NL37



NL104



NL120



Appendix IV. (cont'd)

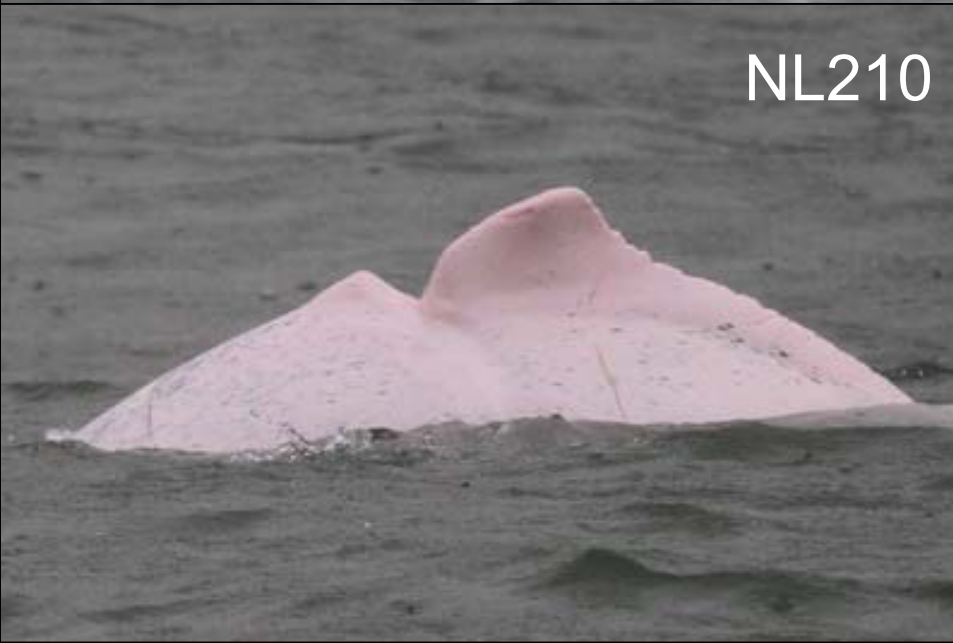
NL123



NL136



NL210



NL247



Appendix IV. (cont'd)



Appendix IV. (cont'd)



Appendix IV. (cont'd)

WL17



WL46



WL61



WL79



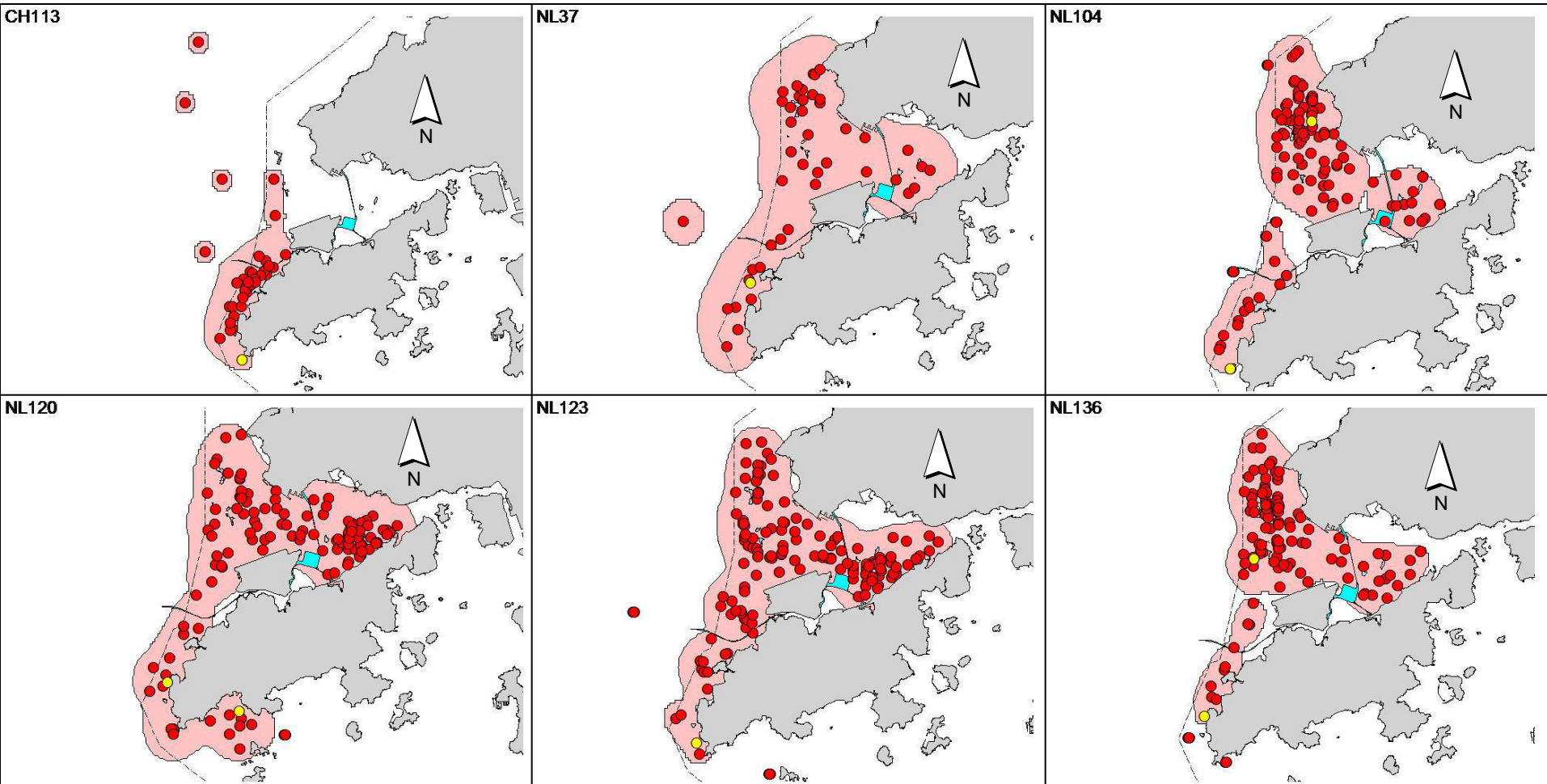
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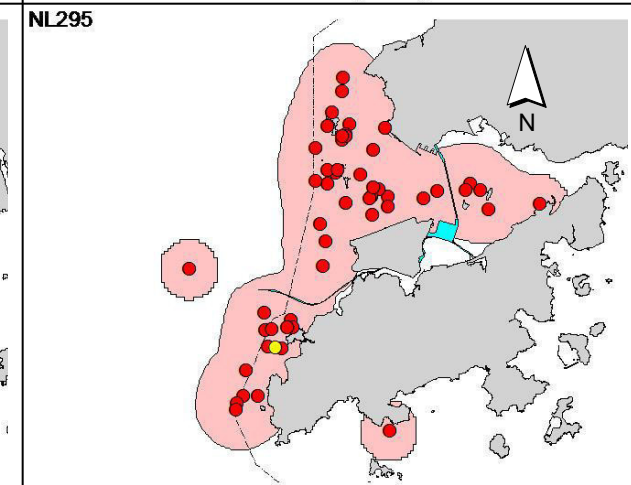
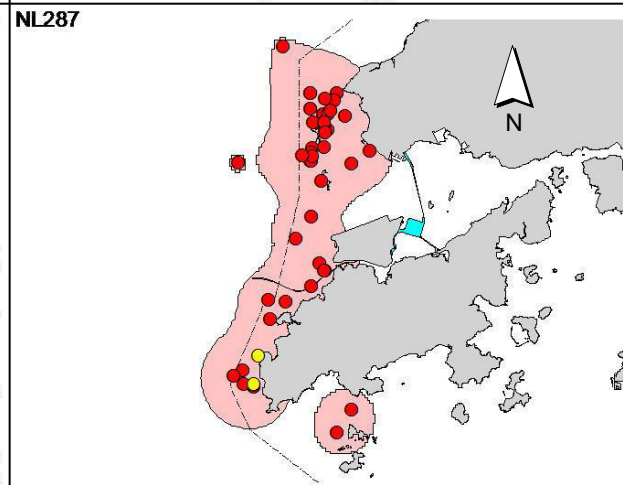
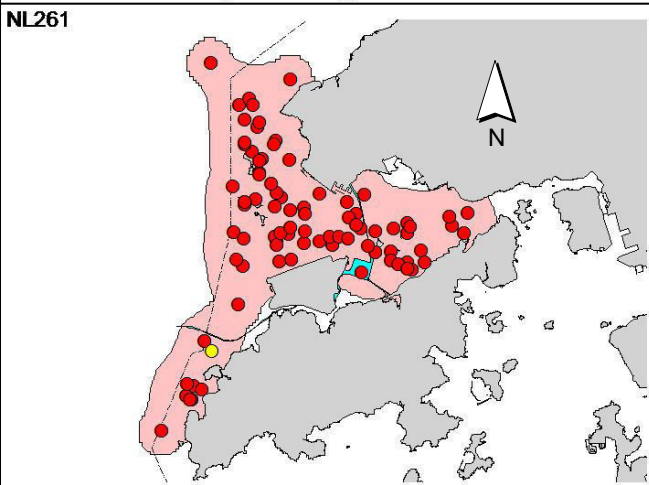
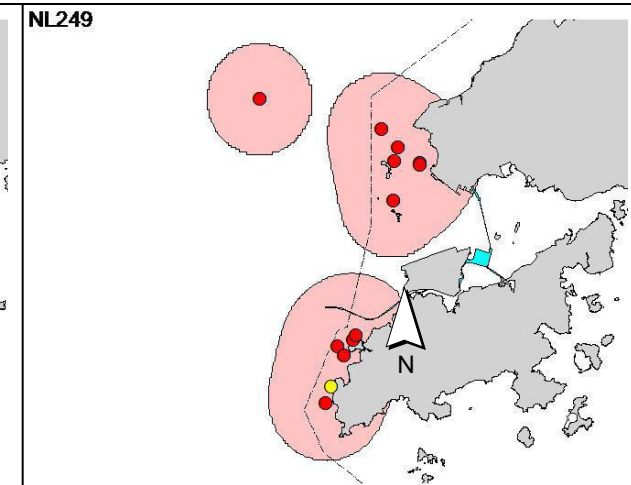
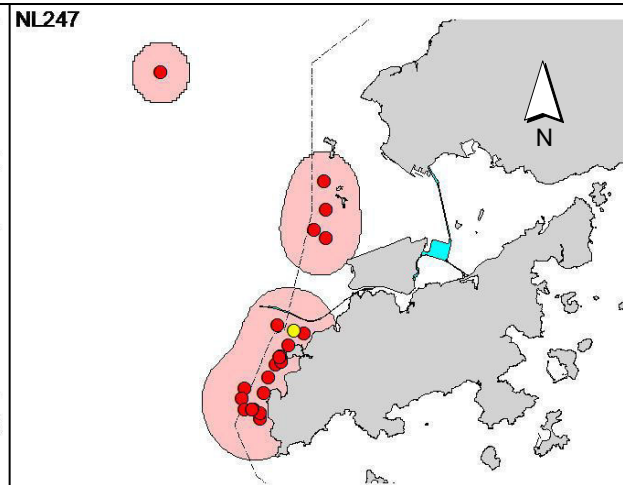
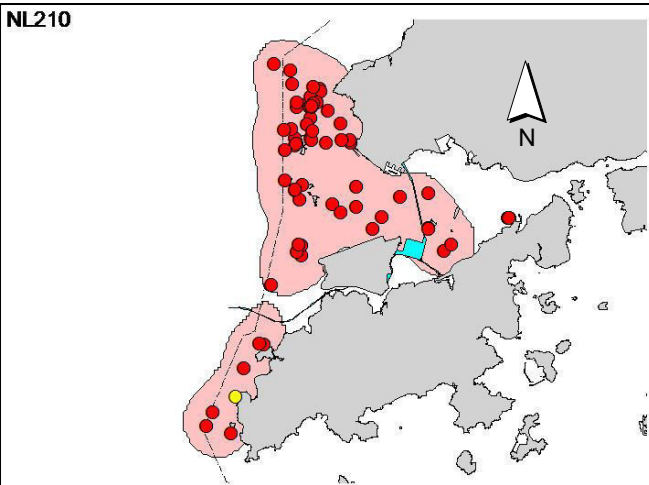
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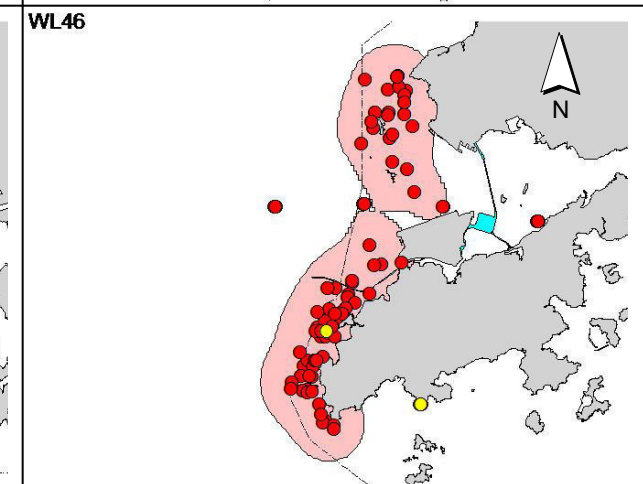
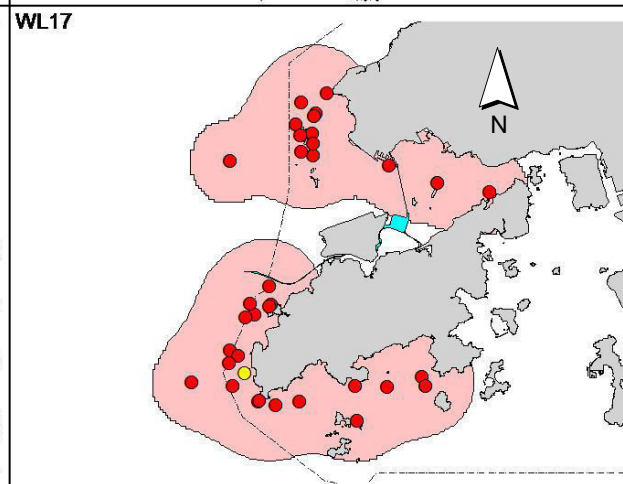
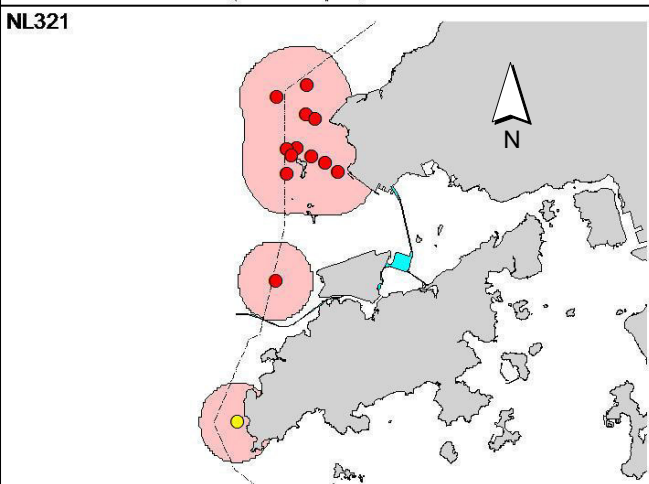
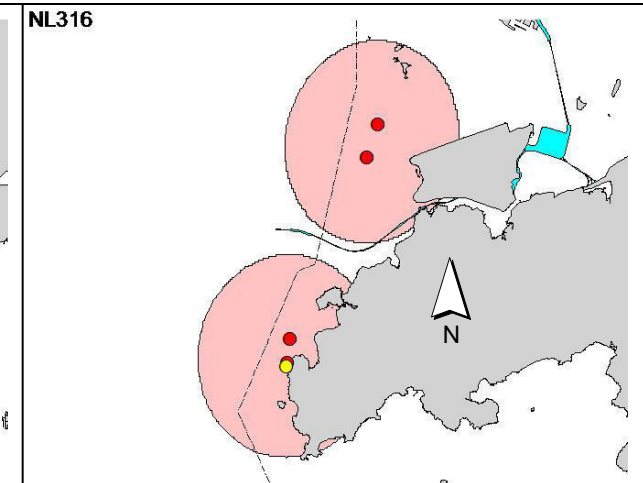
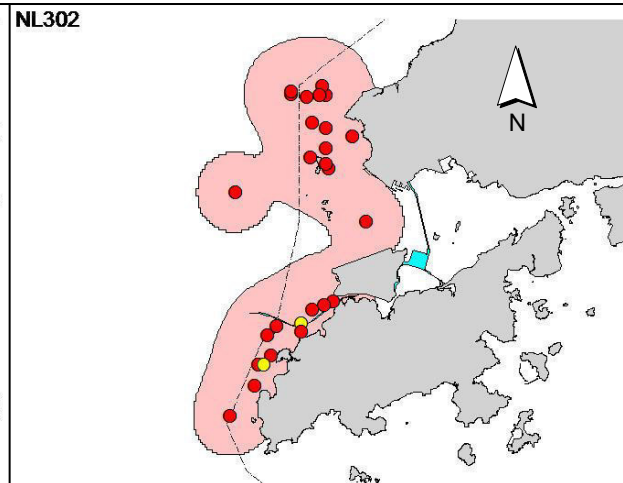
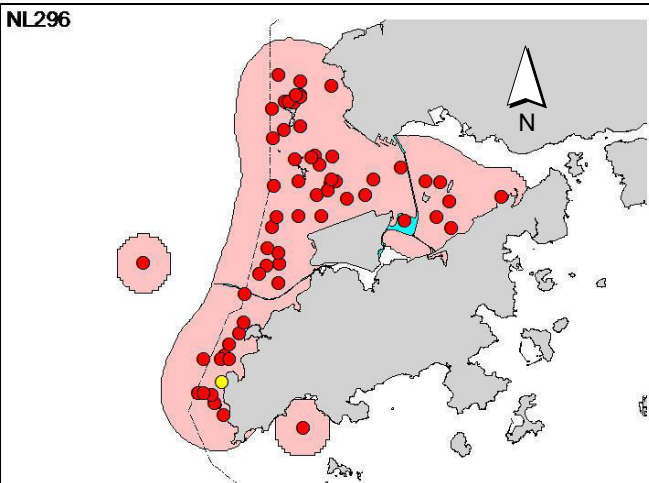
Appendix V. Ranging patterns (95% kernel ranges) of 26 individual dolphins that were sighted during HKLR09 impact phase monitoring period (note: yellow dots indicates sightings made in June – August 2016 during HZMB-related monitoring surveys)



Appendix V. (cont'd)

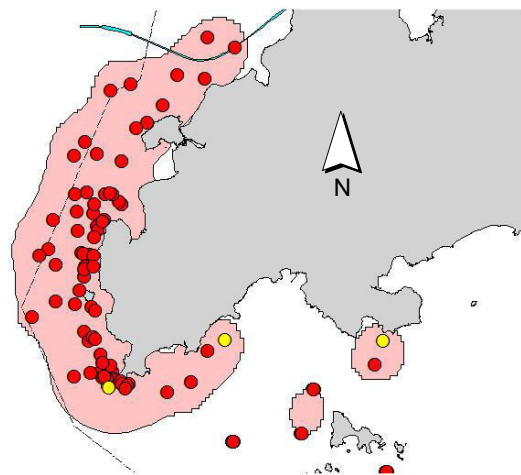


Appendix V. (cont'd)

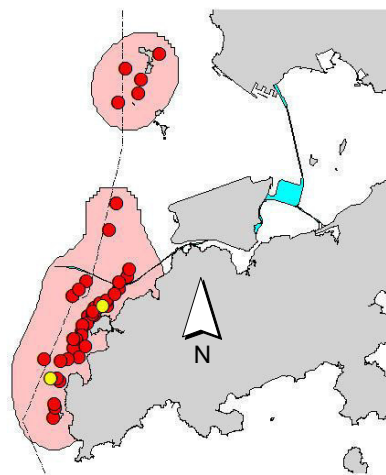


Appendix V. (cont'd)

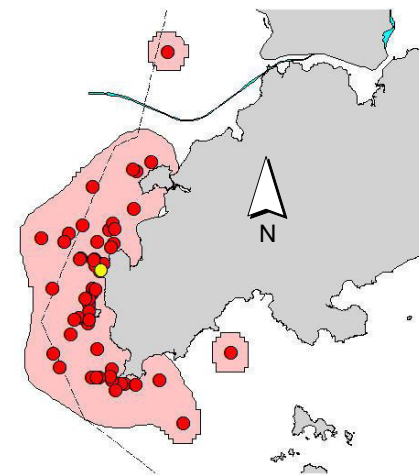
WL61



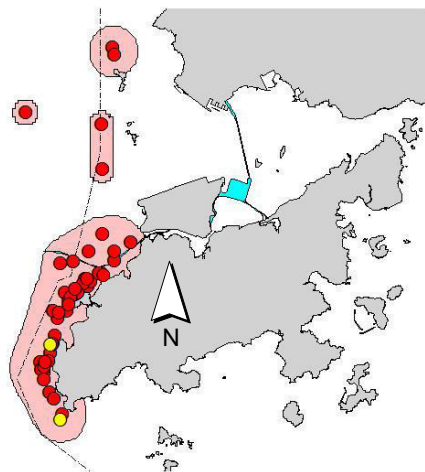
WL79



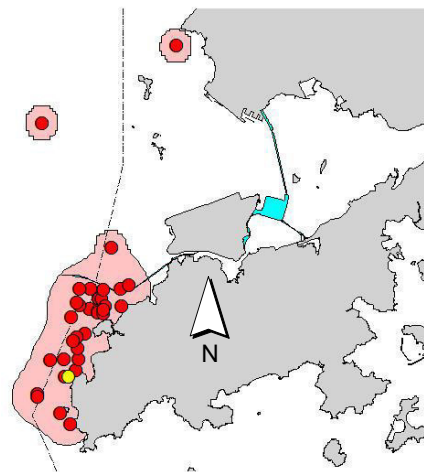
WL118



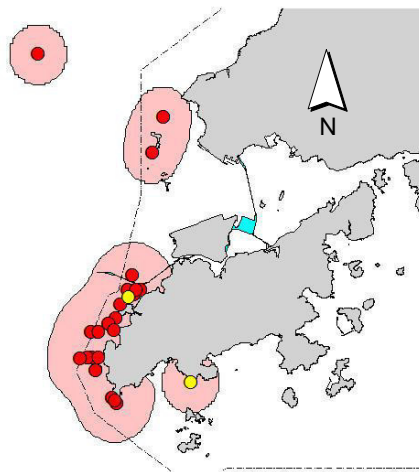
WL124



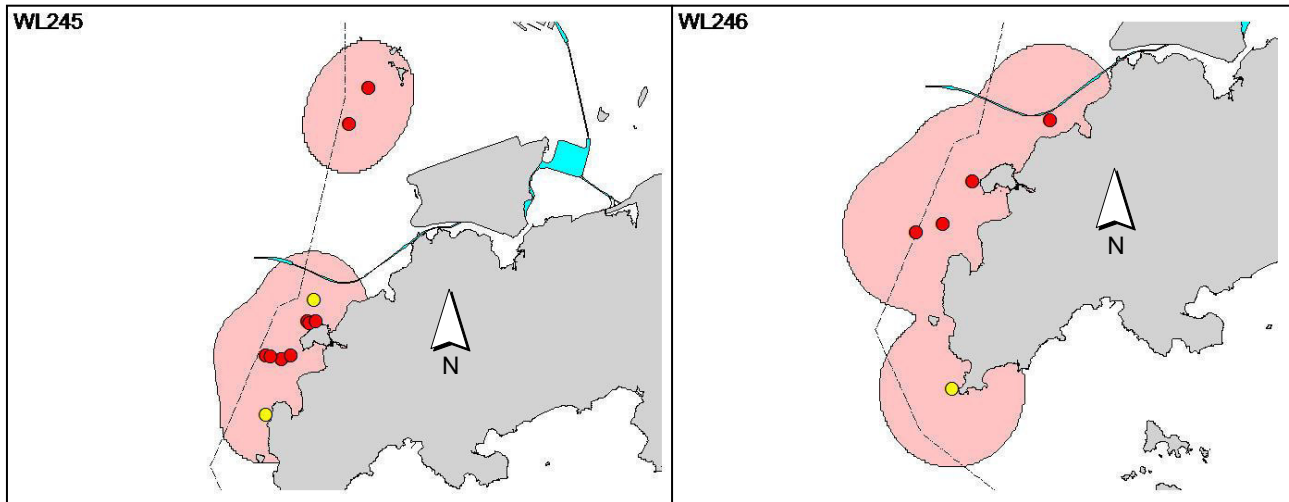
WL193



WL216



Appendix V. (cont'd)



APPENDIX G
EVENT ACTION PLANS

Event / Action Plan for Air Quality

EVENT	ACTION			
	ET	IEC	SO	CONTRACTOR
ACTION LEVEL				
1. Exceedance for one sample	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method. 	<ol style="list-style-type: none"> 1. Notify Contractor. 	<ol style="list-style-type: none"> 1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Identify 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
2.Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Notify 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 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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; 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the SO until the exceedance

	<p>the remedial actions to be taken;</p> <p>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and SO informed of the results;</p> <p>8. If exceedance stops, cease additional monitoring.</p>	<p>remedial measures.</p>	<p>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.</p>	<p>is abated.</p>
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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	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals.
Limit Level	<ol style="list-style-type: none"> 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; 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals;

EVENT	ACTION			
	ET	IEC	SO	CONTRACTOR
	<p>6. Inform IEC, SO and EPD the causes and actions taken for the exceedances;</p> <p>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and SO informed of the results;</p> <p>8. If exceedance stops, cease additional monitoring.</p>	<p>remedial measures.</p>	<p>noise problem;</p> <p>4. Ensure remedial measures properly implemented;</p> <p>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.</p>	<p>4. Resubmit proposals if problem still not under control;</p> <p>5. Stop the relevant portion of works as determined by the SO until the exceedance is abated.</p>

Event and Action Plan for Water Quality

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

Event	ET Leader	IEC	SO	Contractor
				IEC and SO.
Limit level being exceeded by two or more consecutive sampling days	<p>Repeat measurement on next day of exceedance to confirm findings;</p> <p>Identify source(s) of impact;</p> <p>Inform IEC, contractor, SO and EPD;</p> <p>Check monitoring data, all plant, equipment and Contractor's working methods;</p> <p>Discuss mitigation measures with IEC, SO and Contractor;</p> <p>Ensure mitigation measures are implemented;</p>	<p>Check monitoring data submitted by ET and Contractor's working method;</p> <p>Discuss with ET and Contractor on possible remedial actions;</p> <p>Review the Contractor's mitigation measures whenever necessary to assure their effectiveness and advise the SO accordingly;</p> <p>Supervise the implementation of mitigation measures.</p>	<p>Discuss with IEC, ET and Contractor on the proposed mitigation measures;</p> <p>Request Contractor to critically review the working methods;</p> <p>Make agreement on the mitigation measures to be implemented;</p> <p>Ensure mitigation measures are properly implemented;</p> <p>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.</p>	<p>Take immediate action to avoid further exceedance;</p> <p>Submit proposal of mitigation measures to SO within 3 working days of notification and discuss with ET, IEC and SO;</p> <p>Implement the agreed mitigation measures;</p> <p>Resubmit proposals of mitigation measures if problem still not under control;</p> <p>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.</p>

Event Action Plan for Dolphin Monitoring

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

Event	ET Leader	IEC	ER / SOR	Contractor
Limit Level	<ol style="list-style-type: none"> 1. Repeat statistical data analysis to confirm findings. 2. Review all available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&A, to ascertain if differences are as a result of natural variation or previously observed seasonal differences. 3. Identify source(s) of impact. 4. Inform the IEC, ER/SOR and Contractor of findings, 5. Check monitoring data. 6. Repeat reviewing to ensure all the dolphin protective measure are fully and properly implemented and advise on additional measures if necessary. 7. If the ET proves that the source of impact is caused by any of the construction activity by the works contract, the ET to arrange a meeting to discuss with IEC, ER/SOR and Contractor for necessity of additional dolphin monitoring, and/or any other potential mitigation measures (eg, consider to modify the perimeter silt curtain or consider to control/temporarily stop relevant construction activities...etc), and submit to the IEC a proposal of additional dolphin monitoring and/or 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET and Contractor; 2. Discuss monitoring results and findings with the ET and the Contractor; 3. Attend the meeting to discuss with ET, ER/SOR and Contractor the necessity of additional dolphin monitoring and other potential mitigation measures. 4. Review proposals for additional monitoring and any other mitigation measures submitted by ET and Contractor, and advise ER/SOR of the results and findings accordingly. 5. Supervise / Audit the implementation of additional monitoring and/or any other mitigation measures, and advise ER/SOR of the results and findings accordingly. 	<ol style="list-style-type: none"> 1. Attend the meeting to discuss with ET, IEC and Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures. 2. If ER/SOR is satisfied with proposals for additional dolphin monitoring and/or any other mitigation measures submitted by the ET and Contractor and verified by the IEC, ER/SOR to signify the agreement in writing on such proposals and any other mitigation measures. 3. Supervise the implementation of additional monitoring and/or any other mitigation measures. 	<ol style="list-style-type: none"> 1. Inform the ER/SOR and confirm notification of the non-compliance in writing; 2. Attend the meeting to discuss with ET, IEC and ER/SOR the necessity of additional dolphin monitoring and any other potential mitigation measures. 3. Jointly submit with ET to IEC a proposal of additional dolphin monitoring and/or any other mitigation measures when necessary. 4. Implement the agreed additional dolphin monitoring and/or any other mitigation measures.

	mitigation measures where necessary.			
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**APPENDIX H
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: <ul style="list-style-type: none"> • 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	^ ^ ^ ^ *
S5.5.6.2	A2	<ul style="list-style-type: none"> • When there are open excavation and reinstatement works, hoarding 	Good construction site	Contractor	All construction	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
		<p>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;</p> <ul style="list-style-type: none"> • 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 ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides; 	<p>practices to control the dust impact at the nearby sensitive receivers to within the relevant criteria.</p>		sites	stage	<p style="text-align: center;">*</p> <p style="text-align: center;">^</p> <p style="text-align: center;">^</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">^</p> <p style="text-align: center;">^</p>

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
		<p>materials should be carried out in totally enclosed system;</p> <ul style="list-style-type: none"> 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. 	<p>monitoring stations to ensure compliance with relevant criteria throughout the construction period.</p>		monitoring station		<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>
S5.5.2.7	A7	<p>The following mitigation measures should be adopted to prevent fugitive dust emissions at barging point:</p> <ul style="list-style-type: none"> 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	<p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>
Construction Noise (Air borne)							
S6.4.10	N1	1) Use of good site practices to limit noise emissions by considering the	Control construction airborne	Contractor	All construction	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
		<p>following:</p> <ul style="list-style-type: none"> 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. 	noise by means of good site practices		sites	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 sites	Construction stage	^
S6.4.13	N4	4) Select "Quiet plants" which comply with the BS 5228 Part 1 or TM	Reduce the noise levels of	Contractor	For plant items	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
		standards.	plant items		listed in Appendix 6D of the EIA report at all construction sites	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	<u>Construction and Demolition Material</u> The following mitigation measures should be implemented in handling the waste: <ul style="list-style-type: none"> 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 effectively for recycling purpose, where possible; Implement a trip-ticket system for each works contract to ensure that 	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
		<p>the disposal of C&D materials are properly documented and verified; and</p> <ul style="list-style-type: none"> 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 					<p style="text-align: center;">*</p> <p style="text-align: center;">^</p>
S8.3.9 - S8.3.11	WM2	<p><u>C&D Waste</u></p> <ul style="list-style-type: none"> 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 practicable, concrete and masonry can be crushed and used as fill. Steel reinforcement bar can be used by scrap steel mills. Different 	<p>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</p>	Contractor	All construction sites	Construction stage	<p style="text-align: center;">^</p> <p style="text-align: center;">^</p>

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
		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	<u>Sewage</u> <ul style="list-style-type: none"> • 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	<u>General Refuse</u> <ul style="list-style-type: none"> • 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 local collection scheme should be considered by the Contractor. In addition, waste separation facilities for paper, aluminum cans, 	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
		<p>plastic bottles etc., should be provided.</p> <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 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, 	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
		<ul style="list-style-type: none"> • 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. 					<p style="text-align: center;">^</p> <p style="text-align: center;">^</p>
S9.11.1.3	W2	<p><u>Land Works</u></p> <p>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:</p> <ul style="list-style-type: none"> • 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 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 	To control construction water quality	Contractor	During seawall dredging and filling	Construction stage	<p style="text-align: center;">*</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">*</p> <p style="text-align: center;">*</p>

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
		<ul style="list-style-type: none"> • 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. 					<p style="text-align: center;">^</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">*</p> <p style="text-align: center;">^</p> <p style="text-align: center;">*</p> <p style="text-align: center;">^</p>
S9.14	W3	Implement a water quality monitoring programme	Control water quality	Contractor	At identified monitoring location	During construction period	^
Ecology (Construction Phase)							
S10.7	E1	<ul style="list-style-type: none"> • Good site practices to avoid runoff entering woodland habitats in Scenic Hill 	Avoid potential disturbance on habitat of Romer's Tree	Designer; Contractor	Scenic Hill	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
		<ul style="list-style-type: none"> Reinstate works areas in Scenic Hill Avoid stream modification in Scenic Hill 	Frog in Scenic Hill				N/A ^
S10.7	E2	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Dolphin Exclusion Zone; Dolphin watching plan 	Minimize temporary marine habitat loss impact to dolphins	Contractor	Marine works	During marine works	^ ^
S10.7	E7	<ul style="list-style-type: none"> Decouple compressors and other equipment on working vessels Avoidance of percussive piling Marine underwater noise monitoring 	Minimise marine noise impacts on dolphins	Contractor	Marine works	During marine works	^ ^ ^

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
		<ul style="list-style-type: none"> Temporal suspension of drilling bored pile casing in rock during peak dolphin calving season in May and June 					N/A
S10.7	E8	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Reduce re-suspension of sediments Limit dredging and works fronts. Good site practices Strict enforcement of no marine dumping Spill response plan 	Minimise marine water quality impacts	Contractor	Seawall,	During construction	^ ^ ^ ^ ^
Landscape & Visual (Construction Phase)							
S14.3.3.3	LV2	<p>Mitigate both Landscape and Visual Impacts</p> <ul style="list-style-type: none"> G1. Grass-hydroseed bare soil surface and stock pile areas. 	Minimise visual & landscape impact	Contractor	HKLR	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
		<ul style="list-style-type: none"> • 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). 					<p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>
S14.3.3.3	LV3	<p><u>Mitigate Visual Impacts</u></p> <ul style="list-style-type: none"> • 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. 					<p>^</p> <p>^</p>

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
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 I
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

Inspection Information

Checklist Reference Number	160607
Date	7 June 2016 (Tuesday)
Time	9:15 – 11:55

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	A. Water Quality	
	• No environmental deficiency was identified during site inspection.	
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
160607-R03	• Properly check and repair the generator at P47 (deck-surface) to avoid heavy smoke emission.	D19
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
160607-R01	• Clear the accumulated rubbish at P48 (deck-surface).	F1i.
160607-R02	• Clear the construction waste and rubbish at the gully near the grouting plant at P49 (deck-surface).	F1iii.
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 160531), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		7 June 2016
Checked by	Dr. Priscilla Choy		7 June 2016

Hong Kong-Zhuhai-Macao Bridge


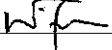
Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	160614
Date	14 June 2016 (Tuesday)
Time	9:00 – 11:45 and 13:30 – 15:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	A. Water Quality	
	• No environmental deficiency was identified during site inspection.	
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
160614-R01	• To provide proper label for chemical containers at Portion C and provide bund for chemical waste storage area to prevent leakage.	F3i.
160614-R02	• To provide a drip tray for oil drum near P109 and label it properly.	F8, 9
160614-R03	• Accumulated general refuse should be disposed of properly near P83.	F1i, Iii, Iiii
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 160607), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		14 June 2016
Checked by	Dr. Priscilla Choy		14 June 2016

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

Inspection Information

Checklist Reference Number	160621
Date	21 June 2016 (Tuesday)
Time	9:30 – 11:50

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	A. Water Quality	
	• No environmental deficiency was identified during site inspection.	
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
160621-R01	• Clear the accumulated wastes at P79.	F11.
160621-R02	• Clear the stagnant water at drip tray to maintain its capacity at P16.	F9
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 160614), follow up action is required for the item 160614-R01.	

	Name	Signature	Date
Recorded by	Ivy Tam		21 June 2016
Checked by	Dr. Priscilla Choy		21 June 2016

Hong Kong-Zhuhai-Macao Bridge



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

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	160628
Date	28 June 2016 (Tuesday)
Time	9:15 – 11:40

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	A. Water Quality	
	• No environmental deficiency was identified during site inspection.	
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
160628-R01	• Clear the rubbish in front of the mobile crane at P68.	F1iii.
160628-R02	• Clear the oil spillage properly at P68.	F8
160628-R03	• Provide proper container and drip tray for temporary storage of chemicals.	F3i. & F9
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 160621), all environmental deficiencies were improved/rectified by contractor during the site inspection. Follow up action is required for the item 160614-R01.	

	Name	Signature	Date
Recorded by	Ivy Tam		28 June 2016
Checked by	Dr. Priscilla Choy		28 June 2016

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

Inspection Information

Checklist Reference Number	160705
Date	5 July 2016 (Tuesday)
Time	9:15 – 11:45 and 13:30 – 16:15

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	
160705-R04	• To properly provide wheel washing facility at exit S8.	D9
	E. Noise	
	• No environmental deficiency was identified during site inspection.	
	F. Waste / Chemical Management	
160705-R01	• To clear the accumulated waste material at P57.	F1iii.
160705-R02	• To properly repair the waste skip at entrance of Portion C.	F1iii.
160705-R03	• To improve the bunding at the chemical storage area of Portion C.	F8
	G. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	H. Others	
	• Follow-up on previous site audit session (Ref. No. 160628), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		5 July 2016
Checked by	Dr. Priscilla Choy		5 July 2016

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

Inspection Information

Checklist Reference Number	160712
Date	12 July 2016 (Tuesday)
Time	13:30 – 15:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	B. Water Quality	
160712-R02	• Clear the mud trails and provide wheel-wash to vehicles using site exit (S8).	B9
	C. Ecology	
	• No environmental deficiency was identified during site inspection.	
	D. Air Quality	
160712-R02	• Clear the mud trails and provide wheel-wash to vehicles using site exit (S8).	D3 & D9
	E. Noise	
	• No environmental deficiency was identified during site inspection.	
	F. Waste / Chemical Management	
160712-R01	• Clear the rubbish at the planter area at P107 (Portion A).	F1iii.
	G. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	H. Others	
	• Follow-up on previous site audit session (Ref. No. 160705), follow up action is required for the item 160705-R04.	

	Name	Signature	Date
Recorded by	Ivy Tam		12 July 2016
Checked by	Dr. Priscilla Choy		12 July 2016

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

Inspection Information

Checklist Reference Number	160719
Date	19 July 2016 (Tuesday)
Time	13:30 – 15:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	B. Water Quality	
160719-R02	• Clear the handrail within the silt curtain at P89.	B21
160719-R03	• Clear the floating rubbish which enter to the site through the gap of silt curtain at between P83 and P84. The silt curtain should also be repaired to avoid the gap accordingly.	B21 & B25
	C. Ecology	
	• No environmental deficiency was identified during site inspection.	
	D. Air Quality	
	•	
	E. Noise	
	• No environmental deficiency was identified during site inspection.	
	F. Waste / Chemical Management	
160719-R01	• Clear the accumulated rubbish at near PI08 (Portion C).	F1. & F1iii.
	G. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	H. Others	
	• Follow-up on previous site audit session (Ref. No. 160712), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		19 July 2016
Checked by	Dr. Priscilla Choy		19 July 2016

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge

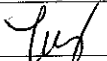
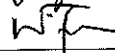
Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	160726
Date	26 July 2016 (Tuesday)
Time	9:30 – 12:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	B. Water Quality	
160726-R01	<ul style="list-style-type: none">Properly collect the concrete wash water for further treatment at P79 to avoid leaking to the sea.	B3i.
	C. Ecology	
	<ul style="list-style-type: none">No environmental deficiency was identified during site inspection.	
	D. Air Quality	
160726-R03	<ul style="list-style-type: none">Properly display the proper label of NRMM for the forklift at P72.	D26
	E. Noise	
	<ul style="list-style-type: none">No environmental deficiency was identified during site inspection.	
	F. Waste / Chemical Management	
160726-R02	<ul style="list-style-type: none">To seal the hole / close the valve of the drip tray at P72.	F9
	G. Permits/Licences	
	<ul style="list-style-type: none">No environmental deficiency was identified during site inspection.	
	H. Others	
	<ul style="list-style-type: none">Follow-up on previous site audit session (Ref. No. 160719), all environmental deficiencies were improved/rectified by contractor during the site inspection.	


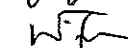
	Name	Signature	Date
Recorded by	Ivy Tam		26 July 2016
Checked by	Dr. Priscilla Choy		26 July 2016

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	160803
Date	3 August 2016 (Wednesday)
Time	9:30 – 11:45

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	B. Water Quality	
160803-O01	<ul style="list-style-type: none"> Muddy water was observed discharge from site to the gullies during heavy rainstorm at P114. The Contractor was reminded to enhance the water quality mitigation measures (e.g. direct muddy water to appropriate sedimentation facilities, adequate maintenance of drainage, earth bunds or sand bag barriers to protect the gullies) to avoid flooding and untreated site runoff entering the public drainage directly. 	B1, B3i, B4, B6, B11i, B16
160803-R02	<ul style="list-style-type: none"> Clear the floating rubbish within the site curtain after the typhoon at Portion A. 	B21
160803-R03	<ul style="list-style-type: none"> Provide earth bunds or sand bag barrier at the site boundary at P101 to prevent the site runoff discharging to the sea. 	B16
	C. Ecology	
	<ul style="list-style-type: none"> No environmental deficiency was identified during site inspection. 	
	D. Air Quality	
	<ul style="list-style-type: none"> No environmental deficiency was identified during site inspection. 	
	E. Noise	
	<ul style="list-style-type: none"> No environmental deficiency was identified during site inspection. 	
	F. Waste / Chemical Management	
	<ul style="list-style-type: none"> No environmental deficiency was identified during site inspection. 	
	G. Permits/Licences	
	<ul style="list-style-type: none"> No environmental deficiency was identified during site inspection. 	
	H. Others	
	<ul style="list-style-type: none"> Follow-up on previous site audit session (Ref. No. 160726), all environmental deficiencies were improved/rectified by contractor during the site inspection. 	

	Name	Signature	Date
Recorded by	Ivy Tam		3 August 2016
Checked by	Dr. Priscilla Choy		3 August 2016

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge

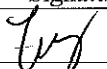

Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	160809
Date	9 August 2016 (Tuesday)
Time	9:15 – 11:00 and 13:30 – 15:30

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	
160809-R01	• To maintain a good house-keeping at works area of P77.	F7
160809-R02	• To clear the wastewater properly as chemical waste at the skip at P77.	F2i, 2ii
160809-R03	• To properly repair the drip tray at Portion A.	F9
	G. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	H. Others	
	• Follow-up on previous site audit session (Ref. No. 160803), follow up action is required for the item 160803-R02.	

	Name	Signature	Date
Recorded by	Ivy Tam		9 August 2016
Checked by	Dr. Priscilla Choy		9 August 2016

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge


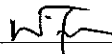
Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	160816
Date	16 August 2016 (Tuesday)
Time	9:15 – 11:00 and 13:30 – 16:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	B. Water Quality	
160816-R03	• To repair the damaged silt curtain near P68.	B25
	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	
160816-R01	• To properly repair the drip tray near P83 and clear the oil stain.	F8 & F9
160816-R02	• To clear the waste materials floating within the silt curtain near P91.	F4ii
160816-R04	• To clear the accumulated waste material near P68.	F1iii
	G. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	H. Others	
	• Follow-up on previous site audit session (Ref. No. 160809), follow up action is required for the item(s) 160809-R03 and 160803-R02.	

	Name	Signature	Date
Recorded by	Ivy Tam		16 August 2016
Checked by	Dr. Priscilla Choy		16 August 2016

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge


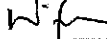
Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	160823
Date	23 August 2016 (Tuesday)
Time	9:30 – 12:00

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	
160823-R01	• Clear the accumulated waste materials at the waste skip at P58.	F1i.
160823-R02	• To close the opening of drip tray for the generator at P71.	F9
	G. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	H. Others	
	• Follow-up on previous site audit session (Ref. No. 160816), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		23 August 2016
Checked by	Dr. Priscilla Choy		23 August 2016

Contract HY/2011/09

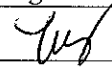

Hong Kong-Zhuhai-Macao Bridge

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

Weekly Site Inspection Record Summary
Inspection Information

Checklist Reference Number	160830
Date	30 August 2016 (Tuesday)
Time	9:15 – 11:30 and 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	
160830-R01	• To provide a drip tray for oil drums and label it properly at P60 and LF3.	F8 & F9
160830-R02	• To properly store the chemical containers or remove it near P60.	F2i
160830-R03	• Chemical material should be properly stored in chemical storage area at Portion C.	F2i
160830-R04	• Waste water should be cleared from waste skip near P83.	F1i & F1iii
	G. Permits/Licences • No environmental deficiency was identified during site inspection.	
	H. Others • Follow-up on previous site audit session (Ref. No. 160823), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		30 August 2016
Checked by	Dr. Priscilla Choy		30 August 2016

**APPENDIX J
WASTE GENERATION IN THE
REPORTING PERIOD**



Appendix: C6 Monthly Summary Waste Flow Table

Name of Department: HyD

Contract No.: HY/2011/09

Monthly Summary Waste Flow Table for 2016 (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	1.095	0.000	0.000	0.000	0.283	0.812	0.020	1.145	0.000	0.000	0.241
Feb	0.209	0.000	0.000	0.000	0.209	0.000	0.113	0.811	0.000	4.099	0.241
Mar	0.388	0.000	0.086	0.000	0.302	0.000	0.023	1.201	0.000	1.387	0.260
Apr	2.094	0.000	0.286	1.512	0.297	0.000	0.131	0.818	0.000	0.000	0.208
May	4.436	0.000	0.000	3.982	0.454	0.000	0.078	0.917	0.000	1.586	0.189
Jun	6.100	0.000	0.000	5.777	0.322	0.000	0.025	0.626	0.000	2.973	0.202
Sub-Total	14.323	0.000	0.372	11.270	1.869	0.812	0.390	5.518	0.000	10.045	1.339
Jul	0.431	0.000	0.000	0.122	0.310	0.000	0.062	0.626	0.000	0.991	0.189
Aug	1.366	0.000	1.103	0.000	0.262	0.000	0.111	0.936	0.000	2.775	0.195
Sep											
Oct											
Nov											
Dec											
Total	16.120	0.000	1.475	11.392	2.441	0.812	0.564	7.080	0.000	13.811	1.723



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)
231.111	0.000	5.000	73.111	100.000	53.000	5.000	40.000	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 m³. (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/m³ and 1.8 tonnes/m³ respectively.
- (7) Assuming the loading quantities of a 30-tonne truck and a 24-tonne truck are 8.0m³ and 6.5m³ respectively.
- (8) The forecast of C&D materials to be generated from the Contract is sourced from the works program in May 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/m³.
- (11) The C&D materials were delivered to TM-CLKL Project.

APPENDIX K
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)	3	0	0	0
	Turbidity	0	0	0	0
	Suspended Solids (SS)	0	0	0	0

**(D) Exceedance Report for Line-transect Vessel Surveys
(NIL in the reporting period)**

**APPENDIX L
COMPLAINT LOG**

Appendix L - 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 (around 8:45a.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:- <ul style="list-style-type: none"> •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
			<p>April 2013 (Com-2013-04-001).</p> <p>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.</p>	<p>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:</p> <ul style="list-style-type: none"> • 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 17 th 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
			<p>operation of concrete lorry mixers during evening and night-time period at Southeast Quay of Chek Lap Kok.</p>	<p>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.</p> <p>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.</p> <p>On 30 July 2013, no tug boat and concrete lorry mixers were observed during the inspection.</p> <p>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.</p> <p>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</p>	

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				<p>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.</p> <p>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.</p>	
Com-2013-11-001	Chek Lap Kok (CLK) South Road	16 November 2013	The complaint was received by project customer services on 16 th November 2013 regarding the dust problem at Chek Lap Kok (CLK) South Road.	<p>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:-</p> <ul style="list-style-type: none"> • 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
				<p>at every site exit at CLK South Road and South Perimeter Road.</p> <ul style="list-style-type: none"> No dark smoke was observed emitting from the plant equipments. <p>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.</p>	
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 3 rd 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.	<p>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.</p> <p>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.</p> <p>Nevertheless, the Contractor was advised to strictly follow the conditions of the permit because any deviation from the</p>	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				<p>conditions may lead to cancellation of the permit, subsequent prosecution action and the Authority’s refusal to issue further permit.</p> <p>In addition, the following environmental mitigation measures were recommended:</p> <ul style="list-style-type: none"> • 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
				<p>mitigation measures.</p> <p>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):-</p> <ol style="list-style-type: none"> 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: <ul style="list-style-type: none"> • 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 1 st investigation report has been submitted to EPD on 21 March 2014 and the 2 nd 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
				<p>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:</p> <ul style="list-style-type: none"> · 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)	<p>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.</p> <p>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.</p> <p>In regard to the complaint, the following recommendations were made:</p>	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				<ul style="list-style-type: none"> ➤ In case stranded cetaceans are found, the AFCD shall be contacted immediately and provide the following information to facilitate AFCD’s investigation: <ol style="list-style-type: none"> 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.	<p>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.</p> <p>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.</p>	
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.	<p>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.</p> <p>EPD and AFCD provided their comments on 5 and 9 June 2014 respectively.</p> <p>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.</p>	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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • To maintain the surface of ro-ro-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 ro-ro-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 ro-ro barge and marine littering were suspected. The following recommendations were made: <ul style="list-style-type: none"> ➤ 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 ro-ro barge to prevent these removed materials from getting into the sea. 	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	The worker should also pay special care to remove the concrete stains to	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 ro-ro 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. <ul style="list-style-type: none"> ➤ Keep cleanliness of the surface of ro-ro-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 ro-ro-barge. ➤ Provide spare and sufficient sand bags at each ro-ro 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
			<p>east side had disturbed the seabed causing an increase of turbidity in marine waters at around noon of 15 November 2014.</p>	<p>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.</p> <p>3) No illegally discharge of wastewater or domestic wastewater to the sea from FCBP.</p> <p>4) Relevant environmental mitigation measures as shown in EP-352/2009/C were properly implemented.</p> <p>5) No deterioration of marine water quality based on the marine water quality monitoring results on 15 November 2014.</p> <p>Nevertheless, DCVJV was also recommended the mitigation measures as below:</p> <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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:- <ul style="list-style-type: none"> • 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
			<i>be loading or unloading a boat at the pier. Noise was still going on right now at 20:04.”</i>	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.	<p>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.</p> <p>Nevertheless, DCVJV was also recommended the mitigation measures as below:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>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).</p> <p>The Contractor was reminded to obtain Construction Noise Permit (CNP) for PME use in restricted hours.</p> <p>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:-</p> <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • To deploy professional personnel to supervise the works. 	

**APPENDIX M
SUMMARY OF SUCCESSFUL
PROSECUTION**

Appendix M - 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.